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PROPOSED CLEANUP ACTIONS FOR REMEDIATION OF
HANFORD'S 300 AREA
(along the Columbia River)

MEETING

HELD ON
WEDNESDAY, JULY 31, 2013
6:00 P.M.

UNIVERSITY HEIGHTS CENTER
SEATTLE, WASHINGTON



NaegeliUSA.com

MEETING**HELD ON****WEDNESDAY, JULY 31, 2013****6:00 P.M.**

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6 **DIETER BOHRMANN:** We are right at seven o'clock so
7 let's get rolling. I want to welcome everybody to tonight's
8 meeting on Hanford's 300 Area. I appreciate everybody
9 coming out tonight. The focus of tonight's meeting is going
10 to be a proposed plan to clean up soil and groundwater in
11 the 300 Area, which is in the southeastern corner of the
12 Hanford site and hopefully you were able to get a chance to
13 look at some of the posters here. And if not feel free to
14 do that. We encourage you to do that. I will say that the
15 300 Area tastes great. If you haven't had a piece of cake
16 yet I encourage you to do that.

17 My name is Dieter Bohrmann and I do work for the
18 Washington Department of Ecology but I'm wearing my
19 facilitator hat tonight so that is the role I'm going to
20 play and regulatory questions will be directed to the
21 Environmental Protection Agency.

22 Let me just run down the agenda and then we can
23 start with our first speaker. We're going to start with JD
24 Dowell, an introduction of the Hanford site. He's the
25 assistant manager for Richland Operations Office for the

1 U.S. Department of Energy. JD will then turn it over to
2 Mike Thompson, also with Department of Energy. And that
3 will be followed by Larry Gadbois with the EPA. And then
4 Liz Mattson who is representing Hanford Challenge will share
5 with us a local perspective. And that will be followed by
6 Ryan Strong who is with Heart of America Northwest. So they
7 are going to co-present on the local perspective.

8 And at about 7:30 we're going to go into a
9 question and answer session so that will be an opportunity
10 to continue the back and forth that we just had here with
11 Jerry and Tom and some others and your opportunity to talk
12 to the agencies and have some of your questions answered
13 about what's in this proposed plan and what are the remedies
14 that are being considered here. And after that we will go
15 into the final part of our meeting which will be the formal
16 comment period. So the difference between the Q and A
17 session and the formal comment period is that those comments
18 will be stated for the record. The meeting is being
19 recorded here and there will be a transcript available on
20 the Department of Energy website at some point following the
21 meeting here.

22 So during formal comment period opportunity the
23 agencies will not be able to respond at that time so please
24 ask your questions during the Q and A period. So during the
25 formal comment the agencies will respond in the comment

1 response document after the comment period has ended. So we
2 won't be responding tonight, at tonight's meeting.

3 If you would like to provide written comments you
4 may also do that on the back of your agenda here. You can
5 turn those in at the end of the meeting or at another time.
6 And of course this is not the last opportunity you will have
7 to comment. The comment period is running through September
8 16th so you may e-mail or mail your comments in up until
9 that date.

10 I think that covers the bulk of it. We also
11 encourage if you have an opportunity we always like to know
12 how we're doing and how these public meetings are working
13 and how they can be improved. So if you could fill out one
14 of these evaluation sheets for us that would be much
15 appreciated. If you haven't had a chance to get one yet
16 they are right up on the front table here. So we'll remind
17 folks again at the end but really we appreciate your
18 feedback on this.

19 So without further ado I think we'll turn it over
20 to JD Dowell here to open the meeting.

21 **JD DOWELL:** Thank you. Good afternoon or good
22 evening everybody. I'm going to turn this off. I think you
23 will be able to hear me. Can everybody hear me? Great,
24 great.

25 Good evening and thank you for coming. Thanks to

1 Heart America and Hanford Challenge and the general public
2 that showed up here. It's really important that we get this
3 opportunity to give you some exposure to the decision making
4 on these kinds of decisions. You know, our perspective, my
5 perspective has always been as a federal employee that I'm
6 working for you. You're the tax payer. You are our primary
7 interest. We're trying to protect the public and we're here
8 to listen to you. We do have a short brief. We try to make
9 it by 7:30. It's going to be challenging to do that. We
10 did this last night in Richland and it took a little longer
11 than that. And I want to make sure we take the time so that
12 we -- because it is fairly detailed when Mike gets into his
13 part of the brief to make sure you have all the insight. And
14 we really encourage the questions. This is really exciting
15 to us because this is the opportunity to see if we've got
16 holes in our plan and this is a great group to do that with.
17 So this should be an interesting night and hopefully we can
18 answer your questions or take up look-ups if we can't answer
19 them here.

20 So I would like to introduce a couple of other
21 people. Sonya Johnson and Kim Ballinger are also some of
22 the folks in the background. They're kind of the comment
23 outreach-type folks that brought in all these placards and
24 things like that, prepared the space. Thank you for that.
25 Bruce Cord is also part of our team. Jim Hanson is another.

1 Dr. Jim Hanson is a biologist and our risk manager. He's
2 part of our team. We've got Kathleen McKee here who is the
3 stenographer. She's recording this whole thing so you will
4 have a record if you need to come back to it. And Dave is
5 the sound man back there in the corner. We can't see Dave
6 but thank you for that.

7 This is our second public hearing of three. We
8 have another public hearing in Hood River next week. It's
9 on Thursday, the 8th of August. So if you have friends down
10 there, get the word out. We'd love to see them come out to
11 it.

12 So I just want to do kind of a Hanford cleanup
13 overview. I think this group is pretty well educated on
14 this. You have a fairly good background of materials about
15 the history of Hanford. Forty-seven years of operations.
16 Greater than 450 billion gallons of liquids discharged
17 throughout the site in the history of those operations in
18 this large 586-square-mile site. Tonight we're really
19 focused on the River Corridor but before I get there there's
20 two offices that operate the River Plateau. It's fairly
21 simple. And if you look at this we're talking about this
22 blue area right here. That's Central Plateau. And then
23 this green outline here is the River Corridor. So those are
24 the two functional areas or primary areas of operation for
25 Richland Operations through the history of Hanford site. And

1 we're going to focus on the River Corridor and one part of
2 the River Corridor tonight.

3 So there are two operational offices. The
4 Richland Office, which is where we're from, are responsible
5 for the three dimensions of waste in the River Corridor and
6 Central Plateau. And what's excluded is really how you
7 remember the Office of River Protection. The Office of
8 River Protection is there to manage and process and
9 remediate the tank waste. So tanks and the waste treatment
10 is the other office. Pretty simple boundary.

11 For Richland cleanup work, like I said the three
12 dimensions that you could think of are facilities, waste
13 sites. We actually do clean air permits with the state.
14 We've got the deep vadose zone and groundwater. We'll talk
15 to that a little bit in a second. So hopefully that's
16 fairly straightforward.

17 Just because we're talking about a final record of
18 decision, we say "final." The reason we say that is because
19 we're operating under interim cleanup actions right now.
20 Those were designed in the nineties so that we could get
21 started with the cleanup, start actually initiating some
22 remediation. They were done to very conservative measures.
23 We'll talk to those tonight. We're about 88 percent
24 complete with the cleanup along the River Corridor right
25 now. And the River Corridor is that 220-square-mile area

1 highlighted in green that includes the nine reactors and the
2 300 Area that make up that portion of the Hanford site. So
3 again, if I'm going too fast forgive me but we've got to get
4 through this.

5 Now, I talked about 88 percent complete. There
6 are going to be groundwater operations and progress, pumping
7 treatment operations on the River Corridor that are not part
8 of what we're talking about from a standpoint of the final
9 remediation in this ROD. There's also ISS reactors. All of
10 the reactors are on ISS. The cores and hot stuff has been
11 removed but the shells remain because we want them to be
12 paved so we can have greater worker safety to go in and
13 remove those facilities in about 70 years. That's the
14 current plan.

15 The 300 Area is roughly right there when you look
16 at this map or this chart. And Richland butts up to the
17 bottom of the 300 Area. North Richland is right to the
18 south of that. So this is probably the closest area to the
19 city.

20 When you look at the six major cleanup decisions
21 that we'll be making over the next five or so years you can
22 see their broken down by reactor areas. They're fairly
23 similar but they have different constituents of concern. And
24 we'll be talking to the ones again on the 300 Area
25 specifically. 300 Area, that's primarily a fabrication and

1 laboratory area. We put through about 20 million pieces of
2 reactor fuel rods of uranium that were potentially
3 irradiated to make plutonium. So a lot of material came
4 through here, a lot of waste, and you'll know all about that
5 by the end of the night.

6 Real quickly, the CERCLA process. Comprehensive
7 Environmental Response, Compensation, and Liability Act of
8 1980. This process is what we're basically following
9 tonight. When we go into a site inspection we determine
10 areas or operating units where we determine if there's going
11 to be a remediation action. We coordinate that with the EPA
12 and Ecology under the Tri-Party Agreement. And then we use
13 this process to analyze, scope, determine the risk, and then
14 develop a remediation plan to which we bring to the public,
15 which is what we're doing tonight. So that's what this
16 does. Remedial Investigation and Feasibility Studies, RIFS.
17 A very thick document. That's got a lot of the materials,
18 the studies of the levels of constituents of concern or
19 COCs. That's an important document. And that leads us into
20 making a proposed plan for what we're going to do and a
21 various number of alternatives that you'll talk to tonight
22 and hear.

23 For what we're actually going to try and do we
24 select one of those as the best one and that's what we're
25 here to defend. That's what we're here to do is examine

1 that, demonstrate it to you, and for you to ask us the hard
2 questions. So we're here at the record of decision. And
3 this is the point where we're making -- addressing public
4 comments. So we're going to take your questions and do
5 question and answer tonight, as well as comments. And then
6 those comments become part of the formal document when we
7 publish it. And then it goes into the remedial action which
8 means after we've made a record of decision, we've decided
9 what we're going to do, we develop a work plan and then we
10 execute that work plan. Typically that's done in about six
11 months after a decision is made.

12 That's not it. We have a feedback process. Every
13 five years these decisions are evaluated for remedy
14 effectiveness. Remedy effectiveness. It doesn't mean we go
15 out and reevaluate the whole site. We just evaluate the
16 remedy to determine to the effectiveness that we are trying
17 to target. Very important concept to understand that.

18 This is also important. There's a placard back
19 there. I'm going to whip through this because you're
20 probably familiar with it. This is the threshold,
21 balancing, and modifying criteria. There's nine criteria we
22 use for CERCLA when we look at these decisions. So they're
23 not over-focused on budget. A lot of people say oh, you're
24 just doing it because it costs less. That's one element.
25 Another element I would suggest to you is community

1 acceptance. We take that very seriously at the Department
2 of Energy and the EPA and Ecology. That's why we're out
3 here. That's what this is designed to do, get those inputs.
4 But I'm not going to go through all nine of these. They're
5 back there on the placard. If you're interested you can see
6 those there.

7 And lastly, the four areas of protection. This
8 will kind of give you the way that we look at the
9 constituents of concern, how we evaluate that risk, and what
10 those risk paths can be to human health and the environment.
11 So there's direct contact at the surface. Think of like a
12 trench or surface land use, picking flowers, growing things,
13 stuff like that. There's the groundwater protection to
14 human health, which is here is the deep vadose zone.
15 Anything that can trickle down and filtrate through the
16 soils to the groundwater. There's the groundwater use
17 itself for human health. So cleaning up this water to the
18 best use, the best practical use, which in this case is
19 drinking water standards, is our target for the River
20 Corridor. And lastly surface water. And that's for human
21 health and the eco effects. And that would be water like in
22 the river. So when this trickles into the river we evaluate
23 that as surface water effect as well. Think of those four
24 dimensions and that's how those remedies are developed
25 because we have to think of all four of those areas.

1 So lastly you can find out more on our website.
2 I'm not going to go into that. We really do take this
3 seriously. I think this is the best part of the process and
4 we're here to learn. We're on your team. We're not the
5 ones who made the mess. We're the ones that are here to
6 clean it up. So we want to do that hand in hand with a
7 partnership with our community. So thank you very much for
8 your attendance. I'm going to turn it over to Mike.

9 **MIKE THOMPSON:** Good evening. I'm going to use
10 the mic because last night my friend over there said I
11 needed to use the mic for her to hear me when I walk around
12 and talk to you. So she can hear me I'm going to use it
13 tonight.

14 My name is Mike Thompson. By education and
15 training and experience I'm a geologist, hydrogeologist.
16 I've got degrees in geology and watershed management.
17 Licensed to practice both geology and hydrology in the state
18 of Washington. I've been working at Hanford for about 30
19 years, from the beginning of the cleanup. A number of
20 different jobs there from Tri-Party Agreement manager to
21 branch environmental restoration, groundwater technologist,
22 to division director and all sorts of jobs. And before that
23 I worked for a short stint with for example Energy Northwest
24 licensing the power plant. And before that I worked for My
25 Land Reclamation. And before that in exploration for oil.

1 So that's my background.

2 Let's talk a little bit about what we're here for
3 tonight. The 300 Area, just to kind of put it in
4 perspective for you -- I wish I had three arms. The 300
5 Area is just north of the city of Richland. The city of
6 Richland is where I live. I get my drinking water, my
7 family's drinking water, and up until tomorrow my
8 grandchildren's drinking water. They're moving to Virginia.
9 I live up in Richland. I get my drinking water from a
10 facility that's right about here. This is the Columbia
11 River. It flows by at an average of 115,000 cubic feet per
12 second. And frankly it's the reason why I live in the Tri-
13 Cities. I like to do things on the river. I'm a very avid
14 fisherman. I like to duck hunt and those sorts of things.
15 The city of Richland goes right about up to here. This is
16 the dock where barges come in where submarine reactor
17 compartments are offloaded and then dragged about at a
18 walking pace up through here and then up to the 200 Area
19 plateau. This is the core industrial zone of the 300 Area.

20 There's been a lot of discussion earlier tonight
21 about cleanup standards. This area here within these city
22 streets within the area that has been industrialized will be
23 still industrial area because of Pacific Northwest National
24 Laboratory is retaining facilities out there. And the
25 Department of Energy intends to reindustrialize this area.

1 This is the only part, and the 618-11 site up here, just a
2 few acres, this is the only part that we're proposing to
3 clean up to industrial standards. All the rest of it will
4 be cleaned up to standards that would suit residential
5 exposures. So industrial standards is only this industrial
6 area where the dirt is now. The 300 Area is a pretty good-
7 sized block of the Hanford site. It runs all the way from
8 the city of Richland all the way up past the commercial
9 reactor site up here.

10 Our overview of organization tonight, what I hope
11 to do in terms of organization is talk about the location
12 nature, and extent. What are the risks driving contaminants
13 of concern. In other words what are the contaminants that
14 we feel that are out there that are driving the risk. What
15 is the cleanup progress that has been done under the
16 existing record of decision for interim action. A lot of
17 work has been done out there. There's some common elements
18 in all the remedial decisions that are going to occur
19 regardless of which one of the decisions is chosen in the
20 end. We're going to talk about those. And then finally,
21 the uranium conceptual model and remedies alternative
22 because the only difference between all the alternatives
23 that we're evaluating and talking about tonight are how to
24 deal with the uranium source that's continuing to feed the
25 half a square kilometer of uranium plume that's in the 300

1 Area.

2 So looking north again, the city of Richland is
3 right about here. The pathway for the reactor compartments.
4 This is the industrialized zone. Pretty much some of those
5 buildings have been taken down but that's what it looks like
6 today. 618-11 is up here fairly close to the Energy
7 Northwest operating facility. 618-10 is out here. These
8 are particularly interesting burial grounds in that the 300
9 Area has been used primarily for the manufacture of uranium
10 fuel. Uranium fuel was then taken up to the reactors,
11 irradiated, and then to the Central Plateau where separation
12 processes were used to get the plutonium out of the fuel
13 rods after they were irradiated. But most of the activity
14 in the 300 Area was the fabrication of those fuel rods.
15 However, at all of the production facilities up here, all
16 the separation facilities, all those chemical processes, the
17 research and development was done down here. So they
18 brought irradiated fuel back down from the 100 Area and 200
19 Area down here to optimize chemical processes for processing
20 this out. So there were some really, really, really highly
21 intense radioactive materials that they didn't want to put
22 in the ground beneath the burial grounds because of the
23 proximity to the city of Richland so they drove them out in
24 shielded trucks. And that's about as far as they could get
25 before they start exceeding allowable distance for the

1 drivers. And they had these burial grounds out there that
2 were specifically designed with caissons to -- paint cans
3 with the waste that was in it into these caissons.

4 We have agreed in the interim record of decision
5 to dig those burial grounds up. In fact we agreed to dig
6 all the burial grounds associated with the 300 Area up in
7 the interim record of decision. We intend to fulfill that
8 commitment and that commitment is in this record of
9 decision. All the burial grounds will be removed, treated,
10 disposed and the material taken to the appropriate place in
11 the 200 Area plateau or shipped off to other facilities that
12 are intended for things like transuranic waste. So to
13 answer one of your questions tonight, yes, all the burial
14 grounds are covered. And we are intending to remove, treat,
15 and dispose all the burial grounds.

16 **PUBLIC CITIZEN:** So does that include ditches,
17 trenches, the whole works in relation to the sites?

18 **MIKE THOMPSON:** We'll talk about it. Okay? It's
19 a different process a little bit.

20 So in terms of the map what's included, what's not
21 included, this kind of nasty yellow-looking color here is
22 the 300 Area upper area that's covered under the decision.
23 What is not being addressed are areas that are still active.
24 And that is the HAMMER Training Facility here, the Hanford
25 Patrol Academy out here. And of course Energy Northwest

1 which is on a DOE site out here. The FFTF reactor is not
2 part of this decision. It is covered under a MEBA decision.
3 So the industrial area is down in here. There were two
4 source operable units, 300-FF-1 which is primarily the
5 liquid waste disposal sites that created the uranium plume;
6 300-FF-2 which is the source term that covers all the waste
7 sites in here, and the 300-FF-5 which is groundwater.

8 So talking about groundwater which is one of my
9 favorite things. The 300 Area decision area is here. Within
10 that the uranium plume is this little dot right here. There
11 is a nitrate plume from off-site sources. It's coming in
12 from the west and is not a DOE-derived contaminant which we
13 will monitor that over time. 618-11, 618-10 are the primary
14 waste sites outside of that. 618-11, there's a tritium
15 plume out here that although it's small it has some of the
16 highest levels of tritium on the site. It was like two
17 million picocuries per liter when we discovered it. But
18 it's not moving very fast. Tritium has less than a 13 year
19 half-life. But that means that every 13 years half of the
20 radioactivity goes away. So it's half, half, and half. So
21 13 years half of it goes away. Another 13 years half of
22 that, one less half goes away. And then 13 years after that
23 half of a half of a half is left. So it's expo -- it's not
24 a linear curve but it kind of makes a curve downward.

25 So the tritium plume that we're dealing with here,

1 this is from that 618-11 burial ground. I think that's from
2 lithium aluminum tritium parts that were buried there in the
3 past. What is not also being covered is there's what we
4 call the base site line plumes. Base site line plumes are
5 coming out of 200 east out of the PUREX facility primarily.
6 That's the tritium, nitrate, ion 129 plume. They'll be
7 covered with a groundwater-operable unit for the east side
8 of 200 East Area in the future. So this kind of Pac-Man
9 thing here that looks like it's gobbling up Energy Northwest
10 is not covered in this decision here because it will be
11 covered in another decision. We're not going to ignore it.
12 It's just a different decision.

13 So the primary risk-driving contaminants, if you
14 look in the proposed plan in the back of the proposed plan
15 there's a very, very long list of preliminary remediation
16 goals. Now, these are the concentrations of contaminants
17 that one can leave in the ground below the excavation depth
18 for protection, human health, protection of the environment,
19 protection of groundwater but there's a short list of the
20 heavy hitters if you will. For soils, uranium. And that's
21 uranium metal. Most people think of uranium as a
22 radioactive substance. The radioactivity of uranium is
23 actually fairly small but it is an alpha producer. So being
24 an alpha producer you don't want to ingest it. But it's a
25 primary risk driver for uranium 238, a natural uranium,

1 which we're dealing with here is its toxicity as a heavy
2 metal. It's a toxicity primarily through the liver.

3 Also the uranium isotopes. We want to recognize
4 that it is an alpha producer so you want to make sure that
5 we're covered that way. Cesium-137. If you look at the
6 radioactivity of spent nuclear fuel processes the maturity
7 of the radioactivity, the high radioactivity stuff, it's
8 cesium-137, cobalt-60, and strontium-90. So those we want
9 to make sure that we're covered. And then there's some
10 aloclors PCBs that we're finding in the soils in the 300
11 Area.

12 In groundwater we're looking at uranium both in
13 terms of gross alpha. There are standards for that. And as
14 uranium metal. Tritium, nitrate, and the volatile organics
15 of TCE and DCE. Those volatile organics, we'll talk about
16 them a little bit later. They're not located in the primary
17 hopper but they're actually remnants of something that was
18 probably much bigger a long, long time ago. We'll talk
19 about those later.

20 So there's a long list of remedial action
21 objectives which I think I can summarize fairly quickly. We
22 want to prevent human exposure to groundwater that contains
23 concentrations above remediation levels. We want to prevent
24 contaminants of concern migrating or leaching through the
25 soil that will result in groundwater concentrations above

1 PRGs for protection of groundwater and surface water or
2 groundwater discharges to the river. We also want to assure
3 that in the upper 15 feet, which is the area that has been
4 agreed to as the area of human exposure, primarily the area
5 of environmental exposure, we want to assure that direct
6 exposure in that 15 feet does not result in a level that's
7 above risk levels or standards. We also want to manage
8 exposure to contaminated soils deeper than 15 feet. And we
9 want to prevent ecological receptors from direct exposure at
10 the soils and also at the shoreline. And then also what
11 we're talking about primarily today in terms of uranium is
12 the restoration of the aquifer. There's a goal within the
13 national contingency plan, the Superfund, that says we
14 should restore the aquifer within a reasonable amount of
15 time given the conditions of the site. Restoration of the
16 aquifer for us means bringing it back to drinking water
17 standards. I'm having a little bit of trouble convincing
18 some people further east of that but for us it's drinking
19 water standards.

20 So the recent remediation progress, we've done a
21 lot of work investigating the groundwater, looking at the
22 groundwater. But in terms of progress from the early
23 nineties the real progress in terms of physical remediation
24 is knocking down the buildings, digging up the waste sites,
25 hauling the contaminated material away. The Pacific

1 Northwest Natural Lab will continue to occupy some of the
2 buildings that you see here. There's also other buildings
3 that you see here that will be dismantled and taken away.
4 We'll talk about the ones that are going to be a real
5 challenge and we'll hit on that. But in terms of progress -
6 - can I have the next slide for a second? You can see this
7 highly-industrialized area here which is a bunch of
8 laboratory facilities and production facilities, uranium
9 milling facilities and that sort of thing. If we can go
10 back. That used to be here. So that's the kind of progress
11 that you see in knocking down the facilities.

12 One of the first things we did is we -- we'll talk
13 a lot about the liquid waist disposal sites. The north
14 process pond, south process pond, and process trenches. I
15 heard Jerry talk about them earlier. Those are located
16 right there. Those are really the first things that we went
17 after when we decided to do interim cleanup in the area. And
18 the decision that we decided to do was remove, treat, and
19 dispose. Now, that's a very popular remediation concept
20 with the Hanford Advisory Board and with us. We've embraced
21 it through most of the cleanup that we're doing.

22 What we agreed to do was first dig up the
23 engineered structure. Then you dig at least as deep as 15
24 feet if there's contaminants there and you're still above
25 remediation goals in terms of direct exposure. You go at

1 least 15 feet. Then after 15 feet you do an evaluation to
2 determine if what is below 15 feet will impact groundwater
3 above standards from water that seeps from the surface in
4 snowmelt and rainfall. Okay? So you can leave some
5 contamination behind that are 15 feet under that under that
6 agreed process but it cannot be at levels that will re-
7 contaminate groundwater from meteoric water.

8 What was not evaluated back in the early nineties
9 because we didn't really understand the conceptual model was
10 the impact of the river going up and down and causing
11 groundwater to go up and down and the geochemistry involved
12 in that. So when we thought that if we just took the vast
13 majority of the uranium off from that first 15 feet, tens of
14 tons of uranium. And from the characterization data that we
15 had and the response in the groundwater we were a little bit
16 fooled and we thought that would be sufficient. But within
17 five years we found out that the uranium was not cleaning
18 itself up at the rate that we would like it to. So after
19 the first five-year review we started doing more
20 characterization, more studies, more remediation, testing,
21 those sorts of things. And it's gotten us to the point
22 where we're at now.

23 Okay. So in the 300 Area we can talk about
24 progress a little bit. So far there's been about a million
25 tons, a million tons of contaminated soil and debris that

1 has been excavated from the 300 Area and hauled off to the
2 disposal facility in the central part of the plateau. That's
3 a lot of progress. That's a lot of work. There's about 38
4 tons of what is suspected transuranic waste that has been
5 removed, shipped to the central waste process to be managed
6 in accordance with TWE requirements. We've remediated all
7 but about 34 of the 130 waste sites under the interim record
8 of decision. Now, when we decided to go forward when we
9 negotiated the schedule for getting to these records of
10 decision we decided that we needed to go back and look at
11 all the work that was done to make sure that all the work
12 would comport with the new requirements because of changes
13 in the laws. So we went back and looked at all 130 waste
14 sites. And all but 34 of them have been remediated today.

15 Now, there are some challenges. We talk about how
16 much we've done percentage-wise, that sort of thing. Three
17 or four of the more challenging things to do in this
18 operable unit are part of the cleanup. And they are the
19 high remediation source removals. 618-10. We're working on
20 that right now. That's being remediated actively going
21 after. 618-11 is a little more difficult. One of the
22 challenges of being right next to an operating nuclear
23 plant. So that has not been started yet but the decision
24 has been made of what to do there. It is to remove it, RTD.
25 That's not going to change.

1 There's also a couple of areas that we discovered
2 in the removal process in the remediation where we found
3 really, really high levels of radioactivity, lethal doses of
4 radioactively if you allow workers to get into that. So we
5 haven't. It's very challenging, very difficult.

