EPA-4202

Reid Rosnick/DC/USEPA/US		To	Emily Atkinson
01/03/2012 08:07 AM		cc	Daniel Schultheisz, Philip Egidi, Susan Stahle, Tom Peake
		bcc	
		Subject	Subpart W Stakeholders Conference Call

Meeting

Date	01/05/2012
Time	11:00:00 AM to 12:00:00 PM
Chair	Reid Rosnick
Invitees	
Required	Emily Atkinson
Optional	Daniel Schultheisz; Philip Egidi; Susan Stahle; Tom Peake
FYI	
Location	Call-in number - 866-299-3188

Conference Code 2023439563

EPA-1242

1310L Room 533/DC-1310L-OAR

01/03/2012 08:07 AM

To Reid Rosnick

cc

bcc

Subject Accepted: Subpart W Stakeholders Conference Call

EPA-2761

Reid Rosnick/DC/USEPA/US		To	Barry Elman
01/03/2012 09:56 AM		cc	
		bcc	
		Subject	Subpart W EIA

Hi Barry,

Have you had a chance to look through the Subpart W economic impact analysis? If so, I would welcome any comments you have to improve the document. Thanks

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-1800

Reid Rosnick/DC/USEPA/US		To	Beth Miller
01/03/2012 11:28 AM		cc	Glenna Shields, Tom Peake
		bcc	
		Subject	Docket for Subpart W

Beth,

As we discussed, please begin placing relevant documents into the Subpart W docket (EPA-HQ-OAR-2008-0218).A good place to begin is the Subpart W website (http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html). All of the information on the website should go into the docket. The good news is that most of the information is in one place (although I'll be sending you other documents). The bad news is there is a lot of information that has to go in the docket.

We are still hoping to go to FAR around the end of January, so if you could make this one of your higher priorities, I'd appreciate it. Thanks, and please let me know if you have any questions or comments.

Reid]'

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-1801

Glenna Shields/DC/USEPA/US

01/03/2012 12:15 PM

To Reid Rosnick
cc Beth Miller, Tom Peake
bcc
Subject Re: Docket for Subpart W

We'll make it a priority.

Glenna Shields | Director, Center for Radiation Information and Outreach | USEPA | Phone 202.343.9849 | Fax: 202.343.2302 | shields.glenn

Reid Rosnick Beth, As we discussed, please begin pl... 01/03/2012 11:28:23 AM

From: Reid Rosnick/DC/USEPA/US
To: Beth Miller/DC/USEPA/US@EPA
Cc: Glenna Shields/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA
Date: 01/03/2012 11:28 AM
Subject: Docket for Subpart W

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As we discussed, please begin placing relevant documents into the Subpart W docket (EPA-HQ-OAR-2008-0218).A good place to begin is the Subpart W website (http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html). All of the information on the website should go into the docket. The good news is that most of the information is in one place (although I'll be sending you other documents). The bad news is there is a lot of information that has to go in the docket.

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Reid]'

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-5311

Lauren Lovett/DC/USEPA/US		To	Wendy Blake
01/05/2012 10:00 AM		cc	
		bcc	
		Subject	Fw: Pre-brief this afternoon (subpart W slides)

I talked to Sue. She is working on the 112(q) discussion and doesn't anticipate that it will be very long (a couple of paragraphs). She is working from her briefing papers she developed last fall to draft the language. OIRA will discuss in the pre-brief w/ GIna next week when they will schedule FAR (FAR is not currently scheduled, but in the briefing materials they anticipate having the FAR meeting on Feb. 16 -- 15 working days after Jan. 26 distribution date). If FAR is Feb. 16 and there are two weeks between FAR and sending the package to OMB, the package would go to OMB on Mar. 1. She and OIRA are aware that the 112(q) discussion would need to be fully vetted by OGC ARLO (i.e., Patricia and you will need to review it).

Here's the preliminary schedule from the briefing materials:

•FAR meeting can take place 3 weeks (15 working days) after distribution (January 26)
•Assume 1 week after FAR to Office of Policy
•Assume 1 week for OP to transmit package to OMB
•Allowing for prompt acceptance and 90-day review, package would clear OMB in mid-May
FR publication possible early June

Lauren Lovett
Air and Radiation Law Office
EPA Office of General Counsel
Room 7514D ARN
202.564.2560 (phone); 202.564.5416 (fax)
Mail Code 2399A
----- Forwarded by Lauren Lovett/DC/USEPA/US on 01/05/2012 09:42 AM -----

From: Susan Stahle/DC/USEPA/US
To: Lauren Lovett/DC/USEPA/US@EPA
Cc: Wendy Blake/DC/USEPA/US@EPA
Date: 01/04/2012 04:31 PM
Subject: Fw: Pre-brief this afternoon (subpart W slides)

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
ph: (202) 564-1272
fax: (202) 564-5603
stahle.susan@epa.gov
----- Forwarded by Susan Stahle/DC/USEPA/US on 01/04/2012 04:31 PM -----

From: Reid Rosnick/DC/USEPA/US
To: Susan Stahle/DC/USEPA/US@EPA
Date: 01/03/2012 12:52 PM
Subject: Pre-brief this afternoon

Hi Sue,

Happy New Year. I assume you'll be calling in to the pre-brief this afternoon, so here's a copy of the most recent briefing we plan on giving to Gina.

[attachment "FAR v2.pptx" deleted by Lauren Lovett/DC/USEPA/US]

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-1054

"Paulson, Oscar (RTE)" <Oscar.Paulson@riotinto.com>

01/05/2012 12:04 PM

To Reid Rosnick

cc

bcc

Subject Method 115 Test (Radon Flux) Data - Sweetwater Uranium Project

Reid Rosnick:

Method 115 Test (radon flux) data for the Sweetwater Uranium Project from 1990 to 2010 may be found on page 6 of the following document stored in the Nuclear Regulatory Commission's (NRC's) ADAMS public document system:

- **Document Name:** Kennecott Uranium Company, Request for a Five (5) Year Postponement of the Initiation of the Requirements of Timeliness in Decommissioning.
- **ADAMS Accession Nunber:** ML11157A017

If you go to the ADAMS page (http://www.nrc.gov/reading-rm/adams.html) click *Begin Web-based ADAMS Search,* click on the *Content Search* tab and type in *ML11157A017* you should be able to retrieve the document.

Oscar Paulson
Facility Supervisor
Kennecott Uranium Company
Sweetwater Uranium Project
P.O. Box 1500
42 Miles Northwest of Rawlins
Rawlins, Wyoming 82301-1500
Telephone: (307)-324-4924
Fax: (307)-324-4925
Cellular: (307)-320-8758
E-mail: oscar.paulson@riotinto.com

EPA-3480

Reid Rosnick/DC/USEPA/US

01/06/2012 02:41 PM

To: Albion Carlson, Andrea Cherepy, Angelique Diaz, Barry Elman, CharlesA Hooper, Charlie Garlow, Daniel Schultheisz, Davis Zhen, George Brozowski, Marilyn Ginsberg, Robert Dye, Stephen Hoffman, Stuart Walker, Susan Stahle, Tim Benner, Tom Peake

cc:

bcc:

Subject: Subpart W Workgroup Meeting

Meeting room has changed

EPA-4481

Gina McCarthy/DC/USEPA/US

Sent by: Cindy Huang

01/09/2012 01:58 PM

To: Alan Perrin, Anna Duncan, Daniel Schultheisz, Jonathan Edwards, Mike Flynn, Reid Rosnick, Susan Stahle, Tom Peake

cc: Cindy Huang, Don Zinger, Joyce Crowley, Kirsten King, Kristina Friedman, Virginia Stradford

bcc:

Subject: Cancelled: Pre-brief on Final Agency Review for 40CFR Part 61, Subpart W: National Emission Standards for Radon Emissions from Operating Mill Tailings.

EPA-4710

Susan Stahle/DC/USEPA/US	To	Lauren Lovett
01/09/2012 01:58 PM	cc	Wendy Blake
	bcc	
	Subject	Fw: Cancelled: Pre-brief on Final Agency Review for 40CFR Part 61, Subpart W: National Emission Standards for Radon Emissions from Operating Mill Tailings.

FYI

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
ph: (202) 564-1272
fax: (202) 564-5603
stahle.susan@epa.gov
----- Forwarded by Susan Stahle/DC/USEPA/US on 01/09/2012 01:58 PM -----

Cancelled: Pre-brief on Final Agency Review for 40CFR Part 61, Subpart W: National Emission Standards for Radon Emissions from Operating Mill Tailings.

Tue 01/10/2012 4:15 PM - 5:15 PM

Attendance is **required** for Susan Stahle

Chair: **Gina McCarthy/DC/USEPA/US**
Sent By: **Cindy Huang/DC/USEPA/US**
Location: ARN-OAR-5400

Gina McCarthy has cancelled this meeting. Your calendar will be updated to reflect this change.

Pending reschedule but taking off the calendar for now

Required:	Alan Perrin/DC/USEPA/US@EPA, Anna Duncan/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA, Mike Flynn/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA
Optional:	Cindy Huang/DC/USEPA/US@EPA, Don Zinger/DC/USEPA/US@EPA, Joyce Crowley/DC/USEPA/US@EPA, Kirsten King/DC/USEPA/US@EPA, Kristina Friedman/DC/USEPA/US@EPA, Virginia Stradford/DC/USEPA/US@EPA

Description

EPA-4992

Alan Perrin/DC/USEPA/US	To	Raymond Lee
01/09/2012 04:05 PM	cc	
	bcc	
	Subject	Re: SCOUT Dates/60-Day List

Hi Ray, I think some changes will need to be made; could you provide me with a hard copy of the schedules shown below. Thanks, Alan

~~~~~~~~~~~~~~~~~~~~

Alan Perrin, Acting Director
Radiation Protection Division, USEPA
office (202) 343-9775 | bb (202) 279-0376

Raymond Lee	Hi all, The draft 60-day list for the AA's...	01/09/2012 01:04:47 PM

From:	Raymond Lee/DC/USEPA/US
To:	Alan Perrin/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA
Cc:	Anna Duncan/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Lee Veal/DC/USEPA/US@EPA
Date:	01/09/2012 01:04 PM
Subject:	SCOUT Dates/60-Day List

Hi all,

The draft 60-day list for the AA's & Administrator is due to go out this week, and we need changes by COB Wednesday, 1/11. I wanted to make sure that what we have right now in the system is up-to-date, because I know some of our dates are coming up in the next week or two (most notably with the NESHAP Subpart W rule and 40 CFR 190 ANPR).

Once I get the go-ahead that Jon has ok'd everything as our new OD, I'll make any changes and forward them onto OAR.

Thanks!

Ray
~~~~~~~~~~~~~~~~~~~~

ADP Actions with Milestones - IBM Lotus Notes

File Edit View Create Actions Text Tools Window Help

Open | Home | Raymond Lee - Mail | > draft 60 Day List for January-Febr... | Work

SCOUT

Create Action Print Organization: OAR/ORIA

Use Basic Navigator

OAR
- Approval Required
- Milestones
- Actions
- Green Only
- AO Mgmt Lists
- ADP Milestones
- ADP Actions
  - All
  - w/ Milestones
  - w/ MS by EG-OS-FAR
  - By SAN (All)
  - By Tier
  - Completed

AO Mgmt Lists
- Policy Priorities
- 60 Day List
- OPA Watch List
- AA/RA External Events
- NEPA
- Discussion Milestones
- Consolidated Lists
- ADP Milestones
- ADP Actions

OAR Special

Archive

	Next Date	Action Title	
Y	01/17/2012 Tuesday	**NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W); SAN 5281**	FAR; Stage: NPR
		01/17/2012 (Tuesday); FAR; NPRM stage	
		01/24/2012 (Tuesday); OMB Review (Prog Office to OP); NPRM stage	
		05/11/2012 (Friday); Administrator's Signature (Prog Office to OP); NPRM st	
		Long-term; Administrator's Signature; Final Action stage	
Y	01/19/2012 Thursday	**Revised Regulation for Environmental Radiation Protection Standard for Nuclear Power Operations - 40 CFR Part 190; SAN 5581**	Early Guida Stage: ANF
		01/19/2012 (Thursday); Early Guidance; ANPRM stage	
		01/20/2012 (Friday); Detailed Analytic Blueprint; ANPRM stage	
		02/27/2012 (Monday); Option Selection; ANPRM stage	
		03/14/2012 (Wednesday); AA Signature (Proj sig date); ANPRM stage	
		03/30/2012 (Friday); FAR; ANPRM stage	
		04/13/2012 (Friday); OMB Review (Prog Office to OP); ANPRM stage	
Y	02/02/2012 Thursday	**Federal Guidance Report No. 14: Diagnostic and Interventional X-Ray Procedures; SAN 5592**	OMB Revie Stage: NOD
		02/02/2012 (Thursday); OMB Review (OMB to complete review); NODA sta	
		02/23/2012 (Thursday); Delegated OD Signature (Proj sig date); NODA stag	
Y	02/03/2012 Friday	**Protective Action Guidance for Radiological Incidents; SAN 5198**	OMB Revie Stage: NOD
		02/03/2012 (Friday); OMB Review (OMB to complete review); NODA 2 stag	
		02/06/2012 (Monday); Administrator's Signature (Prog Office to OP); NODA	
Y	02/15/2012 Wednesday	**Uranium Extraction Facilities; SAN 5319**	Option Sele Stage: NPR
		02/15/2012 (Wednesday); Option Selection; NPRM stage	
		04/25/2012 (Wednesday); FAR; NPRM stage	
		05/16/2012 (Wednesday); OMB Review (Prog Office to OP); NPRM stage	
		08/17/2012 (Friday); Administrator's Signature (Prog Office to OP); NPRM st	
		Long-term; Administrator's Signature; Final Action stage	
Y	03/30/2012 Friday	**NESHAP for Radionuclides - Amendment to Definitions (subparts H and I); SAN 5114**	Delegated Stage: Dire
		03/30/2012 (Friday); Delegated OD Signature (Proj sig date); Direct Final Ac	

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

EPA-5003

Alan Perrin/DC/USEPA/US		To	Tom Peake
01/09/2012 04:16 PM		cc	
		bcc	
		Subject	Re: SCOUT Dates/60-Day List