6 One is below the 324 building where a hot cell has
7 leaked underneath the building. It's like 8,000-rad
8 radiation which is a lethal dose. That's going to be a
9 difficult removal but we're going to do it. And also this
10 340 vault. This is a vault that received radioactive waste
11 from the building.

12 And to put it in perspective how deep we're
13 digging this up, these little yellow shirts down here, this
14 is a six-foot tall man here. So you can put it in
15 perspective how deep we're digging. You know, first of all
16 we removed the structure, right? So to remove the structure
17 we're digging down below that. Now, what's right underneath
18 of it we found that there's a little leak. It's not on the
19 outside edges but in there where we have to drive I-beams to
20 pick this thing up. There's a high amount of strontium-90
21 in there that we have to deal with. So we're actually
22 looking at using phosphates to bind some of the stuff in the
23 soil as we're remediating.

24 So here's what this meeting is mostly about, the
25 uranium plume. The uranium plume in the 300 Area is

1 dynamic. It's persistent. And it has been studied to
2 death. It's about 125 acres in size at any one time if you
3 look airally. But it's like an amoeba. It moves with the
4 response to the river. But the river levels change through
5 the operations of the dams. It goes up and down a lot some
6 days. I've seen boaters stranded on islands on the Columbia
7 River.

8 When we have high water in the river the
9 groundwater gets backed up because the river come up, the
10 groundwater stops. And then it still wants to go to the
11 river but it again rises up in response to the river. When
12 that happens it goes up to a level where it normally doesn't
13 exist and it picks up the little bit of uranium that's still
14 left in the vadose zone out there. Little bit compared to
15 what was there originally. You've got to remember we put --
16 oh, what's the number -- 74,000 to 130,000 pounds of uranium
17 into these liquid waste disposal facilities. It's a lot of
18 uranium. So most of that has been dug up and hauled away
19 because uranium generally likes to bind to the soil. It's
20 moderately mobile but most of it has been removed and taken
21 away.

22 So at high water when it comes up there is some
23 uranium left, mostly at the process trench right here. And
24 there's a little bit here that comes up. This one is
25 getting smaller all the time. This one here is quite

1 persistent. And when the river goes down the groundwater
2 tends to follow the river. So the groundwater has
3 bicarbonate in it which tends to dissolve, helps dissolve
4 uranium. River water does not. It helps it precipitate.

5 So what happens at low water is this plume that
6 has been pushed back and up now goes towards the Columbia
7 River. And this is the area where we talked about where
8 it's about 4,000 feet or 4500 feet where above drinking
9 water standards gets to the Columbia River. And it upwells
10 into the bottom of the river along the shoreline. And it
11 really expresses itself in the little springs along the
12 river. So you will see that plume even at low waters
13 anchored right about here. So this is what we think from
14 here and characterization data is the hotspot.

15 This little devil over here didn't exist until we
16 dug up this burial ground. Now, this is kind of important
17 because when you dig up uranium-contaminated soil you have
18 to put water on it for dusting purposes because you don't
19 want the workers breathing and ingesting the uranium.
20 Uranium on your skin is -- you don't want it there but it
21 doesn't give you much of a dose. Uranium inhaled into your
22 lungs does give you a dose. You don't want that. So what
23 happened here was when they were digging this burial ground
24 up, removing it, using water to protect the workers and the
25 people downstream that were using the river we created a new

1 groundwater plume of uranium here which will dissipate with
2 time. But this was caused by the remedial actions of
3 remove, treat, and dispose of this burial ground.

4 So let's talk about the process trenches a little
5 bit. These are the areas that received all the liquid waste
6 from the disposal. First the south process pond. When it
7 started to fail at high water before the dams were operating
8 groundwater would actually come up into these and kind of
9 spread around. Then they went to the north process pond and
10 then the process trenches. The process trenches were the
11 last ones to be used. All three of these have been dug up.
12 What I mean by dug up, we've done the remove, treat, and
13 dispose. Those have been excavated to about 15 feet. And
14 281,000 cubic feet of uranium-contaminated soil has been
15 removed from these source areas. So we've done a
16 significant amount of removal action for the areas that
17 created the uranium. But what we found is that what the
18 residual underneath of that, because of the river going
19 underneath, still as persistent to the point where we have
20 to deal with it. Next slide.

21 So this is a well in the hotspot. And this well
22 tells a lot. Blue is the level of groundwater in the well.
23 And you really don't need to look so much at the numbers.
24 This is elevation, meters of elevation above sea level. This
25 is uranium. The drinking water standard is here, this

1 little dot along here. This is the federal drinking water
2 standard, 90, 180, 270, 360, 450. So what was happening
3 before we did remediation the river levels went up and down.
4 Uranium bounced around a lot between almost drinking water
5 standards up to about 500 micrograms per meter parts per
6 billion. The discharge of uranium to the trenches, the
7 contaminated discharge, discharge with uranium in it, ended
8 in 1985. However, we did not have a water treatment
9 facility out there so water that was fairly clean river
10 water was then disposed from '85 out to 1994 when we got a
11 wastewater treatment facility out there. And in the
12 meantime we sprayed the top of the trenches off 1991. 1991 I
13 wrote a strategy for the Department of Energy that was
14 negotiated with the agencies to go do the removal actions.
15 It was the Hanford Past Practice Strategy. It was the basis
16 of all the interim actions. So one of the first things we
17 did was so we know that uranium was -- there's a lot of
18 uranium in that trench. We scraped off the first couple of
19 feet of that trench. It had a lot of uranium in it. Pushed
20 it out to the end because we didn't have any place for it to
21 go. We didn't want that really contaminated soil to be in
22 contact with that water that's being discharged out there.
23 Kind of a smart thing to do. And then later when ERDA was
24 built we hauled it off to ERDA.

25 So what happened was, in looking at that response,

1 my heavens, the uranium went kind of well below the drinking
2 water standards. Oh, what a good thing to do. This is
3 great. Let's make a decision. All we have to do is dig up
4 uranium in these facilities down the first few feet and
5 we're going to get a response like this. So this is what
6 fed the decision back in the mid-nineties to say let's wash
7 the uranium out there. But we know better now. We know
8 that not only do you have to dig up the vast majority of it
9 in the first 15 feet. There's some hotspots that are left
10 behind that will continue to bleed out, if you will. And
11 what happened was as soon as we turned off the river water
12 discharge the uranium bounced back.

13 So if you look at the trends in the river you can
14 see it's kind of like this, up and down, but there's some
15 really high peaks. But when the river goes up and the
16 groundwater goes up it goes up and snatches some more
17 uranium out of the soil. And you can see a pretty good
18 relationship, at least I think I can. But if you get really
19 high water you get high uranium. But after awhile it comes
20 down almost to the drinking water standards. Well, what
21 happened in here was we did the removal actions, the big dig
22 if you will, for 281,000 cubic yards. And we backfilled
23 over top of it, all using the water to control it, the
24 discharge, the dust, that sort of thing.

25 So what happened there is we're putting water on

1 the system. And then when the river started to come back up
2 again my heavens it bounced back up. Bounced up but it
3 started to come back down again. Then over the last couple
4 of years we've had some really good high water years. Okay?
5 And the water levels balanced out. And what happened is the
6 uranium kicked up pretty high, 4,000 micrograms per liter,
7 but it bounced back really, really quick. So what we're
8 seeing is that these levels decay away and over time, even
9 though if you get a really high water year, they bounce
10 back. So this is kind of for the behavior we're seeing,
11 this is about the worst level out there. So give you some
12 background of what's happening there. Next.

13 So in terms of remediation there's about 30
14 percent of the remaining uranium in this periodically re-
15 wetted zone. And about half of that, maybe a little more
16 than half of that is mobile. So as the river goes up and
17 down and picks up that mobile stuff and it takes it down to
18 groundwater. Again, relationship, well levels, uranium
19 levels. It goes up, goes up, up, up, up. When it goes way
20 up high it gets more. So when you get these really, really
21 high years it gets more uranium though what we're seeing is
22 this a fairly long response. This is a fairly short
23 response. So even though we've gone up really high we've
24 picked up some.

25 So the way I like to think of it is I'm about to

1 retire in a few years or sometime in the future. I'm not
2 going to tell my boss back there when it is because it's
3 negotiable. And when you're facing retirement you want your
4 money to last so you build a nest egg. You can think of the
5 uranium in the soil as a nest egg. It's a defined volume of
6 a substance, whether it be money or uranium. There's a
7 defined amount. What's coming down from the soil above, the
8 dry soil, is a little trickle of uranium brought back down
9 by a few millimeters of recharged water every year. So the
10 amount of money coming into the savings account or the
11 amount of uranium coming into that savings account is really
12 small compared to what you had before. But you keep writing
13 checks on that. So every time the river comes up, goes back
14 down it removes a substantial amount of uranium. And I'm
15 going to be honest with you. What happens to that uranium,
16 some of it binds up but it is an advection, dispersion,
17 diffusion down. Mostly it goes to the river. Okay? I'm
18 going to be honest with you. That's what happens to
19 uranium.

20 Now, the uranium is above drinking water
21 standards. But the uranium drinking water standard is based
22 on a 150-pound person, and I see a lot of 150-pound people
23 out there, a lot smaller than me, drinking two liters of
24 water a day every day and getting a (inaudible) dose. Now,
25 the drinking water standard for that would be 48 but if you

1 look at the metal response, the heavy metal response it's 30
2 so we go with the 30. That's the federal drinking water
3 standard. And it's based on a continual two liter ingestion
4 of this all the time.

5 To get back to where I was so this goes to the
6 river. And you're writing checks on this account. And
7 there's nothing more coming into it. And sooner or later
8 you're going to be out of savings or out of uranium. So
9 it's inflow minus outflow the exchange of storage. Simple
10 math.

11 So if you don't have a lot coming in, you're
12 taking it out every year, pretty soon this one will go away.
13 The models that were used in looking at the hottest part of
14 the uranium say 28 years if the river behaves itself the way
15 it did over the last few years. Is that something I can
16 hang my hat on? No, it's not because I can't predict what
17 the river is going to do. So I've been telling people less
18 than 40 or 50 years, just to be conservative.

19 So if you do nothing, if you watch it, it should
20 attenuate itself to drinking water standards in about 50
21 years but we want to do better than that is what we said
22 last night. We're going to try to bind up, in other words
23 take a lot of the source away. We're going to write a big
24 check and bind it up so it can't be used. So we're going to
25 put a hold on that money if you will and try to tie it up in

1 place.

2 So in terms of the alternatives that we're
3 presenting today in all of the alternatives we will remove,
4 treat, dispose contaminant sources. We will continue to
5 remove the burial grounds. We will continue to dig up the
6 river waste disposal areas that we find. We will continue
7 to take out pipelines as appropriate, all continuing what we
8 planned to do. We have to monitor the groundwater because
9 the uranium is still going to be there regardless of what we
10 do for awhile so we have to monitor that. And we will
11 monitor the nitrates coming in from off site so we
12 understand what's going on there.

13 Monitored natural attenuation. And that is a
14 remediation process that is endorsed by EPA in a number of
15 records of decision. But to call it monitored natural
16 attenuation you have to have a mechanism that destroys the
17 contaminant. Half-life of 13 years radioactive decay. Short
18 half-life is a reasonable attenuation process. The
19 attenuation of uranium, which I can't even think of what it
20 is. It's so large you can't say let's monitor natural
21 attenuation. It wouldn't be right. But for a short-lived
22 radionuclide that would decay away in place and not get to
23 the river, that's an appropriate thing to do because in 13
24 years half-life goes away. And it's not moving or anything.
25 So that's a reasonable rational decision. So monitored

1 natural attenuation for tritium.

2 Now, organic chemicals, at some point in time
3 there must have been one hell of a release of organic
4 chemicals, PCE, in the 300 Area. But in the 300 Area there
5 are two formations. One is a Hanford formation which is
6 sands and gravels. And the groundwater velocity there is as
7 much as 50 feet a day. To put that in perspective most
8 groundwater goes about a foot a day. But in the central
9 part of the 300 Area when the river is low we plot the
10 groundwater going 50 feet a day. It's like a jet ski,
11 right? And it's flushed out all of that organic chemical
12 out of the useable part of the aquifer. That means you can
13 pump water out. Underneath of that we have a rainbow
14 formation. On top of the rainbow formation this location is
15 very silty, dirty, compacted sand that you have difficulty
16 getting enough water to take a sample, let alone use it. So
17 above it you've got no organic chemicals. Below it you've
18 got some footprints of something that was there a long, long
19 time ago that has since flushed out except for where it's
20 been driven deep into these sediments that don't flush out.

21 But when we take the samples we see the
22 degradation so above they're working. These aren't moving
23 very fast. And there's not a lot of it. We see it in three
24 wells. The right and proper thing to do is to let nature
25 take its course. I don't know of any remediation process

1 that would work in formation of the site to begin with and
2 it's degrading the lake. And no one is going to use -- you
3 can't pump from there to get a rational amount of water to
4 use it. Above it you can pump like hell to get all the
5 water you want. But where the TCE in one well, the TCE is
6 so tight you can't use the aquifer and the bugs are taking
7 care of it. So that is monitored natural attenuation.

8 Now, we have to have institution controls
9 regardless of what we're doing in cleanup until we meet the
10 standards. The institutional controls are keeping people
11 out. Don't have, you know, the kind of access that would
12 cause an unreasonable amount of exposure.

13 Now, this is a nuclear facility and will be a
14 nuclear facility for quite awhile. Pacific Northwest
15 Natural Laboratory is using this for quite awhile so it is a
16 nuclear facility. We will access controls there and suffice
17 it to keep the public from being exposed. And quite frankly
18 what has been cleaned up is quite good so we're doing pretty
19 well. So this is what's common to all alternatives. Next
20 slide.

21 So we've got six alternatives to deal with the
22 source of uranium that is continuing to pump uranium into
23 the groundwater. Now, the first one is required by law.
24 It's no action. You can take that off the table. No one is
25 going to discuss that and no one is going to consider it but

1 we have to have it up there but don't worry about it.

2 The second one is groundwater monitoring. This is
3 where we sit back on our heels and we watch it. Okay? Which
4 is what we started doing back in the mid-nineties. We know
5 that's not going to work very well. So we don't believe
6 that that's one that we want to do.

7 Alternative 3. Over the years we have looked
8 diligently at all the remediation options out there for
9 dealing with uranium that's deep in the soil that is being
10 re-wetted and getting to the water. The problem with
11 digging it up to dig up the source of uranium is estimated
12 to be over a billion dollars. Okay? That's money. But the
13 real reason you don't want to do it is because when you dig
14 this up you're going to put -- you're going to release more
15 uranium to the environment to the underlying groundwater.

16 You're right next to the Columbia River. You're
17 right upstream from where I get my water. I don't want to
18 put more uranium in the river doing a remedial action than
19 what would be there if we did option two, which is do
20 nothing. So the unintended consequences of digging it up at
21 that level at that size is not rational in my mind. And we
22 would have to build a couple ERDA cells to handle it. And
23 if you look at the mileage, you look at the diesel consumed,
24 you know, the emissions and all these sorts of things. You
25 look at green technology, it doesn't fit. But mostly it's

1 the unintended consequences of putting more uranium in the
2 groundwater and in the river that's the issue why you would
3 not choose the dig-it-up option, which is number five by the
4 way.

5 So we looked at dig it up. We looked at
6 biological processes. We looked at things. There's a lot
7 of research out there about if you use bugs with uranium you
8 get it from an aerobic oxygenated system to an anaerobic
9 where the oxygen goes away. The chemical stage of uranium
10 changes when you take the oxygen away and binds up really,
11 really well. Okay? It looks really, really good but then
12 you walk away. You run away. You don't look back. And
13 then the oxygen always comes back. And what happens when
14 the oxygen comes back, uranium is happy. It starts to
15 become mobile again. It wants to return back. It's not
16 like chrome-6 where once you get it in chrome-3 it's very
17 happy it's chrome-3. It prefers to be chrome-3. Uranium
18 prefers to be in a mobile state. When you oxidize it it's
19 wanting to be mobile again. So we took that off the table.

20 We looked at pump treatment systems. We looked at
21 binding up. We looked at permeable reactive barriers. And
22 what we came down to was we originally thought that we could
23 precipitate some out by putting phosphates in. You change
24 it from a carbonate form to a phosphate form. It's very
25 immobile. You get it out of the system. And we were going

1 to build a habitat there like we have at 100M which is a
2 permeable reactive barrier.

3 Well, with the groundwater flow and the velocities
4 as fast as they are and the chemistry differences between
5 groundwater, surface water we dropped the appetite for it.
6 It's just not going to work. That part of the test failed.
7 The part of the test that didn't fail was dropping it out as
8 alunite. That worked very good for us.

9 So alternative 3 is a two-phase approach where you
10 start off in one area and then you do a very large area
11 treatment. About \$120 million worth of treatment. And you
12 proceed that way. Alternative 3a which is the one that has
13 been negotiated with EPA. And EPA and we have put, you
14 know, we've developed the proposed plan is that we're going
15 after the hotspot up there which is the main source of
16 what's in the uranium. The rest of it through
17 characterization efforts we believe that the rest of it will
18 attenuate by itself within the amount of time that it would
19 take for the treated area to rebuild. So it's optimization
20 of the engineering alternative. So alternative 3 is our
21 preferred alternative.

22 Alternative 4 involves digging up part of it.
23 Alternative 5 is the big dig. So our preferred alternative
24 is alternative 3a. And keep in mind that we're still going
25 to do all of the common elements.

1 So groundwater cleanup is driven by three things:
2 Mitigation of risk to human health from exposure or
3 consumption and exposure of uranium. The uranium that's
4 upwelling into the river, I want to be very clear on this,
5 the uranium that's upwelling into the river and coming out
6 on the shoreline is above drinking water standards. Okay?
7 If you drink two liters of it a day every day you will
8 exceed the dose limits. And the chemical limits for
9 uranium. The river itself, 150,000 cubic feet per second,
10 the river itself has about one picocurie per liter of
11 uranium in it. Where I get my drinking water from the city
12 of Richland, the first inflow from the home stream, it's
13 less than one picocurie per liter of uranium. As a matter
14 of fact the city monitors gross output and you can convert
15 that over to that. So the river itself is not the issue.

16 The exposure at the shoreline at low water is not
17 the issue. The amount of uranium in the soils that are
18 there at the shoreline is not an issue. And for perspective
19 purposes only, we're not using this as an excuse not to do
20 cleanup, the uranium coming in across the river from three
21 uranium -- or three irrigation outfalls is 10 times more
22 uranium than what's coming out of the 300 Area and all of
23 Hanford. Hanford produces anywhere from about two to maybe
24 eight percent of the total uranium loading in the 54 miles
25 of the Hanford Reach.

1 So in terms of protection of the river, the river
2 is safe. I recreate on the water. I fish on the water. I
3 hunt on the water. I play in the water. I get my drinking
4 water immediately downstream from this so the river is safe.
5 So why are we doing this? We're doing it because the
6 national contingency plan says restore the aquifer within a
7 reasonable time frame given the circumstances of the site.

8 Now, there's some uncertainties I have to admit in
9 terms of how long it will take for that uranium to clean
10 itself up. We believe we can do significantly better than
11 what natural attenuation alone can do. So we're planning to
12 go after the hotspot. We want to inject phosphates at the
13 surface and the vadose zone and in the groundwater in that
14 area to try to bind up this hotspot of uranium. And by
15 doing so we'll do better than natural attenuation and
16 enhanced attenuation. We can't call it a monitored natural
17 attenuation because we're not destroying the contaminant.
18 We're binding it up in place. And a stable mineral does not
19 dissolve like the current uranium does. So it's that last
20 factor that's driving us to make the decision.

21 So we talked a little bit about this and I want to
22 go over it. The uranium-contaminated areas located within
23 the core industrial zone, no one is going to be using that
24 groundwater for the next 50 years. DOE and the National Lab
25 will be using that core industrialized zone as a nuclear

1 facility. And we will control access to it and control
2 access to the groundwater.

3 The existing area has an alternative drinking
4 water supply that's piped in from the city of Richland so we
5 don't have to use the groundwater. The amount of flux
6 going to the Columbia River is that two to eight percent of
7 the total loading. It's about 100 to 150 kilograms per year
8 versus 10 times that coming up from the irrigation returns
9 and a lot more coming from the Yakima River. So to put it
10 in perspective how much we're putting in. But we're not
11 using that as an excuse not to do anything because we have
12 to restore the aquifer.

13 Uranium concentrations upwelling from the river
14 substrate at times do indeed exceed federal drinking water
15 standards. It's about 120 at the most picocuries per liter.
16 The standard for drinking water is 30. But that is far
17 below levels of environmental concern that are established
18 for uranium. And there's no statistical difference in what
19 we see up gradient and down gradient of Hanford and the
20 uranium in the river. There hasn't been for a long time.
21 And if there is a statistical difference about eight percent
22 of it is ours.

23 So restoration of the aquifer, in other words
24 achieving federal drinking water standards, is the reason
25 why we're going forward with this. The primary source of

1 the contamination is that fraction, that 30 percent that is
2 local and periodically re-wet itself. And about one percent
3 of the inventory is dissolved in groundwater. Three percent
4 is bound up in groundwater solids. And about two percent of
5 the total amount in any one year goes to the river. So the
6 two percent of the total goes to the river in any one year
7 and about 15 percent of the mobile stuff isn't periodically
8 re-wet itself. So even with the declining curve you should
9 be able to get there in a fairly reasonable amount of time.

10 So the continuation of the plume the model says 28
11 years. I think to be safe I'll say 30, 40 or 50 years.

12 There may be some wells out there that on occasion because
13 if you get those going really high those will exceed
14 standards but most of those times those levels will be below
15 standard. And that's okay within the guidelines that the
16 EPA has.

17 So alternative 3a, the alternative that we're
18 proposing, we believe it has the best balance in all the
19 CERCLA criteria. It meets the threshold criteria. It meets
20 the balancing criteria. And we're now trying to figure out
21 if it meets the modifying criteria. So out of 130 waste
22 sites we looked at 38 require no additional action. Remove,
23 treat, and dispose to industrial standards this core zone
24 with 74 waste sites within that little core zone. And
25 there's 12 waste sites outside the core zone. They'll be

1 done to those residential standards.

2 When we get the record of decision, if we get the
3 record of decision this fall or early winter or whenever we
4 think there's about 34 of the waste sites yet to be
5 remediated. But we've gone back and looked at everything
6 that has been done to make sure that it comports with the
7 new requirement.

8 So there is this hotspot out here which seems to
9 be the anchor of the plume. And this is where we want to do
10 the treatment. To see if that works. And we should know
11 when it's funded when we put it in very shortly after we put
12 it in if it works.

13 If it doesn't work we're required at least every
14 five years to go back and review the protectiveness of this
15 decision. So even though it's -- the acronym we call it a
16 final record of decision. There's no such thing as a final
17 record of decision. There is a record of decision for
18 interim action, which we did back in the nineties, and a
19 record of decision. All of those have to by law be
20 reevaluated every five years.

21 Natural monitored attenuation because tritium has
22 a short half-life and TCE and DCE three wells, DCE one well,
23 TCE. And this part, it's decaying away so the monitored
24 natural attenuation fits for that. And then groundwater
25 monitoring and institution controls are going to be

1 necessary until we reach standards. So that is our
2 preferred alternative that we're putting out today. And I'd
3 be glad to answer -- oh, Larry has got one more final slide.

4 **LARRY GADBOIS:** I'm going to be quick because I
5 know a whole bunch of people have things they want to say.
6 We have things we wanted to say and this is all about
7 exchanging of information, you hearing from us, us hearing
8 from you and having a dialogue. And then informal comments
9 as well.

10 Just a reminder. In public comment we're going to
11 have a Q and A and you can answer some information. If you
12 ask questions we don't know off the top of our head we can
13 get back to you. And then after we'll do a comment and
14 that's for the record and that's not a part of response.
15 That becomes part of the record of decision.

16 Mike has given you the bulk of the information.
17 I'm Larry Gadbois with EPA. EPA as the regulator, our job
18 is to oversee the Department of Energy and help them do the
19 task. Everybody in this room I think wants the same
20 objective. We want a good cleanup. And EPA's job is to
21 oversee and help DOE make a good cleanup decision and
22 execute it. That's our job to oversee them. So I'll be
23 available for Q and A and why don't we proceed to Liz are
24 you up next?

25 **LIZ MATTSON:** My name is Liz Mattson and I am the

1 program coordinator for Hanford Challenge which is a non-
2 profit organization focused on making Hanford a model of
3 safe and effective cleanup. And I'm actually going to be
4 introducing one of our legal interns, Nathan Reeves, who has
5 been working with us this summer and we asked him to look at
6 the 300 Area and the proposed plan and come up with some
7 comments to give him some experience doing that this summer.
8 So Nathan, if you want to come up. He's going to share some
9 of his findings. And here he is.

10 **NATHAN REEVES:** Hi. As Liz said my name is Nathan
11 Reeves. I'm an intern with Hanford Challenge. I think the
12 best use of this time is probably just to sort of re go over
13 some of the things we've already heard. We've spent over an
14 hour now listening to the plan. And I think it would just be
15 good to sum it up in a few minutes and get some simple
16 concepts that we can all hang onto.

17 So first of all we know where the 300 Area is. Now
18 it's in the southeast corner of the site. It's a fairly
19 small area of the site compared to the full site. It
20 contains the three organizational units that are covered in
21 this plan. So we heard about that just a few minutes ago.
22 300-FF-1 is part of the industrial complex where the uranium
23 was leaking in the ground. 300-FF-2 is most of the 300 Area
24 where there were waste sites and other things going on. And
25 300-FF-5 is the groundwater that's under the site. So those

1 are some important things to help you -- to help coordinate
2 you as to where these different things are going to be going
3 on.

4 The 300 Area industrial complex is that smaller
5 area in the southeast corner of the 300 Area where all the
6 buildings are. This is where Northwest Natural Laboratories
7 is going to be operating and where the uranium is. That's
8 the area of the site that's been proposed to be cleaned up
9 to industrial standard, whereas the rest of the site has
10 been proposed to clean up to residential standard where it's
11 safe for people to live there. But the cleanup of the
12 industrial complex to the industrial standard requires
13 institutional controls, which are things like fences,
14 guards, and making sure that people don't get in there, that
15 people aren't exposed to things they shouldn't be. So one
16 of the things to think about when we're thinking about
17 institutional controls is how long they're going to be
18 viable. The cleanup of this site is supposed to be forever
19 so if institution controls are required then they're going
20 to be required forever as well. So that's just something to
21 keep in mind.

22 Now, we heard about six alternatives that are
23 evaluated in the plan. The first alternative, do nothing,
24 really seems way out of line. I don't think anyone is
25 considering that seriously. We're required to look at it

1 under the law so it's there but no one is really considering
2 it.

3 Alternative 2 is the monitored natural
4 attenuation, MNA. That's an important term to remember,
5 MNA, monitored natural attenuation. That basically means
6 we're not taking action, we're just looking at it and making
7 sure -- we're observing the natural processes. Alternative
8 2, again I think Mike said we're not really considering
9 that.

10 Alternative 3 and 3a are the ones that use uranium
11 sequestration. So this is the injection of the phosphates
12 into the ground. 3a uses it in a very small square area, as
13 Mike said, where the hotspot is considered to be.
14 Alternative 3 as opposed to 3a would start there but then
15 would expand to more areas if it works.

16 Just a few -- just to remind you guys about
17 uranium sequestration. That's drilling wells, injecting
18 phosphates that's supposed to bind up with the uranium and
19 keep it from dissolving into the groundwater. That
20 technology has been tested a little bit but not -- has never
21 been used on a full-scale cleanup operation. The proposed
22 plan in alternatives 3 and 3a doesn't really include backup
23 plans that have been made into a plan. So if sequestration
24 doesn't work the plan doesn't really tell us what happens
25 then.

1 And then alternatives 4 and 5 include some RTD,
2 remove, treat, and dispose, which is, as we've heard,
3 digging up areas, removing the soil, taking it to a secure
4 landfill, and filling it with clean soil. Alternative 4
5 also includes the uranium sequestration.

6 So that's a basic overview of what we've heard I
7 think tonight. Real quick, gives you an idea of some of the
8 terms of some of the plans. Some questions that Hanford
9 Challenge has and things just to keep in mind as we're
10 asking questions and then we're commenting, we heard a
11 little bit about the plan for tritium and some of those
12 organic chemicals. That plan is common throughout all of
13 the alternatives and it is monitored natural attenuation. We
14 would just like to know what else is considered there, why
15 we chose monitored natural attenuation. Just a little more
16 detail on that we think would be helpful to understanding
17 that part of the plan.

18 Another question we have is what happens if
19 sequestration doesn't work. We heard that there's going to
20 be a five-year review. I think it would be helpful to know
21 what standard is going to be used in that review, how we're
22 going to evaluate everything to make sure that we're
23 actually cleaning up the way we want to clean up.

24 And finally we would like to know how the plan
25 would change if we wanted to clean up the entire 300 Area,

1 not just -- including the industrial complex, to residential
2 standards instead of industrial standards. And so I didn't
3 hear an explanation of why the industrial standard was
4 chosen and what the costs for a procedure change would be to
5 clean that all the way up to residential standard as well.

6 So those are just a few questions to keep in mind
7 as we ask questions as we make comments. As we said
8 earlier, the comment period is open through mid-September.
9 You'll be able to submit written comments through that time.
10 You will also have the opportunity a little bit later to
11 verbally submit comments or just to submit written comments
12 tonight. You can do any or all of those things. You can
13 speak tonight, you can submit a written comment later.
14 You'll be able to go back and look at what we said tonight.
15 Just again something else to keep in mind as you're
16 preparing to comment and ask questions today. Thank you.

17 **DIETER BOHRMANN:** Ryan?

18 **RYAN STRONG:** I will be very, very quick because I
19 think most of you saw the presentation so I won't just redo
20 the presentation all over again. I just want to make a
21 couple of points. There's a thousand kilograms of uranium
22 that's not being cleaned up. Right? So some of that
23 submitted, acknowledged by the agencies that that is going
24 into the Columbia River. We don't think that's good. More
25 of that is just going to stay right where it is and that's

1 not safe, right, because in 50 years, however long it's
2 going to be people are going to dig sewer lines. People are
3 going to dig basements to building. That contamination is
4 still going to be there. Now, the DOE is very confident in
5 its institutional controls. We're not as confident in its
6 institutional controls because we've just seen institution
7 controls fail. They sound great but they fail. So they're
8 very confident; we're not. That's a big difference that we
9 have with them.

10 As far as recreational use I forgot to mention
11 Native Americans. And I'm not the first that forgot to
12 mention Native Americans. It seems to be a problem that we
13 kind of have where we just forget about Native Americans and
14 their rights to the land, their rights to the river, their
15 rights to eat that fish, their rights to that riverbank
16 where uranium is springing up right where children play.
17 Right? So let's not forget the Native Americans. They're
18 not industrial workers, right? So let's not forget them.

19 Let's talk about 15 millirem which is the cleanup
20 standard. Sort of went over this but 15 millirem is eight
21 additional cancers per 10,000 individuals. Adults, right?
22 So that doesn't meet the federal standard of 1 per 10,000
23 and it certainly doesn't meet the applicable standard or
24 state standard of 1 in 100,000. We think MOCA applies. We
25 think that we should meet that standard.

1 As far as land use goes we think that the
2 definition of the industrial area is way too broad. There's
3 a very small group of buildings that are going to supposedly
4 still be used for industrial areas. Fence those buildings
5 off. Make sure that no contamination gets out. Make sure
6 that no people get in. And if the phosphate injection works
7 in that area or something maybe that can qualify, maybe, but
8 not the trenches up top. That's not part of the industrial
9 area. So that's our main point there. Let's make sure that
10 we're using the most accurate definition of what the
11 industrial area is. We think it's too broad.

12 Last thing I wanted to touch on, this idea that
13 we're going to contaminate the groundwater more by cleaning
14 up. Right? You don't have to wet the groundwater. That's
15 a false assumption. We'll talk more about that later.
16 That's not the right way to do it to protect the workers.
17 There's other ways to do it. So even if we do 15 feet like
18 they're planning and we wet, well, that's still going to
19 contaminate the groundwater more. Right? And so if we go
20 30 feet and we wet, well, that will contaminate the
21 groundwater too but it's going to contaminate the
22 groundwater no matter what if we don't use the right
23 technique for not contaminating the groundwater. That's our
24 position on that.

25 I think that's all the notes I have so I'm looking

1 forward to the question and answer period.

2 **DIETER BOHRMANN:** Okay. Thank you, Ryan. Thank
3 you, Nathan. We are behind schedule. I apologize for that.
4 I want to be respectful of people's time. A couple of
5 options here. We could continue on with the Q&A, start the
6 Q&A now. I don't want people -- there's about a dozen
7 people that are signed up for formal comment. I don't want
8 folks to leave without getting the opportunity up to do
9 that. So we could do the formal comment period now and then
10 do the Q&A following that. The agencies are available to
11 stick around a little bit longer if we prefer to do that.
12 Feedback on that? Yay or nay?

13 **PUBLIC CITIZEN:** I'm just saying if we could have
14 a short Q&A I think it will help people formulate their
15 responses. And in saying that I need to leave but I have a
16 very quick question so I opted for Q&A.

17 **DIETER BOHRMANN:** Okay. So folks okay going like
18 15 minutes Q&A and then jump in and then we can go with the
19 comments? Okay. Well, let's go ahead and do that. We have
20 another microphone we can pass around if we need to. This
21 is a pretty small room so we may not need it but for the
22 transcript and for the stenographer it will be helpful to
23 make sure everyone's questions are captured. So we'll just
24 start right over here.

25 **PUBLIC CITIZEN:** When you talk about removing this

1 to off site I don't know if you're aware, you might be, that
2 yesterday or today they were having hearings in Washington,
3 D.C. about mobile Chernobyls. And putting toxic waste on
4 the road. And the threat of accidents, of terrorists. And
5 I'm wondering what you-all are talking about, where you're
6 going to move this stuff. And how are you going to move it.
7 I happen to live -- I just moved here from Las Vegas. And
8 we have been aware of stuff going to the Nevada test site
9 without any radiation symbols on them. And we don't know
10 what's in them and we know that the DOE, and other agencies,
11 have kind of this little loose thing about mixing waste and
12 they're not telling us what's in it. So I have to tell you
13 I'm very concerned when you're talking about moving this
14 outside and where it's going and how it's going to get
15 there. Are the governors of those states going to be
16 notified when it's coming and what it is.

17 **LARRY GADBOIS:** Okay. Most of the waste that's a
18 result of the cleanup that we're generating, most of the
19 waste is eligible to be disposed on site. Primarily that's
20 in our environmental restoration disposal facility in the
21 central part of Hanford. A small portion of the waste is
22 transferred out. And that has to go to the waste
23 installation part of the project plant in New Mexico. So
24 that we package either on site or there is a commercial
25 facility in Richland that can package that.

1 **PUBLIC CITIZEN:** There are people in New Mexico
2 that are fighting that.

3 **LARRY GADBOIS:** Oh, of course. All through this,
4 this is a controversial topic.

5 **PUBLIC CITIZEN:** Yes, it is.

6 **LARRY GADBOIS:** We haven't been getting sent to us
7 here but other parts of Hanford generate spent fuel that
8 would have gone to the Yakima unit but that's off the table.

9 **PUBLIC CITIZEN:** We closed that.

10 **LARRY GADBOIS:** So at this point spent fuel that
11 was at Hanford is still at Hanford and the future home of
12 that we don't know. But we haven't had much of a spent fuel
13 issue for the 300 Area.

14 **JD DOWELL:** And those things meet all the
15 different compliance. Lately it's done in the course of
16 regulations and law.

17 **PUBLIC CITIZEN:** No, it isn't.

18 **JD DOWELL:** We're talking about the 300 Area.

19 **PUBLIC CITIZEN:** Okay. But I'm talking about the
20 shipments. They're not done legally.

21 **JD DOWELL:** Okay. Well, we can take further
22 questions if you have them and answer them but what we ship
23 we meet the law with. And we also have agreements with each
24 state's governor so that we drive through the states on
25 their order.

1 **PUBLIC CITIZEN:** I have to tell you but I just
2 spoke to the guy who is head of the nuclear projects agency
3 for the department of -- for Nevada state. The governor has
4 not signed off on any of this coming through. I have to
5 tell you that. Okay? And that's right from the governor's
6 office.

7 **MIKE THOMPSON:** We appreciate the comments but we
8 would like to kind of focus it on the 300 Area. There are
9 people who want to give comments.

10 **PUBLIC CITIZEN:** Gosh, I wish you two hadn't said
11 that because you're shipping waste using parade permits
12 locally. Anyway. Just so we can get straight it's not
13 quite proforma.

14 My question was, I've got a couple of quick
15 questions. What is the half-life of uranium 238?

16 **LARRY GADBOIS:** 238 is about four and a half
17 billion years.

18 **PUBLIC CITIZEN:** So natural attenuation for that
19 is probably not.

20 **LARRY GADBOIS:** It's just laughable. Nobody would
21 make that claim.

22 **PUBLIC CITIZEN:** All right. And are there decay
23 products associated with the presence of uranium 238?

24 **MIKE THOMPSON:** The primary decay product of
25 natural uranium that is of interest in terms of human health

1 and environmental health is radon gates. Okay? We did look
2 at that and that's covered in the RIFS report.

3 **PUBLIC CITIZEN:** So if you leave it there you
4 won't get radon gas coming up into whatever structures or
5 people that might be still there.

6 **MIKE THOMPSON:** We've looked at that. As a matter
7 of fact somebody from the EPA called me one day. Said
8 Michael, you must evaluate this. I said sir, yes, sir,
9 because it was a rational question.

10 **PUBLIC CITIZEN:** And finally the thorium question.
11 There are thorium trenches out there. There's a lot of
12 thorium disposed of. I don't see it in the documents here.
13 We detected it in our own readings and, you know, what do
14 you have to say about that?

15 **MIKE THOMPSON:** We've not found thorium at levels
16 of concern in the rate that we've done. So thorium, you're
17 going to find thorium everywhere. You're going to find
18 plutonium everywhere. As a matter fact you may find
19 plutonium in the sediments of the reservoir from which
20 Portland gets its drinking water because of atmospheric
21 testing and because of high levels of rain over there. You
22 can find plutonium on the west side. As a matter fact where
23 I like to camp at Ohanapecosh, the levels of plutonium in
24 the soil there are higher than the levels of plutonium
25 generally at Hanford.

1 **PUBLIC CITIZEN:** Before Hanford there weren't
2 levels of plutonium.

3 **MIKE THOMPSON:** Yes, it's atmospheric testing by
4 us and other countries, yes. But what I'm saying is you're
5 going to find -- you're going to find some level of these
6 contaminants virtually everywhere. So the question is is it
7 a level of concern, can we find it at levels that pose risk,
8 and we have not.

9 **PUBLIC CITIZEN:** You look at isotopes.

10 **MIKE THOMPSON:** Yes. There was a lady back here?

11 **PUBLIC CITIZEN:** I spent last night watching for
12 three hours the Senate committee, Wyden's committee, talk
13 about the handling of nuclear waste. And one of the big
14 questions that people said that we haven't clarified what
15 was DOE waste, which was the most toxic, most radioactive
16 waste, and the commercial waste. Of course the nuclear
17 industry wants to get nuclear facility waste handled in
18 commercial reactors. But what at Hanford is the figure on
19 the DOE waste and the DOD waste, the commercial waste? I
20 know the DOE is responsible for all the waste but it's --
21 this has been the biggest scandal that the DOD have walked
22 away from their big mess that they created because that --
23 all of the people agreed at the hearing, the ones that are
24 for more nuclear energy production, that combining the
25 waste, you know, just makes it almost, you know -- it's not

1 even clarified what the problem is. What is it?

2 **LARRY GADBOIS:** The 300 Area has been Department
3 of Energy nuclear materials and nuclear waste generated.
4 They haven't -- essentially haven't been involved in the
5 commercial nuclear sort of things that you're talking about.
6 So we're talking about--

7 **PUBLIC CITIZEN:** No, clarifying the defense
8 department waste that was the most radioactive that is in
9 these sites. Now, how much at Hanford is that? Does
10 anybody know?

11 **LARRY GADBOIS:** I don't know about a Hanford
12 total.

13 **JIM HANSON:** About 400 million curies.

14 **PUBLIC CITIZEN:** The weapons waste.

15 **JIM HANSON:** It's about 400 million curies at
16 Hanford.

17 **PUBLIC CITIZEN:** And then what is the commercial
18 waste?

19 **JIM HANSON:** About 20 billion.

20 **PUBLIC CITIZEN:** Well, that was a question at the
21 Senate hearing yesterday.

22 **PUBLIC CITIZEN:** Yeah, I have some questions and I
23 will save my comments for the comment period but some of the
24 questions I have is, you know, we've heard a lot about
25 uranium but uranium comes in several different isotopic

1 forms. They're very different in their radioactive effect.
2 So I was interested in, you know, we've heard about the
3 runoff in the pre-nitrate streams and the Yakima River also
4 brings in a lot of uranium but that's 238. So I was just
5 curious as to if you have any reading of the relative ratios
6 of 238 to 235 in uranium that is under the Hanford site and
7 leaching into the groundwater.

8 **MIKE THOMPSON:** Sure. What was done in the 300
9 Area was the fabrication of uranium into configuration that
10 is suitable for fuel rods in the reactors. So it was
11 primarily 238. There was not a lot of enrichment in most of
12 the runs at Hanford. Enrichment can go anywhere from a
13 fraction of a percent down to I think 10 percent which is
14 highly enriched by 235. But most of the reactors at Hanford
15 throughout the life used primarily 238. So what was used
16 there is this is where they took billets or massive amounts
17 of uranium and shaped it into fuel rods and clad those fuel
18 rods to go up to--

19 **PUBLIC CITIZEN:** Yeah, I understand that. But my
20 understanding is--

21 **MIKE THOMPSON:** So it's mostly natural uranium.

22 **PUBLIC CITIZEN:** My understanding is that you do
23 it enriched. And it is a matter of percents of maybe up to
24 20. And if you go up to 95 for a weapons grade. I
25 understand that. But you -- just raw 238 doesn't make a

1 good fuel. You do have to enrich it some. And you're
2 saying 10 percent or less?

3 **MIKE THOMPSON:** Oh, yes. Far less.

4 **PUBLIC CITIZEN:** Okay, fine. Then some of the
5 other questions I have. The industrial area, my concern
6 echoes what they were saying. When you talk about the
7 industrial area my understanding is that you're making it as
8 safe as the industrial standard that we were talking about
9 that it presupposes that the area is either a parking lot
10 covered with asphalt, sealing in what's in the ground, or
11 it's concrete inside a building, again sealing in what's in
12 the ground. So my interest was how much of this area that's
13 going to be set aside to be remediated to the industrial
14 standard, how much of that is actually covered with either
15 asphalt or concrete and how much is just exposed ground?

16 **MIKE THOMPSON:** Sure. Let's talk about the
17 perception of what industrial cleanup means. The
18 residential scenario that we used to develop remediation
19 goals would be people living there all the time and there
20 are -- there is irrigation. So you've got a lot of water
21 moving down through the system. One of the primary
22 differences that we cited for the 300 Area industrial zone
23 would be that well, families aren't going to live there.
24 It's going to be adult workers for the most part working
25 anywhere. Outside, inside, it doesn't have to be paved. So

1 you can be working in the dirt because we've dug this stuff
2 down to 15 feet and backfilled behind it. And a lot of that
3 backfill actually meets residential standards. I looked at
4 that awhile back when we did the 300 Area end states thing.

5 But the primary difference is how much soil -- how
6 much contaminant you can leave behind in the soil below 15
7 feet. And there is a difference between the remediation
8 goal for a residential scenario which includes irrigation
9 and an industrial scenario which does not include irrigation
10 which would be natural precipitation on top of a plant
11 community, on top of parking lots and that sort of thing.
12 And that plant community does not evolve to a mature sort of
13 step. So it's kind of a moderate amount.

14 **PUBLIC CITIZEN:** All right. So let me ask you a
15 question about that then. With respect to an industrial
16 area can we say that there is any kind of guarantee that the
17 area that's going to be designated remediated to industrial
18 standards, is there any guarantee or control saying that
19 none of that will be used for residential purposes or by the
20 City of Richland up to 50 years out? Is there any real way
21 of nailing that down or is it just we hope it won't be used?

22 **LARRY GADBOIS:** The record of decision that we're
23 proposing would put an institutional control which applies
24 to the land. And DOE as the land owner now has to ensure
25 that any activity they do or if they allow somebody to come

1 on site that they would honor those. So the DOE is
2 responsible for that. And EPA can take and enforce it if
3 they don't live up to that.

4 If DOE turns the land over to somebody else, you
5 know, sells the land or gives it away a deed is generated
6 and there's a deed restriction on that that would transfer.
7 So it's an imposition on the land that DOE is responsible
8 for fulfilling.

9 Let me get to that one other thing when Mike was
10 explaining what does industrial land use. This is a cleanup
11 level for the soil that would allow future industrial users
12 to be exposed to that soil and be protected. And our
13 industrial scenario is 40-hour week, 50 weeks a year,
14 outside all eight hours in the dirt. So it's not on a
15 parking lot or in a building. They're outside exposed to
16 the dirt so we're setting a dirt cleanup level.

17 **PUBLIC CITIZEN:** And that is -- the cancer is
18 supposed to be what, 8 per 10,000? That does seem a bit
19 high.

20 **LARRY GADBOIS:** For the radionuclides we're using
21 a 1 in 10,000. For the chemicals we're using the MOCA
22 numbers.

23 **PUBLIC CITIZEN:** Larry, you're not using those
24 numbers.

25 **LARRY GADBOIS:** Yes, we are. Let me get the one

1 up. The 15 millirem, when we did the interim actions we
2 used 15 millirem. There was a draft proposal out there at
3 the time. That's what we adopted. What's in the proposed
4 plan and I challenge you to prove me wrong is we're using a
5 risk-based standard of -- the standard of 1 in 10,000.

6 **PUBLIC CITIZEN:** That's federal standard.

7 **LARRY GADBOIS:** Yes, that's federal standard.

8 We're not using 15 millirem there. And the remedial
9 investigation disability study talks about that and why
10 we're not doing that and we're going with a risk-based
11 standard. EPA no longer supports the 15 millirem that we
12 used to use.

13 **PUBLIC CITIZEN:** So my question has to do with the
14 discharges to the river where essentially you're proposing a
15 formal decision under which 150 kilograms of uranium per
16 year will discharge to the river. Do you have an NPDES
17 permit in place or applied for for that discharge to the
18 river? And do you have a consultation under the Endangered
19 Species Act since this is critical habitat for those
20 discharges to the river?

21 **LARRY GADBOIS:** First part, NPDES, no. CERCLA
22 actions don't do permits. I think you know that. As for
23 the consultation I'm not sure where it's -- the Department
24 of Energy does consultations with Fish and Wildlife for
25 those sorts of species. Department of Energy does a

1 biological assessment. The Endangered Species Act has some
2 of its own processes. And that's a regulation that comes
3 into play when you do a CERCLA action. You look at other
4 environmental laws that are out there.

5 **PUBLIC CITIZEN:** So will you send us that
6 consultation? I mean why don't the two of you send me the
7 consultation?

8 **LARRY GADBOIS:** I don't have it.

9 **MIKE THOMPSON:** Jim, can you help?

10 **JIM HANSON:** Yeah, I'm not aware of consultation
11 going on with this action.

12 **MIKE THOMPSON:** And you had something on a
13 previous comment you wanted to?

14 **JIM HANSON:** On the 15 millirem versus risk level?
15 The proposed numbers in the (inaudible) for rads are the
16 lower of the 15 millirem versus the risk level of 10 minus
17 4. So 1 in 10,000. And what you'll find, what you're
18 probably looking at, we're still seeing the interim action
19 number. That number actually ends up being lower than the
20 risk-based number. What you see is your calculation that
21 shows that you've identified 8 in 10,000. That's an average
22 concentration. And so when you look at the different
23 emitters, the alpha emitters typically go -- the risk level
24 if you go tritium risk level that will be a much higher
25 concentration and less conservative. So we're going with

1 the lower.

2 **PUBLIC CITIZEN:** Now, we will comment extensively
3 on that. You're not meeting 1 in 10,000. And you're not
4 even attempting to meet MOCA. But your PRGs, your
5 remediation goals clearly identify either four millirems for
6 water standard. And they clearly identify 15 millirem as
7 the equivalent.

8 **LARRY GADBOIS:** Again, like Dr. Jim Hanson said,
9 for the radionuclides we're using the more conservative of
10 the 1 in 10,000 risks for the interim action. We've been
11 doing cleanup out there. Like you've heard we've been doing
12 a lot of cleanup action. We've dug up most of the waste
13 sites already under an interim action. We don't want our
14 final ROD to be any worse than that. So we're at least as
15 good as the interim actions. And then where a risk-based
16 standard for radionuclides is more conservative, that's what
17 we're proposing to use. And I would love you to find where
18 the proposed plan says something other than that because we
19 scrubbed that pretty thoroughly.

20 **PUBLIC CITIZEN:** Absolutely.

21 **DIETER BOHRMANN:** Can we take one more question
22 here and then I think it's about -- this is a little fast
23 here but it's about 20 til. We'll get to the formal comment
24 period.

25 **PUBLIC CITIZEN:** Hi, my name is Tommy Gunn with

1 Washington Physicians for Social Responsibility. We're
2 concerned about what's being assumed and really not talking
3 about. So one of the assumption, and it's a lot of it was
4 in a 2011 study that Bob Alvarez did who has a lot of
5 experience with the site. And he found through research
6 about 3.5 tons of plutonium that was not counted in the
7 inventory. Not just at Hanford. This is throughout the
8 complex. And then he started looking at, for example,
9 what's called absorption rates of soil. One of the
10 assumptions that we have at the Hanford site the higher the
11 number the more the soil actually absorbs plutonium for
12 example. And he said that the operating model at Hanford is
13 150 absorb rate, its KD rate, whereas most of the measured
14 material in the soil is about 10. So we're making a mistake
15 of a factor of 15 over how long -- how fast these, plutonium
16 in this case, travels both in water but mostly in soil.

17 I think that we've got a problem here. You know,
18 we've talked about 130 sites. I would like to see test
19 wells drilled, maybe three, at each downstream portion of
20 those sites. That's not terribly expensive. Let's not wait
21 around for five years to find three more uranium hotspots.
22 We could actually have drilling taking place at these 130 or
23 134 sites, even just on the 300 level, and find what the up
24 and down are.

25 I'm a little concerned about that last blip of

1 uranium close to the Columbia in 2010 because that means to
2 me there's a little something more than just floating up and
3 down because it's so high up. Well, it's based on two wells
4 maybe. Maybe three or four. But just in the 300 Area you
5 can do some test wells. They need to be deeper. What about
6 -- 15 feet is no magic number in terms of soil. You know
7 that stuff goes a lot further down and hits groundwater a
8 lot further down than 15 feet. And I'm hearing that that's
9 what you folks are doing generally to dig up the soil and
10 remove it. It might be some of the hottest but there's also
11 some other material. You know, we've got 42 byproducts out
12 of the reactor that's radioactive ions. And they go a lot
13 of different places, including sticky plutonium that doesn't
14 bind with the soil at Hanford as much as we thought. So this
15 stuff needs to not be simulated tested. It needs to be
16 measured at the site. And I know that there's room to do
17 this but it's not terribly expensive in relation to a lot of
18 other stuff that's spent every year out there.

19 **MIKE THOMPSON:** Well, a couple of things in
20 response. Plutonium, our knowledge of plutonium, it
21 generally is very as you say sticky. It likes to bind to
22 the soil. And if the chemistry is such within normal ranges
23 plutonium binds up extremely well to the soil. It doesn't
24 move very far. If it does get into the groundwater it binds
25 to the soil within the groundwater.

1 Early days of Hanford before we had tanks there
2 were things called reverse wells. Anywhere else they would
3 have called it an injection well where waste was actually
4 injected into the aquifer. There's a number of these. Small
5 but a fair number. Those have been studied extensively
6 because that's where things like plutonium and uranium and
7 cesium and strontium and that sort of thing were injected
8 directly into the groundwater. So it's sort of a
9 serendipitous laboratory nature to look at the stuff so
10 we've studied that so we know it pretty well.