Please review dates, provide me with any necessary changes. I want to discuss with Jon tomorrow at 1 pm. Thx, Alan

~~~~~~~~~~~~~~~~~~~~

Alan Perrin, Acting Director
Radiation Protection Division, USEPA
office (202) 343-9775 | bb (202) 279-0376

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Cc:	Anna Duncan/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Lee Veal/DC/USEPA/US@EPA
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Subject:	SCOUT Dates/60-Day List

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SCOUT

Create Action Print Organization: OAR/ORIA

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  - Approval Required
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- **Archive**

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Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

EPA-2835

1310L Room 502/DC-1310L-OAR

01/10/2012 06:33 AM

To Reid Rosnick

cc

bcc

Subject Accepted: Subpart W Workgroup Meeting

EPA-1373

Philip Egidi/DC/USEPA/US	To	Kelly Hunt
01/11/2012 08:49 AM	cc	Reid Rosnick
	bcc	
	Subject	Re: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Kelly,
Reid Rosnick carries that folder, I will defer to him the honor of a response...
PVE

Philip Egidi
Environmental Scientist
U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Radiation Protection Division
Center for Waste Managment and Regulations
Washington, DC

phone: 202-343-9186
email: egidi.philip@epa.gov
cell: 970-209-2885

Kelly Hunt	Hi Phil, We got a media request in fro...	01/11/2012 08:29:30 AM

From: Kelly Hunt/DC/USEPA/US
To: Philip Egidi/DC/USEPA/US@EPA
Date: 01/11/2012 08:29 AM
Subject: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Hi Phil,

We got a media request in from Manuel Quinones, a reporter for "Environment & Energy Publishing." Are you the right person to answer this question? Thank you in advance for any help you can give me on this one.
I found this document from 2008, if that helps:
http://www.epa.gov/radiation/docs/neshaps/subpart-w/tailings-impoundment-tech.pdf

Here is the email from Manuel:

I am checking into EPA rule-making or review into radon / air rules pertaining uranium mine tailings ponds. I understand the agency is scheduled or supposed to come out with a proposal in the next few days?

Any background or information you can provide would be most helpful.

Thanks!
Manuel

And here is some information on E&E:

Environment & Energy - E&E – Background

http://www.eenews.net/eep/learn_more/

- **Markets served:** Major U.S. federal institutions including Congress and agencies; major law firms; multinational corporations; energy companies/utilities; lobbyists; financial institutions; environmental organizations; foreign governments; universities; U.S. states.

- Cover the Washington policy and political, in addition to national/global.

- Leading source for comprehensive, daily coverage of environmental and energy policy and markets.

- Four daily online publications considered must-reads by people who track and influence energy, environmental and climate policy. Publishing includes ClimateWire, Greenwire, E&ENews and Environment & Energy Daily.

- 52-person award-winning editorial team enjoys unrivaled access to key players in energy and environmental policy.

- Coverage of major, breaking news goes deeper than the mass-market news services and brings readers informed, balanced, spin-free reporting that keeps them atop critical issues and developments.

- Staff regularly appears on PBS's NewsHour, C-SPAN and NPR, and our news-breaking reporting is frequently cited by the Washington Post, the New York Times, Associated Press and other mass media organizations.

Kelly Hunt | Communications Specialist | Radiation Protection Division | U.S. EPA | Tel. 202.343-9053 | www.epa.gov/radiation

EPA-2755

Kelly Hunt/DC/USEPA/US		To	Reid Rosnick
01/11/2012 08:57 AM		cc	
		bcc	
		Subject	Fw: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Hi Reid. Would you be able to assist in this media request? Or direct me to the correct information? Thank you in advance.

Kelly Hunt | Communications Specialist | Radiation Protection Division | U.S. EPA | Tel. 202.343-9053 | www.epa.gov/radiation

----- Forwarded by Kelly Hunt/DC/USEPA/US on 01/11/2012 08:56 AM -----

From: Philip Egidi/DC/USEPA/US
To: Kelly Hunt/DC/USEPA/US@EPA
Cc: Reid Rosnick/DC/USEPA/US@EPA
Date: 01/11/2012 08:49 AM
Subject: Re: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Kelly,
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PVE

Philip Egidi
Environmental Scientist
U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Radiation Protection Division
Center for Waste Managment and Regulations
Washington, DC

phone: 202-343-9186
email: egidi.philip@epa.gov
cell: 970-209-2885

Kelly Hunt   Hi Phil, We got a media request in fro...   01/11/2012 08:29:30 AM

From: Kelly Hunt/DC/USEPA/US
To: Philip Egidi/DC/USEPA/US@EPA
Date: 01/11/2012 08:29 AM
Subject: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

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- Staff regularly appears on PBS's NewsHour, C-SPAN and NPR, and our news-breaking reporting is frequently cited by the Washington Post, the New York Times, Associated Press and other mass media organizations.

Kelly Hunt | Communications Specialist | Radiation Protection Division | U.S. EPA | Tel. 202.343-9053 | www.epa.gov/radiation

EPA-2862

Reid Rosnick/DC/USEPA/US	To	Kelly Hunt
01/11/2012 09:13 AM	cc	Tom Peake
	bcc	
	Subject	Re: Fw: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Hi Kelly,

Here's my response. Feel free to edit or let me know if you have questions/comments:

EPA is currently revising the NESHAP at 40 CFR 61.250. This NESHAP is a radon emissions standard for operating uranium mill tailings. The rule was originally promulgated in 1989, and currently sets radon emission limits for impoundments constructed before December 15, 1989, and work practice standards for impoundments constructed after that date. EPA will be proposing revisions to the rule, clarifying certain definitions in the rule, and also clarifying what types of units the rule applies to at uranium recovery facilities. A workgroup was established within EPA to write the proposed revisions, and we expect to complete the proposal and submit it to OMB for their review within the next couple of months.

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Kelly Hunt Hi Reid. Would you be able to assist in... 01/11/2012 08:57:38 AM

From: Kelly Hunt/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 01/11/2012 08:57 AM
Subject: Fw: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Hi Reid. Would you be able to assist in this media request? Or direct me to the correct information? Thank you in advance.

Kelly Hunt | Communications Specialist | Radiation Protection Division | U.S. EPA | Tel. 202.343-9053 | www.epa.gov/radiation

----- Forwarded by Kelly Hunt/DC/USEPA/US on 01/11/2012 08:56 AM -----

From: Philip Egidi/DC/USEPA/US
To: Kelly Hunt/DC/USEPA/US@EPA
Cc: Reid Rosnick/DC/USEPA/US@EPA
Date: 01/11/2012 08:49 AM
Subject: Re: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Kelly,
Reid Rosnick carries that folder, I will defer to him the honor of a response...
PVE

Philip Egidi
Environmental Scientist
U.S. Environmental Protection Agency

Office of Radiation and Indoor Air
Radiation Protection Division
Center for Waste Managment and Regulations
Washington, DC

phone: 202-343-9186
email: egidi.philip@epa.gov
cell: 970-209-2885

Kelly Hunt	Hi Phil, We got a media request in fro...	01/11/2012 08:29:30 AM

From: Kelly Hunt/DC/USEPA/US
To: Philip Egidi/DC/USEPA/US@EPA
Date: 01/11/2012 08:29 AM
Subject: Media request - EPA rule-making/review of radon/air rules pertaining to uranium mine tailings ponds

Hi Phil,

We got a media request in from Manuel Quinones, a reporter for "Environment & Energy Publishing." Are you the right person to answer this question? Thank you in advance for any help you can give me on this one.
I found this document from 2008, if that helps:
http://www.epa.gov/radiation/docs/neshaps/subpart-w/tailings-impoundment-tech.pdf

Here is the email from Manuel:

I am checking into EPA rule-making or review into radon / air rules pertaining uranium mine tailings ponds. I understand the agency is scheduled or supposed to come out with a proposal in the next few days?

Any background or information you can provide would be most helpful.

Thanks!
Manuel

And here is some information on E&E:

Environment & Energy - E&E – Background

http://www.eenews.net/eep/learn_more/

- **Markets served:** Major U.S. federal institutions including Congress and agencies; major law firms; multinational corporations; energy companies/utilities; lobbyists; financial institutions; environmental organizations; foreign governments; universities; U.S. states.

- Cover the Washington policy and political, in addition to national/global.

- Leading source for comprehensive, daily coverage of environmental and energy policy and markets.

- Four daily online publications considered must-reads by people who track and influence energy, environmental and climate policy. Publishing includes ClimateWire, Greenwire, E&ENews and Environment & Energy Daily.

- 52-person award-winning editorial team enjoys unrivaled access to key players in energy and environmental policy.

- Coverage of major, breaking news goes deeper than the mass-market news services and brings readers informed, balanced, spin-free reporting that keeps them atop critical issues and developments.

- Staff regularly appears on PBS's NewsHour, C-SPAN and NPR, and our news-breaking reporting is frequently cited by the Washington Post, the New York Times, Associated Press and other mass media organizations.

Kelly Hunt | Communications Specialist | Radiation Protection Division | U.S. EPA | Tel. 202.343-9053 | www.epa.gov/radiation

EPA-1302

Beth Miller/DC/USEPA/US
01/12/2012 09:17 AM

To Marisa Savoy
cc Glenna Shields, Reid Rosnick
bcc
Subject Web Question

Hi Marisa

Reid and I are wondering how we should go about putting some comments that were sent in to the subpart w page on the rulemaking page. Is there a way we can have a link to a folder that once it opens will show all the comments that have come in? We also don't want to give out any email addresses of those that submitted comments. Does this make sense? If you have any questions please call me and I can explain it better. Thank you.

Beth Miller
202-343-9223

EPA-1431

Marisa Savoy/DC/USEPA/US	To	Beth Miller
01/12/2012 10:03 AM	cc	Glenna Shields, Reid Rosnick
	bcc	
	Subject	Re: Web Question

Hey Beth,

Please send me the link so I can look at the page.

Thanks!
Marisa

Marisa D. Savoy | Center for Radiation and Information Outreach | U.S. EPA | Tel. 202.343.9237 | Fax: 202.343.2305 | savoy.marisa @epa.

Beth Miller   Hi Marisa Reid and I are wondering ho...   01/12/2012 09:17:51 AM

From: Beth Miller/DC/USEPA/US
To: Marisa Savoy/DC/USEPA/US@EPA
Cc: Glenna Shields/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA
Date: 01/12/2012 09:17 AM
Subject: Web Question

Hi Marisa

Reid and I are wondering how we should go about putting some comments that were sent in to the subpart w page on the rulemaking page. Is there a way we can have a link to a folder that once it opens will show all the comments that have come in? We also don't want to give out any email addresses of those that submitted comments. Does this make sense? If you have any questions please call me and I can explain it better. Thank you.

Beth Miller
202-343-9223

EPA-1303

Marisa Savoy/DC/USEPA/US

01/12/2012 10:10 AM

To Beth Miller, Reid Rosnick

cc Glenna Shields

bcc

Subject Re: Web Question

Beth and Reid,

We can capture the email comments something like this - http://epa.gov/japan2011/data-updates-april.html

Marisa

Marisa D. Savoy | Center for Radiation and Information Outreach | U.S. EPA | Tel. 202.343.9237 | Fax: 202.343.2305 | savoy.marisa @epa.

Beth Miller	Hi Marisa Reid and I are wondering ho...	01/12/2012 09:17:51 AM

From: Beth Miller/DC/USEPA/US
To: Marisa Savoy/DC/USEPA/US@EPA
Cc: Glenna Shields/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA
Date: 01/12/2012 09:17 AM
Subject: Web Question

Hi Marisa

Reid and I are wondering how we should go about putting some comments that were sent in to the subpart w page on the rulemaking page. Is there a way we can have a link to a folder that once it opens will show all the comments that have come in? We also don't want to give out any email addresses of those that submitted comments. Does this make sense? If you have any questions please call me and I can explain it better. Thank you.

Beth Miller
202-343-9223

EPA-1259

Reid Rosnick/DC/USEPA/US		To	subpartw
01/13/2012 09:43 AM		cc	
		bcc	
		Subject	Fw: Method 115 Test (Radon Flux) Data - Sweetwater Uranium Project

---

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

----- Forwarded by Reid Rosnick/DC/USEPA/US on 01/13/2012 09:42 AM -----

From:	"Paulson, Oscar (RTE)" <Oscar.Paulson@riotinto.com>
To:	Reid Rosnick/DC/USEPA/US@EPA
Date:	01/05/2012 12:04 PM
Subject:	Method 115 Test (Radon Flux) Data - Sweetwater Uranium Project

Reid Rosnick:

Method 115 Test (radon flux) data for the Sweetwater Uranium Project from 1990 to 2010 may be found on page 6 of the following document stored in the Nuclear Regulatory Commission's (NRC's) ADAMS public document system:

- **Document Name:** Kennecott Uranium Company, Request for a Five (5) Year Postponement of the Initiation of the Requirements of Timeliness in Decommissioning.
- **ADAMS Accession Nunber:** ML11157A017

If you go to the ADAMS page (http://www.nrc.gov/reading-rm/adams.html) click *Begin Web-based ADAMS Search,* click on the *Content Search* tab and type in *ML11157A017* you should be able to retrieve the document.
Oscar Paulson
Facility Supervisor
Kennecott Uranium Company
Sweetwater Uranium Project
P.O. Box 1500
42 Miles Northwest of Rawlins
Rawlins, Wyoming 82301-1500
Telephone: (307)-324-4924
Fax: (307)-324-4925
Cellular: (307)-320-8758
E-mail: oscar.paulson@riotinto.com

Avis:

EPA-5585

Tom Peake/DC/USEPA/US		To	Alan Perrin, Lee Veal
01/13/2012 03:14 PM		cc	
		bcc	
		Subject	Fw: EIA Products for Subpart W

FYI

Tom Peake
Director
Center for Waste Management and Regulations
US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

----- Forwarded by Tom Peake/DC/USEPA/US on 01/13/2012 03:14 PM -----

From: "azeitoun" <azeitoun@scainc.com>
To: Jeffrey Blizzard/DC/USEPA/US@EPA
Cc: Reid Rosnick/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Valentine Anoma/DC/USEPA/US@EPA, Andrea Cherepy/DC/USEPA/US@EPA, Valerie Daigler/DC/USEPA/US@EPA, <pettengillh@verizon.net>, "'Steve Marschke'" <smarschke@scainc.com>
Date: 01/13/2012 02:31 PM
Subject: RE: EIA Products

Jeff,

We intend to provide you with the necessary cost data to fill in the blanks of the most current draft of the preamble and rule language by mid next week. Also we intend to complete the regulatory analysis of the RFA at the same time. I am pushing to get these inputs to you for Reid's use by late Wednesday or Thursday morning.

I am planning on delivering the revision of Chapter 6, however, including the new cost data and the resolution of the comments received on the draft by Friday the 27th.

Abe Zeitoun

any use, reliance, dissemination, disclosure, or copying of this e-mail or any part of this e-mail or attached files is unauthorized.

From: Jeffrey Blizzard [mailto:Blizzard.Jeffrey@epamail.epa.gov]
Sent: Friday, January 13, 2012 12:00 PM
To: azeitoun@scainc.com
Cc: Reid Rosnick; Tom Peake; Daniel Schultheisz; Valentine Anoma; Andrea Cherepy; Valerie Daigler; pettengillh@verizon.net
Subject: EIA Products

Abe,

I'm sorry for missing the call the other day, but I was in Kansas City, MO for a conference. I understand that progress was made on the call and would like to know when you will have the products ready that were agreed to on the call.

Please let me know. Thanks.

Jeff

Jeff Blizzard
Program Analyst
United States Environmental Protection Agency
Office of Air and Radiation
Radiation Protection Division
Center for Radiological Emergency Management
(202) 343-9470 - Office
(202) 695-5331 - Cell

extension and resend the Email with the renamed attachment.
After
receiving the revised Email, containing the renamed attachment,
you can
rename the file extension to its correct name.

For further information, please contact the EPA Call Center at
(866) 411-4EPA (4372). The TDD number is (866) 489-4900.

*********************** ATTACHMENT NOT DELIVERED
****

EPA-3285

Tom Peake/DC/USEPA/US
01/13/2012 03:48 PM

To Andrea Cherepy
cc Marye Clark, Philip Egidi, Reid Rosnick, Daniel Schultheisz, Kenneth Czyscinski
bcc
Subject Oscar Paulson called me about our letter

FYI,
Oscar Paulson (Kennecot) called to reply to our letter. I found his response amusing. He pointed out that his company does not have ISL operations so he can't provide any ISL data. (How convenient he did not mention this at the SAB calls!) He told me that NRC has data that can be accessed through ADAMS and I let him know that NRC gave us their data but its not in the most useful format, but it is referred to in our report.

He is going to send me an email with ADAMS document numbers that are associated with his mill tailings site and those documents may be useful if/when we revise other parts of the regulation.

He sent our letter on to Katie Sweeney but I let him know we had sent her one already.

Tom Peake
Director
Center for Waste Management and Regulations
US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

EPA-1955

Reid Rosnick/DC/USEPA/US	To	Tom Peake
01/17/2012 07:28 AM	cc	Andrea Cherepy, Daniel Schultheisz, Kenneth Czyscinski, Marye Clark, Philip Egidi
	bcc	
	Subject	Re: Oscar Paulson called me about our letter

All,

During our Subpart W stakeholder conference call Oscar supplied me with an ADAMS number for Sweetwater's radon flux data. The email below is FYI:

Reid Rosnick:

Method 115 Test (radon flux) data for the Sweetwater Uranium Project from 1990 to 2010 may be found on page 6 of the following document stored in the Nuclear Regulatory Commission's (NRC's) ADAMS public document system:

- **Document Name:** Kennecott Uranium Company, Request for a Five (5) Year Postponement of the Initiation of the Requirements of Timeliness in Decommissioning.
- **ADAMS Accession Nunber:** ML11157A017

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Oscar Paulson
Facility Supervisor
Kennecott Uranium Company
Sweetwater Uranium Project
P.O. Box 1500
42 Miles Northwest of Rawlins
Rawlins, Wyoming 82301-1500
Telephone: (307)-324-4924
Fax: (307)-324-4925
Cellular: (307)-320-8758
E-mail: oscar.paulson@riotinto.com

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Tom Peake   FYI, Oscar Paulson (Kennecot) called t...   01/13/2012 03:48:52 PM

From: Tom Peake/DC/USEPA/US
To: Andrea Cherepy/DC/USEPA/US@EPA
Cc: Marye Clark/DC/USEPA/US@EPA, Philip Egidi/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Kenneth Czyscinski/DC/USEPA/US@EPA
Date: 01/13/2012 03:48 PM

Subject: Oscar Paulson called me about our letter

FYI,
Oscar Paulson (Kennecot) called to reply to our letter. I found his response amusing. He pointed out that his company does not have ISL operations so he can't provide any ISL data. (How convenient he did not mention this at the SAB calls!) He told me that NRC has data that can be accessed through ADAMS and I let him know that NRC gave us their data but its not in the most useful format, but it is referred to in our report.

He is going to send me an email with ADAMS document numbers that are associated with his mill tailings site and those documents may be useful if/when we revise other parts of the regulation.

He sent our letter on to Katie Sweeney but I let him know we had sent her one already.

Tom Peake
Director
Center for Waste Management and Regulations
US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

EPA-1991

Marisa Savoy/DC/USEPA/US		To	Beth Miller, Reid Rosnick
01/17/2012 12:04 PM		cc	
		bcc	
		Subject	Subpart W Rulemaking Email Comments

Reid,

Please review format style and wording - http://epastage.epa.gov/staging1/rpd/neshaps/subpartw/rulemaking-activity.html. If you approve of the format Beth can then add the remainder of the comments. Let me know if I can be of any assistance.

Thanks!
Marisa

Marisa D. Savoy | Center for Radiation and Information Outreach | U.S. EPA | Tel. 202.343.9237 | Fax: 202.343.2305 | savoy.marisa @epa.

EPA-2782

Reid Rosnick/DC/USEPA/US
01/17/2012 01:23 PM

To Marisa Savoy
cc Beth Miller
bcc
Subject Re: Subpart W Rulemaking Email Comments

Marisa/Beth,

I think the format is good. Please go ahead with the rest. Thanks!

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Marisa Savoy Reid, Please review format style and w... 01/17/2012 12:04:39 PM

From: Marisa Savoy/DC/USEPA/US
To: Beth Miller/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA
Date: 01/17/2012 12:04 PM
Subject: Subpart W Rulemaking Email Comments

Reid,

Please review format style and wording - http://epastage.epa.gov/staging1/rpd/neshaps/subpartw/rulemaking-activity.html. If you approve of the format Beth can then add the remainder of the comments. Let me know if I can be of any assistance.

Thanks!
Marisa

Marisa D. Savoy | Center for Radiation and Information Outreach | U.S. EPA | Tel. 202.343.9237 | Fax: 202.343.2305 | savoy.marisa @epa.

EPA-1951

Reid Rosnick/DC/USEPA/US

01/17/2012 03:07 PM

To Susan Stahle

cc

bcc

Subject Re: found the subpart W language

You rule!!

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Susan Stahle see pg 35 -- Susan Stahle Air and Radi... 01/17/2012 03:05:18 PM

From: Susan Stahle/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 01/17/2012 03:05 PM
Subject: found the subpart W language

---

see pg 35 --

[attachment "64_FR_38706-01.pdf" deleted by Reid Rosnick/DC/USEPA/US]

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
ph: (202) 564-1272
fax: (202) 564-5603
stahle.susan@epa.gov

EPA-4784

Susan Stahle/DC/USEPA/US		To	Reid Rosnick
01/17/2012 03:14 PM		cc	
		bcc	
		Subject	Re: found the subpart W language

I can't take the credit - my supervisor found it - but wahoo nonetheless! :)

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
ph: (202) 564-1272
fax: (202) 564-5603
stahle.susan@epa.gov

Reid Rosnick You rule!! ---------------------------------------... 01/17/2012 03:07:38 PM

From: Reid Rosnick/DC/USEPA/US
To: Susan Stahle/DC/USEPA/US@EPA
Date: 01/17/2012 03:07 PM
Subject: Re: found the subpart W language

You rule!!

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Susan Stahle see pg 35 -- Susan Stahle Air and Radi... 01/17/2012 03:05:18 PM

From: Susan Stahle/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 01/17/2012 03:05 PM
Subject: found the subpart W language

see pg 35 --

[attachment "64_FR_38706-01.pdf" deleted by Reid Rosnick/DC/USEPA/US]

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
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fax: (202) 564-5603
stahle.susan@epa.gov

EPA-1688

Reid Rosnick/DC/USEPA/US
01/18/2012 11:28 AM

To Beth Miller
cc Glenna Shields, Marisa Savoy
bcc
Subject Re: Website

Thank you!

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

-----Beth Miller/DC/USEPA/US wrote: -----
To: Marisa Savoy/DC/USEPA/US@EPA
From: Beth Miller/DC/USEPA/US
Date: 01/18/2012 10:19AM
Cc: Reid Rosnick/DC/USEPA/US@EPA, Glenna Shields/DC/USEPA/US@EPA
Subject: Re: Website

Hi Again:

Can you please post the rulemaking-activity page and this pdf please
../../docs/neshaps/subpart-w/subpartw_1-5-2012_quarterlyconfcall.pdf

Thank you

Inactive hide details for Reid Rosnick---01/17/2012 02:36:04 PM---Hi Beth, Attached is the draft of the stakeholder conference Reid Rosnick---01/17/2012 02:36:04 PM---Hi Beth, Attached is the draft of the stakeholder conference call notes from the January 5, 2012 Sub

From: Reid Rosnick/DC/USEPA/US
To: Beth Miller/DC/USEPA/US@EPA
Date: 01/17/2012 02:36 PM
Subject: Website

Hi Beth,

Attached is the draft of the stakeholder conference call notes from the January 5, 2012 Subpart W conference call. Will you please post these on the website? Thanks

[attachment "SubpartW_1-5-2012_QuarterlyConfCall.docx" deleted by Beth Miller/DC/USEPA/US]

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
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202.343.9563
rosnick.reid@epa.gov

EPA-2850

Reid Rosnick/DC/USEPA/US		To	Angelique Diaz
01/24/2012 10:51 AM		cc	
		bcc	
		Subject	Re: Fw: Subpart W Comments

Thank you!

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Angelique Diaz Angelique D. Diaz, Ph.D. Environmenta... 01/24/2012 10:46:47 AM

From:	Angelique Diaz/R8/USEPA/US
To:	Reid Rosnick/DC/USEPA/US@EPA
Date:	01/24/2012 10:46 AM
Subject:	Fw: Subpart W Comments

Angelique D. Diaz, Ph.D.
Environmental Engineer
Air Program, USEPA/Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Office: 303.312.6344
Fax: 303.312.6064
diaz.angelique@epa.gov
----- Forwarded by Angelique Diaz/R8/USEPA/US on 01/24/2012 08:46 AM -----

From:	Angelique Diaz/R8/USEPA/US
To:	Reid Rosnick/DC/USEPA/US@EPA
Date:	01/20/2012 01:37 PM
Subject:	Subpart W Comments

Finally! Here are some comments on the Rev 6 version of the preamble.

[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev 6_add.docx" deleted by Reid Rosnick/DC/USEPA/US]

I hope things are going well after taking a break from the document for a bit. Enjoy your weekend.

-Angelique

Angelique D. Diaz, Ph.D.
Environmental Engineer
Air Program, USEPA/Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Office: 303.312.6344
Fax: 303.312.6064

diaz.angelique@epa.gov

EPA-2849

Tony Nesky/DC/USEPA/US
01/24/2012 11:09 AM

To: Reid Rosnick
cc:
bcc:
Subject: Re: Subpart W Communications Plan