11 Plutonium generally does not move very far. Now,
12 there's a couple of exceptions to that. One exception is if
13 you get very high pH or very low pH. So in the 200 Area if
14 you had a liquid waste disposal creek that received things
15 like plutonium and uranium and those sorts of things, binds
16 up fairly well close to the surface. But if say for
17 instance the folks that are doing the work have to meet
18 production schedules and they need some place to put their
19 waste and this thing is bound up they've been known to put
20 acid solutions into those to break it free and to use it.
21 That's one of the practices that was used. So there are
22 some areas in the 200 Area where the waste has solidified.
23 And plutonium was deep into the soil. You can see that.
24 It's in the characterization. It's very well published.

25 The other is if you have really, really extreme

1 chemistries in the stuff. You can get some (inaudible) in
2 the processes. And plutonium likes to bind really, really
3 well so there is another mechanism for that as well.
4 Transport this. More than what is generally considered for
5 the sticky stuff.

6 In the 300 Area I hope we haven't given you the
7 impression that our knowledge ends at 15 feet because over
8 the last 24 years we've drilled a tremendous number of holes
9 out here looking exactly for what you're talking about
10 today. Characterization data, three dimensional. You're
11 actually go down taking samples looking for things like
12 uranium, plutonium, strontium, cesium. Generally in the
13 early days it was the radionuclides. And then later as we
14 saw in the Tri-Party Agreement and we got into this there
15 are remedial investigations that occurred that were approved
16 by the agencies where we looked at the characterization
17 looking for that. So we do have a lot of characterization
18 data below the 15-foot interval. So if you would look in
19 the state document all of the information that's available.
20 Look through plots and you'll see uranium, plutonium,
21 strontium. All that's available for your perusal.

22 **PUBLIC CITIZEN:** So you're talking about the EIS
23 document?

24 **MIKE THOMPSON:** No, this isn't an EIS thing. The
25 proposed plan has a big, thick document associated with it.

1 It's the Remedial Investigation Feasibility Study.
2 Everything that we know that's pertinent about the decision,
3 you know, all that characterization data is published in
4 there. So if you want to go back and look at that it's all
5 there. You can make your mind up as to whether it is
6 sufficient.

7 **PUBLIC CITIZEN:** Just one quick question. How
8 about PCBs, polychlorinated biphenyl, for a second? Are you
9 monitoring for PCBs in the fish or where are the PCBs at?
10 How much is used in the 300 Area?

11 **MIKE THOMPSON:** We're finding PCBs in some of the
12 soil sites. And frankly we're finding some of the aloclors
13 of PCBs in some of the sites a little deeper than we would
14 have expected. But they are looking as they're excavating
15 and we would look as we drill for PCBs. And we have found
16 some. That's why you saw on those contaminants of concern
17 because we've identified that in the characterization. So
18 we want to be very careful and look for that and make sure
19 we get it.

20 **DIETER BOHRMANN:** Okay, thank you everybody for
21 your questions. And like I said, if we have further
22 questions after we're done with formal comment the agencies
23 are going to be available to stick around and talk to you
24 further.

25 When you signed in you had the opportunity to

1 check the box if you wanted to provide formal comment so I'm
2 just going to go down the list in order that folks signed in
3 at and we'll go from there. If there are people who still
4 want to comment who didn't sign up we can do a check-in
5 after we get through this list. I will ask that you state
6 your name for the record and we have you speak into the
7 microphone to make sure we accurately capture your comment
8 on the recording here. Not going to put a clock on you but,
9 you know, if you could keep your comments to about three
10 minutes I think that would be a good start. And then, you
11 know, if we have some time and you want to comment further
12 after that we'll go from there.

13 So our first person who signed up is Armand
14 Kechel. Sorry if I butcher your name here. Is Armand still
15 here? Okay. Steven Gilbert is--

16 **PUBLIC CITIZEN:** I'll provide a couple of
17 comments.

18 **DIETER BOHRMANN:** Excuse me. Can you just state
19 your name?

20 **PUBLIC CITIZEN:** I'm Steven Gilbert. I'm with --
21 president of the board of Washington Physicians for Social
22 Responsibility. Toxicologist for the University of
23 Washington.

24 So one of my comments are we spend 35 billion a
25 year on nuclear weapons. We spend 5.5 trillion overall on

1 nuclear weapons. I think cleaning up Hanford to return it
2 to where it was is an important goal and we should accept
3 responsibility for that and we can certainly take a bigger
4 fraction than what we spend on nuclear weapons, including
5 the cleanup site.

6 Also I want to point out that there's an assertion
7 here that a 150 kilogram male is used as a standard. Now,
8 children eat more and drink more than adults do. And I
9 wonder if your standard would change if you took a two- to
10 three-year-old kid and used that as the standard. See if
11 they're eating fish or drinking the water that's in the
12 Columbia, your grandchildren for example.

13 The other thing I do think the area should be to
14 residential standards. We should try to get it back to what
15 it was initially and not fool around with trying to make or
16 put in controls that we know. That's just shoveling the
17 work. I'll leave it there.

18 **DIETER BOHRMANN:** Thank you. Our next commenter
19 is Mary Hansen followed by James Kelly. Is Mary here?

20 **PUBLIC CITIZEN:** I'm Mary Hanson and I am cochair
21 of Seattle Fellowship of Reconciliation. And I would just
22 like to concur with the comments that Steve Gilbert just
23 made and also with the comments of Tom Carpenter, Tom
24 Buchanan, Jerry Hallett, and the interns.

25 I just really think that the concern I have is

1 that not putting enough money into it and not bringing it up
2 to the standard that we can bring it up to. And I
3 personally do not feel comfortable at all with kind of
4 making assumptions that things will work out. I think we're
5 going into a time where things are rather chaotic. And I'm
6 very uncomfortable about the fact that you have our state's
7 only nuclear power plant right, you know, with a parking lot
8 right near this. And the comment was made how much
9 dangerous waste there is stored at that site. That is of
10 extreme concern to me. So it's not pertinent to this
11 directly but I would prefer to see huge amounts of money
12 poured into putting that waste into hard cask storage
13 because the danger to Richland and the danger to the effort
14 to do this remediation are made, in my opinion, jeopardized
15 by the fact that you have the fuel rods on the roof of a
16 nuclear power plant right nearby. And so I would like to
17 see that process speeded up because even though I understand
18 that different organizations have different responsibilities
19 for different things. Ultimately the birds, the squirrels,
20 and nature and water don't even know. That isn't real to
21 all of that. So I think we need to really demand more in
22 the way of resources so that we can deal with making the
23 whole area safer, the parts that you're responsible for and
24 the parts that other entities are responsible for. And I
25 will make further comments in writing before the 16th of

1 September. Thank you.

2 **PUBLIC CITIZEN:** Jim Kelly from Seattle. And I
3 actually don't really have anything to add in terms of oral
4 comments right now. I do want to really echo one of the
5 things that the intern and Ryan mentioned which is from
6 Heart of America which is that there has been really no
7 discussion about treaty rights of the Yakima Nation. And to
8 me that is very disturbing, particularly in light of some of
9 the comments that were made. Almost -- essentially just
10 saying that nobody uses this area in that way. You know, to
11 me that's very insensitive. And so, you know, I really am
12 concerned about that particular point. But I will also
13 submit some written comments. So thanks.

14 **DIETER BOHRMANN:** The next commenter is Roxy
15 Giddings followed by Peggy Maze Johnson.

16 **PUBLIC CITIZEN:** I'm Roxy Giddings. 12211 C
17 Street South in Tacoma, 98444. And I'm telling you that
18 because I didn't write it down and I don't have e-mail so I
19 can't receive any comments from anybody except through snail
20 mail. A wonderful idea, snail mail.

21 I got on the telephone with Denny Heck for an hour
22 the other day. He's our state guy, number 10, our federal
23 guy. And he sent me some things, including the Hanford
24 funding summary. And I would like to know how much of the
25 request for 2014 of the \$2,000,203,624 will go to this

1 particular section of the cleanup at Hanford. I've been
2 coming to these now for ever since they started. We're
3 still paying out for World War II. Remember how long it
4 takes. Anyhow, I understand the Operations Office and the
5 Office of River Protection and all these other things but I
6 kind of think I would like to have a response to that
7 question. How much of the request is going to go to this
8 because that's a lot of money. And I also would like to say
9 that the total requested for 2013 is 2,000,155,886.
10 155,886,000. I can't even read all these zeroes. But we
11 haven't gotten that much. So I guess I would just like to
12 say ask for as much as you need and we will do the best we
13 can to get Congress off their sequestered butt -- don't put
14 that in there. And I want to thank you for using the word
15 "sequestered" in the proper way. If we're going to
16 sequester some of this stuff if we really want to hold it
17 down and keep in in control. Okay.

18 **DIETER BOHRMANN:** Peggy--

19 **PUBLIC CITIZEN:** She's gone.

20 **DIETER BOHRMANN:** Next commentator is Tom Buchanan
21 followed by Barbara Zepera.

22 **PUBLIC CITIZEN:** Just one comment. I know in West
23 Valley, New York, which was the historical site of the first
24 reprocessing plant, which never really worked but there was
25 actual waste brought to the West Valley site. A lot of it

1 is under water. And one of the things that they've done to
2 prevent the waste from traveling into the water systems is
3 to dig a huge trench and fill it with an absorbent. In this
4 case it was cetalite which is used to at least absorb some
5 of the radioactive elements that were impinging. And one of
6 the things that would be possible, and we're talking about
7 an engineering solution, at some point should be at least
8 proposed. It's alternatives. How long would that trench be
9 in the 300 Area along the Columbia, how long would you have
10 to dig pilings down to protect and keep that seepage that's
11 in many ways going into the Columbia now? How often would
12 you have to take that cetalite out and put some more in,
13 because we're talking about mass solutions of a very, very
14 tough problem? And what I'm asking for as well is having
15 this not the single solution, just like the hotspot should
16 not be the single solution in terms of seeing it go up and
17 down. I would not be surprised to see many other hotspots.
18 I don't want to wait five more years to see some more
19 hotspots trickling down in the underground groundwater or in
20 the vadose area. I don't want to see that. And I want to
21 see a barrier on the Columbia because every year that it
22 drops in it's not just drinking water standards at Richland
23 or at the Hanford Reach that I'm concerned about.

24 What about when it reconcentrates? What about
25 those sturgeon behind the dams? What about downstream? When

1 the biological symptoms collect and start to reconcentrate
2 so much of the radioactivity. It's a very serious problem
3 and we don't deal with that in this vision of the cleanup
4 process. We deal just with onsite and offsite drinking
5 water standards. I realize we have to have some standards
6 but we also should measure the biota and the living systems
7 including plants and see where this stuff concentrates
8 again. We know it's in duck eggs. We know that it's in
9 other species. We know it's in fish. So why don't we have
10 some indicator species? And why don't we protect the river
11 with as much engineering as we have that's not terribly that
12 expensive in terms of -- we've been digging trenches out
13 there for years. Let's build another trench. And in this
14 case let's fill it with material and see if we can stop a
15 lot of the leakage that's going into the Columbia right now.
16 Thank you.

17 **DIETER BOHRMANN:** Barbara Zepera.

18 **PUBLIC CITIZEN:** I would like to put two things on
19 the record because obviously I really don't trust anything
20 that the DOE is doing. The NRC is now totally controlled by
21 the nuclear energy plan pushers. But on the record Ron
22 Wyden's committee yesterday, the Senate committee on nuclear
23 issues on cleanup and containing the waste. The FIFO person
24 spoke briefly. And Ron Wyden spoke and Cantwell spoke and
25 they're in the Congressional Record. And I wish their

1 statements would be put on the record of this hearing
2 because they're trying to get at the real issue. And David
3 Lochbaum -- I think it's L-O-C-K-B-A-U-M -- union of
4 Concerned Scientists, had a clear statement. I can't repeat
5 his statement here but I would ask that you put his
6 statement on the record of this hearing because I am a
7 bomber. I lived in Richland and my mother worked at the
8 very lowest level in the decontamination lab. And she was a
9 Reagan Republican. But she had to go through this. And
10 I've said this repeatedly at all of these hearings that the
11 supervisors who really tried to hold up the so-called safety
12 standards were not promoted. In fact they were criticized.
13 And as long as we have a society that says that anybody that
14 tells the truth in government is put in jail for 100 years
15 we're not going to solve any problems like this.

16 I was -- I had security clearance. I worked at
17 Boeing on test flights. Not bombers. I worked at the
18 applied physics lab. And I worked for the physicists who
19 were doing the submarine target projectories arrays -- solar
20 arrays. And they said that all the secrecy that we have
21 really is stupid because if we wanted to really confuse the
22 enemy we'd give them all our data because it's much harder
23 for them to look at our data and figure it out than it is
24 for everybody who is a real scientist. Our real problem is
25 that all the people getting physics degrees and math degrees

1 are from China now, so. My daughter got her Ph.D. in
2 economics and all of the people that got Ph.D.s down at
3 Davis in science and physics, 90 percent of them were from
4 China.

5 And anybody that is putting people in jail. I
6 mean we have a government that is so stupid that they are
7 putting people that tell the truth and tell the stupid
8 mistakes that we have done in our government and are
9 unwilling to find them. We can't solve these problems. But
10 I would ask that the Union of Concerned Scientists statement
11 that was on the record of the Congressional Record yesterday
12 be put on this record. And I also ask that Plutopia by Kate
13 Brown, a new book that's come out about the Hanford -- both
14 Hanford in Richland and Ozersk in Russia each issued at
15 least 200 million curies of radioactivity in the four
16 decades of operation for weapons. This is twice what
17 Chernobyl emitted.

18 And in the TV last week they had a reporter go to
19 Fukushima. They weren't getting very big readings when they
20 walked around the plant in the dirt. But when they got near
21 any of these plants that are just growing up in these empty
22 streets their meters went off the charts because the plants.
23 And that's why you're getting higher readings from
24 irrigation probably because the plants, our food basket, is
25 being radiated by this unclean weapon system that we have

1 been hiding from the truth. But I urge people to ask for
2 this book in the library so they have to carry it. Plutopia,
3 Kate Brown. And I ask people to go to the Congressional
4 Record and read what -- there's a few people in Congress,
5 Maria Cantwell, Ron Wyden, that are trying to get at this
6 cleanup. And we're insane if we don't really do it. And we
7 can't just sit here and give us, you know, well, weapons
8 don't have anything to do with it.

9 **DIETER BOHRMANN:** Could you state your name for
10 the record please? I think we missed that at the beginning.

11 **PUBLIC CITIZEN:** Barbara Zepera. I'm in the phone
12 book. I live at 308 East Republican Street, apartment 710,
13 Seattle, 98102.

14 **DIETER BOHRMANN:** Thank you. I just want to make
15 sure we associate your name with your comments so we can get
16 a response to this document. Next commenter is Jude Kmil.

17 **PUBLIC CITIZEN:** Hi. I am Jude Kmil. I live in
18 Seattle. And I was not clear on something like this
19 attenuation in terms of how long that would last. If you do
20 it. Five generations? Two generations? Does it just last
21 forever? Does it stay down forever? I wasn't clear on that
22 so I wanted to be made clear on that. And I wanted to say
23 that I think again the best thing for us to do is just to
24 clean it up. Take the money, get it out of the soils. Not
25 15 feet down. Get it out of the soils. Clean it up. And

1 it's a very simple statement and I can say more but I can't
2 really follow the last one. Thank you.

3 **DIETER BOHRMANN:** Okay. We have Bert Webb
4 followed by Liz Mattson and Jerry Hallett is our final
5 commenter signed up.

6 **PUBLIC CITIZEN:** Okay. Hanford is one of the most
7 polluted sites on the planet. And I consider it an
8 environmental crime of huge proportions. With respect to
9 the Native Americans the Yakima Indian Nation originally was
10 given a reservation where the Hanford site became. And then
11 they were moved west of that but they still by treaty rights
12 had the right to monitor the environment. And I was
13 actually hired by the Yakima Indian Nation in the mid-70s to
14 help them find a nuclear contractor that could oversee at
15 Hanford by the Department of Energy and Department of
16 Ecology. And as we can see, 40 years later and more
17 apparently not enough is being done.

18 Your presentation was too technical by far. You
19 know, you dropped a lot of different technical terms you
20 didn't define. So to even think about being done from 7:00
21 to 7:30. It took you almost an hour to dump that load of
22 technical information on us. And then you want to list out
23 a nuclear engineer. Could not follow about half of what
24 you're talking about. For the record by the way my name is
25 Burt Webb. I have a blog at newville tidings dot com but I

1 blog daily on nuclear matters.

2 You need continual monitoring. There's too many
3 unknowns. There's just far too many unknowns at Hanford
4 with respect to what is still in the ground, what's going to
5 come out of the ground, when it's going to come out of the
6 ground. You need to be continuously monitoring it. Like
7 the guy said wells, biological issues, plants, animals, and
8 so one.

9 I have just a minor side question. I was at a
10 hearing at Magnuson Park. And the Navy is cleaning that
11 site up but apparently they haven't heard from the
12 Department of Energy and EPA because they were saying that
13 15 millirems was just fine, thank you very much. So maybe
14 all the federal departments ought to talk about that if you
15 don't think 15 millirems is good enough.

16 I am afraid to say that the Department of Energy
17 and other agencies at Hanford have a really wretched record
18 with respect to transparency, safety, planning, competence.
19 They've even been caught breaking laws. The tank fiasco
20 that has been happening now with leakage in the double-
21 walled tanks that were guaranteed never to leak. The
22 vitrification plant that they sank a lot of money into
23 before they even understood what they were up against and
24 then had to stop because they realized it just wasn't going
25 to work. So you'll excuse me if I lack confidence in your

1 process.

2 **LIZ MATTSON:** I'm Liz Mattson with Hanford
3 Challenge. Thanks for the opportunity to comment today and
4 for explaining how the comment periods that we have until
5 September 16th. We always appreciate when that is done,
6 when we request that and that request is met. I have a few
7 comments today and then I'm also going to submit comments in
8 writing.

9 Some of my concerns are about the uranium
10 sequestration since it is not a sure technology. We're not
11 completely sure it's going to work. We need a backup plan.
12 And so I hope that the Department of Energy and EPA will
13 consider that as they're looking at their preferred
14 alternative and considering public comments that if it
15 doesn't work they need a plan in place that's not just
16 monitored natural attenuation and letting uranium go into
17 the river and washing away that way, which eventually gets
18 to drinking water standards in the aquifer but is a pretty
19 passive plan. And I think removal, treatment, and disposal
20 is potentially an option. Obviously it's a complicated
21 situation with the 300 Area but I think it should be
22 considered as part of a backup plan if uranium sequestration
23 does not work.

24 And then one of my biggest concerns is around
25 residential standard versus industrial standard. And for

1 the industrial complex the assumption that we can put
2 institutional controls in place and keep people with
3 restricted use to that area forever is something that is
4 very troubling to me. And I think we need to be really
5 careful any time we make assumptions about controlling land
6 and the decisions of people that will come after us.

7 It's really easy to forget about decisions that
8 were made before. We have trouble remembering things that
9 happened a year ago, five years ago. Transferring
10 information to people in the future is a challenge. And
11 it's easy to forget especially when what we leave behind is
12 invisible. We've seen people change their land use in other
13 situations and this is probably not going to be that
14 different, especially with the city of Richland right next
15 to that area. It's really easy to imagine that some day
16 someone will want to build a house there and having a
17 residential standard, cleanup standard in that area would
18 make more sense and help protect the future of the people
19 that come after us. Thank you and I will be submitting more
20 comments in writing.

21 **PUBLIC CITIZEN:** Jerry Hallett for Heart of
22 America Northwest. First let me start by requesting that
23 this portion of the record that the public interest
24 presentation given shared by Hanford Challenge and Heart of
25 America Northwest be considered formal comments to make it

1 easier for us not to repeat all of that again.

2 And secondly in regard to since as I understand it
3 the question and answers have been recorded I am very
4 concerned with Mike Thompson's presentation because
5 apparently he's been very candid in saying that you believe
6 that it will take 50 years for monitored natural attenuation
7 to reach the drinking water standard but the proposed plan
8 documents that will be the basis for the decision and basis
9 for other evaluations clearly identifies 22 to 28 years.

10 There's obviously professional discrepancy here. And I
11 believe it's very important that we have on the record that
12 you offered a professional opinion that it will take 50
13 years. And that the record itself and the proposed plan
14 itself be changed to reflect significant uncertainty in the
15 22- to 28-year range.

16 That range, near as I can tell, for example, fails
17 to consider the fact that it is expected that we are going
18 to increase the flows and returns to the Columbia River
19 which will increase the bank storage and influx of water to
20 a higher level than we have currently today. That is a plan
21 that our environmental agencies have adopted and are seeking
22 to implement. And there is no consideration in the proposed
23 plan that I've been able to find that refers to the fact
24 that we're going to have a higher average flow level, not
25 just a historical flow level.

1 Thirdly, let's start with the big picture now. The
2 300 Area and areas covered by these proposed records of
3 decision are the southern gateway to the Hanford Reach
4 National Monument. It is clear from the history of
5 development along the Columbia River in the past 10 and 15
6 years that there is incredibly intense pressure to develop
7 this area. The City of Richland has proposed developments.
8 Trident has. Energy Northwest has. It is going to be
9 developed.

10 I am very disappointed that EPA, which for years
11 stood up at these public meetings and told us that they
12 would absolutely reject the Energy Department's use of its
13 land use plan as the basis for cleanup decisions has now
14 rolled over and is accepting this. The Energy Department's
15 land use plan only controls how it will use the 300 Area
16 while the Energy Department is doing cleanup and controls
17 the land. Pacific Northwest National Lab under other Energy
18 Department decisions isn't even part of the cleanup any
19 longer. It isn't even part of that land use plan. And to
20 say that we're going to make a permanent cleanup decision
21 based on the temporary land use while the Energy Department
22 is using the area is not only shortsighted but illegal and a
23 great disappointment to hear EPA now having retreated
24 tremendously from its prior statements. Washington Ecology
25 we would urge to refuse such occurrence. And it's

1 disappointing that we didn't hear from Washington Ecology
2 tonight except as the moderator.

3 What we heard tonight very clearly is that there
4 is not even an effort to meet Washington State's Model Toxic
5 Control Act risk requirement and standard which federal law
6 says the more stringent state standard has to be attempted
7 to be met. That state cancer risk standard is 1 in 100,000.
8 So if we accept EPA's statements tonight that we're cleaning
9 up to 1 in 10,000 cancer risks for adults exposed, that is
10 not meeting our state standard or even attempting to do so.

11 Secondly, MTCA, the state's Model Toxic Control
12 Act, requires that an industrial cleanup standard can only
13 be used where there is no reasonably foreseeable future use,
14 reasonably foreseeable future use any time for the area
15 where nonindustrial workers may be invited in for using it.
16 We already have these areas that were recently cleaned up
17 that are already being used for trails and river shore
18 access. We know that's going to be used and Washington
19 State needs to step in and say you're not meeting our MTCA
20 requirements.

21 Thirdly in that regard, the state law says that we
22 have to have a shoreline plan that will be used after the
23 federal government leaves. And there is no discussion of
24 this in any of the documents. The shoreline is critical
25 habitat. What is typical for river shore or even stream is

1 200 feet of protected land. Instead we have an industrial
2 area zone proposed with significant contamination much
3 closer to the high water mark of the river. And Ecology
4 needs to weigh in and say what's acceptable to Ecology for
5 how far back from the river we have to have designated
6 equivalent to critical habitat and critical zone for
7 protection under shoreline management and growth management
8 standard. And then we have to apply cleanup at least to
9 that shoreline area, which is not the industrial zone.

10 So in some -- it's disappointing that we seem to
11 have a retreat from commitments from our agencies that were
12 going to meet our state or even our federal cleanup
13 standards and that we're going to now allow the Energy
14 Department to say that a temporary land use plan is the same
15 thing as a permanent decision about what is reasonably
16 foreseeable, including the failure to address how it will
17 affect the treaty rights under the law and fish, the
18 shoreline and public areas.

19 And my final comment for the evening is that it is
20 highly ironic that the excuse given for not adopting a
21 retrieve, treat, and dispose alternative and not even
22 examining other alternatives here is that the groundwater
23 infiltration increase for uranium when we did retrieve,
24 treat, and dispose. Larry, you know that I was the person
25 who came to EPA and complained about the amounts of water

1 that were being applied to those 300 Area sites. Now to say
2 that we applied too much water and we drove uranium into the
3 groundwater therefore we shouldn't be applying water and
4 digging up as much is highly ironic and wrongheaded. There's
5 no discussion in the plan of numerous other alternatives to
6 control and suppress dust. And that needs to be explored.
7 The plan needs to be pulled back, reviewed, and have those
8 formally presented in a revised proposal. Thank you.

9 **DIETER BOHRMANN:** Okay. Jerry was the last person
10 signed up for formal comment. Is there anyone else who
11 wishes to make a formal comment?

12 **PUBLIC CITIZEN:** My name is Tom Carpenter and I'm
13 with Hanford Challenge and I've just got a short comment and
14 we intend to submit written comments. But I think one of
15 the facts that was prevailing here tonight was that the
16 half-life of uranium was 4.6 billion years. And that's
17 about the age of the planet Earth. I've read that the sun
18 may not last another five billion years. So we won't even
19 make it to the 10 half-live for uranium 238 to go away.

20 And you know, when I think about it before the
21 20th century most of that uranium was socked safely away
22 inside of mountains. And it wasn't available biologically
23 as much as it is today. Well, we mined a lot of that
24 uranium and we brought it to places like the Hanford site.

25 We brought it from fairly dry areas and put it

1 into -- next to a river. And with half-lives this long, you
2 know, it's preposterous to think that whatever is on the
3 Hanford site today, including that uranium, isn't going to
4 be in the environment (inaudible) for years. Maybe a couple
5 thousand. But at some point that uranium will be where it
6 is right now in the long view. And get into the air, the
7 water, the food in the general living environment. And that
8 goes for the plutonium. That goes for all the long-lived
9 products out there. And I think we need to think about
10 Hanford in those terms. And, you know, commercially the
11 power plants in those terms and radioactive waste in those
12 terms. Whether it comes out of fertilizer, whether it comes
13 out of, you know, making nuclear weapons or for nuclear
14 plants we need to be aware of what we're doing to our
15 genetics in particular.

16 As an alpha emitter when this stuff gets inside
17 you it can damage the genetic structure. And even if 99
18 percent of that genetic damage is repaired and 1 percent is
19 not over time that can build up and cascade and lead to
20 birth defects and mutations that are not desirable. So I
21 worry about that.

22 And when I think about the figures, you know, it
23 will cost a billion dollars to go after uranium in the 300
24 Area. And I think about the, you know, how much that Steve
25 Gilbert mentioned that we spend \$5.5 trillion, actually \$8

1 trillion in adjusted money to make nuclear weapons, a
2 trillion dollars. A billion dollars doesn't sound so bad,
3 right? I mean that's half of what Hanford spends in a year.
4 And it is a lot of money. And I would like to see other
5 areas of Hanford given a higher priority frankly. I don't
6 think this is the huge big priority. I think the hotter
7 waste is. And I think the pollution in the soil underneath
8 the tanks and the hotter waste there and some of the other,
9 you know, urgent dangers of explosions. Those are
10 priorities. But it doesn't mean this one isn't just because
11 it's a lower level priority.

12 So, you know, for the short-term I could see
13 trying the polyphosphate to, you know, hopefully bind and
14 prevent the uranium from going in but I don't want to walk
15 away from the problem. I want to see a removal, treatment,
16 disposal option for all of that contamination. And I don't
17 care if agriculture puts in more or not. We've got to do
18 our part to, you know, put back to rights what we're doing
19 to future generations just like we need to there. Thank
20 you.

21 **DIETER BOHRMANN:** Is there anybody, anybody else
22 who wishes to make a formal comment? Nathan?

23 **PUBLIC CITIZEN:** My name is Nathan Reeves for
24 Hanford Challenge. My comment will be short. I would urge
25 the responsible agencies to consider two time-related

1 values. First, the cleanup should be finished and done as
2 soon as possible. And second, the cleanup should be
3 structured in such a way as that it will last forever. And
4 those two values lead me to two concerns. First, that the
5 industrial complex be cleaned up to the industrial standard.
6 I believe that it's not a standard that is going to be safe
7 forever. I believe that the residential standard should be
8 considered there. And second, I believe that the plan, the
9 proposed plan should include a backup, a specifically-worded
10 backup to the uranium sequestration technology. Even if
11 that technology doesn't work and it's revisited in five
12 years I don't feel that that's soon enough. The cleanup
13 should be completed as soon as possible and in order to do
14 that we ought to have a backup plan in place. Thank you.

15 **DIETER BOHRMANN:** Okay, thank you. Last call for
16 formal comment. Anybody else?

17 **PUBLIC CITIZEN:** My name is Laura Maierhofer. And
18 just very briefly I would like to see the responsible
19 agencies consult with the Fish and Wildlife Service
20 regarding compliance with the Species Act and the Critical
21 Habitat Act.

22 **DIETER BOHRMANN:** Okay. Thank you everybody.

23 **PUBLIC CITIZEN:** One more. Hi, my name is Anthony
24 Devron. I just wanted to make a comment about the fact that
25 I really don't feel that there's enough people here. And

1 whoever was involved with letting people know that this
2 meeting took place didn't do a good enough job. And
3 considering the amount of people that this issue affects,
4 not just here in Washington but down river in Oregon and
5 Portland, there really should be more people here focusing
6 on this issue.

7 **DIETER BOHRMANN:** Anybody else? And remember,
8 this isn't your last opportunity. The comment period is
9 open until September 16th. You can provide written comments
10 tonight or any time up until that time. Okay. I want to
11 thank everybody so much for coming out and spending your
12 evening with us, coming out and talking to us. Just a
13 reminder. If you have filled out one of your evaluation
14 sheets for the meeting if you could please turn that in to
15 the front table. We really appreciate your input. Don't
16 forget to grab a piece of cake for the road. And there is
17 one more public meeting on the 300 Area. It's a week from
18 tomorrow in Hood River, Oregon. So thanks again and have a
19 good night.

20 **(The proceedings were recessed at 9:30 p.m.)**

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CERTIFICATE

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2
3 I, Kathleen M. McKee, do hereby certify that pursuant
4 to the Rules of Civil Procedure, the witness named
5 herein appeared before me at the time and place set
6 forth in the caption herein; that at the said time
7 and place, I reported in stenotype all testimony
8 adduced and other oral proceedings had in the
9 foregoing matter; and that the foregoing transcript
10 pages constitute a full, true and correct record of
11 such testimony adduced and oral proceeding had and
12 of the whole thereof.

13
14 IN WITNESS HEREOF, I have hereunto set my hand this
15 9th day of August, 2013.

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21 /S/ Kathleen M. McKee
22
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\$	125 25:2	15-foot 69:18	59:4 59:6
\$120 38:11	129 18:6	16th 4:8	59:11 59:15
\$2,000,203,62	13 17:18	73:25	59:25 89:19
4 74:25	17:19 17:21	83:5 93:9	24 69:8
\$5.5 90:25	17:21 17:22	180 28:2	270 28:2
\$8 90:25	33:17 33:23	1980 9:8	28 32:14
	130 23:7	1985 28:8	42:10 85:9
1	23:13 42:21	1991 28:12	281,000 27:14
1 50:22 50:24	66:18 66:22	28:12	29:22
62:21	130,000 25:16	1994 28:10	28-year 85:15
63:5	134 66:23		
64:17	15 20:3	2	3
65:3	20:6 20:8	2 47:3 47:8	3 36:7 38:9
65:10	21:23	2,000,155,886	38:20 47:10
87:7 87:9	22:1 22:1	75:9	47:14 47:22
90:18	22:2 22:5	20 9:1	3.5 66:6
10 39:21 41:8	22:13 27:13	58:19 59:24	30 12:18
59:13	29:9 42:7	65:23	30:13
60:2	50:19 50:20	200 13:18	32:1 32:2
64:16 66:14	51:17 52:18	15:18 16:11	41:16
74:22	61:2 61:6	18:5 18:8	42:1
86:5 89:19	63:1 63:2	68:13 68:22	42:11 51:20
10,000	63:8	79:15 88:1	300 2:8
50:21 50:22	63:11 64:14	2010 67:1	2:11 2:15
62:18 62:21	64:16	2011 66:4	8:2 8:15
63:5	65:6	2013 2:3 75:9	8:17 8:24
64:17 64:21	66:15	2014 74:25	8:25 13:3
65:3	67:6 67:8	20th 89:21	13:4
65:10 87:9	69:7	22 85:9 85:15	13:19
100 15:18	80:25 82:13	220-square-	14:6
41:7 78:14	82:15 86:5	mile 7:25	14:25
100,000 50:24	150 41:7	235 59:6	15:8
87:7	63:15 66:13	59:14	15:14
100M 38:1	72:7	238 18:25	16:6
115,000 13:11	150,000 39:9	55:15 55:16	16:22
12 42:25	150-pound	55:23	17:9
120 41:15	31:22 31:22	155,886,000	19:10 22:23
12211 74:16	75:10		23:1
			24:25
			34:4 34:4

34:9	47:14 47:22	618-10 15:7	absolutely
39:22		17:13 23:19	65:20 86:12
45:6	<hr/> 4 <hr/>	618-11 14:1	absorb
45:17 45:23	4 38:22	15:6	66:13 76:4
46:4 46:5	48:1 48:4	17:13 17:14	absorbent
48:25 54:13	64:17	18:1 23:21	76:3
54:18	4,000 26:8	<hr/> 7 <hr/>	absorbs 66:11
55:8 58:2	30:6	7:00 81:20	absorption
59:8	4.6 89:16	7:30 3:8	66:9
60:22	40 32:18	5:9 81:21	Academy 16:25
61:4	42:11 81:16	70 8:13	accept 72:2
66:23	400 58:13	710 80:12	87:8
67:4 69:6	58:15	74 42:24	acceptable
70:10	40-hour 62:13	74,000 25:16	88:4
76:9	42 67:11	<hr/> 8 <hr/>	acceptance
83:21	450 6:16 28:2	8 62:18 64:21	11:1
86:2	4500 26:8	8,000-rad	accepting
86:15	48 31:25	24:7	86:14
89:1	<hr/> 5 <hr/>	85 28:10	access
90:23 93:17	5 38:23 48:1	88 7:23 8:5	35:11 35:16
300-FF-1 17:4	5.5 71:25	8th 6:9	41:1 41:2
45:22	50 32:18	<hr/> 9 <hr/>	87:18
300-FF-2 17:6	32:20	9:30 93:20	accidents
45:23	34:7	90 28:2 79:3	53:4
300-FF-5 17:7	34:10 40:24	95 59:24	accordance
45:25	42:11	98102 80:13	23:6
308 80:12	50:1	98444 74:17	account 31:10
31 2:3	61:20 62:13	99 90:17	31:11 32:6
324 24:6	85:6 85:12	<hr/> A <hr/>	accurate
34 23:7 23:14	500 28:5	able 2:12	51:10
43:4	54 39:24	3:23 4:23	accurately
340 24:10	586-square-	42:9 49:9	71:7
35 71:24	mile 6:18	49:14 85:23	achieving
360 28:2	<hr/> 6 <hr/>		41:24
38 23:3 42:22	6:00 2:4		acid 68:20
3a 38:12			acknowledged
38:24 42:17			
47:10 47:12			

49:23	66:22	age 89:17	40:11
acres 14:2	68:3	agencies 3:12	alpha 18:23
25:2	69:11	3:23 3:25	18:24
acronym 43:15	74:3	28:14 49:23	19:4
across 39:20	81:13 90:25	52:10 53:10	19:13 64:23
Act 9:7 63:19	add 74:3	69:16 70:22	90:16
64:1 87:5	additional	82:17 85:21	already 45:13
87:12 92:20	42:22 50:21	88:11 91:25	65:13 87:16
92:21	address 88:16	92:19	87:17
action 9:11	addressed	agency 2:21	alterative
10:7	16:23	55:2	38:20
14:16 19:20	addressing	agenda 2:22	alternative
27:16 35:24	10:3	4:4	14:21
36:18 42:22	adjusted 91:1	ago 19:18	36:7 38:9
43:18	admit 40:8	34:19 45:21	38:12 38:20
47:6 64:3	ado 4:19	84:9 84:9	38:21 38:22
64:11 64:18	adopted	agreed 16:4	38:23 38:23
65:10 65:12	63:3 85:21	16:5 20:4	38:24
65:13	adopting	21:22	41:3
actions	88:20	22:6 57:23	42:17 42:17
7:19 27:2	adult 60:24	Agreement	44:2
28:14 28:16	adults	9:12	46:23
29:21	50:21	12:20 69:14	47:3 47:7
63:1	72:8 87:9	agreements	47:10 47:14
63:22 65:15	advection	54:23	48:4
active 16:23	31:16	agriculture	83:14 88:21
actively	Advisory	91:17	alternatives
23:20	21:20	ahead 52:19	9:21
activity	aerobic 37:8	air 7:13 90:6	14:22
15:13 61:25	affect 88:17	airally 25:3	33:2 33:3
actual 75:25	affects 93:3	allow 24:4	35:19 35:21
actually 7:13	afraid 82:16	61:25 62:11	46:22 47:22
7:21 9:23	afternoon	88:13	48:1
18:23 19:17	4:21	allowable	48:13
24:21	against 82:23	15:25	76:8
27:8 45:3		alocloris	88:22 89:5
48:23 60:14		19:10 70:12	aluminum 18:2
61:3		alone 34:16	alunite 38:8
64:19 66:11			Alvarez 66:4
			am 44:25

72:20 74:11 78:6 80:17 82:16 85:3 86:10 America 3:6 5:1 74:6 84:22 84:25 Americans 50:11 50:12 50:13 50:17 81:9 amoeba 25:3 amount 20:14 24:20 27:16 31:7 31:10 31:11 31:14 35:3 35:12 38:18 39:17 41:5 42:5 42:9 61:13 93:3 amounts 59:16 73:11 88:25 anaerobic 37:8 analyze 9:13 anchor 43:9 anchored 26:13 animals 82:7 answer 3:9 5:18 5:18 10:5 16:13 44:3 44:11	52:1 54:22 answered 3:12 answers 85:3 Anthony 92:23 anybody 58:10 74:19 78:13 79:5 91:21 91:21 92:16 93:7 Anyhow 75:4 anyone 46:24 89:10 anything 11:15 33:24 41:11 74:3 77:19 80:8 Anyway 55:12 anywhere 39:23 59:12 60:25 68:2 apartment 80:12 apologize 52:3 apparently 81:17 82:11 85:5 appetite 38:5 applicable 50:23 applied 63:17 78:18 89:1 89:2 applies 50:24 61:23 apply 88:8	applying 89:3 appreciate 2:8 4:17 55:7 83:5 93:15 appreciated 4:15 approach 38:9 appropriate 16:10 33:7 33:23 approved 69:15 aquifer 20:12 20:14 20:16 34:12 35:6 40:6 41:12 41:23 68:4 83:18 area 2:8 2:11 2:15 6:22 7:25 8:2 8:15 8:17 8:18 8:24 8:25 9:1 13:3 13:5 13:18 13:19 13:21 13:22 13:23 13:25 14:6 14:6 15:1 15:9 15:14 15:18 15:19 16:6 16:11 16:22 16:22 17:3 17:9 17:9 18:8 19:11 20:3 20:4	20:4 21:7 21:17 22:23 23:1 24:25 26:7 34:4 34:4 34:9 38:10 38:10 38:19 39:22 40:14 41:3 45:6 45:17 45:19 45:23 46:4 46:5 46:5 46:8 47:12 48:25 51:2 51:7 51:9 51:11 54:13 54:18 55:8 58:2 59:9 60:5 60:7 60:9 60:12 60:22 61:4 61:16 61:17 67:4 68:13 68:22 69:6 70:10 72:13 73:23 74:10 76:9 76:20 83:21 84:3 84:15 84:17 86:2 86:7 86:15 86:22 87:14 88:2 88:9 89:1 90:24 93:17 areas 6:24 6:24 8:22 9:10 11:7
---	--	---	---

11:25 16:23 24:1 27:5 27:15 27:16 33:6 40:22 47:15 48:3 51:4 68:22 86:2 87:16 88:18 89:25 91:5 aren't 34:22 46:15 60:23 Armand 71:13 71:14 arms 13:4 arrays 78:19 78:20 aside 60:13 asphalt 60:10 60:15 assertion 72:6 assessment 64:1 assistant 2:25 associate 80:15 associated 16:6 55:23 69:25 assumed 66:2 assumption 51:15 66:3 84:1 assumptions 66:10	73:4 84:5 assure 20:2 20:5 atmospheric 56:20 57:3 attempted 87:6 attempting 65:4 87:10 attendance 12:8 attenuate 32:20 38:18 attenuation 33:13 33:16 33:18 33:19 33:21 34:1 35:7 40:11 40:15 40:16 40:17 43:21 43:24 47:4 47:5 48:13 48:15 55:18 80:19 83:16 85:6 August 6:9 available 3:19 44:23 52:10 69:19 69:21 70:23 89:22 average 13:11 64:21 85:24 avid 13:13 aware 53:1 53:8 64:10 90:14 away 17:20	17:21 17:22 20:25 21:3 25:18 25:21 30:8 32:12 32:23 33:22 33:24 37:9 37:10 37:12 37:12 43:23 57:22 62:5 83:17 89:19 89:21 91:15 awhile 29:19 33:10 35:14 35:15 61:4 <hr/> B <hr/> backed 25:9 backfill 61:3 backfilled 29:22 61:2 background 5:22 6:14 13:1 30:12 backup 47:22 83:11 83:22 92:9 92:10 92:14 bad 91:2 balance 42:18 balanced 30:5 balancing 10:21 42:20 Ballinger 5:21	bank 85:19 Barbara 75:21 77:17 80:11 barges 13:16 barrier 38:2 76:21 barriers 37:21 base 18:4 18:4 based 31:21 32:3 67:3 86:21 basements 50:3 basic 48:6 basically 9:8 47:5 basis 28:15 85:8 85:8 86:13 basket 79:24 became 81:10 become 10:6 37:15 becomes 44:15 begin 35:1 beginning 12:19 80:10 behaves 32:14 behavior 30:10 behind 22:5 29:10 52:3 61:2 61:6
--	---	---	---

76:25 84:11	40:18	2:6 2:17	5:13
believe	binds 31:16	49:17	briefly 77:24
36:5	37:10 67:23	52:2	92:18
38:17 40:10	67:24 68:15	52:17 65:21	bring 9:14
42:18	biological	70:20 71:18	73:2
85:5	37:6 64:1	72:18 74:14	bringing
85:11	77:1 82:7	75:18 75:20	20:16 73:1
92:6 92:7	biologically	77:17	brings 59:4
92:8	89:22	80:9	broad 51:2
beneath 15:22	biologist 6:1	80:14	51:11
Bert 81:3	biota 77:6	81:3 89:9	broken 8:22
best 9:24	biphenyl 70:8	91:21 92:15	brought
11:18 11:18	birds 73:19	92:22 93:7	5:23
12:3	birth 90:20	bomber 78:7	15:18
42:18 45:12	bit 7:15 13:2	bombers 78:17	31:8
75:12 80:23	16:19 19:16	book 79:13	75:25 89:24
better 29:7	20:17 22:15	80:2 80:12	89:25
32:21 40:10	22:24 25:13	boss 31:2	Brown 79:13
40:15	25:14 25:24	bottom 8:17	80:3
bicarbonate	27:5	26:10	Bruce 5:25
26:3	40:21 47:20	bounce 30:9	Buchanan
bigger	48:11 49:10	bounced	72:24 75:20
19:18 72:3	52:11 62:18	28:4	budget 10:23
biggest 57:21	bleed 29:10	29:12	bugs 35:6
83:24	blip 66:25	30:2 30:2	37:7
billets 59:16	block 14:7	30:7	build 31:4
billion	blog 81:25	bound 42:4	36:22
6:16 28:6	82:1	68:19	38:1
36:12 55:17	blue 6:22	boundary 7:10	77:13 84:16
58:19 71:24	27:22	box 71:1	90:19
89:16 89:18	board 21:20	branch 12:21	building 24:6
90:23 91:2	71:21	break 68:20	24:7
bind 24:22	boaters 25:6	breaking	24:11
25:19 32:22	Bob 66:4	82:19	50:3
32:24 40:14	Boeing 78:17	breathing	60:11 62:15
47:18 67:14	Bohrmann	26:19	buildings
67:21		brief 5:8	15:5 20:24
69:2 91:13			
binding 37:21			

21:2 21:2 46:6 51:3 51:4 built 28:24 bulk 4:10 44:16 bunch 21:7 44:5 burial 15:8 15:22 16:1 16:5 16:6 16:9 16:13 16:15 18:1 26:16 26:23 27:3 33:5 buried 18:2 Burt 81:25 butcher 71:14 butt 75:13 butts 8:16 byproducts 67:11 <hr/> <p style="text-align: center;">C</p> <hr/> caissons 16:2 16:3 cake 2:15 93:16 calculation 64:20 camp 56:23 cancer 62:17 87:7 87:9 cancers 50:21 candid 85:5	cans 16:2 Cantwell 77:24 80:5 capture 71:7 captured 52:23 carbonate 37:24 care 35:7 91:17 careful 70:18 84:5 Carpenter 72:23 89:12 carry 80:2 cascade 90:19 case 11:18 66:16 76:4 77:14 cask 73:12 caught 82:19 cause 35:12 caused 27:2 causing 22:10 cell 24:6 cells 36:22 central 6:22 7:6 15:11 23:2 23:5 34:8 53:21 century 89:21 CERCLA 9:6 10:22 42:19 63:21 64:3 certainly	50:23 72:3 cesium 68:7 69:12 cesium-137 19:5 19:8 cetalite 76:4 76:12 challenge 3:4 5:1 21:5 45:1 45:11 48:9 63:4 83:3 84:10 84:24 89:13 91:24 challenges 23:15 23:22 challenging 5:9 23:17 24:5 chance 2:12 4:15 change 23:25 25:4 37:23 48:25 49:4 72:9 84:12 changed 85:14 changes 23:12 37:10 chaotic 73:5 characterizat ion 22:14 22:20 26:14 38:17 68:24 69:10 69:16 69:17	70:3 70:17 chart 8:16 charts 79:22 check 32:24 71:1 check-in 71:4 checks 31:13 32:6 chemical 15:16 15:19 34:11 37:9 39:8 chemicals 34:2 34:4 34:17 48:12 62:21 chemistries 69:1 chemistry 38:4 67:22 Chernobyl 79:17 Chernobyls 53:3 children 50:16 72:8 China 79:1 79:4 choose 37:3 chose 48:15 chosen 14:19 49:4 chrome-3 37:16 37:17 37:17 chrome-6
--	--	--	---

37:16	13:5 13:5	21:21 23:18	COCs 9:19
circumstances	13:15 13:21	35:9 39:1	collect 77:1
40:7	14:8 15:2	39:20 44:20	color 16:21
cited 60:22	15:23 39:11	44:21	Columbia
Cities 13:13	39:14	45:3	13:10
CITIZEN 16:16	41:4	46:11 46:18	25:6 26:6
52:13 52:25	61:20 84:14	47:21 50:19	26:9
54:1 54:5	86:7	53:18 60:17	36:16
54:9	clad 59:17	62:10 62:16	41:6
54:17 54:19	claim 55:21	65:11 65:12	49:24
55:1	clarified	72:5 75:1	67:1
55:10 55:18	57:14 58:1	77:3	72:12
55:22	clarifying	77:23	76:9
56:3	58:7	80:6	76:11 76:21
56:10	clean 2:10	84:17 86:13	77:15 85:18
57:1 57:9	7:13 12:6	86:16 86:18	86:5
57:11	14:3 28:9	86:20 87:12	com 81:25
58:7	40:9	88:8	combining
58:14 58:17	46:10	88:12	57:24
58:20 58:22	48:4	92:1 92:2	comes 25:22
59:19 59:22	48:23 48:25	92:12	25:24 29:19
60:4	49:5	clear 39:4	31:13 37:13
61:14 62:17	80:24 80:25	78:4	37:14 58:25
62:23	cleaned	80:18 80:21	64:2
63:6	14:4	80:22 86:4	90:12 90:12
63:13	35:18	clearance	comfortable
64:5 65:2	46:8	78:16	73:3
65:20 65:25	49:22 87:16	clearly	coming 2:9
69:22	92:5	65:5 65:6	4:25
70:7	cleaning	85:9 87:3	17:11
71:16 71:20	11:17 22:17	clock 71:8	18:5 31:7
72:20	48:23 51:13	close 15:6	31:10 31:11
74:2	72:1	67:1 68:16	32:7
74:16 75:19	82:10 87:8	closed 54:9	32:11 33:11
75:22 77:18	cleanup	closer 88:3	39:5
80:11 80:17	6:12 7:11	closest 8:18	39:20 39:22
81:6	7:19 7:21	cobalt-60	41:8 41:9
84:21 89:12	7:24 8:20	19:8	53:16
91:23 92:17	12:19 13:21	cochair 72:20	55:4 56:4
92:23	14:15 21:17		75:2
city 8:19			

93:11 93:12	58:23	13:17 15:3	45:16
comment	71:9	Compensation	conceptual
3:16 3:17	71:17 71:24	9:7	14:21 22:9
3:22 3:25	72:22 72:23	competence	concern
3:25 4:1	73:25	82:18	8:23 9:18
4:7 4:7	74:4 74:9	complained	11:9
5:22	74:13 74:19	88:25	14:13 19:24
44:10 44:13	80:15	complete 7:24	41:17 56:16
49:8	83:7 83:7	8:5	57:7 60:5
49:13 49:16	83:14 84:20	completed	70:16 72:25
52:7 52:9	84:25 89:14	92:13	73:10
58:23 64:13	93:9	completely	concerned
65:2	commercial	83:11	53:13
65:23 70:22	14:8	complex 45:22	66:2
71:1 71:4	53:24 57:16	46:4	66:25 74:12
71:7	57:18 57:19	46:12	76:23
71:11	58:5 58:17	49:1 66:8	78:4
73:8	commercially	84:1 92:5	79:10 85:4
75:22	90:10	compliance	concerns 83:9
83:3 83:4	commitment	54:15 92:20	83:24 92:4
88:19 89:10	16:8 16:8	complicated	concrete
89:11 89:13	commitments	83:20	60:11 60:15
91:22 91:24	88:11	comport 23:12	concur 72:22
92:16 92:24	committee	comports 43:6	conditions
93:8	57:12 57:12	Comprehensive	20:15
commentator	77:22 77:22	9:6	confidence
75:20	common	concentrates	82:25
commenter	14:17 35:19	77:7	confident
72:18 74:14	38:25 48:12	concentration	50:4 50:5
80:16 81:5	community	64:22 64:25	50:8
commenting	10:25	concentration	configuration
48:10	12:7	s 18:16	59:9
comments 3:17	61:11 61:12	19:23 19:25	confuse 78:21
4:3 4:8	compacted	41:13	Congress
10:4 10:5	34:15	concept 10:17	75:13 80:4
10:6 44:8	compared	21:19	Congressional
45:7 49:7	25:14 31:12	concepts	77:25 79:11
49:9	45:19		80:3
49:11 49:11	compartments		
52:19			
55:7 55:9			

consequences 36:20 37:1	28:22	33:6 52:5	Cord 5:25
conservative 7:22 32:18 64:25 65:9 65:16	containing 77:23	continuing 14:24 33:7 35:22	core 13:19 40:23 40:25 42:23 42:24 42:25
consider 35:25 81:7 83:13 85:17 91:25	contains 19:22 45:20	continuously 82:6	cores 8:10
consideration 85:22	contaminant 17:12 33:4 33:17 40:17 61:6	contractor 81:14	corner 2:11 6:5 45:18 46:5
considered 3:14 47:13 48:14 69:4 83:22 84:25 92:8	contaminants 14:12 14:13 18:13 18:16 19:24 21:24 57:6 70:16	control 29:23 41:1 41:1 61:18 61:23 75:17 87:5 87:11 89:6	Corridor 6:19 6:23 7:1 7:2 7:5 7:24 7:25 8:7 11:20
considering 46:25 47:1 47:8 83:14 93:3	contaminate 22:7 51:13 51:19 51:20 51:21	controlled 77:20	cost 90:23
constituents 8:23 9:18 11:9	contaminated 20:8 20:25 22:25 28:7 28:21	controlling 84:5	costs 10:24 49:4
consult 92:19	contaminating 51:23	controls 35:8 35:10 35:16 43:25 46:13 46:17 46:19 50:5 50:6 50:7 72:16 84:2 86:15 86:16	counted 66:6
consultation 63:18 63:23 64:6 64:7 64:10	contamination 22:5 42:1 50:3 51:5 88:2 91:16	controversial 54:4	countries 57:4
consultations 63:24	contingency 20:13 40:6	convert 39:14	couple 5:20 24:1 28:18 30:3 36:22 49:21 52:4 55:14 67:19 68:12 71:16 90:4
consumed 36:23	continual 32:3 82:2	convincing 20:17	course 4:6 16:25 34:25 54:3 54:15 57:16
consumption 39:3	continuation 42:10	coordinate 9:11 46:1	covered 16:14 16:22 17:2 18:3 18:7 18:10 18:11 19:5 19:9
contact 11:11	continue 3:10 21:1 29:10 33:4 33:5	coordinator 45:1	
		co-present 3:7	