I'm teleworking today, so let's chat about the fact sheets tomorrow or Thursday. Or if you prefer, you can call me at 703-329-6272.

Tony Nesky
Center for Radiation Information and Outreach
Tel: 202-343-9597
nesky.tony@epa.gov

EPA-5444

Reid Rosnick/DC/USEPA/US		To	Tony Nesky
01/24/2012 11:10 AM		cc	
		bcc	
		Subject	Re: Subpart W Communications Plan

EPA-2888

Reid Rosnick/DC/USEPA/US		To	Tony Nesky
01/24/2012 11:36 AM		cc	
		bcc	
		Subject	Re: Subpart W Communications Plan

Thanks, Tony. Tomorrow or Thursday it is.

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Tony Nesky I'm teleworking today, so let's chat abo... 01/24/2012 11:09:27 AM

From: Tony Nesky/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 01/24/2012 11:09 AM
Subject: Re: Subpart W Communications Plan

I'm teleworking today, so let's chat about the fact sheets tomorrow or Thursday. Or if you prefer, you can call me at 703-329-6272.

Tony Nesky
Center for Radiation Information and Outreach
Tel: 202-343-9597
nesky.tony@epa.gov

EPA-5453

Reid Rosnick/DC/USEPA/US	To	Tony Nesky
01/24/2012 11:36 AM	cc	
	bcc	
	Subject	Re: Subpart W Communications Plan

Thanks, Tony. Tomorrow or Thursday it is.

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Tony Nesky   I'm teleworking today, so let's chat abo...   01/24/2012 11:09:27 AM

From: Tony Nesky/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 01/24/2012 11:09 AM
Subject: Re: Subpart W Communications Plan

I'm teleworking today, so let's chat about the fact sheets tomorrow or Thursday. Or if you prefer, you can call me at 703-329-6272.

Tony Nesky
Center for Radiation Information and Outreach
Tel: 202-343-9597
nesky.tony@epa.gov

EPA-2763

Reid Rosnick/DC/USEPA/US		To	Emily Atkinson
01/26/2012 11:36 AM		cc	
		bcc	
		Subject	Hi Emily

How are you? You're definitely missed in ORIA!

I know you're busy, but if you get a minute, would you please call me? I need to talk to you about the January Subpart W conference call notes. Thanks!

Reid 202-343-9563

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-3362

Reid Rosnick/DC/USEPA/US

02/01/2012 09:47 AM

To Beth Miller

cc

bcc

Subject Fw: Question

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

----- Forwarded by Reid Rosnick/DC/USEPA/US on 02/01/2012 09:47 AM -----

From: David Frydenlund <DFrydenlund@denisonmines.com>
To: Reid Rosnick/DC/USEPA/US@EPA
Cc: Harold Roberts <HRoberts@denisonmines.com>
Date: 03/28/2011 11:39 AM
Subject: RE: Question

Reid,

Cell 3 is almost full. We have placed as much tailings sands into it as we can at this time. We are now pumping any residual free solution out of the cell and contouring the sands. We will then determine if any more solids need to be added to the cell to fill it to the specified final elevation.

We currently expect to be able to make these final adjustments and close out Cell 3 by the end of this year.

Dave

David Frydenlund
Vice President, Regulatory Affairs, Counsel and Corp Secretary

t: 303-389-4130 | f: 303-389-4125
1050 17th Street, Suite 950
Denver, CO, US, 80265

DENISON MINES (USA) CORP
www.denisonmines.com

From: Rosnick.Reid@epamail.epa.gov [mailto:Rosnick.Reid@epamail.epa.gov]
Sent: Friday, March 25, 2011 7:17 AM
To: David Frydenlund

Subject: Question

Hi David,

I have a quick question on the status of Cell 3 at the White Mesa mill. In your 2009 response to our Section 114 request for information you stated that Cell 3, an impoundment in existence before December 31, 1989, was near capacity, although currently in operation. I know that I have probably asked you this but I can't find your response. Do you have a timeframe in mind when Cell 3 will reach capacity? Thanks

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-4982

Alan Perrin/DC/USEPA/US	To	Anna Duncan, Jonathan Edwards
02/02/2012 11:31 AM	cc	Lee Veal
	bcc	
	Subject	ORIA rulemakings, follow up

Anna, bullets for Mike following up on yesterday's budget meeting. Let me know if you have Qs or suggestions. -Alan

Tier I Regulatory Actions -- 2012

We are committed to supporting our priority regulatory activity under even the most limited funding scenarios.

Standards for Uranium Processing Facilities (40 CFR part 192) -- proposal for public comment

- ORIA will issue a proposed rule focused on ground water protection requirements for in-situ extraction facilities. We expect to hold Final Agency Review at the end of April.
- This action is fully funded, including public meetings following proposal and the development of our response to comments.

Nuclear Fuel-cycle Safety Standards (40 CFR part 190) -- ANPR

- ORIA will issue an Advance Notice of Proposed Rulemaking for our nuclear fuel-cycle safety standards. We expect to hold Final Agency Review in February.
- Public meetings following the ANPR are funded; this action does not require a formal response to comments.
- Reduced funding levels will slow some analyses (e.g., exposure modelling) that will be needed prior to proposal, however, our primary focus at this point is public dialogue and comment.

Radon emission standards for operating uranium mill tailings (40 CFR 61 subpart W) -- proposal for public comment

- ORIA is very close to holding Final Agency Review on this proposed rule revision.
- We do not have contract dollars to support proposal follow up.
- If a public hearing is requested (as we anticipate), we will keep it to one meeting (DC or Denver) and minimize extramural expense to recording, transcribing and logistic requirements.
- The development of our response to comments will be done in-house, this will slow, but not stop, progress toward a final rule.

Alan Perrin, Acting Director
Radiation Protection Division, USEPA
office (202) 343-9775 | bb (202) 279-0376

EPA-4705

Susan Stahle/DC/USEPA/US		To	
02/06/2012 03:08 PM		cc	
		bcc	
		Subject	Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

Meeting

Date	02/09/2012
Time	01:30:00 PM to 02:00:00 PM
Chair	Susan Stahle
Invitees	
Required	Wendy Blake
Optional	
FYI	
Location	Wendy's office

Hi - I'd like to discuss the following:

1. Subpart W - language for preamble describing our section 112(q)(1) requirements - the email I sent you on 1/9/12

2. Rad NESHAP notice of availability for pre-construction approvals - the email I sent you on 1/30/12

3. Acrylic/Modacrylic Fibers (AMF) MACT - OAQPS is beginning their (d)(6)/(f)(2) work on this rule (proposal deadline is 10/31/12). We have some legal questions that I think you can likely answer off the top of your head (relating to general MACT and residual risk legal issues) so I wanted to run these by you.

EPA-4712

Wendy Blake/DC/USEPA/US

02/06/2012 03:30 PM

To Susan Stahle

cc

bcc

Subject Countered: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

EPA-5308

Susan Stahle/DC/USEPA/US

02/06/2012 04:30 PM

To Wendy Blake

cc

bcc

Subject Rescheduled: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions (Feb 8 04:00 PM EST in Wendy's office)

Hi - I'd like to discuss the following:

1. Subpart W - language for preamble describing our section 112(q)(1) requirements - the email I sent you on 1/9/12

2. Rad NESHAP notice of availability for pre-construction approvals - the email I sent you on 1/30/12

3. Acrylic/Modacrylic Fibers (AMF) MACT - OAQPS is beginning their (d)(6)/(f)(2) work on this rule (proposal deadline is 10/31/12). We have some legal questions that I think you can likely answer off the top of your head (relating to general MACT and residual risk legal issues) so I wanted to run these by you.

EPA-4731

Wendy Blake/DC/USEPA/US

02/06/2012 04:57 PM

To Susan Stahle

cc

bcc

Subject Accepted:Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

EPA-4706

Wendy Blake/DC/USEPA/US

02/08/2012 11:49 AM

To Susan Stahle

cc

bcc

Subject Countered: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

EPA-5313

Susan Stahle/DC/USEPA/US	To	Wendy Blake
02/08/2012 12:06 PM	cc	
	bcc	
	Subject	Rescheduled: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions (Feb 8 04:30 PM EST in Wendy's office)

Hi - I'd like to discuss the following:

1. Subpart W - language for preamble describing our section 112(q)(1) requirements - the email I sent you on 1/9/12

2. Rad NESHAP notice of availability for pre-construction approvals - the email I sent you on 1/30/12

3. Acrylic/Modacrylic Fibers (AMF) MACT - OAQPS is beginning their (d)(6)/(f)(2) work on this rule (proposal deadline is 10/31/12). We have some legal questions that I think you can likely answer off the top of your head (relating to general MACT and residual risk legal issues) so I wanted to run these by you.

EPA-4775

Wendy Blake/DC/USEPA/US

02/08/2012 12:50 PM

To Susan Stahle

cc

bcc

Subject Countered: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

EPA-5312

Susan Stahle/DC/USEPA/US

02/08/2012 01:35 PM

To: Wendy Blake

cc:

bcc:

Subject: Rescheduled: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions (Feb 9 09:00 AM EST in Wendy's office)

Hi - I'd like to discuss the following:

1. Subpart W - language for preamble describing our section 112(q)(1) requirements - the email I sent you on 1/9/12

2. Rad NESHAP notice of availability for pre-construction approvals - the email I sent you on 1/30/12

3. Acrylic/Modacrylic Fibers (AMF) MACT - OAQPS is beginning their (d)(6)/(f)(2) work on this rule (proposal deadline is 10/31/12). We have some legal questions that I think you can likely answer off the top of your head (relating to general MACT and residual risk legal issues) so I wanted to run these by you.

EPA-4719

Wendy Blake/DC/USEPA/US

02/08/2012 02:39 PM

To Susan Stahle

cc

bcc

Subject Accepted: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

EPA-4763

Wendy Blake/DC/USEPA/US

02/09/2012 08:26 AM

To Susan Stahle

cc

bcc

Subject Countered: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

EPA-5307

Susan Stahle/DC/USEPA/US
02/09/2012 08:58 AM

To Wendy Blake
cc
bcc
Subject Declined: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

Hi - I'd like to discuss the following:

1. Subpart W - language for preamble describing our section 112(q)(1) requirements - the email I sent you on 1/9/12

2. Rad NESHAP notice of availability for pre-construction approvals - the email I sent you on 1/30/12

3. Acrylic/Modacrylic Fibers (AMF) MACT - OAQPS is beginning their (d)(6)/(f)(2) work on this rule (proposal deadline is 10/31/12). We have some legal questions that I think you can likely answer off the top of your head (relating to general MACT and residual risk legal issues) so I wanted to run these by you.

EPA-5309

Susan Stahle/DC/USEPA/US
02/09/2012 08:59 AM

To Wendy Blake
cc
bcc
Subject Rescheduled: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions (Feb 9 01:30 PM EST in Wendy's office)

Hi - I'd like to discuss the following:

1. Subpart W - language for preamble describing our section 112(q)(1) requirements - the email I sent you on 1/9/12

2. Rad NESHAP notice of availability for pre-construction approvals - the email I sent you on 1/30/12

3. Acrylic/Modacrylic Fibers (AMF) MACT - OAQPS is beginning their (d)(6)/(f)(2) work on this rule (proposal deadline is 10/31/12). We have some legal questions that I think you can likely answer off the top of your head (relating to general MACT and residual risk legal issues) so I wanted to run these by you.

EPA-4790

Wendy Blake/DC/USEPA/US	To	Susan Stahle
02/09/2012 09:06 AM	cc	
	bcc	
	Subject	Accepted: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

EPA-5301

Wendy Blake/DC/USEPA/US
02/09/2012 09:08 AM

To Susan Stahle
cc
bcc
Subject Fw: Declined: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions

I have looked at everything.   Lets meet at the time you proposed. I will try to send edits to the rad NESHAP piece now and we can discuss the other items.

I just ended my meeting with Patricia, which is why I moved our meeting back.   No worries - we will meet today.

Wendy

----- Forwarded by Wendy Blake/DC/USEPA/US on 02/09/2012 09:07 AM -----

Declined: Three items - (1) subpart W; (2) rad NESHAP notice; and (3) AMF MACT (d)(6)/(f)(2) legal questions
Thu 02/09/2012 9:00 AM - 9:30 AM
Attendance is **required** for Wendy Blake
Chair: **Susan Stahle/DC/USEPA/US**
Location: Wendy's office

Susan Stahle has declined your proposed changes

I now have a meeting with Patricia at 9:15 am so I'm going to try and reschedule this for later today. I would really like to meet with you today as I am out tomorrow. Thanks.

Required: Wendy Blake/DC/USEPA/US@EPA

Description

Hi - I'd like to discuss the following:

1. Subpart W - language for preamble describing our section 112(q)(1) requirements - the email I sent you on 1/9/12

2. Rad NESHAP notice of availability for pre-construction approvals - the email I sent you on 1/30/12

3. Acrylic/Modacrylic Fibers (AMF) MACT - OAQPS is beginning their (d)(6)/(f)(2) work on this rule (proposal deadline is 10/31/12). We have some legal questions that I think you can likely answer off the top of your head (relating to general MACT and residual risk legal issues) so I wanted to run these by you.

EPA-2760

Reid Rosnick/DC/USEPA/US

02/13/2012 02:00 PM

To Valentine Anoma

cc

bcc Valerie Daigler

Subject Deliverable

Hi Val,

Did we receive anything from SC&A this weekend regarding the re-write of the Subpart W economic impact analysis? Thanks

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-2811

Reid Rosnick/DC/USEPA/US		To	Valerie Daigler
02/13/2012 02:05 PM		cc	
		bcc	
		Subject	Re:

Nope, I got here late, had an eye doctor appt.

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Valerie Daigler are you working from home today? Val 02/13/2012 02:03:06 PM

From: Valerie Daigler/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 02/13/2012 02:03 PM
Subject: Re:

are you working from home today?

Val

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Valerie Daigler
U.S.EPA/OAR/ORIA
Radiation Protection Division (6608J)
202/343-9204
202/343-2302 (fax)

Reid Rosnick Hi Val, Did we receive anything from S... 02/13/2012 02:00:53 PM

From: Reid Rosnick/DC/USEPA/US
To: Valentine Anoma/DC/USEPA/US@EPA
Date: 02/13/2012 02:00 PM
Subject: Deliverable

Hi Val,

Did we receive anything from SC&A this weekend regarding the re-write of the Subpart W economic impact analysis? Thanks

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

202.343.9563
rosnick.reid@epa.gov

EPA-5527

Gerard Kraus/DC/USEPA/US
02/14/2012 11:56 AM

To Charlie Garlow
cc
bcc
Subject OS and FAR on Two Rules

OS - 02/27 - Revised Regulation for Environmental Radiation Protection Standards for Nuclear Power Operations – 40 CFR Part 190; SAN 5591 (Tier 2) – ANPRM

FAR - **02/28 - NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W); SAN 5281 (Tier 2) – NPRM**

These are both listed in SCOUT with you as the OECA workgroup member. Are there any significant OECA issues? Do you have a recommended position at FAR for the second one?

Thanks.

Jerry

EPA-5480

Gerard Kraus/DC/USEPA/US		To	Charlie Garlow
02/14/2012 12:50 PM		cc	
		bcc	
		Subject	Re: OS and FAR on Two Rules

Thanks.

Charlie Garlow   Jerry, There are no significant OECA is...   02/14/2012 12:49:42 PM

From: Charlie Garlow/DC/USEPA/US
To: Gerard Kraus/DC/USEPA/US@EPA
Cc: Gregory Fried/DC/USEPA/US@EPA
Date: 02/14/2012 12:49 PM
Subject: Re: OS and FAR on Two Rules

Jerry,

There are no significant OECA issues, so I would recommend that OECA's position be concur without comment.

Charlie Garlow, Attorney-Advisor
US Environmental Protection Agency
Air Enforcement Division
202-564-1088 phone
202-564-0068 fax
1200 Pennsylvania Ave, NW, MC 2242A
Washington, DC 20460 mail or 20004 courier

"Life's most urgent question is what are you doing to help others?" - - Martin Luther King, Jr.
"Through the centuries, men [and women - ed.] of law have been persistently concerned with the resolution of disputes in ways that enable society to achieve its goals with a minimum of force and maximum of reason." - - Archibald Cox

Gerard Kraus   OS - 02/27 - Revised Regulation for En...   02/14/2012 11:56:52 AM

From: Gerard Kraus/DC/USEPA/US
To: Charlie Garlow/DC/USEPA/US@EPA
Date: 02/14/2012 11:56 AM
Subject: OS and FAR on Two Rules

OS - 02/27 - Revised Regulation for Environmental Radiation Protection Standards for Nuclear Power Operations – 40 CFR Part 190; SAN 5591 (Tier 2) – ANPRM

FAR - 02/28 - NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W); SAN 5281 (Tier 2) – NPRM

These are both listed in SCOUT with you as the OECA workgroup member. Are there any significant OECA issues? Do you have a recommended position at FAR for the second one?

Thanks.

Jerry

EPA-5492

Julius Banks/DC/USEPA/US

02/15/2012 10:08 AM

To Gregory Fried
cc Charlie Garlow
bcc
Subject Re: Fw: OS and FAR on Two Rules

Neither is on our radar. ORIA is the OAR office in charge of writing these rules. Not sure if we (OC) has ever reviewed ORIA rulemakings.

Gregory Fried Julius, Are these on your radar? Do yo... 02/14/2012 01:23:30 PM

From: Gregory Fried/DC/USEPA/US
To: Julius Banks/DC/USEPA/US@EPA
Cc: Charlie Garlow/DC/USEPA/US@EPA
Date: 02/14/2012 01:23 PM
Subject: Fw: OS and FAR on Two Rules

Julius,

Are these on your radar? Do you have these as "OC-Lead."

Greg Fried
Chief, Stationary Source Enforcement Branch
Air Enforcement Division
Office of Civil Enforcement
U.S. EPA
202-564-7016

----- Forwarded by Gregory Fried/DC/USEPA/US on 02/14/2012 01:21 PM -----

From: Charlie Garlow/DC/USEPA/US
To: Gerard Kraus/DC/USEPA/US@EPA
Cc: Gregory Fried/DC/USEPA/US@EPA
Date: 02/14/2012 12:49 PM
Subject: Re: OS and FAR on Two Rules

Jerry,

There are no significant OECA issues, so I would recommend that OECA's position be concur without comment.

Charlie Garlow, Attorney-Advisor
US Environmental Protection Agency
Air Enforcement Division
202-564-1088 phone
202-564-0068 fax
1200 Pennsylvania Ave, NW, MC 2242A
Washington, DC 20460 mail or 20004 courier

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"Through the centuries, men [and women - ed.] of law have been persistently concerned with the resolution of disputes in ways that enable society to achieve its goals with a minimum of force and maximum of reason." - - Archibald Cox

Gerard Kraus	OS - 02/27 - Revised Regulation for En...	02/14/2012 11:56:52 AM

From: Gerard Kraus/DC/USEPA/US
To: Charlie Garlow/DC/USEPA/US@EPA
Date: 02/14/2012 11:56 AM
Subject: OS and FAR on Two Rules

OS - 02/27 - Revised Regulation for Environmental Radiation Protection Standards for Nuclear Power Operations – 40 CFR Part 190; SAN 5591 (Tier 2) – ANPRM

FAR - 02/28 - NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W); SAN 5281 (Tier 2) – NPRM

These are both listed in SCOUT with you as the OECA workgroup member.   Are there any significant OECA issues? Do you have a recommended position at FAR for the second one?

Thanks.

Jerry

EPA-313

Reid Rosnick/DC/USEPA/US		To	Virginia Stradford
02/15/2012 11:25 AM		cc	
		bcc	
		Subject	Briefing for Gina

Hi Ginny,

As we discussed, we would like to reschedule our briefing for Gina.

-Topic: Preparation for FAR for NESHAP Subpart W

Attendees: Mike Flynn, Jon Edwards, Anna Duncan, Alan Perrin, Tom Peake, Susan Stahle, Reid Rosnick

Timing: We are ready to go, so as early as next week is fine.

Thank you!

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-524

Reid Rosnick/DC/USEPA/US	To	Virginia Stradford
02/15/2012 12:15 PM	cc	
	bcc	
	Subject	Re: Briefing for Gina

Hi Ginny,

No problem.

The purpose of the briefing is to get Gina's approval to move forward to FAR. The workgroup has voted to move forward, and there are no outstanding issues. NESHAP Subpart W is a radon emission standard for operating uranium mill tailings. It is a proposed rule to revise the existing rule promulgated in 1989. We are proposing GACT standards for the impoundments that store uranium byproduct tailings.

Proposed dates: February 22, 23, 24, 27, 28, 29.

Briefing is time sensitive in that we are trying to meet our commitments in the ADP Tracker.

Contact Point: Alan Perrin

Please let me know if you need more information.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Virginia Stradford Hi Reid, We need a bit more backgro... 02/15/2012 12:07:54 PM

From: Virginia Stradford/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 02/15/2012 12:07 PM
Subject: Re: Briefing for Gina

Hi Reid,

We need a bit more background information for your meeting request w/Gina as follows:

1) Purpose and background w/few sentences

2) Proposed Dates and if briefing is critical/time sensitive, explain why

3) Point of Contact

Thanks.

-Ginny

Reid Rosnick	Hi Ginny, As we discussed, we would li...	02/15/2012 11:25:16 AM

From: Reid Rosnick/DC/USEPA/US
To: Virginia Stradford/DC/USEPA/US@EPA
Date: 02/15/2012 11:25 AM
Subject: Briefing for Gina

Hi Ginny,

As we discussed, we would like to reschedule our briefing for Gina.

-Topic: Preparation for FAR for NESHAP Subpart W

Attendees: Mike Flynn, Jon Edwards, Anna Duncan, Alan Perrin, Tom Peake, Susan Stahle, Reid Rosnick

Timing: We are ready to go, so as early as next week is fine.

Thank you!

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-4750

Gina McCarthy/DC/USEPA/US

Sent by: Cindy Huang

02/15/2012 02:18 PM

To: Alan Perrin, Jonathan Edwards, Mike Flynn, Reid Rosnick, Susan Stahle, Tom Peake

cc: Cynthia Browne, Don Zinger, Kirsten King, Kristina Friedman, Virginia Stradford

bcc:

Subject: Preparation for FAR for NESHAP Subpart W

Meeting

Date: 02/22/2012

Time: 02:00:00 PM to 03:00:00 PM

Chair: Gina McCarthy

Invitees

Required: Alan Perrin; Jonathan Edwards; Mike Flynn; Reid Rosnick; Susan Stahle; Tom Peake

Optional: Cynthia Browne; Don Zinger; Kirsten King; Kristina Friedman; Virginia Stradford

FYI:

Location: ARN 5400 / Conference: 1-866-299-3188 access: 2025647412

Revised November 29, 2005

OAR Meeting Request Form

Requesting Meeting with: Gina McCarthy, AA

Date of this Request: February 15, 2012

Point of Contact (Name/Number): Jon Edwards (Acting OD/ORIA) / 343-9320

Title of Meeting: Preparation for FAR for NESHAP Subpart W

Purpose of Meeting: To present a briefing update and to obtain AA's approval to move forward for the Final Agency Review (FAR). The Workgroup has voted to move forward and there are no outstanding issues. NESHAP Subpart W is a radon emission standard for operating uranium mill tailings. It is a proposed rule to revise the existing rule promulgated in 1989. We are proposing Generally Available Control Technologies (GACT) standards for the impoundments that store uranium byproduct tailings.

Status (check one) –X Critical _ Less Immediate

Proposed Date/Last Possible Date: Week of February 22 or February 27 (Preferably before March 1 if possible).

If the meeting is critical, please explain why: This briefing is time-sensitive in that we are trying to meet our commitments in the ADP Tracker.

Location of Meeting: AA's office

Length of Meeting: 45 minutes / 1 hr. as AA schedules permits.

Equipment/resources needed:

DATES TO AVOID:

Key Participants:

Office/Organization	**Name**	**Number**
ORIA-OD	**Jonathan Edwards**	**343-9320**
	Alan Perrin	
	Mike Flynn	
	Reid Rosnick	
	Tom Peake	
	Susan Stahle	

Submitted by: Ginny Stradford (343-9205)

EPA-5098

Angelique Diaz/R8/USEPA/US
02/16/2012 11:50 AM

To pgoble@utah.gov
cc
bcc
Subject Subpart W Rulemaking Website

Phil, thanks for joining us on the quarterly call. Here is the link to the Subpart W rulemaking website:

http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

Let me know if you have any questions.

-Angelique

Angelique D. Diaz, Ph.D.
Environmental Engineer
Air Program, USEPA/Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Office: 303.312.6344
Fax: 303.312.6064
diaz.angelique@epa.gov

EPA-310

Angelique Diaz/R8/USEPA/US
02/17/2012 10:55 AM

To Reid Rosnick, Sara Laumann, Susan Stahle
cc
bcc
Subject Subpart W Pond Question

Internal Deliberative

I just saw in part of a news story (http://www.krdo.com/news/30466112/detail.html) that Cotter is planning on building an evaporation pond system to manage water during closure of mill. Here is the design plan, it includes information on what the ponds will contain:

http://www.cdphe.state.co.us/hm/cotter/letterfromcotter/111215evapponddesignrpt.pdf

I'm wondering, would these ponds be subject to Subpart W? It looks like water from the primary impoundment dewatering (i.e, uranium byproduct, right?), site process water, as well as groundwater will be stored in the ponds.

I'm not sure we every discussed this, but are ponds used during closure/clean-up activities subject to Subpart W if they will contain uranium byproduct material? Sara/Sue, I'm interested to hear what you think since I keep going back and forth on this. Let me know if we need a call to discuss.

Enjoy the long weekend,
Angelique

Angelique D. Diaz, Ph.D.
Environmental Engineer
Air Program, USEPA/Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Office: 303.312.6344
Fax: 303.312.6064
diaz.angelique@epa.gov

EPA-4145

Lee Veal/DC/USEPA/US
02/17/2012 10:57 AM

To Daniel Schultheisz, Tom Peake
cc Alan Perrin
bcc
Subject Subpart W briefing materials

Good morning Dan and Tom,

We'd like to send the revised Subpart W briefing materials up to the IO today. I checked through my old email and I don't have a copy of that brief.
Would you please send me a copy?

Also, has Jon seen the latest materials?

Thanks

Lee

Lee B. Veal
Acting Deputy Director
Radiation Protection Division
Office of Radiation and Indoor Air
Environmental Protection Agency
1310 L Street, NW
Washington DC, 20005
Mail Code: 6608J
202-343-9448
cell 202-617-4322

EPA-5001

Alan Perrin/DC/USEPA/US
02/17/2012 01:25 PM

To Lee Veal
cc Tom Peake
bcc
Subject Fw: Preamble/Rule/Briefing

BTW, just the ppt would go up to OAR as advance material (not the proposal).
~~~~~~~~~~~~~~~~~~~~