45:20 56:2 60:10 60:14 86:2 covers 4:10 17:6 created 17:5 26:25 27:17 57:22 creek 68:14 crime 81:8 criteria 10:21 10:21 42:19 42:19 42:20 42:21 critical 63:19 87:24 88:6 88:6 92:20 criticized 78:12 cubic 13:11 27:14 29:22 39:9 curies 58:13 58:15 79:15 curious 59:5 current 8:14 40:19 currently 85:20 curve 17:24 17:24 42:8 <hr/> <p style="text-align: center;">D</p> <hr/> D.C 53:3	daily 82:1 damage 90:17 90:18 dams 25:5 27:7 76:25 danger 73:13 73:13 dangerous 73:9 dangers 91:9 data 22:14 26:14 69:10 69:18 70:3 78:22 78:23 date 4:9 daughter 79:1 Dave 6:4 6:5 David 78:2 Davis 79:3 day 31:24 31:24 34:7 34:8 34:10 39:7 39:7 56:7 74:22 84:15 days 25:6 68:1 69:13 DCE 19:15 43:22 43:22 deal 14:24 24:21 27:20 35:21 73:22 77:3 77:4 dealing 17:25 19:1 36:9	death 25:2 debris 22:25 decades 79:16 decay 30:8 33:17 33:22 55:22 55:24 decaying 43:23 decided 10:8 21:17 21:18 23:8 23:10 decision 5:3 7:18 10:2 10:8 10:11 14:16 16:4 16:7 16:9 16:22 17:2 17:2 17:9 18:10 18:11 18:12 21:18 23:8 23:10 23:23 29:3 29:6 33:15 33:25 40:20 43:2 43:3 43:15 43:16 43:17 43:17 43:19 44:15 44:21 61:22 63:15 70:2 85:8 86:3 86:20 88:15 decisions 5:4 8:20 10:13 10:22	14:18 14:19 84:6 84:7 86:13 86:18 declining 42:8 decontaminati on 78:8 deed 62:5 62:6 deep 7:14 11:14 21:23 24:12 24:15 34:20 36:9 68:23 deeper 20:8 67:5 70:13 defects 90:20 defend 9:25 defense 58:7 define 81:20 defined 31:5 31:7 definition 51:2 51:10 degradation 34:22 degrading 35:2 degrees 12:16 78:25 78:25 demand 73:21 demonstrate 10:1 Denny 74:21 department 2:18 3:1 3:2 3:20
---	---	---	--

11:1	86:9	73:18 73:18	11:11
13:25 28:13	development	73:19 81:19	20:5 20:9
44:18	15:17 86:5	84:14	21:25
55:3 58:2	developments	difficult	directed 2:20
58:8	86:7	23:21	directly 68:8
63:23 63:25	devil 26:15	24:5 24:9	73:11
81:15 81:15	Devron 92:24	difficulty	director
82:12 82:16	dialogue 44:8	34:15	12:22
83:12 86:16	diesel 36:23	diffusion	dirt 14:6
86:18 86:21	Dieter 2:6	31:17	61:1
88:14	2:17	dig 16:5 16:5	62:14 62:16
departments	49:17	21:22 21:23	62:16 79:20
82:14	52:2	26:17	dirty 34:15
Department's	52:17 65:21	29:3 29:8	disability
86:12 86:14	70:20 71:18	29:21	63:9
depth 18:17	72:18 74:14	33:5	disappointed
designated	75:18 75:20	36:11 36:13	86:10
61:17 88:5	77:17	37:5	disappointing
designed 7:20	80:9	38:23	87:1 88:10
11:3 16:2	80:14	50:2 50:3	disappointmen
desirable	81:3 89:9	67:9 76:3	t 86:23
90:20	91:21 92:15	76:10	discharge
destroying	92:22 93:7	digging 20:24	28:6 28:7
40:17	difference	24:13 24:15	28:7
destroys	3:16	24:17 26:23	29:12 29:24
33:16	14:22 41:18	36:11 36:20	63:16 63:17
detail 48:16	41:21	38:22	discharged
detailed 5:12	50:8 61:5	48:3	6:16 28:22
detected	61:7	77:12 89:4	discharges
56:13	differences	dig-it-up	20:2
determine 9:9	38:4 60:22	37:3	63:14 63:20
9:10 9:13	different	diligently	discovered
10:16 22:2	8:23	36:8	17:17 24:1
develop	12:20 16:19	dimensional	discrepancy
9:14 10:9	18:12	69:10	85:10
60:18 86:6	46:2	dimensions	discuss 35:25
developed	54:15 58:25	7:5 7:12	discussion
11:24 38:14	59:1	11:24	
	64:22 67:13	direct	

13:20	division	dose 24:8	31:21 31:23
74:7	12:22	26:21 26:22	31:25
87:23 89:5	dock 13:16	31:24 39:8	32:2
dismantled	document	doses 24:3	32:20
21:3	4:1 9:17	dot 17:10	39:6
dispersion	9:19 10:6	28:1 81:25	39:11
31:16	69:19 69:23	double 82:20	40:3 41:3
disposal 17:5	69:25 80:16	Dowell 2:24	41:14 41:16
21:13	documents	4:20 4:21	41:24 56:20
23:2	56:12	54:14 54:18	72:11 76:22
25:17	85:8 87:24	54:21	77:4
27:6 33:6	DOD 57:19	downstream	83:18 85:7
53:20 68:14	57:21	26:25	drive 24:19
83:19 91:16	DOE 17:1	40:4	54:24
dispose 16:15	40:24 44:21	66:19 76:25	driven
21:19	50:4	downward	34:20 39:1
27:3	53:10 57:15	17:24	driver 18:25
27:13	57:19 57:20	dozen 52:6	drivers 16:1
33:4	61:24	Dr 6:1 65:8	driving 14:12
42:23	62:1 62:4	draft 63:2	14:14 40:20
48:2	62:7 77:20	dragged 13:17	dropped
88:21 88:24	DOE-derived	drill 70:15	38:5 81:19
disposed	17:12	drilled 66:19	dropping 38:7
16:10 28:10	dollars 36:12	69:8	drops 76:22
53:19 56:12	90:23	drilling	drove 15:23
dissipate	91:2 91:2	47:17 66:22	89:2
27:1	done 7:22	drink 39:7	dry 31:8
dissolve 26:3	10:10 14:15	72:8	89:25
26:3 40:19	14:17 15:17	drinking	duck 13:14
dissolved	20:20 23:11	11:19	77:8
42:3	23:16 27:12	13:6 13:7	dug 25:18
dissolving	27:15	13:8 13:9	26:16 27:11
47:19	43:1 43:6	20:16 20:18	27:12
distance	54:15 54:20	26:8	61:1 65:12
15:25	56:16	27:25	dump 81:21
disturbing	59:8	28:1 28:4	during 3:22
74:8	70:22	29:1	3:24 3:24
ditches 16:16	76:1 79:8	29:20 31:20	dust 29:24
	81:17 81:20		
	83:5 92:1		

89:6	12:14	92:16 93:7	86:21 88:13
dusting 26:18	effect	e-mail 4:8	enforce 62:2
dynamic 25:1	11:23 59:1	74:18	engineer
<hr/>	effective	embraced	81:23
E	45:3	21:20	engineered
earlier 13:20	effectiveness	emissions	21:23
21:15 49:8	10:14 10:14	36:24	engineering
early 20:22	10:16	emitted 79:17	38:20
22:8 43:3	effects 11:21	emitter 90:16	76:7 77:11
68:1 69:13	effort	emitters	enhanced
Earth 89:17	73:13 87:4	64:23 64:23	40:16
easier 85:1	efforts 38:17	employee 5:5	enrich 60:1
east 18:5	egg 31:4 31:5	empty 79:21	enriched
18:7 18:8	eggs 77:8	encourage	59:14 59:23
20:18 80:12	eight 39:24	2:14 2:16	enrichment
easy 84:7	41:6	4:11 5:14	59:11 59:12
84:11 84:15	41:21 50:20	Endangered	ensure 61:24
eat 50:15	62:14	63:18 64:1	entire 48:25
72:8	EIS 69:22	endorsed	entities
eating 72:11	69:24	33:14	73:24
echo 74:4	either	enemy 78:22	environment
echoes 60:6	53:24	energy 3:1	11:10 18:18
eco 11:21	60:9	3:2 3:20	36:15 81:12
ecological	60:14 65:5	11:2	90:4 90:7
20:9	element 10:24	12:23 13:25	environmental
Ecology	10:25	15:6	2:21 9:7
2:18 9:12	elements	16:25	12:21
11:2	14:17 38:25	18:9	20:5
81:16 86:24	76:5	28:13 44:18	41:17 53:20
87:1 88:3	elevation	57:24	56:1 64:4
88:4	27:24 27:24	58:3	81:8 85:21
economics	eligible	63:24 63:25	EPA 3:3
79:2	53:19	77:21 81:15	9:11 11:2
edges 24:19	else 48:14	82:12 82:16	33:14 38:13
educated 6:13	49:15	83:12	38:13 42:16
education	62:4 68:2	86:8	44:17 44:17
	89:10 91:21	86:12 86:14	56:7 62:2
		86:16 86:17	63:11 82:12

83:12 86:10 86:23 88:25 EPA's 44:20 87:8 equivalent 65:7 88:6 ERDA 28:23 28:24 36:22 especially 84:11 84:14 essentially 58:4 63:14 74:9 established 41:17 estimated 36:11 evaluate 10:15 11:9 11:22 48:22 56:8 evaluated 10:13 22:8 46:23 evaluating 14:23 evaluation 4:14 22:1 93:13 evaluations 85:9 evening 4:22 4:25 12:9 88:19 93:12 eventually 83:17	everybody 2:7 2:8 4:22 4:23 44:19 70:20 78:24 92:22 93:11 everyone's 52:23 everything 43:5 48:22 70:2 everywhere 56:17 56:18 57:6 evolve 61:12 exactly 69:9 examine 9:25 examining 88:22 example 12:23 66:8 66:12 72:12 85:16 excavated 23:1 27:13 excavating 70:14 excavation 18:17 exceed 39:8 41:14 42:13 exceeding 15:25 except 34:19 74:19 87:2 exception	68:12 exceptions 68:12 exchange 32:9 exchanging 44:7 exciting 5:14 excluded 7:6 excuse 39:19 41:11 71:18 82:25 88:20 execute 10:10 44:22 exist 25:13 26:15 existing 14:16 41:3 expand 47:15 expected 70:14 85:17 expensive 66:20 67:17 77:12 experience 12:15 45:7 66:5 explaining 62:10 83:4 explanation 49:3 exploration 12:25 explored 89:6 explosions 91:9	expo 17:23 exposed 35:17 46:15 60:15 62:12 62:15 87:9 exposure 5:3 19:22 20:4 20:5 20:6 20:8 20:9 21:25 35:12 39:2 39:3 39:16 exposures 14:5 expresses 26:11 extensively 65:2 68:5 extent 14:12 extreme 68:25 73:10 extremely 67:23 <hr/> F <hr/> fabrication 8:25 15:14 59:9 facilitator 2:19 facilities 7:12 8:13 13:24 15:15 15:16 16:11 21:8 21:8 21:9 21:11 25:17 29:4
---	--	---	--

facility	89:25	26:8 26:8	81:4 88:19
13:10	fall 43:3	27:13 27:14	finally 14:20
15:7	false 51:15	28:19	48:24 56:10
16:24	familiar	29:4 29:9	finding 19:10
18:5 23:2	10:20	34:7	70:11 70:12
28:9	families	34:10	findings 45:9
28:11 35:13	60:23	39:9	fine 60:4
35:14 35:16	family's 13:7	51:17 51:20	82:13
41:1	fast 8:3	61:2 61:7	finished 92:1
53:20 53:25	17:18 34:23	67:6 67:8	first 2:23
57:17	38:4	69:7	21:12 21:16
facing 31:3	65:22 66:15	80:25 88:1	21:22 22:13
fact 16:5	favorite 17:9	Fellowship	22:19 24:15
39:14	Feasibility	72:21	27:6
56:7	9:16 70:1	Fence 51:4	28:16 28:18
56:18 56:22	fed 29:6	fences 46:13	29:4 29:9
73:6	federal 5:5	fertilizer	35:23 39:12
73:15 78:12	28:1 32:2	90:12	45:17 46:23
85:17 85:23	41:14 41:24	FFTF 17:1	50:11 63:21
92:24	50:22	fiasco 82:19	71:13 75:23
factor	63:6 63:7	FIFO 77:23	84:22
40:20 66:15	74:22 82:14	fighting 54:2	92:1 92:4
facts 89:15	87:5	figure	fish 40:2
fail 27:7	87:23 88:12	42:20 57:18	50:15 63:24
38:7 50:7	feed 14:24	78:23	70:9
50:7	feedback 4:18	figures 90:22	72:11
failed 38:6	10:12 52:12	fill 4:13	77:9
fails 85:16	feel 2:13	76:3 77:14	88:17 92:19
failure 88:16	14:14	filled 93:13	fisherman
fair 68:5	73:3	filling 48:4	13:14
fairly 5:12	92:12 92:25	filtrate	fit 36:25
6:14 6:20	feet 13:11	11:15	fits 43:24
7:16 8:22	20:3 20:6	final 3:15	five 8:21
15:6	20:8	7:17 7:18	10:13 22:17
18:23 19:21	21:24	8:8 43:16	37:3
28:9	22:1 22:1	43:16	43:14 43:20
30:22 30:22	22:2 22:5	44:3 65:14	66:21 76:18
42:9	22:13		80:20 84:9
45:18 68:16			

89:18 92:11	46:20 80:21	23:8	54:11 62:11
five-year	80:21	41:25 52:1	84:10 84:18
22:19 48:20	84:3 92:3	fraction 42:1	87:13 87:14
fleshed 34:11	92:7	59:13 72:4	91:19
flights 78:17	forget	frame 40:7	
floating 67:2	50:13 50:17	frankly 13:12	G
flow 38:3	50:18	35:17 70:12	Gadbois 3:3
85:24 85:25	84:7	91:5	44:4
flowers 11:12	84:11 93:16	free 2:13	44:17 53:17
flows 13:11	forgive 8:3	68:20	54:3 54:6
85:18	forgot	friend 12:10	54:10 55:16
flush 34:20	50:10 50:11	friends 6:9	55:20
flushed 34:19	form 37:24	front 4:16	58:2
flux 41:5	37:24	93:15	58:11 61:22
focus 2:9 7:1	formal 3:15	fuel 9:2	62:20 62:25
55:8	3:17 3:22	15:10 15:10	63:7
focused	3:25 10:6	15:12 15:14	63:21
6:19 45:2	52:7 52:9	15:18	64:8 65:8
focusing 93:5	63:15 65:23	19:6 54:7	gallons 6:16
folks 4:17	70:22	54:10 54:12	gas 56:4
5:22 5:23	71:1	59:10 59:17	gates 56:1
52:8	84:25 89:10	59:17	gateway 86:3
52:17	89:11 91:22	60:1 73:15	general 5:1
67:9	92:16	Fukushima	90:7
68:17 71:2	formally 89:8	79:19	generally
food 79:24	formation	fulfill 16:7	25:19 56:25
90:7	34:5	fulfilling	67:9
fool 72:15	34:14 34:14	62:8	67:21 68:11
fooled 22:16	35:1	full 45:19	69:4 69:12
foot 34:8	formations	full-scale	generate 54:7
footprints	34:5	47:21	generated
34:18	forms 59:1	functional	58:3 62:5
foreseeable	formulate	6:24	generating
87:13 87:14	52:14	funded 43:11	53:18
88:16	forth 3:10	funding 74:24	generations
forever 46:18	Forty-seven	future 18:8	80:20 80:20
	6:15	31:1	91:19
	forward		genetic 90:17
			90:18

genetics 90:15	65:5	39:14	37:2 38:3
geochemistry 22:11	gobbling 18:9	ground 15:22	38:5 39:1
geologist 12:15	gone 30:23 43:5 54:8 75:19	18:1	40:13 40:24
geology 12:16 12:17	Gosh 55:10	18:17 26:16	41:2 41:5
gets 5:12 25:9 26:9 30:20 30:21 51:5 56:20 83:17 90:16	gotten 22:21 75:11	26:23	42:3 42:4
getting 23:9 25:25 31:24 34:16 36:10 52:8 54:6 78:25 79:19 79:23	government 78:14 79:6 79:8 87:23	27:3	43:24 45:25
Giddings 74:15 74:16	governor 54:24 55:3	45:23 47:12	47:19 51:13
Gilbert 71:15 71:20 72:22 90:25	governors 53:15	60:10 60:12	51:14 51:19
given 20:15 40:7 44:16 69:6 81:10 84:24 88:20 91:5	governor's 55:5	60:15	51:21 51:22
gives 48:7 62:5	grab 93:16	82:4 82:5	51:23
glad 44:3	grade 59:24	82:6	59:7 67:7
goal 20:12 61:8 72:2	gradient 41:19 41:19	grounds 15:8 15:22 16:1 16:5 16:6 16:9 16:14 16:15 33:5	67:24 67:25
goals 18:16 21:25 60:19	grandchildren 72:12	groundwater 2:10 7:14 8:6 11:13 11:16 11:16 12:21 17:7 17:8 18:19 19:12 19:22 19:25 20:1 20:2 20:21 20:22 22:2 22:7 22:11 22:15 25:9 25:10 26:1 26:2 27:1 27:8 27:22 29:16 30:18 33:8 34:6 34:8 34:10 35:23 36:2 36:15	68:8
	grandchildren's 13:8		76:19 88:22
	gravels 34:6		89:3
	great 2:15 4:23 4:24 5:16 29:3 50:7 86:23		groundwater- operable 18:7
	greater 6:16 8:12		group 5:16 6:13 51:3
	green 6:23 8:1 36:25		growing 11:12 79:21
	gross 19:13		growth 88:7
			guarantee 61:16 61:18
			guaranteed 82:21
			guards 46:14
			guess 75:11
			guidelines 42:15
			Gunn 65:25
			guy 55:2 74:22 74:23 82:7
			guys 47:16
			<hr/> H <hr/>
			habitat

38:1	34:5	58:15 58:19	health
63:19 87:25	39:23 39:23	64:10 64:14	11:10 11:14
88:6 92:21	39:25 41:19	65:8 72:20	11:17 11:21
half 14:25	45:1 45:2	happen 53:7	18:18
17:19 17:20	45:11	happened	39:2
17:20 17:20	48:8	26:23 28:25	55:25 56:1
17:21 17:21	53:21	29:11 29:21	hear 4:23
17:22 17:23	54:7	29:25	4:23 9:22
17:23 17:23	54:11 54:11	30:5 84:9	12:11 12:12
30:15 30:16	56:25	happens 25:12	49:3
55:16 81:23	57:1	26:5	86:23 87:1
91:3	57:18	31:15 31:18	heard 21:15
half-life	58:9	37:13 47:24	45:13 45:21
17:19 33:17	58:11 58:16	48:18	46:22
33:18 33:24	59:6	happy 37:14	48:2 48:6
43:22 55:15	59:12 59:14	37:17	48:10 48:19
89:16	66:7	hard 10:1	58:24
half-live	66:10 66:12	73:12	59:2
89:19	67:14	harder 78:22	65:11 82:11
half-lives	68:1 72:1	hat 2:19	87:3
90:1	74:23	32:16	hearing 6:7
Hallett 72:24	75:1	hailed 23:1	6:8 44:7
81:4 84:21	76:23 79:13	25:18 28:24	44:7
HAMMER 16:24	79:14	hauling 20:25	57:23 58:21
hand 12:6	81:6	haven't	67:8 78:1
12:6	81:10 81:15	2:15 4:15	78:6 82:10
handle 36:22	82:3	24:5 54:6	hearings 53:2
handled 57:17	82:17	54:12 57:14	78:10
handling	83:2	58:4 58:4	Heart 3:6 5:1
57:13	84:24	69:6	74:6
Hanford	86:3	75:11 82:11	84:21 84:24
2:12 2:24	89:13 89:24	having	heavens
3:4 5:1	90:3	20:17	29:1 30:2
6:12 6:15	90:10	44:8 53:2	heavy 18:20
6:25 8:2	91:3 91:5	76:14 84:16	19:1 32:1
12:18	91:24	86:23	Heck 74:21
14:7	Hanford's 2:8	head 44:12	heels 36:3
16:24 21:20	hang 32:16	55:2	HELD 2:2
28:15	45:16	hell 34:3	
	Hansen 72:19		
	Hanson 5:25		
	6:1 58:13		

35:4	highest 17:16	hot 8:10 24:6	51:12 74:20
help 44:18	highlighted	hotspot 26:14	identified
44:21	8:1	27:21 38:15	64:21 70:17
46:1 46:1	highly	40:12 40:14	identifies
52:14	15:20 59:14	43:8	85:9
64:9	88:20 89:4	47:13 76:15	identify 65:5
81:14 84:18	highly-	hotspots 29:9	65:6
helpful 48:16	industriali	66:21 76:17	ignore 18:11
48:20 52:22	zed 21:7	76:19	II 75:3
helps 26:3	hired 81:13	hotter 91:6	I'll 42:11
26:4	historical	91:8	44:22 71:16
here's 24:24	75:23 85:25	hottest 32:13	72:17
he's 2:24 6:1	history	67:10	illegal 86:22
45:8	6:15 6:17	hour 45:14	I'm 2:18 2:19
74:22 85:5	6:25 86:4	74:21 81:21	4:22 5:5
Hi 45:10	hit 21:5	hours 57:12	8:3 10:19
65:25 80:17	hits 67:7	62:14	11:4 12:2
92:23	hitters 18:20	house 84:16	12:8 12:9
hiding 80:1	hold 32:25	huge 73:11	12:12 12:15
high 19:7	75:16 78:11	76:3 81:8	13:13 20:17
23:19	holes 5:16	91:6	30:25
24:3	69:8	human 11:10	31:1
24:20	home 39:12	11:14 11:17	31:14 31:17
25:8	54:11	11:20 18:18	44:4
25:22	honest	19:22	44:17
27:7	31:15 31:18	20:4 39:2	45:3
29:15 29:19	honor 62:1	55:25	45:11 50:11
29:19	Hood 6:8	hunt 13:14	51:25 52:13
30:4 30:6	93:18	40:3	53:5
30:9	hope 14:10	hydrogeologis	53:13 54:19
30:20 30:21	61:21	t 12:15	57:4
30:23 42:13	69:6 83:12	hydrology	63:23 64:10
56:21 62:19	hopefully	12:17	66:25
67:3	2:12 5:17	<hr/>	67:8 71:1
68:13 88:3	7:15 91:13	<hr/>	71:20 71:20
higher	hopper 19:17	I	72:20
56:24 64:24		<hr/>	73:5
66:10 79:23		I-beams 24:19	74:16 74:17
85:20 85:24		I'd 44:2	76:14 76:23
91:5		idea 48:7	80:11

83:2 83:7 89:12 imagine 84:15 immediately 40:4 immobile 37:25 impact 22:2 22:10 impinging 76:5 implement 85:22 important 5:2 9:19 10:17 10:18 26:16 46:1 47:4 72:2 85:11 imposition 62:7 impression 69:7 improved 4:13 inaudible 31:24 64:15 69:1 90:4 include 16:16 47:22 48:1 61:9 92:9 included 16:20 16:21 includes 8:1 48:5 61:8 including 49:1	67:13 72:4 74:23 77:7 88:16 90:3 increase 85:18 85:19 88:23 incredibly 86:6 indeed 41:14 Indian 81:9 81:13 indicator 77:10 individuals 50:21 industrial 13:19 13:23 14:3 14:5 14:5 17:3 40:23 42:23 45:22 46:4 46:9 46:12 46:12 49:1 49:2 49:3 50:18 51:2 51:4 51:8 51:11 60:5 60:7 60:8 60:13 60:17 60:22 61:9 61:15 61:17 62:10 62:11 62:13 83:25 84:1 87:12	88:1 88:9 92:5 92:5 industrialize d 13:22 15:4 40:25 industry 57:17 infiltration 88:23 inflow 32:9 39:12 influx 85:19 informal 44:8 information 44:7 44:11 44:16 69:19 81:22 84:10 ingest 18:24 ingesting 26:19 ingestion 32:3 inhaled 26:21 initially 72:15 initiating 7:21 inject 40:12 injected 68:4 68:7 injecting 47:17 injection 47:11 51:6 68:3	input 93:15 inputs 11:3 insane 80:6 insensitive 74:11 inside 60:11 60:25 89:22 90:16 insight 5:13 inspection 9:9 installation 53:23 instance 68:17 instead 49:2 88:1 institution 35:8 43:25 46:19 50:6 institutional 35:10 46:13 46:17 50:5 50:6 61:23 84:2 intend 16:7 89:14 intended 16:12 intending 16:14 intends 13:25 intense 15:21 86:6 interest 5:7 55:25
--	--	---	--

60:12 84:23	invited 87:15	77:23 82:7	JULY 2:3
interested	involved	I've 12:16	jump 52:18
11:5 59:2	22:11	12:18	<hr/>
interesting	58:4 93:1	25:6	K
5:17 15:8	involves	32:17 55:14	Kate 79:12
interim	38:22	75:1	80:3
7:19	ion 18:6	78:10 85:23	Kathleen 6:2
14:16	ions 67:12	89:13 89:17	KD 66:13
16:4 16:7	ironic	<hr/>	Kechel 71:14
21:17	88:20 89:4	J	Kelly 72:19
23:7	irradiated	jail 78:14	74:2
28:16 43:18	9:3 15:11	79:5	kicked 30:6
63:1	15:13 15:18	James 72:19	kid 72:10
64:18 65:10	irrigation	JD 2:23 3:1	kilogram 72:7
65:13 65:15	39:21	4:20 4:21	kilograms
intern	41:8	54:14 54:18	41:7
45:11 74:5	60:20	54:21	49:21 63:15
interns	61:8 61:9	jeopardized	kilometer
45:4 72:24	79:24	73:14	14:25
interval	islands 25:6	Jerry 3:11	Kim 5:21
69:18	isn't 42:7	21:15 72:24	kinds 5:4
introduce	54:17 69:24	81:4	Kmil 80:16
5:20	73:20 86:18	84:21 89:9	80:17
introducing	86:19	jet 34:10	knocking
45:4	90:3	Jim 5:25	20:24 21:11
introduction	91:10 93:8	6:1 58:13	knowledge
2:24	isotopes 19:3	58:15 58:19	67:20 69:7
inventory	57:9	64:9	known 68:19
42:3 66:7	isotopic	64:10 64:14	<hr/>
investigating	58:25	65:8 74:2	L
20:21	ISS 8:9 8:10	job 44:17	lab 21:1
investigation	issue 37:2	44:20 44:22	40:24
9:16 63:9	39:15 39:17	93:2	78:8
70:1	39:18 54:13	jobs 12:20	78:18 86:17
investigation	78:2 93:3	12:22	Laboratories
s 69:15	93:6	Johnson	46:6
invisible	issued 79:14	5:21 74:15	
84:12	issues	Jude 80:16	
		80:17	

laboratory 9:1 13:24 21:8 35:15 68:9	32:15 32:22 40:19 51:12 57:11 66:25 69:8 79:18 80:19 80:20 81:2 89:9 89:18 92:3 92:15 93:8	82:20 leaked 24:7 leaking 45:23 learn 12:4 least 21:23 22:1 29:18 43:13 65:14 76:4 76:7 79:15 88:8	27:24 30:11 36:21 57:5 57:7 62:11 62:16 64:14 64:16 64:23 64:24 66:23 78:8 85:20 85:24 85:25 91:11
lack 82:25	lastly 11:7 11:20 12:1	leave 18:17 22:4 52:8 52:15 56:3 61:6 72:17 84:11	levels 9:18 17:16 19:23 20:7 22:6 24:3 25:4 28:3 30:5 30:8 30:18 30:19 41:17 42:14 56:15 56:21 56:23 56:24 57:2 57:7
lady 57:10	Lately 54:15	leaves 87:23	Liability 9:7
lake 35:2	later 19:16 19:19 28:23 32:7 49:10 49:13 51:15 69:13 81:16	legal 45:4	library 80:2
land 11:12 12:25 50:14 51:1 61:24 61:24 62:4 62:5 62:7 62:10 84:5 84:12 86:13 86:15 86:17 86:19 86:21 88:1 88:14	laughable 55:20	legally 54:20	Licensed 12:17
landfill 48:4	Laura 92:17	less 10:24 17:18 17:22 32:17 39:13 60:2 60:3 64:25	licensing 12:24
large 6:18 33:20 38:10	law 35:23 43:19 47:1 54:16 54:23 87:5 87:21 88:17	lethal 24:3 24:8	life 59:15
Larry 3:3 44:3 44:4 44:17 53:17 54:3 54:6 54:10 55:16 55:20 58:2 58:11 61:22 62:20 62:23 62:25 63:7 63:21 64:8 65:8 88:24	laws 23:13 64:4 82:19	let's 2:7 13:2 27:4 29:3 29:6 33:20 50:17 50:18 50:19 51:9 52:19 60:16 66:20 77:13 77:14 86:1	limits 39:8 39:8
Las 53:7	leaching 19:24 59:7	letting 83:16 93:1	line 18:4 18:4 46:24
last 4:6 5:10 12:10 27:11 30:3 31:4	lead 90:19 92:4	level 20:6 25:12 27:22	linear 17:24
	leads 9:19		lines 50:2
	leak 24:18 82:21		liquid 17:5 21:13 25:17 27:5 68:14
	leakage 77:15		

liquids 6:16	lived 78:7	long-lived	lower 64:16
list 18:15	liver 19:2	90:8	64:19
18:19 19:20	living	look-ups 5:18	65:1 91:11
71:2 71:5	60:19	loose 53:11	lowest 78:8
81:22	77:6 90:7	lot 9:3 9:4	lungs 26:22
listen 5:8	Liz 3:4 44:23	9:17	<hr/>
listing 45:14	44:25 44:25	10:23 13:20	M
liter 17:17	45:10	14:16 20:21	magic 67:6
30:6 32:3	81:4 83:2	21:13	Magnuson
39:10 39:13	83:2	23:3 23:3	82:10
41:15	load 81:21	25:5	Maierhofer
liters	loading 39:24	25:17 27:22	92:17
31:23 39:7	41:7	28:4	mail 4:8
lithium 18:2	local 3:5 3:7	28:17 28:19	74:20 74:20
little 5:10	42:2	31:22 31:23	main 38:15
7:15 13:2	locally 55:12	32:11 32:23	51:9
16:19 17:10	located 19:16	34:23	major 8:20
19:16 20:17	21:15 40:22	37:6 41:9	majority
22:15 22:24	location	56:11 58:24	22:13 29:8
23:21 24:13	14:11 34:14	59:4	male 72:7
24:18 25:13	Lochbaum 78:3	59:11	man 6:5 24:14
25:14 25:24	L-O-C-K-B-A-	60:9	manage 7:8
26:11 26:15	U-M 78:3	60:20	20:7
27:4 28:1	long 18:15	61:2	managed 23:5
30:15	19:18 19:18	62:15 65:12	management
31:8	19:20 30:22	66:3 66:4	12:16
40:21 42:24	34:18 34:18	67:7 67:8	88:7 88:7
47:20 48:11	40:9	67:12 67:17	manager
48:15 49:10	41:20 46:17	69:17	2:25 6:1
52:11 53:11	50:1	73:7 75:8	12:20
65:22 66:25	66:15	75:25 77:15	manufacture
67:2 70:13	75:3 76:8	81:19 82:22	15:9
live 13:6	76:9	89:23 91:4	map 8:16
13:9	78:13 80:19	lots 61:11	16:20
13:12 46:11	90:1 90:6	love 6:10	Maria 80:5
53:7	longer 5:10	65:17	mark 88:3
60:23	52:11 63:11	low 26:5	
62:3	86:19	26:12	
80:12 80:17		34:9	
		39:16 68:13	

Mary 72:19 72:19 72:20	27:12 64:6 79:6 91:3 91:10	mention 50:10 50:12	47:13 55:7 55:24 56:6 56:15
mass 76:13	means 10:8 17:19 20:16	mentioned 74:5 90:25	57:3 57:10 59:8 59:21
massive 59:16	34:12 47:5 60:17 67:1	mess 12:5 57:22	60:3 60:16 62:9 64:9 64:12 67:19
material 9:3 16:10 20:25 66:14 67:11 77:14	meantime 28:12	met 83:6 87:7	69:24 70:11 85:4
materials 6:14 9:17 15:21 58:3	measure 77:6	metal 18:21 19:2 19:14 32:1 32:1	mileage 36:23
math 32:10 78:25	measured 66:13 67:16	meteoric 22:7	miles 39:24
matter 39:13 51:22 56:6 56:18 56:22 59:23	measures 7:22	meter 28:5	millimeters 31:9
matters 82:1	MEBA 17:2	meters 27:24 79:22	milling 21:9
Mattson 3:4 44:25 44:25 81:4 83:2 83:2	mechanism 33:16 69:3	Mexico 53:23 54:1	million 9:1 17:17 22:24 22:25 38:11 58:13 58:15 79:15
mature 61:12	meet 35:9 50:22 50:23 50:25 54:14 54:23 65:4 68:17 87:4 88:12	mic 12:10 12:11	millirem 50:19 50:20 63:1 63:2 63:8 63:11 64:14 64:16 65:6
maturity 19:6	meeting 2:1 2:8 2:9 3:15 3:18 3:21 4:2 4:5 4:20 24:24 65:3 87:10 87:19 93:2 93:14 93:17	Michael 56:8	millirems 65:5 82:13 82:15
maybe 30:15 39:23 51:7 51:7 59:23 66:19 67:4 67:4 82:13 90:4	meetings 4:12 86:11	micrograms 28:5 30:6	mind 36:21 38:24 46:21 48:9 49:6 49:15 70:5
Maze 74:15	meets 42:19 42:19 42:21 61:3	microphone 52:20 71:7	mined 89:23
McKee 6:2		mid-70s 81:13	
mean 10:14		mid- nineties 29:6 36:4	
		mid-September 49:8	
		migrating 19:24	
		Mike 3:2 5:12 12:8 12:9 12:14 16:18 44:16 47:8	

mineral 40:18	31:6	67:24 68:11	43:21 43:24
minor 82:9	31:10 32:25	moved 53:7	46:6 47:3
minus 32:9	36:12	81:11	47:5 47:7
64:16	73:1	moves 25:3	48:13 48:15
minutes 45:15	73:11	moving 13:8	55:18 55:25
45:21 52:18	75:8	17:18 33:24	59:21 61:10
71:10	80:24 82:22	34:22 53:13	83:16 85:6
missed 80:10	91:1 91:4	60:21	nature
mistake 66:14	monitor 17:13	MTCA 87:11	14:12 34:24
mistakes 79:8	33:8	87:19	68:9 73:20
Mitigation	33:10 33:11	mutations	Navy 82:10
39:2	33:20 81:12	90:20	nay 52:12
mixing 53:11	monitored	<hr/>	nearby 73:16
MNA 47:4 47:5	33:13 33:15	N	necessary
mobile	33:25	nailing 61:21	44:1
25:20 30:16	35:7	nasty 16:21	negotiable
30:17 37:15	40:16 43:21	Nathan 45:4	31:3
37:18 37:19	43:23	45:8	negotiated
42:7 53:3	47:3 47:5	45:10 45:10	23:9
MOCA 50:24	48:13 48:15	52:3	28:14 38:13
62:21 65:4	83:16 85:6	91:22 91:23	nest 31:4
model 14:21	monitoring	Nation 74:7	31:5
22:9	36:2	81:9 81:13	Nevada 53:8
42:10	43:25	national	55:3
45:2	70:9 82:2	13:23 20:13	newville
66:12	82:6	40:6	81:25
87:4 87:11	monitors	40:24	night 5:10
models 32:13	39:14	86:4 86:17	5:17 9:5
moderate	months 10:11	Native	12:10 32:22
61:13	Monument 86:4	50:11 50:12	57:11 93:19
moderately	mostly	50:13 50:17	nine 8:1
25:20	24:24 25:23	81:9	10:21 11:4
moderator	31:17 36:25	natural 18:25	nineties 7:20
87:2	59:21 66:16	21:1	20:23
modifying	mother 78:7	33:13 33:15	22:8 43:18
10:21 42:21	mountains	33:20	nitrate 17:11
money 31:4	89:22	34:1 35:7	18:6 19:14
	move 53:6	35:15 40:11	nitrates
	53:6	40:15 40:16	

33:11	57:13 57:16	6:20 7:3	onto 45:16
nobody	57:17 57:24	offloaded	open 4:20
55:20 74:10	58:3 58:3	13:17	49:8 93:9
non 45:1	58:5	offsite 77:4	operable 17:4
none 61:19	71:25	off-site	23:18
nonindustrial	72:1 72:4	17:11	operate 6:20
87:15	73:7	oh 10:23	operating
normal 67:22	73:16 77:21	25:16	7:19 9:10
normally	77:22 81:14	29:2 44:3	15:7
25:12	81:23	54:3 60:3	23:22
north 8:17	82:1	Ohanapecosh	27:7 46:7
13:5 15:2	90:13 90:13	56:23	66:12
21:13 27:9	91:1	oil 12:25	operation
Northwest 3:6	numerous 89:5	okay 16:18	6:24
12:23 13:23	<hr/> 0 <hr/>	22:4	47:21 79:16
15:7	objective	22:23	operational
16:25	44:20	30:4	7:3
18:9 21:1	objectives	31:17	operations
35:14	19:21	36:3	2:25 6:15
46:6	obviously	36:12 37:11	6:17 6:25
84:22 84:25	77:19 83:20	39:6	8:6 8:7
86:8 86:17	85:10	42:15	25:5 75:4
notes 51:25	occasion	52:2	opinion 73:14
nothing	42:12	52:17 52:17	85:12
32:7	occupy 21:1	52:19 53:17	opportunity
32:19 36:20	occur 14:18	54:19 54:21	3:9 3:11
46:23	occurred	55:5 56:1	3:22 4:6
notified	69:15	60:4	4:11 5:3
53:16	occurrence	70:20 71:15	5:15
NPDES 63:16	86:25	75:17	49:10
63:21	o'clock 2:6	81:3 81:6	52:8
NRC 77:20	offered 85:12	89:9	70:25
nuclear	office 2:25	92:15 92:22	83:3 93:8
19:6	7:4 7:7 7:7	93:10	opposed 47:14
23:22 35:13	7:10 55:6	ones 8:24	opted 52:16
35:14 35:16	75:4 75:5	12:5 12:5	optimization
40:25 55:2	offices	21:4	38:19
		27:11 47:10	optimize
		57:23	
		onsite 77:4	

15:19	output 39:14	Park 82:10	31:22 32:17
option	outreach-type	parking	35:10
36:19	5:23	60:9	44:5
37:3	outside 17:14	61:11 62:15	46:11 46:14
83:20 91:16	24:19 42:25	73:7	46:15
options	53:14 60:25	particular	50:2 50:2
36:8 52:5	62:14 62:15	74:12	51:6 52:6
oral 74:3	overall 71:25	75:1 90:15	52:7
order 54:25	over-	particularly	52:14
71:2 92:13	focused	15:8 74:8	54:1 55:9
Oregon 93:4	10:23	partnership	56:5
93:18	oversee 44:18	12:7	57:14 57:23
organic	44:21 44:22	pass 52:20	60:19
34:2 34:3	81:14	passive 83:19	71:3
34:11 34:17	overview 6:13	past 14:8	78:25
48:12	14:10 48:6	18:3	79:2 79:5
organics	owner 61:24	28:15 86:5	79:7 80:1
19:14 19:15	oxidize 37:18	paths 11:10	80:3 80:4
organization	oxygen 37:9	pathway 15:3	84:2 84:6
14:10 14:11	37:10 37:13	Patrol 16:25	84:10 84:12
45:2	37:14	paved 8:12	84:18 92:25
organizational	oxygenated	paveed 60:25	93:1 93:3
1 45:20	37:8	payer 5:6	93:5
organizations	Ozersk 79:14	paying 75:3	people's 52:4
73:18		PCBs 19:10	per 13:11
originally	P	70:8 70:9	17:17
25:15 37:22	p.m 2:4 93:20	70:9	28:5 28:5
81:9	pace 13:18	70:11 70:13	30:6 39:9
others 3:11	Pacific 13:23	70:15	39:10 39:13
ought 82:14	20:25 35:14	PCE 34:4	41:7
92:14	86:17	peaks 29:15	41:15 50:21
ours 41:22	package 53:24	Peggy 74:15	50:22 62:18
outfalls	53:25	75:18	63:15
39:21	Pac-Man 18:8	people 5:21	percent
outflow 32:9	paint 16:2	10:23 18:21	7:23 8:5
outline 6:23	parade 55:11	20:18 26:25	30:14 39:24
			41:6
			41:21
			42:1 42:2
			42:3 42:4
			42:6 42:7
			59:13 59:13

60:2 79:3 90:18 90:18 percentage-wise 23:16 percents 59:23 perception 60:17 period 3:16 3:17 3:22 3:24 4:1 4:7 49:8 52:1 52:9 58:23 65:24 93:8 periodically 30:14 42:2 42:7 periods 83:4 permanent 86:20 88:15 permeable 37:21 38:2 permit 63:17 permits 7:13 55:11 63:22 persistent 25:1 26:1 27:19 person 31:22 71:13 77:23 88:24 89:9 personally 73:3 perspective 3:5 3:7 5:4	5:5 13:4 24:12 24:15 34:7 39:18 41:10 pertinent 70:2 73:10 perusal 69:21 pH 68:13 68:13 Ph.D 79:1 Ph.D.s 79:2 phone 80:11 phosphate 37:24 51:6 phosphates 24:22 37:23 40:12 47:11 47:18 physical 20:23 Physicians 66:1 71:21 physicists 78:18 physics 78:18 78:25 79:3 pick 24:20 picked 30:24 picking 11:12 picks 25:13 30:17 picocurie 39:10 39:13 picocuries 17:17 41:15 picture 86:1	piece 2:15 93:16 pieces 9:1 pilings 76:10 piped 41:4 pipelines 33:7 placard 10:18 11:5 placards 5:23 places 67:13 89:24 plan 2:10 3:13 5:16 8:14 9:14 9:20 10:9 10:10 18:14 18:14 20:13 38:14 40:6 45:6 45:14 45:21 46:23 47:22 47:23 47:24 48:11 48:12 48:17 48:24 63:4 65:18 69:25 77:21 83:11 83:15 83:19 83:22 85:7 85:13 85:20 85:23 86:13 86:15 86:19 87:22 88:14 89:5 89:7 92:8 92:9 92:14 planet 81:7	89:17 planned 33:8 planning 40:11 51:18 82:18 plans 47:23 48:8 plant 12:24 23:23 53:23 61:10 61:12 73:7 73:16 75:24 79:20 82:22 plants 77:7 79:21 79:22 79:24 82:7 90:11 90:14 plateau 6:20 6:22 7:6 13:19 15:11 16:11 23:2 play 2:20 40:3 50:16 64:3 please 3:23 80:10 93:14 plot 34:9 plots 69:20 plume 14:25 17:5 17:10 17:11 17:15 17:25 18:6 24:25 24:25 26:5 26:12 27:1
--	--	---	---

42:10 43:9	portion 8:2	preliminary	previous
plumes 18:4	53:21 66:19	18:15	64:13
18:4	84:23	pre-nitrate	PRGs 20:1
plutonium 9:3	Portland	59:3	65:4
15:12 56:18	56:20 93:5	prepared 5:24	primarily
56:19 56:22	pose 57:7	preparing	8:25 15:9
56:23 56:24	position	49:16	17:4 18:5
57:2 66:6	51:24	preposterous	19:2 20:4
66:11 66:15	possible 76:6	90:2	20:11 53:19
67:13 67:20	92:2 92:13	presence	59:11 59:15
67:20 67:23	posters 2:13	55:23	primary 5:6
68:6	potentially	presentation	6:24
68:11 68:15	9:2 83:20	49:19 49:20	17:13 18:13
68:23	pounds 25:16	81:18 84:24	18:25 19:16
69:2	poured 73:12	85:4	41:25 55:24
69:12 69:20	power 12:24	presented	60:21 61:5
90:8	73:7	89:8	prior 86:24
Plutopia	73:16 90:11	presenting	priorities
79:12 80:2	practical	33:3	91:10
point 3:20	11:18	president	priority 91:5
10:3	practice	71:21	91:6 91:11
22:21 27:19	12:17 28:15	pressure 86:6	probably 8:18
34:2 51:9	practices	presupposes	10:20 19:18
54:10	68:21	60:9	45:12 55:19
72:6	precipitate	pretty 6:13	64:18 79:24
74:12	26:4 37:23	7:10 14:6	84:13
76:7 90:5	precipitation	15:4	problem 36:10
points 49:21	61:10	29:17	50:12
polluted 81:7	predict 32:16	30:6	58:1
pollution	prefer	32:12 35:18	66:17 76:14
91:7	52:11 73:11	52:21 65:19	77:2
polychlorinat	preferred	68:10 83:18	78:24 91:15
ed 70:8	38:21 38:23	prevailing	problems
polyphosphate	44:2 83:13	89:15	78:15 79:9
91:13	prefers 37:17	prevent 19:22	procedure
pond 21:14	37:18	19:23	49:4
21:14	portion 8:2	20:9 76:2	proceed 38:12
27:6 27:9	53:21 66:19	91:14	44:23
popular 21:19	84:23	preliminary	proceedings

93:20	profit 45:2	63:14 65:17	58:14 58:17
process 7:8	proforma	protect 5:7	58:20 58:22
9:6 9:8	55:13	26:24 51:16	59:19 59:22
9:13	program 45:1	76:10 77:10	60:4
10:12	progress	84:18	61:14 62:17
12:3	8:6 14:15	protected	62:23
16:19 21:14	20:20 20:22	62:12 88:1	63:6
21:14 21:14	20:23	protection	63:13
22:6 23:5	21:5	2:21 7:7	64:5 65:2
24:2	21:10 22:24	7:8 11:7	65:20 65:25
25:23	23:3	11:13 18:18	69:22
27:4 27:6	project 53:23	18:18 18:19	70:7
27:9	projectories	20:1 40:1	71:16 71:20
27:10 27:10	78:19	75:5 88:7	72:20
33:14 33:18	projects 55:2	protectiveness	74:2
34:25 73:17	promoted	s 43:14	74:16 75:19
77:4 83:1	78:12	prove 63:4	75:22 77:18
processes	proper	provide 4:3	80:11 80:17
15:12 15:16	34:24 75:15	71:1	81:6
15:19	proportions	71:16 93:9	83:14 84:21
19:6 37:6	81:8	proximity	84:23 86:11
47:7 64:2	proposal 63:2	15:23	88:18 89:12
69:2	89:8	public 4:12	91:23 92:17
processing	proposed 2:10	5:1 5:7 6:7	92:23 93:17
15:19	3:13 9:20	6:8 9:14	publish 10:7
producer	18:14 18:14	10:3	published
18:23 18:24	38:14	16:16 35:17	68:24 70:3
19:4	45:6 46:8	44:10 52:13	pulled 89:7
produces	46:10 47:21	52:25	pump 34:13
39:23	63:3	54:1 54:5	35:3 35:4
product 55:24	64:15 65:18	54:9	35:22 37:20
production	69:25	54:17 54:19	pumping 8:6
15:15	76:8 85:7	55:1	PUREX 18:5
21:8	85:13 85:22	55:10 55:18	purposes
57:24 68:18	86:2 86:7	55:22	26:18 39:19
products	88:2 92:9	56:3	61:19
55:23 90:9	proposing	56:10	pushed 26:6
professional	14:2	57:1 57:9	28:19
85:10 85:12	42:18 61:23	57:11 58:7	pushers 77:21

puts 91:17	quick 30:7	rain 56:21	readings
putting 29:25	44:4 48:7	rainbow 34:13	56:13 79:19
37:1	49:18 52:16	34:14	79:23
37:23 41:10	55:14 70:7	rainfall 22:4	Reagan 78:9
44:2 53:3	quickly 9:6	range 85:15	real 9:6
73:1	19:21	85:16	20:23
73:12	quite 25:25	ranges 67:22	21:4
79:5 79:7	35:14 35:15	rate 22:18	36:13
	35:17 35:18	56:16 66:13	48:7
	55:13	66:13	61:20 73:20
		rates 66:9	78:2
<hr/> Q <hr/>	<hr/> R <hr/>	rather 73:5	78:24 78:24
Q&A 52:5 52:6	radiated	rational	realize 77:5
52:10 52:14	79:25	33:25	realized
52:16 52:18	radiation	35:3	82:24
qualify 51:7	24:8 53:9	36:21 56:9	really 4:17
question	radioactive	ratios 59:5	5:2 5:14
3:9 10:5	15:21 18:22	raw 59:25	5:14 6:18
48:18	24:10 33:17	re 22:6 30:14	7:6 12:2
52:1	57:15	45:12	15:20 15:20
52:16 55:14	58:8 59:1	reach 39:25	15:20 21:16
56:9	67:12	44:1	22:9 24:3
56:10	76:5 90:11	76:23	24:3
57:6	radioactively	85:7 86:3	26:11 27:23
58:20 61:15	24:4	reactive	28:21 29:15
63:13 65:21	radioactivity	37:21 38:2	29:18
70:7 75:7	17:20 18:22	reactor	30:4 30:7
82:9 85:3	19:6 19:7	8:22 9:2	30:7 30:9
questions	19:7 24:3	13:16	30:20 30:20
2:20 3:12	77:2 79:15	14:9 15:3	30:23 31:11
3:24 5:14	radionuclide	17:1 67:12	37:10 37:11
5:18 10:2	33:22	reactors	37:11 37:11
10:4	radionuclides	8:1 8:9	42:13 46:24
16:13 44:12	62:20	8:10	47:1 47:8
48:8	65:9	15:10 57:18	47:22 47:24
48:10	65:16 69:13	59:10 59:14	66:2
49:6 49:7	radon 56:1	reading 59:5	68:25 68:25
49:16 52:23	56:4		69:2 69:2
54:22 55:15	rads 64:15		72:25 73:21
57:14 58:22			74:3 74:4
58:24			74:6
60:5			
70:21 70:22			