Alan Perrin, Acting Director
Radiation Protection Division, USEPA
office (202) 343-9775 | bb (202) 279-0376

----- Forwarded by Alan Perrin/DC/USEPA/US on 02/17/2012 01:24 PM -----

From: Reid Rosnick/DC/USEPA/US
To: Alan Perrin/DC/USEPA/US@EPA
Date: 02/16/2012 12:29 PM
Subject: Preamble/Rule/Briefing

As requested.

[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev8.docx" deleted by Alan Perrin/DC/USEPA/US] [attachment "FAR v3.pptx" deleted by Alan Perrin/DC/USEPA/US]

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov
~~~~~~~~~~~~~~~~~~~~

EPA-5559

Lee Veal/DC/USEPA/US

02/17/2012 01:45 PM

To Alan Perrin
cc Tom Peake
bcc
Subject Re: Fw: Preamble/Rule/Briefing

Thank you!

Lee B. Veal
Acting Deputy Director
Radiation Protection Division
Office of Radiation and Indoor Air
Environmental Protection Agency
1310 L Street, NW
Washington DC, 20005
Mail Code: 6608J
202-343-9448
cell 202-617-4322

Alan Perrin BTW, just the ppt would go up to OAR... 02/17/2012 01:25:39 PM

From: Alan Perrin/DC/USEPA/US
To: Lee Veal/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA
Date: 02/17/2012 01:25 PM
Subject: Fw: Preamble/Rule/Briefing

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office (202) 343-9775 | bb (202) 279-0376

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Reid J. Rosnick
Radiation Protection Division (6608J)
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Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov
~~~~~~~~~~~~~~~~~~~~

EPA-5163

Anna Duncan/DC/USEPA/US
02/17/2012 02:10 PM

To Jonathan Edwards
cc
bcc
Subject do you want to review

the briefing Gina on Subpart W before I forward it OAR.? RPD is sending it to us later today. The briefing is on Wednesday. I believe Gina may have already left for the weekend, so I think you can review it but we will need send it to OAR SAs Tuesday am. LMK

Anna Duncan
Chief of Staff
Office of Radiation and Indoor Air, USEPA
Phone : 202-343-9316

EPA-4995

Alan Perrin/DC/USEPA/US
02/21/2012 07:02 AM

To Jonathan Edwards, David Rowson
cc Anna Duncan
bcc
Subject Re: Items for OAR staff mtg?

Possibles:

Subpart W brief tomorrow

Mars SL INSRP review

FRPCC mtg on the 24th

IMAAC training on the 23rd

(More detail on last 3 in 2/17 weekly, also some IED items there)

Alan Perrin
EPA Wireless
Jonathan Edwards

----- Original Message -----
From: Jonathan Edwards
Sent: 02/20/2012 10:42 PM EST
To: David Rowson; Alan Perrin
Cc: Anna Duncan
Subject: Items for OAR staff mtg?