74:11 75:16 75:24 77:19 78:11 78:21 78:21 80:6 81:2 82:17 84:4 84:7 84:15 92:25 93:5 93:15 reason 7:18 13:12 36:13 41:24 reasonable 20:14 33:18 33:25 40:7 42:9 reasonably 87:13 87:14 88:15 rebuild 38:19 receive 74:19 received 24:10 27:5 68:14 recent 20:20 recently 87:16 receptors 20:9 recessed 93:20 recharged 31:9 Reclamation 12:25 recognize 19:3 reconcentrate	77:1 reconcentrate s 76:24 Reconciliatio n 72:21 record 3:18 6:4 7:17 10:2 10:8 14:16 16:4 16:7 16:8 23:7 43:2 43:3 43:16 43:17 43:17 43:19 44:14 44:15 61:22 71:6 77:19 77:21 77:25 78:1 78:6 79:11 79:11 79:12 80:4 80:10 81:24 82:17 84:23 85:11 85:13 recorded 3:19 85:3 recording 6:3 71:8 records 23:9 33:15 86:2 recreate 40:2 recreational 50:10 redo 49:19 reevaluate 10:15	reevaluated 43:20 Reeves 45:4 45:10 45:11 91:23 refers 85:23 reflect 85:14 refuse 86:25 regard 85:2 87:21 regarding 92:20 regardless 14:19 33:9 35:9 regulation 64:2 regulations 54:16 regulator 44:17 regulatory 2:20 reindustriali ze 13:25 reject 86:12 relation 16:17 67:17 relationship 29:18 30:18 relative 59:5 release 34:3 36:14 remain 8:11 remaining 30:14	remedial 9:16 10:7 14:18 19:20 27:2 36:18 63:8 69:15 70:1 remediate 7:9 remediated 23:6 23:14 23:20 43:5 60:13 61:17 remediating 24:23 remediation 7:22 8:9 9:11 9:14 18:15 19:23 20:20 20:23 21:19 21:25 22:20 23:19 24:2 28:3 30:13 33:14 34:25 36:8 60:18 61:7 65:5 73:14 remedies 3:13 11:24 14:21 remedy 10:13 10:14 10:16 remember 7:7 25:15 47:4 75:3 93:7 remembering 84:8
---	--	--	--

remind 4:16 47:16	79:18	61:3 61:8 61:19 72:14 83:25 84:17 92:7	rest 14:3 38:16 38:17 46:9
reminder 44:10 93:13	representing 3:4	residual 27:18	restoration 12:21 20:12 20:15 41:23 53:20
remnants 19:17	reprocessing 75:24	resources 73:22	restore 20:14 40:6 41:12
removal 24:2 24:9 27:16 28:14 29:21 83:19 91:15	Republican 78:9 80:12	respect 61:15 81:8 82:4 82:18	restricted 84:3
removals 23:19	request 74:25 75:7 83:6 83:6	respectful 52:4	restriction 62:6
remove 8:13 16:14 21:18 23:24 24:16 27:3 27:12 33:3 33:5 42:22 48:2 67:10	requested 75:9	respond 3:23 3:25	result 19:25 20:6 53:18
removed 8:11 16:9 23:5 24:16 25:20 27:15	requesting 84:22	responding 4:2	retaining 13:24
removes 31:14	require 42:22	response 4:1 9:7 22:15 25:4 25:11 28:25 29:5 30:22 30:23 32:1 32:1 44:14 67:20 75:6 80:16	retire 31:1 retirement 31:3
removing 26:24 48:3 52:25	required 35:23 43:13 46:19 46:20 46:25	responses 52:15	retreat 88:11
repaired 90:18	requirement 43:7 87:5	responsibilit ies 73:18	retreated 86:23
repeat 78:4 85:1	requirements 23:6 23:12 87:20	responsibilit y 66:1 71:22 72:3	retrieve 88:21 88:23
repeatedly 78:10	requires 46:12 87:12	responsible 7:4 57:20 62:2 62:7 73:23 73:24 91:25 92:18	return 37:15 72:1
report 56:2	research 15:17 37:7 66:5		returns 41:8 85:18
reporter	reservation 81:10		reverse 68:2
	reservoir 56:19		review 22:19 43:14 48:20 48:21
	residential 14:4 43:1 46:10 49:1 49:5 60:18		reviewed 89:7 revised 89:8 revisited

scandal 57:21	78:16	47:23	shirts 24:13
scenario	sediments	48:5	shore 87:17
60:18	34:20 56:19	48:19 83:10	87:25
61:8 61:9	seeing 30:8	83:22 92:10	shoreline
62:13	30:10 30:21	serendipitous	20:10 26:10
schedule 23:9	64:18 76:16	68:9	39:6
52:3	seeking 85:21	serious 77:2	39:16 39:18
schedules	seem 62:18	seriously	87:22 87:24
68:18	88:10	11:1 12:3	88:7 88:9
science 79:3	seems 43:8	46:25	88:18
scientist	46:24 50:12	Service 92:19	short 5:8
78:24	seen 25:6	session 3:9	12:23 18:19
Scientists	50:6 84:12	3:17	30:22 33:17
78:4 79:10	seepage 76:10	setting 62:16	43:22 52:14
scope 9:13	seeps 22:3	seven 2:6	89:13 91:24
scraped 28:18	select 9:24	several 58:25	short-lived
scrubbed	sells 62:5	sewer 50:2	33:21
65:19	Senate	shaped 59:17	shortly 43:11
sea 27:24	57:12 58:21	share 3:4	shortsighted
sealing 60:10	77:22	45:8	86:22
60:11	send 64:5	shared 84:24	short-term
Seattle 72:21	64:6	sheets 4:14	91:12
74:2	sense 84:18	93:14	shoveling
80:13 80:18	sent 54:6	shells 8:11	72:16
second 6:7	74:23	She's 6:3	showed 5:2
7:15	separation	75:19	shows 64:21
13:12	15:11 15:16	shielded	sign 71:4
21:6 36:2	September 4:7	15:24	signed 52:7
39:9 70:8	74:1 83:5	ship 54:22	55:4
92:2 92:8	93:9	shipments	70:25
secondly 85:2	sequester	54:20	71:2
87:11	75:16	shipped 16:11	71:13
secrecy 78:20	sequestered	23:5	81:5 89:10
section 75:1	75:13 75:15	shipping	significant
secure 48:3	sequestration	55:11	27:16 85:14
security	47:11 47:17		88:2
			significantly
			40:10

silty 34:15	23:7	snatches	solutions
similar 8:23	23:14 42:22	29:16	68:20 76:13
simple 6:21	42:24 42:25	snowmelt 22:4	solve 78:15
7:10 32:9	43:4	so-called	79:9
45:15 81:1	45:24	78:11	somebody 56:7
simulated	58:9	Social 66:1	61:25 62:4
67:15	65:13 66:18	71:21	someone 84:16
single	66:20 66:23	society 78:13	sometime 31:1
76:15 76:16	70:12 70:13	socked 89:21	Sonya 5:21
sir 56:8 56:8	81:7 89:1	soil 2:10	sooner 32:7
sit 36:3 80:7	situation	19:25 22:25	Sorry 71:14
site 2:12	83:21	24:23 25:19	sort 21:9
2:24 6:17	situations	26:17 27:14	23:16 29:24
6:18 6:25	84:13	28:21 29:17	45:12 50:20
8:2 9:9	six 8:20	31:5 31:7	58:5
10:15	10:10 35:21	31:8 36:9	61:11 61:12
14:1 14:7	46:22	48:3 48:4	68:7 68:8
14:9 17:1	six-foot	56:24	sorts 12:22
17:16	24:14	61:5 61:6	13:14 22:21
18:4 18:4	size 25:2	62:11 62:12	36:24 63:25
20:15 33:11	36:21	66:9	68:15
35:1 40:7	sized 14:7	66:11 66:14	sound 6:5
45:18 45:19	ski 34:10	66:16	50:7 91:2
45:19 45:25	skin 26:20	67:6 67:9	source
46:8 46:9	slide 21:6	67:14 67:22	14:24
46:18	27:20 35:20	67:23 67:25	17:4 17:6
53:1 53:8	44:3	68:23 70:12	23:19 27:15
53:19 53:24	small 17:15	91:7	32:23 35:22
59:6 62:1	18:23 31:12	soils 11:16	36:11 38:15
66:5	45:19 47:12	18:20 19:10	41:25
66:10 67:16	51:3	20:8	sources 17:11
72:5 73:9	52:21 53:21	20:10 39:17	33:4
75:23 75:25	68:4	80:24 80:25	south 8:18
81:10 82:11	smaller 25:25	solar 78:19	21:14
89:24 90:3	31:23 46:4	solidified	27:6 74:17
sites 7:13	smart 28:23	68:22	southeast
16:17	snail 74:19	solids 42:4	45:18 46:5
17:5 17:7	74:20	solution 76:7	southeastern
17:14 20:24		76:15 76:16	
21:13			

2:11	squirrels	28:5 29:2	87:21 88:12
southern 86:3	73:19	29:20 31:21	stated 3:18
space 5:24	stable 40:18	32:20 35:10	statement
speak 49:13	stage 37:9	39:6	78:4 78:5
71:6	standard	41:15 41:24	78:6
speaker 2:23	27:25	42:14 42:23	79:10 81:1
species 63:19	28:2	43:1 44:1	statements
63:25	31:21 31:25	49:2 49:2	78:1
64:1 77:9	32:3	61:3	86:24 87:8
77:10 92:20	41:16 42:15	61:18 72:14	states
specifically	46:9	76:22	53:15 54:24
8:25 16:2	46:10 46:12	77:5 77:5	61:4
specifically-	48:21	78:12 83:18	state's 54:24
worded 92:9	49:3 49:5	88:13	73:6 87:4
speeded 73:17	50:20 50:22	standpoint	87:11
spend 71:24	50:23 50:24	8:8	statistical
71:25	50:25	start 2:23	41:18 41:21
72:4 90:25	60:8	2:23 7:21	stay 49:25
spending	60:14	15:25 38:10	80:21
93:11	63:5 63:5	47:14	stenographer
spends 91:3	63:6 63:7	52:5	6:3 52:22
spent 19:6	63:11	52:24 71:10	step 61:13
45:13	65:6	77:1	87:19
54:7	65:16	84:22 86:1	Steve 72:22
54:10 54:12	72:7 72:9	started	90:24
57:11 67:18	72:10	7:21	Steven
spoke 55:2	73:2	22:19 23:23	71:15 71:20
77:24 77:24	83:25 83:25	27:7 30:1	stick 52:11
77:24	84:17 84:17	30:3 36:4	70:23
sprayed 28:12	85:7 87:5	66:8 75:2	sticky
spread 27:9	87:6 87:7	starts 37:14	67:13 67:21
springing	87:10 87:12	state 7:13	69:5
50:16	88:8 92:5	12:17 37:18	stint 12:23
springs 26:11	92:6 92:7	50:24	stood 86:11
square	standards	55:3	stop 77:14
14:25 47:12	11:19 13:21	69:19	82:24
	14:3 14:4	71:5	stops 25:10
	14:5	71:18 74:22	
	19:13	80:9 87:6	
	20:7	87:7	
	20:17 20:19	87:10 87:19	
	22:3 26:9		

storage 32:9 73:12 85:19	68:10	sufficient 22:16 70:6	59:8 60:16 63:23 70:18 71:7 80:15 83:10 83:11
stored 73:9	studies 9:16 9:18 22:20	suggest 10:25	surface 11:11 11:12 11:20 11:23 20:1 22:3 38:5 40:13 68:16
straight 55:12	stuff 8:10 11:13 19:7 24:22 30:17 42:7 53:6 53:8 61:1 67:7 67:15 67:18 68:9 69:1 69:5 75:16 77:7 90:16	suitable 59:10	surprised 76:17
straightforwa rd 7:16	stupid 78:21 79:6 79:7	sum 45:15	suspected 23:4
stranded 25:6	sturgeon 76:25	summarize 19:21	symbols 53:9
strategy 28:13 28:15	submarine 13:16 78:19	summary 74:24	symptoms 77:1
stream 39:12 87:25	submit 49:9 49:11 49:11 49:13 74:13 83:7 89:14	summer 45:5 45:7	system 30:1 37:8 37:25 60:21 79:25
streams 59:3	submitted 49:23	sun 89:17	systems 37:20 76:2 77:6
Street 74:17 80:12	submitting 84:19	Superfund 20:13	<hr/> T <hr/>
streets 13:22 79:22	substance 18:22 31:6	supervisors 78:11	table 4:16 35:24 37:19 54:8 93:15
stringent 87:6	substantial 31:14	supply 41:4	Tacoma 74:17
Strong 3:6 49:18	substrate 41:14	supports 63:11	taking 32:12 35:6 47:6 48:3 66:22 69:11
strontium 68:7 69:12 69:21	suffice 35:16	supposed 46:18 47:18 62:18	talk 3:11 7:14 7:23 9:21 12:12
strontium- 90 19:8 24:20		supposedly 51:3	
structure 21:23 24:16 24:16 90:17		suppress 89:6	
structured 92:3		sure 5:11 5:13 19:4 19:9 23:11 43:6 46:14 47:7 48:22 51:5 51:5 51:9 52:23	
structures 56:4			
studied 25:1 68:5			

13:2	78:19	67:6 74:3	9:10
14:11 14:20	task 44:19	76:16 77:12	10:18 10:21
16:18 19:15	tastes 2:15	80:19 81:19	11:11 11:13
19:18	tax 5:6	90:10 90:11	11:16 13:20
21:4	TCE 19:15	90:12	14:17 17:14
21:12 21:15	35:5 35:5	terribly	18:3
22:23 23:15	43:22 43:23	66:20 67:17	18:15 18:19
27:4	team 5:25 6:2	77:11	19:9
50:19 51:15	12:4	terrorists	19:20 20:12
52:25 57:12	technical	53:4	21:2
60:6	81:18 81:19	test 38:6	21:24 22:24
60:16 70:23	81:22	38:7 53:8	23:3 24:1
82:14	technique	66:18	24:18 24:20
talked 8:5	51:23	67:5 78:17	25:24 28:17
26:7	technologist	tested	29:9
40:21 66:18	12:21	47:20 67:15	29:14 30:13
talking	technology	testing 22:20	31:6 32:7
6:21 7:17	36:25 47:20	56:21 57:3	34:23
8:8 8:24	83:10 92:10	thank 4:21	37:6 40:8
14:23	92:11	4:25 5:24	41:18 42:25
17:8	telephone	6:6 12:7	43:4
20:11	74:21	49:16	43:16 48:19
53:5	temporary	52:2 52:2	49:21
53:13 54:18	86:21 88:14	70:20 72:18	51:2
54:19	tends 26:2	74:1	51:17
58:5 58:6	26:3	75:14 77:16	52:6
60:8 66:2	tens 22:13	80:14	56:11
69:9	term 17:6	81:2	62:6 67:2
69:22	47:4	82:13 84:19	67:10 67:16
76:6	terms 14:11	89:8	68:4
76:13 81:24	16:20 19:13	91:19 92:14	68:12
93:12	20:11 20:22	92:15 92:22	72:6 80:4
talks 63:9	20:23	93:11	82:2 82:3
tall 24:14	21:5	thanks 4:25	85:10
tank 7:9	21:25 30:13	74:13	89:4 92:25
82:19	33:2 40:1	83:3 93:18	They'll
tanks 7:9	40:9 48:8	therefore	18:6 42:25
68:1	55:25	89:3	they're
82:21 91:8		there's	5:22 8:22
target		6:19 8:9	10:22
10:17 11:19			11:4 13:8
			19:16 19:17

34:22 46:17 46:19 50:7 50:17 51:18 53:12 54:20 59:1 62:15 70:14 72:11 77:25 78:2 83:13 they've 68:19 76:1 82:19 thick 9:17 69:25 Thirdly 86:1 87:21 Thompson 3:2 12:9 12:14 16:18 55:7 55:24 56:6 56:15 57:3 57:10 59:8 59:21 60:3 60:16 64:9 64:12 67:19 69:24 70:11 Thompson's 85:4 thorium 56:10 56:11 56:12 56:15 56:16 56:17 thoroughly 65:19 thousand	49:21 90:5 threat 53:4 three-year-old 72:10 threshold 10:20 42:19 throughout 6:17 48:12 59:15 66:7 Thursday 6:9 tidings 81:25 tie 32:25 tight 35:6 til 65:23 time-related 91:25 today 15:6 20:11 23:14 33:3 44:2 49:16 53:2 69:10 83:3 83:7 85:20 89:23 90:3 Tom 3:11 72:23 72:23 75:20 89:12 Tommy 65:25 tomorrow 13:7 93:18 tonight 2:9 2:19 4:2 6:18 7:2 7:23 9:9 9:15 9:21	10:5 12:13 13:3 13:20 14:10 14:23 16:13 48:7 49:12 49:13 49:14 87:2 87:3 87:8 89:15 93:10 tonight's 2:7 2:9 4:2 tons 22:14 22:25 22:25 23:4 66:6 top 28:12 29:23 34:14 44:12 51:8 61:10 61:11 topic 54:4 total 39:24 41:7 42:5 42:6 58:12 75:9 totally 77:20 touch 51:12 tough 76:14 towards 26:6 toxic 53:3 57:15 87:4 87:11 toxicity 19:1 19:2 Toxicologist 71:22 trails 87:17	training 12:15 16:24 transcript 3:19 52:22 transfer 62:6 transferred 53:22 Transferring 84:9 transparency 82:18 Transport 69:4 transuranic 16:12 23:4 traveling 76:2 travels 66:16 treat 16:14 21:18 27:3 27:12 33:4 42:23 48:2 88:21 88:24 treated 16:9 38:19 treatment 7:9 8:7 28:8 28:11 37:20 38:11 38:11 43:10 83:19 91:15 treaty 74:7 81:11 88:17 tremendous 69:8
--	--	--	---

tremendously 86:24	64:24	uncertainties 40:8	82:3
trench 11:12 25:23 28:18 28:19 76:3 76:8 77:13	trouble 20:17 84:8	uncertainty 85:14	unreasonable 35:12
trenches 16:17 21:14 27:4 27:10 27:10 28:6 28:12 51:8 56:11 77:12	troubling 84:4	unclean 79:25	unwilling 79:9
trends 29:13	trucks 15:24	uncomfortable 73:6	upper 16:22 20:3
Tri 13:12	trust 77:19	underground 76:19	upstream 36:17
trickle 11:15 31:8	truth 78:14 79:7 80:1	underlying 36:15	upwelling 39:4 39:5 41:13
trickles 11:22	try 5:8 9:23 32:22 32:25 40:14 72:14	underneath 24:7 24:17 27:18 27:19 34:13 91:7	upwells 26:9
trickling 76:19	trying 5:7 10:16 42:20 72:15 78:2 80:5 91:13	understand 10:17 22:9 33:12 59:19 59:25 73:17 75:4 85:2	uranium 9:2 14:21 14:24 14:25 15:9 15:10 17:5 17:10 18:20 18:21 18:21 18:22 18:25 18:25 19:3 19:12 19:14 20:11 21:8 22:13 22:14 22:17 24:25 24:25 25:13 25:16 25:18 25:19 25:23 26:4 26:19 26:20 26:21 27:1 27:17 27:25 28:4 28:6 28:7 28:17 28:18 28:19
Trident 86:8	turn 3:1 4:5 4:19 4:22 12:8 93:14	understanding 48:16 59:20 59:22 60:7	
tried 78:11	turned 29:11	understood 82:23	
trillion 71:25 90:25 91:1 91:2	turns 62:4	unintended 36:20 37:1	
Tri-Party 9:12 12:20 69:14	TV 79:18	union 78:3 79:10	
tritium 17:14 17:16 17:18 17:25 18:2 18:6 19:14 34:1 43:21 48:11	TWE 23:6	unit 18:7 23:18 54:8	
	twice 79:16	units 9:10 17:4 45:20	
	two-phase 38:9	University 71:22	
	typical 87:25	unknowns 82:3	
	typically 10:10 64:23		
	<hr/> U <hr/>		
	U.S 3:1		
	Ultimately 73:19		

29:1 29:4	59:9	velocities	53:2 66:1
29:7	59:17 59:21	38:3	71:21 71:23
29:12 29:17	63:15 66:21	velocity 34:6	86:24
29:19	67:1 68:6	verbally	87:1 87:4
30:6	68:15 69:12	49:11	87:18 93:4
30:14 30:18	69:20	versus 41:8	wasn't
30:21	83:9	64:14 64:16	80:21 82:24
31:5 31:6	83:16 83:22	83:25	89:22
31:8	88:23	viable 46:18	waste 7:5 7:9
31:11 31:14	89:2	view 90:6	7:9 7:12
31:15 31:19	89:16 89:19	Virginia 13:8	9:4 16:3
31:20 31:21	89:21 89:24	virtually	16:12
32:8	90:3 90:5	57:6	17:5 17:6
32:14	90:23 91:14	vision 77:3	17:14 20:24
33:9	92:10	vitricification	23:4 23:5
33:19 35:22	uranium-	82:22	23:7
35:22	contaminate	volatile	23:13 24:10
36:9	d 26:17	19:14 19:15	25:17
36:11 36:15	27:14 40:22	volume 31:5	27:5 33:6
36:18	urge 80:1	_____	42:21 42:24
37:1 37:7	86:25 91:24	W	42:25
37:9	urgent 91:9	_____	43:4
37:14 37:17	useable 34:12	waist 21:13	45:24
38:16	users 62:11	wait 66:20	53:3
39:3 39:3	_____	76:18	53:11 53:17
39:5 39:9	V	walk 12:11	53:19 53:21
39:11 39:13	vadose 7:14	37:12 91:14	53:22 55:11
39:17 39:20	11:14 25:14	walked	57:13 57:15
39:21 39:22	40:13 76:20	57:21 79:20	57:16 57:16
39:24	Valley	walking 13:18	57:17 57:19
40:9	75:23 75:25	walled 82:21	57:19 57:19
40:14 40:19	values 92:1	War 75:3	57:20 57:25
41:13 41:18	92:4	wash 29:6	58:3 58:8
41:20 45:22	various 9:21	washing 83:17	58:14 58:18
46:7	vast 22:12	Washington	65:12
47:10 47:17	29:8	2:18 12:18	68:3
47:18	vault 24:10		68:14 68:19
48:5	24:10		68:22
49:21 50:16	Vegas 53:7		73:9
55:15 55:23			73:12 75:25
55:25 58:25			76:2
58:25			77:23 90:11
59:4 59:6			

91:7 91:8	40:4 41:4	93:17	20:11 21:21
wastewater	41:14 41:16	weeks 62:13	22:22 23:19
28:11	41:24 56:20	weigh 88:4	24:9
watch 32:19	60:20	welcome 2:7	24:12 24:15
36:3	65:6	we'll 4:16	24:17 24:21
watching	66:16 72:11	4:19 7:14	24:23
57:11	73:20	7:23 8:21	29:5
water 11:17	76:1 76:2	8:24	29:25
11:19 11:20	76:22	16:18 19:15	30:7
11:21 11:23	77:5	19:18	30:10 30:21
13:6 13:7	83:18	21:4 21:5	32:22 32:23
13:8 13:9	85:7	21:12 40:15	32:24
20:1	85:19	44:13 51:15	33:2 35:9
20:16 20:19	88:3	52:23 65:23	35:18 38:14
22:3 22:7	88:25	71:3 71:12	38:24 39:19
25:8	89:2 89:3	wells 34:24	40:5
25:22	90:7	42:12 43:22	40:11 40:17
26:4 26:5	waters 26:12	47:17 66:19	40:18 41:10
26:9	watershed	67:3 67:5	41:10 41:25
26:18 26:24	12:16	68:2 82:7	42:17 42:20
27:7	ways 51:17	we're 2:23	43:13
27:25	76:11	3:8 4:12	44:2
28:1 28:4	weapon 79:25	5:7 5:7	44:10 46:16
28:8 28:9	weapons 58:14	6:18 6:21	46:25
28:10 28:22	59:24 71:25	7:1 7:4	47:6 47:6
29:2	72:1 72:4	7:17 7:19	47:7 47:8
29:11 29:19	79:16	7:23 8:8	48:9
29:20 29:23	80:7	9:8 9:15	48:10 48:21
29:25	90:13 91:1	9:20 9:23	48:22
30:4 30:5	wearing 2:18	9:24 9:25	50:5 50:8
30:9 31:9	Webb 81:3	10:2 10:3	51:10 51:13
31:20 31:21	81:25	10:4 10:9	53:18 54:18
31:24 31:25	website	11:2 12:4	58:6
32:2	3:20 12:1	12:4 12:4	61:22 62:16
32:20 34:13	we'd 6:10	12:5 13:2	62:20 62:21
34:16	78:22	14:2	63:4 63:8
35:3 35:5	WEDNESDAY 2:3	14:20 14:23	63:10 63:10
36:10 36:17	week 6:8	17:25 18:11	64:18 64:25
38:5 39:6	62:13 79:18	19:1 19:5	65:9
39:11 39:16		19:9	65:14 65:17
40:2 40:2		19:10 19:12	66:1
40:3 40:3			66:14 70:11
			70:12 70:22

73:4 75:2	whatever 56:4	83:15 83:23	written 4:3
75:15	90:2	92:11	49:9
76:6	whenever 43:3	worked	49:11 49:13
76:13 78:15	whereas	12:23 12:24	74:13 89:14
80:6	46:9 66:13	38:8	93:9
83:10 85:24	whether	75:24	wrong 63:4
86:20	31:6 70:5	78:7	wrongheaded
87:8	90:12 90:12	78:16 78:17	89:4
88:13 90:14	whip 10:19	78:18	wrote 28:13
91:18	whoever 93:1	worker 8:12	Wyden 77:24
west 17:12	whole 6:3	workers	80:5
56:22 75:22	10:15 16:17	24:4	Wyden's 57:12
75:25 81:11	44:5 73:23	26:19 26:24	77:22
wet 51:14	Wildlife	50:18 51:16	
51:18 51:20	63:24 92:19	60:24 87:15	
wetted 30:15	winter 43:3	working	Y
we've 5:15	wish 13:4	4:12 5:6	Yakima 41:9
6:2 7:14	55:10 77:25	12:18 23:19	54:8 59:3
8:3 10:8	wishes	34:22	74:7 81:9
10:8	89:11 91:22	45:5	81:13
20:20 21:20	wonder 72:9	60:24 61:1	yards 29:22
23:6	wonderful	works 16:17	Yay 52:12
23:16 27:12	74:20	43:10 43:12	yellow 24:13
27:15	wondering	47:15 51:6	yellow-
30:4	53:5	World 75:3	looking
30:23 30:23	work 2:17	worry 36:1	16:21
35:21 38:14	7:11 10:9	90:21	yesterday
43:5	10:10 14:17	worse 65:14	53:2
45:13 45:13	20:21	worst 30:11	58:21 77:22
48:2 48:6	23:3	worth 38:11	79:11
50:6 56:6	23:11 23:11	wretched	yet 2:16 4:15
56:15 56:16	35:1 36:5	82:17	23:23 43:4
58:24	38:6	write 32:23	York 75:23
59:2 61:1	43:13 47:24	74:18	you-all 53:5
65:10 65:11	48:19 68:17	writing 31:12	you'll 9:4
65:12 66:17	72:17	32:6	9:21 49:9
66:18 67:11	73:4	73:25	49:14 64:17
68:10	82:25 83:11	83:8 84:20	69:20 82:25
69:8			
70:17 77:12			
84:12 91:17			

you've

25:15 34:17

34:17 60:20

64:21 65:11

Z

Zepera

75:21 77:17

80:11

zeroes 75:10**zone** 7:14

11:14 13:19

15:4

25:14 30:15

40:13 40:23

40:25 42:23

42:24 42:25

60:22

88:2 88:6

88:9