Anything for staff mtg?

Sent from my BlackBerry Wireless Handheld (www.BlackBerry.net)

EPA-4738

Susan Stahle/DC/USEPA/US

02/21/2012 05:32 PM

To Cindy Huang

cc Reid Rosnick

bcc

Subject Fw: Preparation for FAR for NESHAP Subpart W

Hi Cindy - I will need to participate in this meeting by phone - is there a call-in number I can use? Thanks.

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
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fax: (202) 564-5603
stahle.susan@epa.gov

----- Forwarded by Susan Stahle/DC/USEPA/US on 02/21/2012 05:31 PM -----

Preparation for FAR for NESHAP Subpart W

Wed 02/22/2012 2:00 PM - 3:00 PM

Attendance is for Susan Stahle

Chair: **Gina McCarthy/DC/USEPA/US**

Sent By: **Cindy Huang/DC/USEPA/US**

Location: ARN 5400

Required:	Alan Perrin/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA, Mike Flynn/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA
Optional:	Cynthia Browne/DC/USEPA/US@EPA, Don Zinger/DC/USEPA/US@EPA, Kirsten King/DC/USEPA/US@EPA, Kristina Friedman/DC/USEPA/US@EPA, Virginia Stradford/DC/USEPA/US@EPA

Description

Revised November 29, 2005

OAR Meeting Request Form

Requesting Meeting with: Gina McCarthy, AA

Date of this Request: February 15, 2012

Point of Contact (Name/Number): Jon Edwards (Acting OD/ORIA) /

343-9320

Title of Meeting: Preparation for FAR for NESHAP Subpart W

Purpose of Meeting: To present a briefing update and to obtain AA's approval to move forward for the Final Agency Review (FAR). The Workgroup has voted to move forward and there are no outstanding issues. NESHAP Subpart W is a radon emission standard for operating uranium mill tailings. It is a proposed rule to revise the existing rule promulgated in 1989. We are proposing Generally Available Control Technologies (GACT) standards for the impoundments that store uranium byproduct tailings.

Status (check one) –X Critical _ Less Immediate

Proposed Date/Last Possible Date: Week of February 22 or February 27 (Preferably before March 1 if possible).

If the meeting is critical, please explain why: This briefing is time-sensitive in that we are trying to meet our commitments in the ADP Tracker.

Location of Meeting: AA's office

Length of Meeting: 45 minutes / 1 hr. as AA schedules permits.

Equipment/resources needed:

DATES TO AVOID:

Key Participants:

Office/Organization	Name	Number
ORIA-OD	**Jonathan Edwards**	**343-9320**
	Alan Perrin	
	Mike Flynn	
	Reid Rosnick	
	Tom Peake	

Susan Stahle

Submitted by: Ginny Stradford (343-9205)

Personal Notes

EPA-4751

Gina McCarthy/DC/USEPA/US

Sent by: Cindy Huang

02/21/2012 06:10 PM

To Alan Perrin, Jonathan Edwards, Mike Flynn, Reid Rosnick, Susan Stahle, Tom Peake

cc Cynthia Browne, Don Zinger, Kirsten King, Kristina Friedman, Virginia Stradford

bcc

Subject Information Update - Location has changed: Preparation for FAR for NESHAP Subpart W

Revised November 29, 2005

OAR Meeting Request Form

Requesting Meeting with: Gina McCarthy, AA

Date of this Request: February 15, 2012

Point of Contact (Name/Number): Jon Edwards (Acting OD/ORIA) / 343-9320

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Office/Organization	Name	Number
ORIA-OD	Jonathan Edwards	343-9320
	Alan Perrin	
	Mike Flynn	
	Reid Rosnick	
	Tom Peake	
	Susan Stahle	

Submitted by: Ginny Stradford (343-9205)

EPA-4990

Alan Perrin/DC/USEPA/US		To	Tom Peake
02/22/2012 04:31 PM		cc	Daniel Schultheisz, Lee.Raymond
		bcc	
		Subject	Re: Fw: Heads up on OAR quarterly meeting with OMB--March 8

Tom, a good start would be a short set of talkies for 190 and for Subpart W to specifically inform this discussion.

~~~~~~~~~~~~~~~~~~~~

Alan Perrin, Acting Director
Radiation Protection Division, USEPA
office (202) 343-9775 | bb (202) 279-0376

Tom Peake   FYI Tom Peake Director   02/22/2012 03:17:08 PM

From: Tom Peake/DC/USEPA/US
To: Lee.Raymond@epamail.epa.gov, Alan Perrin/DC/USEPA/US@EPA
Cc: Daniel Schultheisz/DC/USEPA/US@EPA
Date: 02/22/2012 03:17 PM
Subject: Fw: Heads up on OAR quarterly meeting with OMB--March 8

FYI

Tom Peake
Director
Center for Waste Management and Regulations
US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

----- Forwarded by Tom Peake/DC/USEPA/US on 02/22/2012 03:16 PM -----

From: Jan Gilbreath/DC/USEPA/US
To: Tom Peake/DC/USEPA/US@EPA, Brian Littleton/DC/USEPA/US@EPA
Date: 02/22/2012 02:37 PM
Subject: Heads up on OAR quarterly meeting with OMB

Tom and Brian,

I think that Lesley mentioned in our recent discussion with you that OAR would soon have its quarterly meeting with OMB to discuss upcoming priorities. I think that meeting has been tentatively scheduled for March 8 (you might check with Tom Eagles or someone who works with him). This could be your opportunity to see if Gina will make the ANPRM a priority for OMB review.

Jan
~~~~~~~~~~~~~~~~~~~~

Jan Gilbreath, Ph.D.
Policy and Regulatory Analysis Division
Office of Policy
U.S. Environmental Protection Agency
1200 Pennslyvania Avenue, NW
Washington, DC   20460
Phone: 202-564-6279

EPA-325

Raymond Lee/DC/USEPA/US		To	Reid Rosnick
02/23/2012 01:51 PM		cc	
		bcc	
		Subject	NESHAP Subpart W - FAR Meeting?

Hi Reid,

So in updating the reg. tracker this week I noticed that we are coming up very quickly on the projected FAR meeting date for your rule (see the screenshot below). Are we still on target for this? And if not, what are some revised dates for the meeting as well as some of the more immediate milestones following FAR?

Also, these updates are due tomorrow (we just got the list today! ugh) so if you could respond as soon as you can that would be great.

Thanks!

Ray

NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W) - IBM Lotus

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Open | Home | Raymond ... | > RE: Fin... | EPA Sci... | Replicati... | > DRAFT...

Close | Print | Edit Document | Workgroup | New Comment | Help

Agency Action

NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W)

SAN: 5281 | RIN: 2060-AP26

OAR/ORIA/RPD

Tier 2 Regulation

Action Information

Stages & Milestones

Stages: NPRM
Final Rule

Status	Milestone	Dates
Completed -	NPRM - OMB Determination	03/13/2009 - OMB Determination Submis (Actual) 03/30/2009 - OMB Determination Receive (Actual)
Planned -	NPRM - FAR (reqd)	02/07/2012 - FAR Materials Distribution (Planned) 02/28/2012 - FAR Meeting (Planned)
Planned -	NPRM - OMB Review (reqd)	03/13/2012 - Program to Policy (Planned) 03/27/2012 - Policy to OMB (Planned) 03/27/2012 - Received by OMB (Planned) 06/27/2012 - OMB Review Completed (Pl
Planned -	NPRM - Signature (reqd)	07/13/2012 - Program to Policy (Planned) 07/31/2012 - Signature Date (Planned)

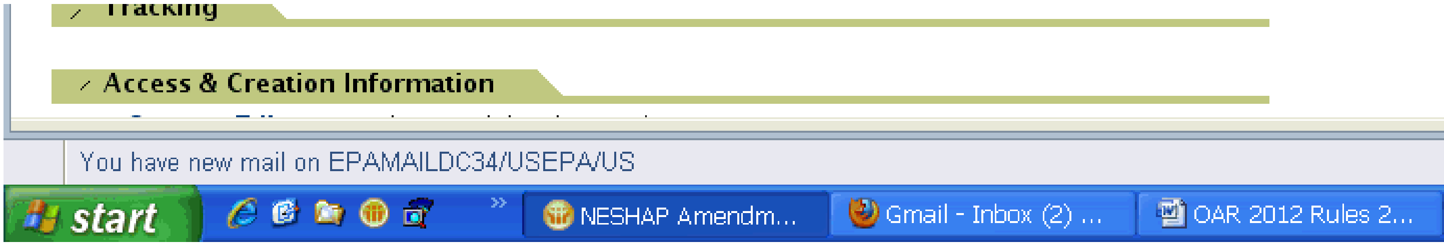
Workgroup – Assigned – 16 Members

Issues, Impacts, and Development

Content

Notes

Tracking



Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

EPA-819

Raymond Lee/DC/USEPA/US
02/23/2012 02:12 PM

To Reid Rosnick
cc Tom Peake
bcc
Subject Re: NESHAP Subpart W - FAR Meeting?

Got it Reid! Will do.

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

Reid Rosnick Hi Ray, We have to kick everything for... 02/23/2012 02:04:46 PM

From: Reid Rosnick/DC/USEPA/US
To: Raymond Lee/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA
Date: 02/23/2012 02:04 PM
Subject: Re: NESHAP Subpart W - FAR Meeting?

Hi Ray,

We have to kick everything forward by a month, we're now shooting for FAR on March 28.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

-----Raymond Lee/DC/USEPA/US wrote: -----
To: Reid Rosnick/DC/USEPA/US@EPA
From: Raymond Lee/DC/USEPA/US
Date: 02/23/2012 01:51PM
Subject: NESHAP Subpart W - FAR Meeting?

Hi Reid,

So in updating the reg. tracker this week I noticed that we are coming up very quickly on the projected FAR meeting date for your rule (see the screenshot below). Are we still on target for this? And if not, what are some revised dates for the meeting as well as some of the more immediate milestones following FAR?

Also, these updates are due tomorrow (we just got the list today! ugh) so if you could respond as soon as you can that would be great.

Thanks!

Ray

NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W) - IBM Lotus

File Edit View Create Actions Section Tools Window Help

Open | Home | Raymond ... | > RE: Fin... | EPA Sci... | Replicati... | > DRAFT...

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SEPA ADP TRACKER

Agency Action

NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W)

SAN: 5281 | RIN: 2060-AP26

OAR/ORIA/RPD

Tier 2 Regulation

Action Information

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Stages: NPRM
Final Rule

Status	Milestone	Dates
Completed -	NPRM - OMB Determination	03/13/2009 - OMB Determination Submis (Actual) 03/30/2009 - OMB Determination Receive (Actual)
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Planned -	NPRM - Signature (reqd)	07/13/2012 - Program to Policy (Planned) 07/31/2012 - Signature Date (Planned)

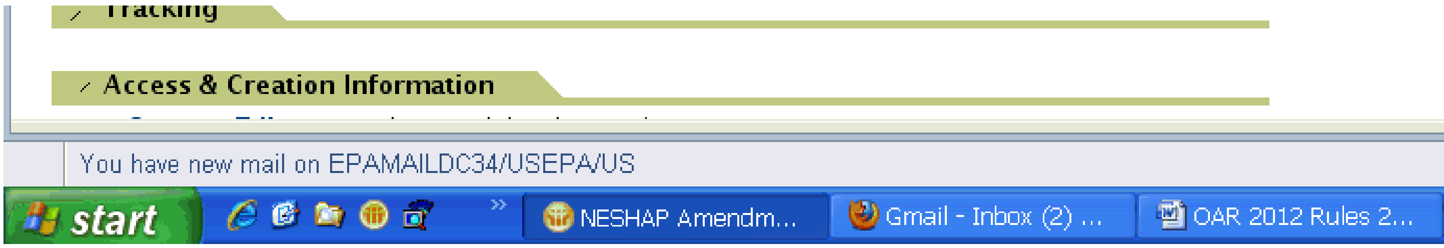
Workgroup – Assigned – 16 Members

Issues, Impacts, and Development

Content

Notes

Tracking



Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

EPA-417

Susan Stahle/DC/USEPA/US	To	Reid Rosnick
02/24/2012 09:49 AM	cc	Alan Perrin, Daniel Schultheisz, Jonathan Edwards, Tom Peake
	bcc	
	Subject	Re: Revised Economics Section for Subpart W

Thanks Reid, I'll get to it as soon as I can.

I have three other projects that I must finish before I can look at this revised document - one of which is for ORIA (the NRC suggested changes to the definition of source material).

Alan/Tom - My front office wants some indication today regarding our reaction to those suggested changes so they can get that back to OCIR and so OCIR can get it back to the appropriate folks.

My other two projects involve litigation with deadlines that both fall on Monday, Feb 27.

I share this with you all so you can understand why I cannot immediately turn and look at this document. Please know though that it is a priority for me and I will get to it as soon as I can.

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
ph: (202) 564-1272
fax: (202) 564-5603
stahle.susan@epa.gov

Reid Rosnick   From: Reid Rosnick/DC/USEPA/US To...   02/23/2012 01:17:09 PM

From:	Reid Rosnick/DC/USEPA/US
To:	Susan Stahle/DC/USEPA/US@EPA
Cc:	Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Alan Perrin/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA
Date:	02/23/2012 01:17 PM
Subject:	Revised Economics Section for Subpart W

Sue,

Attached is a revised section of the economics portion of the preamble to the Subpart W proposal. I have added more language on costs, savings, etc. I have also added some tables from the BID that help explain the numbers. Please have a look and provide your comments to me. I am now working on the additions to the preamble and rule language that Gina suggested yesterday, and I hope to have them to you sometime tomorrow. Thanks

----

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

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rosnick.reid@epa.gov[attachment "SECTION VI2.docx" deleted by Susan Stahle/DC/USEPA/US]

EPA-4742

Susan Stahle/DC/USEPA/US

02/24/2012 09:49 AM

To Reid Rosnick

cc Alan Perrin, Daniel Schultheisz, Jonathan Edwards, Tom Peake

bcc

Subject Re: Revised Economics Section for Subpart W

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fax: (202) 564-5603
stahle.susan@epa.gov

Reid Rosnick From: Reid Rosnick/DC/USEPA/US To... 02/23/2012 01:17:09 PM

From: Reid Rosnick/DC/USEPA/US
To: Susan Stahle/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Alan Perrin/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA
Date: 02/23/2012 01:17 PM
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rosnick.reid@epa.gov[attachment "SECTION VI2.docx" deleted by Susan Stahle/DC/USEPA/US]

EPA-164

Reid Rosnick/DC/USEPA/US	To	Tom Peake
02/24/2012 10:07 AM	cc	
	bcc	
	Subject	Fw: Re: Revised Economics Section for Subpart W

Well...

Reid J. Rosnick
Radiation Protection Division (6608J)
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1200 Pennsylvania Ave., NW
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-----Forwarded by Reid Rosnick/DC/USEPA/US on 02/24/2012 10:07AM -----
To: Reid Rosnick/DC/USEPA/US@EPA
From: Susan Stahle/DC/USEPA/US
Date: 02/24/2012 09:49AM
Cc: Alan Perrin/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA
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fax: (202) 564-5603
stahle.susan@epa.gov

Inactive hide details for Reid Rosnick---02/23/2012 01:17:09 PM---From: Reid Rosnick/DC/USEPA/US To: Susan Stahle/DC/USEPA/US@EReid Rosnick---02/23/2012 01:17:09 PM---From: Reid Rosnick/DC/USEPA/US To: Susan Stahle/DC/USEPA/US@EPA

From: Reid Rosnick/DC/USEPA/US
To: Susan Stahle/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Alan Perrin/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA
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Reid J. Rosnick
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rosnick.reid@epa.gov[attachment "SECTION VI2.docx" deleted by Susan Stahle/DC/USEPA/US]

EPA-388

Susan Stahle/DC/USEPA/US		To	Reid Rosnick
02/27/2012 09:42 AM		cc	
		bcc	
		Subject	Re: Preamble Rewrites - Subpart W

Why don't you drop the new section VI into this document and I'll look at it all together. I'm talking to Wendy this morning about edits to the legal sections so I can add those as well. I think I need to look at the whole package together to make sure the particular edits we're making now are appropriate as part of the whole. I'm going to try and focus on this as much as I can today.

Susan Stahle
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U.S. Environmental Protection Agency
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Washington, D.C. 20460
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fax: (202) 564-5603
stahle.susan@epa.gov

Reid Rosnick   From: Reid Rosnick/DC/USEPA/US To...   02/24/2012 04:12:51 PM

From: Reid Rosnick/DC/USEPA/US
To: Susan Stahle/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Alan Perrin/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA
Date: 02/24/2012 04:12 PM
Subject: Preamble Rewrites - Subpart W

Sue,

Attached for your review are the rewrites to the preamble and suggested rule language based on our discussions with Gina. To make it easier for you the new language is colored red and is on the following pages:

p 27-29, Liner compatibility

p.48-Monitoring for the 3 old impoundments

p.55-56, Recordkeeping requirements

p. 97, Rule language for recordkeeping requirements

Please note that I did not incorporate the new language in section VI into this draft. I'll wait for your comments.

I know that you are busy with litigation deadlines, and can't look at this right away, but I appreciate all of the hard work you have put into this rule. Thanks

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev9.docx" deleted by Susan Stahle/DC/USEPA/US]

EPA-3936

Daniel Schultheisz/DC/USEPA/US

02/27/2012 10:55 AM

To Reid Rosnick

cc Tom Peake

bcc

Subject Re: 1-2 pager for Mike?

Looks good. Send it on to Alan.

Reid Rosnick I incorporated your additions and Tom's... 02/27/2012 10:49:48 AM

From: Reid Rosnick/DC/USEPA/US
To: Daniel Schultheisz/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA
Date: 02/27/2012 10:49 AM
Subject: Re: 1-2 pager for Mike?

I incorporated your additions and Tom's suggestions. I think we're good to go.

[attachment "Issues and Resolutions from the Subpart W FAR Briefing Final.docx" deleted by Daniel Schultheisz/DC/USEPA/US]

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Daniel Schultheisz My comments. I expanded a bit on t... 02/27/2012 10:37:06 AM

From: Daniel Schultheisz/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA
Date: 02/27/2012 10:37 AM
Subject: Re: 1-2 pager for Mike?

My comments. I expanded a bit on the language from part 264 in Issue 3 and attempted an introductory sentence to Issue 4.

[attachment "Issues and Resolutions from the Subpart W FAR Briefing djs.docx" deleted by Reid Rosnick/DC/USEPA/US]

Reid Rosnick As promised. ----------------------------------... 02/27/2012 08:27:48 AM

From: Reid Rosnick/DC/USEPA/US
To: Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA
Date: 02/27/2012 08:27 AM
Subject: 1-2 pager for Mike?

As promised.

[attachment "Issues and Resolutions from the Subpart W FAR Briefing.docx" deleted by Daniel Schultheisz/DC/USEPA/US]

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-4733

Susan Stahle/DC/USEPA/US

02/27/2012 04:26 PM

To

cc

bcc

Subject Subpart W - discuss edits and strategize next steps

Meeting

Date	02/28/2012
Time	09:00:00 AM to 10:00:00 AM
Chair	Susan Stahle
Invitees	
Required	Reid Rosnick
Optional	
FYI	
Location	I will call you

EPA-4734

Reid Rosnick/DC/USEPA/US

02/28/2012 06:26 AM

To: Susan Stahle

cc:

bcc:

Subject: Accepted: Subpart W - discuss edits and strategize next steps

EPA-500

Reid Rosnick/DC/USEPA/US		To	Tony Nesky
03/01/2012 02:21 PM		cc	
		bcc	
		Subject	Work Assignment

Hi Tony,

I have a question. I am beginning to write the work assignment for SC&A for the technical work they do on Subpart W. My question is, since the public hearings for Subpart W will happen during this option year (I hope!) do I need to add money into this work assignment to cover portions of the hearings, or is this coming from one of your work assignments? Thanks, Tony.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-508

Reid Rosnick/DC/USEPA/US	To	Tony Nesky
03/01/2012 02:51 PM	cc	
	bcc	
	Subject	Re: Work Assignment

Terrific! Just what I needed to know. Thanks!

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Tony Nesky   Your hearings have already been cover...   03/01/2012 02:47:53 PM

From: Tony Nesky/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/01/2012 02:47 PM
Subject: Re: Work Assignment

Your hearings have already been covered in our meeting support contract. However, the support DOES NOT include compilation of formal comments and our response to them.

Tony Nesky
Center for Radiation Information and Outreach
Tel: 202-343-9597
nesky.tony@epa.gov

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Tony Nesky/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/01/2012 02:21PM
Subject: Work Assignment

Hi Tony,

I have a question. I am beginning to write the work assignment for SC&A for the technical work they do on Subpart W. My question is, since the public hearings for Subpart W will happen during this option year (I hope!) do I need to add money into this work assignment to cover portions of the hearings, or is this coming from one of your work assignments? Thanks, Tony.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
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1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-589

Rick Westlund/DC/USEPA/US	To	Reid Rosnick, Courtney Kerwin
03/06/2012 10:23 AM	cc	Daniel Schultheisz, Susan Stahle, Tom Peake
	bcc	
	Subject	Re: Revisions to Subpart W Preamble and Rule - PRA/ICR and cost impacts discussion issues

Reid,
Courtney Kerwin is our desk officer for OAR and will work with you on this today.

Rick Westlund
Office of Environmental Information (2822T)
U.S. Environmental Protection Agency
Phone: (202) 566-1682
Fax: (202) 566-1639

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Rick Westlund/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/06/2012 10:06AM
Cc: Susan Stahle/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA
Subject: Revisions to Subpart W Preamble and Rule - PRA/ICR and cost impacts discussion issues

Hello,

I work in the Radiation Protection Division of ORIA/OAR. We are currently revising an existing NESHAP rule for uranium mills and associated tailings. We also currently have an existing ICR on public notice. We will be proposing some extra recordkeeping requirements not covered by the existing ICR, and Grant MacIntyre, the OGC PRA attorney suggested we speak with you on helping us understand whether we can amend the existing ICR or whether we'll need a new one, or whether we aren't posing significant additional burdens on facilities.

If possible we'd like to set up a conference call with you today to discuss. Can you give me some times where you're available? Thanks for your help.

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-4279

Courtney Kerwin/DC/USEPA/US 03/06/2012 11:27 AM	To	Reid Rosnick
	cc	Daniel Schultheisz, Susan Stahle, Tom Peake, Rick Westlund
	bcc	
	Subject	Re: Revisions to Subpart W Preamble and Rule - PRA/ICR and cost impacts discussion issues

Reid,

I would be happy to discuss this with you. I am free today until 3:00. I am also free tomorrow - late morning and early afternoon. Let me know what works for you.

Thanks,

Courtney Kerwin
Office of Information Collection
Office of Environmental Information
U.S. EPA (Mail Code 2822T)
1200 Pennsylvania Ave, N.W.
Washington, D.C. 20460
(Phone) 202-566-1669

Rick Westlund Reid, Courtney Kerwin is our desk offic... 03/06/2012 10:23:56 AM

From: Rick Westlund/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA, Courtney Kerwin/DC/USEPA/US@EPA
Cc: Daniel Schultheisz/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA
Date: 03/06/2012 10:23 AM
Subject: Re: Revisions to Subpart W Preamble and Rule - PRA/ICR and cost impacts discussion issues

Reid,
Courtney Kerwin is our desk officer for OAR and will work with you on this today.

Rick Westlund
Office of Environmental Information (2822T)
U.S. Environmental Protection Agency
Phone: (202) 566-1682
Fax: (202) 566-1639

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Rick Westlund/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/06/2012 10:06AM
Cc: Susan Stahle/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA
Subject: Revisions to Subpart W Preamble and Rule - PRA/ICR and cost impacts discussion issues

Hello,

I work in the Radiation Protection Division of ORIA/OAR. We are currently revising an existing NESHAP rule for uranium mills and associated tailings. We also currently have an existing ICR on public notice. We will be proposing some extra recordkeeping requirements not covered by the existing ICR, and Grant MacIntyre, the OGC PRA attorney suggested we speak with you on helping us understand whether we can amend the existing ICR or whether we'll need a new one, or whether we aren't posing significant additional burdens on facilities.

If possible we'd like to set up a conference call with you today to discuss. Can you give me some times where you're available? Thanks for your help.

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-4447

Reid Rosnick/DC/USEPA/US

03/06/2012 11:32 AM

To: Courtney Kerwin, Daniel Schultheisz, Susan Stahle, Tom Peake

cc:

bcc:

Subject: Discussion of Revisions to Subpart W Preamble and Rule - PRA/ICR and cost impacts discussion issues

Meeting

Date: 03/06/2012

Time: 02:00:00 PM to 03:00:00 PM

Chair: Reid Rosnick

Invitees

Required: Courtney Kerwin; Daniel Schultheisz; Susan Stahle; Tom Peake

Optional:

FYI:

Location: TPO

Call-in number - 866-299-3188

Conference Code 2023439563

EPA-235

Courtney Kerwin/DC/USEPA/US

03/07/2012 11:37 AM

To Reid Rosnick
cc
bcc
Subject Re: ICR for NESHAP Subpart W

Thanks, Reid. That is all I need. Your ICR number is 2464.01. If you need anything else or have any questions, just let me know.

Courtney Kerwin
Office of Information Collection
Office of Environmental Information
U.S. EPA (Mail Code 2822T)
1200 Pennsylvania Ave, N.W.
Washington, D.C. 20460
(Phone) 202-566-1669

Reid Rosnick   Hi Courtney, Thanks again for meeting...   03/07/2012 06:24:52 AM

From: Reid Rosnick/DC/USEPA/US
To: Courtney Kerwin/DC/USEPA/US@EPA
Date: 03/07/2012 06:24 AM
Subject: ICR for NESHAP Subpart W

Hi Courtney,

Thanks again for meeting with us yesterday. Below is the information to get us started on the ICR:

Title: Revisions to National Emission Standards for Radon Emissions from Operating Mill Tailings

Primary Contact: Reid J. Rosnick, Office of Radiation and Indoor Air, Radiation Protection Division, Mailcode 6608J, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW Washington, DC 20460; telephone number: 202-343-9290; fax number: 202-343-2304; email address: rosnick.reid@epa.gov.

SAN: 5281

RIN: 2060-AP21

Please let me know if you need anything else to get us started. Thanks again.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-719

Barry Elman/DC/USEPA/US

03/15/2012 01:52 PM

To Reid Rosnick, Daniel Schultheisz, Wanda Farrar, Deborah Banks, Tom Eagles, Raymond Lee, Darryl Adams

cc

bcc

Subject ADP TRACKER - Regulatory Agenda Entry Policy Review (Concur): NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W)

Regulatory Agenda Entry Policy Review for 'NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W)' with a decision of Concur has been provided. Follow the doclink to review the document.

EPA-196

Stephen Hoffman/DC/USEPA/US	To	Reid Rosnick
03/15/2012 02:33 PM	cc	
	bcc	
	Subject	Re: Subpart W Update

Your package looks good to me. Is there anything I can help on at this point? I am real glad we are finally addressing ISL uranium since ponds at these sites has always been a concerns.

EPA-142

Reid Rosnick/DC/USEPA/US		To	George Brozowski
03/15/2012 02:33 PM		cc	
		bcc	
		Subject	Re: Subpart W Update

Hi George,

FAR is Final Agency Review and ICR is Information Collection Request.

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

George Brozowski Good afternoon and thanks for send... 03/15/2012 02:14:05 PM

From: George Brozowski/R6/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/15/2012 02:14 PM
Subject: Re: Subpart W Update

Good afternoon and thanks for sending. One question: what does FAR and ICR stand for?

U.S. Environmental Protection Agency

George P. Brozowski
Regional Health Physicist/
Radon Coordinator
Planning and Permitting Division
U.S. EPA Region 6
1445 Ross Avenue
Dallas, TX 75202
Phone (214) 665-8541
Fax (214) 665-6655
brozowski.george@epa.gov

EPA-197

Reid Rosnick/DC/USEPA/US	To	Stephen Hoffman
03/15/2012 02:37 PM	cc	
	bcc	
	Subject	Re: Subpart W Update

Thanks, Steve

The only roadblock I've encountered is from OGC (as usual) It gets frustrating when lawyers become geologists, or economists ;) I appreciate the offer, I'll let you know!

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Stephen Hoffman   Your package looks good to me. Is t...   03/15/2012 02:33:12 PM

From: Stephen Hoffman/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/15/2012 02:33 PM
Subject: Re: Subpart W Update

Your package looks good to me. Is there anything I can help on at this point? I am real glad we are finally addressing ISL uranium since ponds at these sites has always been a concerns.

EPA-5260

Michael Jay/R7/USEPA/US		To	Robert Dye
03/16/2012 08:50 AM		cc	CharlesA Hooper
		bcc	
		Subject	Re: Fw: Subpart W Update

Thanks, I was wondering where this was at.

Mike

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Mike Jay, Chief
Atmospheric Programs Section
Air Planning and Development Branch
U.S. Environmental Protection Agency Region 7
901 N. 5th Street
Kansas City, KS 66101

(913) 551-7460
jay.michael@epa.gov
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

EPA-20

"Darrell Liles" <dliles@senesusa.com>

03/19/2012 05:07 PM

To Reid Rosnick

cc

bcc

Subject Questons about Subpart W

Hey Reed,

I have some questions on phased and continuous disposal in tailing cells. If a call is easier, just let me know when you're available and I'll call.

I "understand" that continuous disposal allows no more than 10 acres uncovered at any one time (so the tailing cell cover would have to be constructed 'continually') and phased allows 2 no more than 40 acres each (including existing) in operation at any one time. But I don't really see the difference other than the area difference so I'm pretty sure that I am missing something. It seems that the phased disposal would operationally be the best to go with (assuming that all cells that are built are filled to capacity).

Also I assume the two 40 acres does not include the evaporation pond since it will be dismantled upon closure..???

Thanks....

Darrell Liles, CHP, PE
Sr. Health Physicist
SENES Consultants Limited
8310 South Valley HighwaySuite 3014
Englewood, Colorado, USA80112
email: dliles@senesusa.com
phone: 303 524 1406
cell: 303 717 3257

EPA-57

Sarah Fields
<sarah@uraniumwatch.org>
03/20/2012 12:04 PM

To Reid Rosnick
cc
bcc
Subject Questions Re Subpart W Rulemaking

Dear Reid,

Will there be the quarterly Subpart W conference call in April?

Does the EPA still plan to release the Subpart W draft rule in April?

Thank you,

Sarah Fields
Uranium Watch
PO Box 344
Moab, Utah 84532
435-259-9450

EPA-4752

Reid Rosnick/DC/USEPA/US

03/20/2012 12:38 PM

To Susan Stahle

cc

bcc

Subject Accepted: Subpart W - discuss my questions on the latest version

EPA-132

Reid Rosnick/DC/USEPA/US		To	Beth Miller
03/20/2012 01:50 PM		cc	
		bcc	
		Subject	Change to Subpart W website

Beth,

We forgot to amend the website concerning the next stakeholder conference call. It is scheduled for April 5. Could you please change it in the website, under Conference Call Information. Thanks

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-871

Reid Rosnick/DC/USEPA/US		To	Beth Miller
03/20/2012 02:51 PM		cc	
		bcc	
		Subject	Re: Change to Subpart W website

Thanks!!

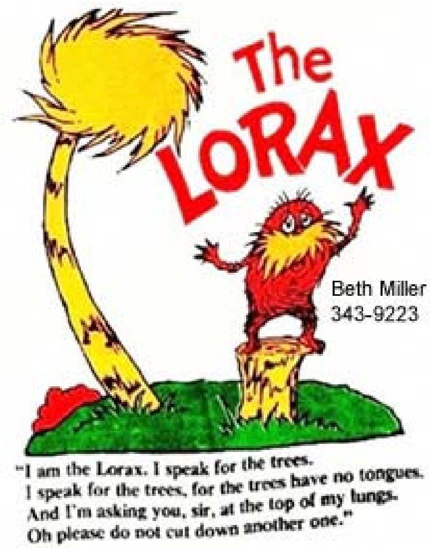
Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Beth Miller done From: Reid Rosnick/DC/USEPA/US 03/20/2012 02:07:39 PM

From: Beth Miller/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/20/2012 02:07 PM
Subject: Re: Change to Subpart W website

---

done



Reid Rosnick Beth, We forgot to amend the website c... 03/20/2012 01:50:30 PM

From: Reid Rosnick/DC/USEPA/US
To: Beth Miller/DC/USEPA/US@EPA
Date: 03/20/2012 01:50 PM
Subject: Change to Subpart W website

Beth,

We forgot to amend the website concerning the next stakeholder conference call. It is scheduled for April 5. Could you please change it in the website, under Conference Call Information. Thanks

Reid

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Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-5500

Tom Peake/DC/USEPA/US		To	Alan Perrin
03/20/2012 02:58 PM		cc	Jonathan Edwards
		bcc	
		Subject	Sue won't quit on Subpart W (in this context that's not a compliment) aka Frustration with Sue

Alan,
In the note to Reid on Subpart W from late yesterday (you were cc'd on it), Sue mentioned "Nice job!" to Reid and his response to her comments. Reid thought he would address those and be on his way. It was positive enough that I suggested he ask Sue if we could schedule the FAR.

Not so fast.

I just walked by Reid's office and he put the phone on mute and said (rather exclaimed) he's been on the phone for a couple of hours with Sue because she sent him another set of edits. He was extremely frustrated. I don't blame him.

By the way, she still has not written her legal parts.

Tom Peake
Director
Center for Waste Management and Regulations
US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

EPA-5501

Jonathan Edwards/DC/USEPA/US

03/20/2012 05:03 PM

To Tom Peake

cc Alan Perrin

bcc

Subject Re: Sue won't quit on Subpart W (in this context that's not a compliment) aka Frustration with Sue

Very concerning. Let's discuss...

Tom Peake Alan, In the note to Reid on Subpart W... 03/20/2012 02:58:53 PM

From: Tom Peake/DC/USEPA/US
To: Alan Perrin/DC/USEPA/US@EPA
Cc: Jonathan Edwards/DC/USEPA/US@EPA
Date: 03/20/2012 02:58 PM
Subject: Sue won't quit on Subpart W (in this context that's not a compliment) aka Frustration with Sue

---

Alan,
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Tom Peake
Director
Center for Waste Management and Regulations
US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

EPA-223

Tom Peake/DC/USEPA/US		To	Reid Rosnick
03/20/2012 05:11 PM		cc	
		bcc	
		Subject	Fw: Sue won't quit on Subpart W (in this context that's not a compliment) aka Frustration with Sue

fyi

Tom Peake
Director
Center for Waste Management and Regulations
US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

----- Forwarded by Tom Peake/DC/USEPA/US on 03/20/2012 05:10 PM -----

From: Jonathan Edwards/DC/USEPA/US
To: Tom Peake/DC/USEPA/US@EPA
Cc: Alan Perrin/DC/USEPA/US@EPA
Date: 03/20/2012 05:03 PM
Subject: Re: Sue won't quit on Subpart W (in this context that's not a compliment) aka Frustration with Sue

Very concerning. Let's discuss...

Tom Peake Alan, In the note to Reid on Subpart W... 03/20/2012 02:58:53 PM

From: Tom Peake/DC/USEPA/US
To: Alan Perrin/DC/USEPA/US@EPA
Cc: Jonathan Edwards/DC/USEPA/US@EPA
Date: 03/20/2012 02:58 PM
Subject: Sue won't quit on Subpart W (in this context that's not a compliment) aka Frustration with Sue

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Tom Peake
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US EPA (6608J)
1200 Pennsylvania Ave, NW
Washington, DC 20460
phone: 202-343-9765

Physical Location and for deliveries:
Room 529
1310 L St, NW
Washington, DC 20005

EPA-82

Reid Rosnick/DC/USEPA/US		To	Sarah Fields
03/21/2012 08:38 AM		cc	
		bcc	
		Subject	Re: Questions Re Subpart W Rulemaking

Hello Sarah,

Yes, the quarterly conference call will take place on Thursday April 5, 2012 at 11am EST, 10am CST, 9am MST and 8am PST. The call in number is 1-866-299-3188. You will be prompted for a conference code, which will be 2023439563. After entering the conference code press the # key and you will then be placed into the conference call.

Regarding the tentative publication date, we have had a few items from our Office of General Council that we needed to address and clear up. As a result we hope to get the package to OMB in late April.

I look forward to speaking with you on the 5th.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Sarah Fields	Dear Reid, Will there be the quarterly S...	03/20/2012 12:04:48 PM

From: Sarah Fields <sarah@uraniumwatch.org>
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/20/2012 12:04 PM
Subject: Questions Re Subpart W Rulemaking

Dear Reid,

Will there be the quarterly Subpart W conference call in April?

Does the EPA still plan to release the Subpart W draft rule in April?

Thank you,

Sarah Fields
Uranium Watch
PO Box 344
Moab, Utah 84532
435-259-9450

EPA-115

Reid Rosnick/DC/USEPA/US		To	"Darrell Liles"
03/21/2012 08:43 AM		cc	
		bcc	
		Subject	Re: Questons about Subpart W

Hi Darrell,

Sorry for the delay in getting back to you. In response to your questions, the difference between phased and continuous disposal is a matter of dewatering the tailings. The area difference is because dry tailings emit more radon than wet ones, and the premise for phased disposal is that the tailings are delivered to the impoundment in a wet state, whereas with continuous disposal the tailings are dewatered before placement. That is why the 10 acre area limit was imposed.

Regarding evaporation ponds, the regs as currently written would include the ponds in the count of impoundments. We are in the process of revising the regulation to address this. Hope this helps.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

"Darrell Liles"	Hey Reed,	03/19/2012 05:07:15 PM

From: "Darrell Liles" <dliles@senesusa.com>
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/19/2012 05:07 PM
Subject: Questons about Subpart W

Hey Reed,

I have some questions on phased and continuous disposal in tailing cells. If a call is easier, just let me know when you're available and I'll call.

I "understand" that continuous disposal allows no more than 10 acres uncovered at any one time (so the tailing cell cover would have to be constructed 'continually') and phased allows 2 no more than 40 acres each (including existing) in operation at any one time. But I don't really see the difference other than the area difference so I'm pretty sure that I am missing something. It seems that the phased disposal would operationally be the best to go with (assuming that all cells that are built are filled to capacity).

Also I assume the two 40 acres does not include the evaporation pond since it will be dismantled upon closure..???

Thanks....

Darrell Liles, CHP, PE

Sr. Health Physicist
SENES Consultants Limited
8310 South Valley HighwaySuite 3014
Englewood, Colorado, USA80112
email: dliles@senesusa.com
phone: 303 524 1406
cell: 303 717 3257

EPA-21

"Darrell Liles" <dliles@senesusa.com>

03/21/2012 08:49 AM

To Reid Rosnick

cc

bcc

Subject Re: Questons about Subpart W

Thanks Reid,

This does help and now makes sense.

Darrell

On Wed, 21 Mar 2012 08:43:25 -0400, Reid Rosnick <Rosnick.Reid@epamail.epa.gov> wrote:

Hi Darrell,

Sorry for the delay in getting back to you. In response to your questions, the difference between phased and continuous disposal is a matter of dewatering the tailings. The area difference is because dry tailings emit more radon than wet ones, and the premise for phased disposal is that the tailings are delivered to the impoundment in a wet state, whereas with continuous disposal the tailings are dewatered before placement. That is why the 10 acre area limit was imposed.

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1200 Pennsylvania Ave., NW
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202.343.9563
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From: "Darrell Liles" <dliles@senesusa.com>

To: Reid Rosnick/DC/USEPA/US@EPA

Date: 03/19/2012 05:07 PM

Subject: Questons about Subpart W

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email: dliles@senesusa.com
phone: 303 524 1406
cell: 303 717 3257

EPA-83

Sarah Fields <sarah@uraniumwatch.org>

03/21/2012 11:24 AM

To Reid Rosnick

cc

bcc

Subject Re: Questions Re Subpart W Rulemaking

Dear Reid,

Thanks for the information and for posting the call info on the Subpart W website.

Sarah

On Mar 21, 2012, at 6:38 AM, Reid Rosnick wrote:

Hello Sarah,

Yes, the quarterly conference call will take place on Thursday April 5, 2012 at 11am EST, 10am CST, 9am MST and 8am PST. The call in number is 1-866-299-3188. You will be prompted for a conference code, which will be 2023439563. After entering the conference code press the # key and you will then be placed into the conference call.

Regarding the tentative publication date, we have had a few items from our Office of General Council that we needed to address and clear up. As a result we hope to get the package to OMB in late April.

I look forward to speaking with you on the 5th.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

From: Sarah Fields <sarah@uraniumwatch.org>
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/20/2012 12:04 PM
Subject: Questions Re Subpart W Rulemaking

Dear Reid,

Will there be the quarterly Subpart W conference call in April?

Does the EPA still plan to release the Subpart W draft rule in April?

Thank you,

Sarah Fields
Uranium Watch
PO Box 344
Moab, Utah 84532
435-259-9450

EPA-573

Reid Rosnick/DC/USEPA/US

03/26/2012 11:04 AM

To Raymond Lee

cc

bcc

Subject Subpart W FAR

Hi Ray,

We've been given the go-ahead for FAR! We're shooting for April 17th. Can we get it scheduled? What do I need to give you?

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-600

Raymond Lee/DC/USEPA/US		To	Reid Rosnick
03/26/2012 11:20 AM		cc	
		bcc	
		Subject	Re: Subpart W FAR

Hi Reid,

Awesome! I actually had looked over your FAR materials and they all looked good to me. What you'll need to do now is reserve a room and a conference number/code on the 17th for the meeting and insert that information into the FAR announcement memo. Once that's done, I'll shoot it over to Wanda/Tom and they'll sign it. Then we'll send out the meeting announcement to the workgroup along with all of the FAR materials.

Thanks!

Ray

Sent by EPA Wireless E-mail Services

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Raymond Lee/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/26/2012 11:04AM
Subject: Subpart W FAR

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Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-675

Reid Rosnick/DC/USEPA/US		To	Raymond Lee
03/26/2012 11:22 AM		cc	
		bcc	
		Subject	Re: Subpart W FAR

Thanks Ray,

Does the meeting room have to be at Arial Rios, or can we do it here?

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Raymond Lee Hi Reid, Awesome! I actually had look... 03/26/2012 11:20:42 AM

From: Raymond Lee/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/26/2012 11:20 AM
Subject: Re: Subpart W FAR

Hi Reid,

Awesome! I actually had looked over your FAR materials and they all looked good to me. What you'll need to do now is reserve a room and a conference number/code on the 17th for the meeting and insert that information into the FAR announcement memo. Once that's done, I'll shoot it over to Wanda/Tom and they'll sign it. Then we'll send out the meeting announcement to the workgroup along with all of the FAR materials.

Thanks!

Ray

Sent by EPA Wireless E-mail Services

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Raymond Lee/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/26/2012 11:04AM
Subject: Subpart W FAR

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Reid

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1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

EPA-501

Raymond Lee/DC/USEPA/US

03/26/2012 01:26 PM

To Mariana Cubeddu

cc Nicole Owens, Reid Rosnick

bcc

Subject FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Mariana/Nicole,

I am putting the finishing touches on another FAR meeting for an ORIA action. This is for the NESHAP Subpart W proposed rule, which will revise national emissions standards for uranium mill tailings.

After discussion amongst the workgroup members, **April 17th (Tuesday) at 1:00 PM** seems to be the best fit. We already have a conference room and call-in number reserved for that date/time, but obviously we want to make sure that you or Nicole are available to chair the meeting then.

Please let me know if those logistics work for either of you and then we'll get all the FAR materials sent out as soon as possible.

Thanks!

Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

EPA-22

EAS.System@EPA	To	Reid Rosnick
03/26/2012 01:44 PM	cc	
	bcc	
	Subject	EAS Document Notification: For your reference: Award: EP-D-10-042/2-03

Award: EP-D-10-042/2-03 has been approved by Jared Van Buskirk in EAS.
Modification: 000004
Description: Technical/Regulatory Support for Subpart W of NESHAPS
Owner: Valerie Daigler
Contract Specialist: Nnenna Njoku
Contracting Officer: Matt Courtad
Project Officer: Valerie Daigler
Site: OAR/ORIA
Contracting Office: RTPPOD

EPA-716

Courtney Kerwin/DC/USEPA/US

03/26/2012 02:13 PM

To Reid Rosnick

cc

bcc

Subject Re: ICR for NESHAP Subpart W

Hi Reid - Sorry for the delay getting back to you. I have been juggling a number of ICR issues lately. I will finish up looking over your ICR and get comments back to you in the next day or two. If you need anything in the meantime, please let me know.

Courtney Kerwin
Office of Information Collection
Office of Environmental Information
U.S. EPA (Mail Code 2822T)
1200 Pennsylvania Ave, N.W.
Washington, D.C. 20460
(Phone) 202-566-1669

Reid Rosnick	Hi Courtney, I have attached our draft o...	03/14/2012 01:35:36 PM

From: Reid Rosnick/DC/USEPA/US
To: Courtney Kerwin/DC/USEPA/US@EPA
Date: 03/14/2012 01:35 PM
Subject: Re: ICR for NESHAP Subpart W

Hi Courtney,

I have attached our draft of the ICR for the Subpart W rulemaking. Can you explain the process as we move forward? Thanks

Reid

[attachment "Support Stm Subpart W draft.docx" deleted by Courtney Kerwin/DC/USEPA/US]

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1200 Pennsylvania Ave., NW
Washington, DC 20460
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rosnick.reid@epa.gov

EPA-23

EAS.System@EPA

03/26/2012 02:29 PM

To Reid Rosnick

cc

bcc

Subject EAS Document Notification: For your reference: Award: EP-D-10-042/2-03

Award: EP-D-10-042/2-03 has been approved by Jared Van Buskirk in EAS.
Modification: 000005
Description: Technical/Regulatory Support for Subpart W of NESHAPS
Owner: Valerie Daigler
Contract Specialist: Nnenna Njoku
Contracting Officer: Matt Courtad
Project Officer: Valerie Daigler
Site: OAR/ORIA
Contracting Office: RTPPOD

EPA-4728

Reid Rosnick/DC/USEPA/US	To	
03/27/2012 09:21 AM	cc	Susan Stahle, Tom Peake
	bcc	
	Subject	Declined: Subpart W Stakeholders Call

EPA-410

1310L Room 502/DC-1310L-OAR

03/27/2012 09:22 AM

To Reid Rosnick

cc

bcc

Subject Accepted: Subpart W Stakeholders Call

EPA-24

"Darrell Liles" <dliles@senesusa.com>

03/28/2012 10:33 AM

To Reid Rosnick
cc
bcc
Subject EPA Subpart W Website

Hey Reid,

Thanks for sending me this. I noticed the letters EPA sent out to have radon flux measured over the evap ponds. Will we have to include flux monitoring over evap ponds in our application? I knew we would for the tailings cell to comply with NESHAPS but didn't think we would over the Evap pond(s).

Talked to the engineers about the continous disposal option. They realize that there will be some operational issues (i.e only ten acres uncover/operational). They are exploring options but have several ideas that seem viable to me.

Darrell

On Tue, 27 Mar 2012 10:22:07 -0400, Reid Rosnick <Rosnick.Reid@epamail.epa.gov> wrote:

http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

----

Reid J. Rosnick
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Darrell Liles, CHP, PE
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8310 South Valley HighwaySuite 3014
Englewood, Colorado, USA80112
email: dliles@senesusa.com
phone: 303 524 1406
cell: 303 717 3257

EPA-518

Raymond Lee/DC/USEPA/US

03/28/2012 11:14 AM

To Reid Rosnick

cc

bcc

Subject Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Reid,

Well, this stinks. Here's the reply from Nicole. If you want to go ahead and pick a time and then insert that into the FAR memo (along with the new 4/19 date), and then forward it on to Wanda and Tom Eagles we should be good to go. Once she signs the memo and gets it back to us, you can send out the official meeting invite along with the materials.

I'm working from home today, so call me at 703-725-8367 if you need anything.

Thanks,

Ray

-----Forwarded by Raymond Lee/DC/USEPA/US on 03/28/2012 11:13AM -----

To: Raymond Lee/DC/USEPA/US@EPA
From: Nicole Owens/DC/USEPA/US
Date: 03/28/2012 10:54AM
Cc: Mariana Cubeddu/DC/USEPA/US@EPA
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Mariana is out.

That time doesn't work for us. Also, neither the day you distribute the material nor the day of the FAR count as full working days. By my count you need to hold the FAR on the 19th, if you distribute the material today. I can do 11:00am or 1:00pm.

Nicole

Inactive hide details for Raymond Lee---03/28/2012 08:49:44 AM---Hi Nicole, Just following up on this FAR meeting request. BoRaymond Lee---03/28/2012 08:49:44 AM---Hi Nicole, Just following up on this FAR meeting request. Both the workgroup chair and I have ping

From: Raymond Lee/DC/USEPA/US
To: owens.nicole@epa.gov
Date: 03/28/2012 08:49 AM
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Nicole,

Just following up on this FAR meeting request. Both the workgroup chair and I have pinged Mariana again but with no response, and we're really trying to get this scheduled so that the date doesn't slip again. Today is the last day we have to send out the FAR materials if we want to meet the 4/17 date.

Does that work on your calendar? Please see the note below for more details.

Thanks,

Ray

-----Raymond Lee/DC/USEPA/US wrote: -----
To: Mariana Cubeddu/DC/USEPA/US@EPA
From: Raymond Lee/DC/USEPA/US
Date: 03/26/2012 01:26PM
Cc: Nicole Owens/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA
Subject: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Mariana/Nicole,

I am putting the finishing touches on another FAR meeting for an ORIA action. This is for the NESHAP Subpart W proposed rule, which will revise national emissions standards for uranium mill tailings.

After discussion amongst the workgroup members, **April 17th (Tuesday) at 1:00 PM** seems to be the best fit. We already have a conference room and call-in number reserved for that date/time, but obviously we want to make sure that you or Nicole are available to chair the meeting then.

Please let me know if those logistics work for either of you and then we'll get all the FAR materials sent out as soon as possible.

Thanks!

Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

EPA-305

Raymond Lee/DC/USEPA/US		To	Reid Rosnick
03/28/2012 11:26 AM		cc	Tom Peake
		bcc	
		Subject	Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Reid,

Already forwarded it on to Wanda and Tom. Apparently Wanda is out, so I've asked Tom Eagles to sign it for us and send it back. I'll get it to you as soon as I hear back!

Thanks,

Ray

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Raymond Lee/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/28/2012 11:20AM
Cc: Tom Peake/DC/USEPA/US@EPA
Subject: Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Ray,

OK, I changed the date on the memo to the 19th, got the same room, and attached is the announcement memo ready for signature. Please let me know if there's anything else. Thanks!

Reid

(See attached file: farannouncementmemoSubpart W.docx)

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Inactive hide details for Raymond Lee---03/28/2012 11:14:56 AM---Hi Reid, Well, this stinks. Here's the reply from Nicole. IRaymond Lee---03/28/2012 11:14:56 AM---Hi Reid, Well, this stinks. Here's the reply from Nicole. If you want to go ahead and pick a time

From: Raymond Lee/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/28/2012 11:14 AM
Subject: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Reid,

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I'm working from home today, so call me at 703-725-8367 if you need anything.

Thanks,

Ray

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To: Raymond Lee/DC/USEPA/US@EPA
From: Nicole Owens/DC/USEPA/US
Date: 03/28/2012 10:54AM
Cc: Mariana Cubeddu/DC/USEPA/US@EPA
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

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Date: 03/28/2012 08:49 AM
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

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Date: 03/26/2012 01:26PM
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Thanks!

Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

[attachment "farannouncementmemoSubpart W.docx" removed by Raymond Lee/DC/USEPA/US]

EPA-462

Reid Rosnick/DC/USEPA/US	To	Raymond Lee
03/28/2012 11:31 AM	cc	
	bcc	
	Subject	Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Thanks!!

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Raymond Lee   Hi Reid, Already forwarded it on to Wa...   03/28/2012 11:26:59 AM

From: Raymond Lee/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA
Date: 03/28/2012 11:26 AM
Subject: Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

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Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

[attachment "farannouncementmemoSubpart W.docx" removed by Raymond Lee/DC/USEPA/US]

EPA-446

Reid Rosnick/DC/USEPA/US		To	Raymond Lee
03/28/2012 11:40 AM		cc	
		bcc	
		Subject	Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Ray,

What's the process once we get the signed memo? Who do we send this stuff to? I assume that since you just worked with Brian on this it should be easier.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Raymond Lee   Hi Reid, Already forwarded it on to Wa...   03/28/2012 11:26:59 AM

From:	Raymond Lee/DC/USEPA/US
To:	Reid Rosnick/DC/USEPA/US@EPA
Cc:	Tom Peake/DC/USEPA/US@EPA
Date:	03/28/2012 11:26 AM
Subject:	Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Reid,

Already forwarded it on to Wanda and Tom. Apparently Wanda is out, so I've asked Tom Eagles to sign it for us and send it back. I'll get it to you as soon as I hear back!

Thanks,

Ray

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Raymond Lee/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/28/2012 11:20AM
Cc: Tom Peake/DC/USEPA/US@EPA
Subject: Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Ray,

OK, I changed the date on the memo to the 19th, got the same room, and attached is the announcement memo ready for signature. Please let me know if there's anything else. Thanks!

Reid

(See attached file: farannouncementmemoSubpart W.docx)

Reid J. Rosnick
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1200 Pennsylvania Ave., NW
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Raymond Lee---03/28/2012 11:14:56 AM---Hi Reid, Well, this stinks. Here's the reply from Nicole. If you want to go ahead and pick a time

From: Raymond Lee/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/28/2012 11:14 AM
Subject: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Reid,

Well, this stinks. Here's the reply from Nicole. If you want to go ahead and pick a time and then insert that into the FAR memo (along with the new 4/19 date), and then forward it on to Wanda and Tom Eagles we should be good to go. Once she signs the memo and gets it back to us, you can send out the official meeting invite along with the materials.

I'm working from home today, so call me at 703-725-8367 if you need anything.

Thanks,

Ray

-----Forwarded by Raymond Lee/DC/USEPA/US on 03/28/2012 11:13AM -----
To: Raymond Lee/DC/USEPA/US@EPA
From: Nicole Owens/DC/USEPA/US
Date: 03/28/2012 10:54AM
Cc: Mariana Cubeddu/DC/USEPA/US@EPA
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Mariana is out.

That time doesn't work for us. Also, neither the day you distribute the material nor the day of the FAR count as full working days. By my count you need to hold the FAR on the 19th, if you distribute the material today. I can do 11:00am or 1:00pm.

Nicole

Raymond Lee---03/28/2012 08:49:44 AM---Hi Nicole, Just following up on this FAR meeting request. Both the workgroup chair and I have ping

From: Raymond Lee/DC/USEPA/US

To: owens.nicole@epa.gov
Date: 03/28/2012 08:49 AM
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Nicole,

Just following up on this FAR meeting request. Both the workgroup chair and I have pinged Mariana again but with no response, and we're really trying to get this scheduled so that the date doesn't slip again. Today is the last day we have to send out the FAR materials if we want to meet the 4/17 date.

Does that work on your calendar? Please see the note below for more details.

Thanks,

Ray

-----Raymond Lee/DC/USEPA/US wrote: -----
To: Mariana Cubeddu/DC/USEPA/US@EPA
From: Raymond Lee/DC/USEPA/US
Date: 03/26/2012 01:26PM
Cc: Nicole Owens/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA
Subject: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Mariana/Nicole,

I am putting the finishing touches on another FAR meeting for an ORIA action. This is for the NESHAP Subpart W proposed rule, which will revise national emissions standards for uranium mill tailings.

After discussion amongst the workgroup members, **April 17th (Tuesday) at 1:00 PM** seems to be the best fit. We already have a conference room and call-in number reserved for that date/time, but obviously we want to make sure that you or Nicole are available to chair the meeting then.

Please let me know if those logistics work for either of you and then we'll get all the FAR materials sent out as soon as possible.

Thanks!

Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

[attachment "farannouncementmemoSubpart W.docx" removed by Raymond Lee/DC/USEPA/US]

EPA-836

Reid Rosnick/DC/USEPA/US		To	Raymond Lee
03/28/2012 12:19 PM		cc	
		bcc	
		Subject	Re: Accepted: Final Agency Review, Subpart W Proposed Rule

Ray,

I'm having a senior moment. Did I attach everything I needed?

Reid J. Rosnick
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Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Raymond Lee	Accepted: Final Agency Review, Subpa...	03/28/2012 12:17:24 PM

Accepted: Final Agency Review, Subpart W Proposed Rule
Thu 04/19/2012 1:00 PM - 2:00 PM

Location:	Call-in number - 866-299-3188 Conference Code 2023439563	Rooms:	1310L Room 502/DC-1310L-OAR@EPA

Raymond Lee has accepted this meeting invitation

Required:	Angelique Diaz/R8/USEPA/US@EPA, Barry Elman/DC/USEPA/US@EPA, CharlesA Hooper/R7/USEPA/US@EPA, Charlie Garlow/DC/USEPA/US@EPA, Davis Zhen/R10/USEPA/US@EPA, George Brozowski/R6/USEPA/US@EPA, Marilyn Ginsberg/DC/USEPA/US@EPA, Nicole Owens/DC/USEPA/US@EPA, Robert Dye/R7/USEPA/US@EPA, Stephen Hoffman/DC/USEPA/US@EPA, Stuart Walker/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tim Benner/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Wanda Farrar/DC/USEPA/US@EPA
Optional:	Alan Perrin/DC/USEPA/US@EPA, Andrea Cherepy/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Mariana Cubeddu/DC/USEPA/US@EPA, Philip Egidi/DC/USEPA/US@EPA, Raymond Lee/DC/USEPA/US@EPA, Tom Eagles/DC/USEPA/US@EPA

Description

EPA-5078

Angelique Diaz/R8/USEPA/US		To	Reid Rosnick
03/28/2012 12:51 PM		cc	
		bcc	
		Subject	Re: Invitation: Final Agency Review, Subpart W Proposed Rule (Apr 19 01:00 PM EDT in 1310L Room 502/DC-1310L-OAR@EPA)

Reid, it's finally happening, eh? Do our RA's (or delegated managers) need to attend and concur on this like they did the Options Selection?

Angelique D. Diaz, Ph.D.
Environmental Engineer
Air Program, USEPA/Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Office: 303.312.6344
Fax: 303.312.6064
diaz.angelique@epa.gov

Reid Rosnick   Invitation: Final Agency Review, Subpa...   03/28/2012 10:04:43 AM

Invitation: Final Agency Review, Subpart W Proposed Rule

Thu 04/19/2012 11:00 AM - 12:00 PM

Attendance is **required** for Angelique Diaz

Chair: **Reid Rosnick/DC/USEPA/US**

Location: Call-in number - 866-299-3188   Rooms: 1310L Room 502/DC-1310L-OAR@EPA

Conference Code 2023439563

Reid Rosnick has invited you to a meeting. You have not yet responded.

Required:	Angelique Diaz/R8/USEPA/US@EPA, Barry Elman/DC/USEPA/US@EPA, CharlesA Hooper/R7/USEPA/US@EPA, Charlie Garlow/DC/USEPA/US@EPA, Davis Zhen/R10/USEPA/US@EPA, George Brozowski/R6/USEPA/US@EPA, Marilyn Ginsberg/DC/USEPA/US@EPA, Nicole Owens/DC/USEPA/US@EPA, Robert Dye/R7/USEPA/US@EPA, Stephen Hoffman/DC/USEPA/US@EPA, Stuart Walker/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tim Benner/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Wanda Farrar/DC/USEPA/US@EPA
Optional:	Alan Perrin/DC/USEPA/US@EPA, Andrea Cherepy/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Mariana Cubeddu/DC/USEPA/US@EPA, Philip Egidi/DC/USEPA/US@EPA, Raymond Lee/DC/USEPA/US@EPA, Tom Eagles/DC/USEPA/US@EPA
Time zones:	This entry was created in a different time zone. The time in that time zone is: Thu 04/19/2012 1:00 PM EDT2:00 PM EDT

Description

[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev15.docx" deleted by Angelique Diaz/R8/USEPA/US] [attachment "Workgroup Members and Contact Information.docx" deleted by Angelique Diaz/R8/USEPA/US] [attachment "Draft Action MEMO Subpart W.docx" deleted by Angelique Diaz/R8/USEPA/US] [attachment "FAR Memo -- Subpart W.pdf" deleted by Angelique Diaz/R8/USEPA/US] All, Attached for the FAR meeting are the announcement memo, the draft action memo, a list of workgroup members and the draft preamble and rule language. Please let me know if you have any questions or comments. Thanks.

EPA-122

Reid Rosnick/DC/USEPA/US	To	Angelique Diaz
03/28/2012 12:54 PM	cc	
	bcc	
	Subject	Re: Invitation: Final Agency Review, Subpart W Proposed Rule (Apr 19 01:00 PM EDT in 1310L Room 502/DC-1310L-OAR@EPA)

Yeah, cross your fingers. Actually, the RAs, etc. don't need to attend, they just need to be briefed. See the FAR announcement memo that was attached to the meeting invitation. There is (of course) a turgid process that must be followed.

Reid J. Rosnick
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rosnick.reid@epa.gov

Angelique Diaz Reid, it's finally happening, eh? Do our... 03/28/2012 12:51:36 PM

From: Angelique Diaz/R8/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/28/2012 12:51 PM
Subject: Re: Invitation: Final Agency Review, Subpart W Proposed Rule (Apr 19 01:00 PM EDT in 1310L Room 502/DC-1310L-OAR@EPA)

Reid, it's finally happening, eh? Do our RA's (or delegated managers) need to attend and concur on this like they did the Options Selection?

Angelique D. Diaz, Ph.D.
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1595 Wynkoop Street (8P-AR)
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diaz.angelique@epa.gov

Reid Rosnick Invitation: Final Agency Review, Subpa... 03/28/2012 10:04:43 AM

Invitation: Final Agency Review, Subpart W Proposed Rule

Thu 04/19/2012 11:00 AM - 12:00 PM

Attendance is **required** for Angelique Diaz

Chair: **Reid Rosnick/DC/USEPA/US**

Location: Call-in number - 866-299-3188 Rooms: 1310L Room 502/DC-1310L-OAR@EPA

Conference Code 2023439563

Reid Rosnick has invited you to a meeting. You have not yet responded.

Required:	Angelique Diaz/R8/USEPA/US@EPA, Barry Elman/DC/USEPA/US@EPA, CharlesA Hooper/R7/USEPA/US@EPA, Charlie Garlow/DC/USEPA/US@EPA, Davis Zhen/R10/USEPA/US@EPA, George Brozowski/R6/USEPA/US@EPA, Marilyn Ginsberg/DC/USEPA/US@EPA, Nicole Owens/DC/USEPA/US@EPA, Robert Dye/R7/USEPA/US@EPA, Stephen Hoffman/DC/USEPA/US@EPA, Stuart Walker/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tim Benner/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Wanda Farrar/DC/USEPA/US@EPA
Optional:	Alan Perrin/DC/USEPA/US@EPA, Andrea Cherepy/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Mariana Cubeddu/DC/USEPA/US@EPA, Philip Egidi/DC/USEPA/US@EPA, Raymond Lee/DC/USEPA/US@EPA, Tom Eagles/DC/USEPA/US@EPA
Time zones:	This entry was created in a different time zone. The time in that time zone is: Thu 04/19/2012 1:00 PM EDT2:00 PM EDT

Description

[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev15.docx" deleted by Angelique Diaz/R8/USEPA/US] [attachment "Workgroup Members and Contact Information.docx" deleted by Angelique Diaz/R8/USEPA/US] [attachment "Draft Action MEMO Subpart W.docx" deleted by Angelique Diaz/R8/USEPA/US] [attachment "FAR Memo -- Subpart W.pdf" deleted by Angelique Diaz/R8/USEPA/US] All, Attached for the FAR meeting are the announcement memo, the draft action memo, a list of workgroup members and the draft preamble and rule language. Please let me know if you have any questions or comments. Thanks.

EPA-5082

Deborah Lebow-Aal/R8/USEPA/US

03/28/2012 01:22 PM

To Angelique Diaz

cc

bcc

Subject Re: Fw: Invitation: Final Agency Review, Subpart W Proposed Rule (Apr 19 01:00 PM EDT in 1310L Room 502/DC-1310L-OAR@EPA)

Carl, who will just let CAllie know. We should brief Carl - not just give him a paper or email.

Deborah Lebow Aal
U.S. Environmental Protection Agency
Region 8 Air Program
Unit Chief, Indoor Air, Transportation and Toxics Unit
1595 Wynkoop Street
Denver, CO 80202
(303) 312-6223

Angelique Diaz Who do we need to brief to give us go a... 03/28/2012 11:04:29 AM

From: Angelique Diaz/R8/USEPA/US
To: Deborah Lebow-Aal/R8/USEPA/US@EPA
Date: 03/28/2012 11:04 AM
Subject: Fw: Invitation: Final Agency Review, Subpart W Proposed Rule (Apr 19 01:00 PM EDT in 1310L Room 502/DC-1310L-OAR@EPA)

Who do we need to brief to give us go ahead to concur (which I'm assuming we will do). I need to look at the final draft rule. The FAR Memo below contains the process for the FAR.

Angelique D. Diaz, Ph.D.
Environmental Engineer
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Denver, CO 80202-1129
Office: 303.312.6344
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diaz.angelique@epa.gov

----- Forwarded by Angelique Diaz/R8/USEPA/US on 03/28/2012 11:02 AM -----

Invitation: Final Agency Review, Subpart W Proposed Rule

Thu 04/19/2012 11:00 AM - 12:00 PM

Attendance is **required** for Angelique Diaz

Chair: **Reid Rosnick/DC/USEPA/US**

Location: Call-in number - 866-299-3188 Rooms: 1310L Room 502/DC-1310L-OAR@EPA

Conference Code 2023439563

Reid Rosnick has invited you to a meeting. You have not yet responded.

Required:	Angelique Diaz/R8/USEPA/US@EPA, Barry Elman/DC/USEPA/US@EPA, CharlesA Hooper/R7/USEPA/US@EPA, Charlie Garlow/DC/USEPA/US@EPA, Davis Zhen/R10/USEPA/US@EPA, George Brozowski/R6/USEPA/US@EPA, Marilyn Ginsberg/DC/USEPA/US@EPA, Nicole Owens/DC/USEPA/US@EPA, Robert Dye/R7/USEPA/US@EPA, Stephen Hoffman/DC/USEPA/US@EPA, Stuart Walker/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tim Benner/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Wanda Farrar/DC/USEPA/US@EPA
Optional:	Alan Perrin/DC/USEPA/US@EPA, Andrea Cherepy/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Mariana Cubeddu/DC/USEPA/US@EPA, Philip Egidi/DC/USEPA/US@EPA, Raymond Lee/DC/USEPA/US@EPA, Tom Eagles/DC/USEPA/US@EPA
Time zones:	This entry was created in a different time zone. The time in that time zone is: Thu 04/19/2012 1:00 PM EDT2:00 PM EDT

Description

[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev15.docx" deleted by Deborah Lebow-Aal/R8/USEPA/US] [attachment "Workgroup Members and Contact Information.docx" deleted by Deborah Lebow-Aal/R8/USEPA/US] [attachment "Draft Action MEMO Subpart W.docx" deleted by Deborah Lebow-Aal/R8/USEPA/US] [attachment "FAR Memo -- Subpart W.pdf" deleted by Deborah Lebow-Aal/R8/USEPA/US] All, Attached for the FAR meeting are the announcement memo, the draft action memo, a list of workgroup members and the draft preamble and rule language. Please let me know if you have any questions or comments. Thanks.

EPA-6494

Paul Balserak/DC/USEPA/US		To	Barry Elman
03/28/2012 04:16 PM		cc	
		bcc	
		Subject	Fw: Quick turn-around on rules

Barry - please see below. Apparently you are now "Brigid" ... let me know if you have questions,
Paul

----- Forwarded by Paul Balserak/DC/USEPA/US on 03/28/2012 04:15 PM -----

From: Bridgid Curry/DC/USEPA/US
To: Paul Balserak/DC/USEPA/US@EPA
Cc: Lesley Schaaff/DC/USEPA/US@EPA
Date: 03/28/2012 04:13 PM
Subject: Re: Quick turn-around on rules

Hi Paul,
The two rules you have me listed for are now Barry's.
Bridgid

Paul Balserak   Michael has a meeting tomorrow at 1:1...   03/28/2012 03:58:28 PM

From: Paul Balserak/DC/USEPA/US
To: William Nickerson/DC/USEPA/US@EPA, Jan Gilbreath/DC/USEPA/US@EPA, Sharon Cooperstein/DC/USEPA/US@EPA, Bridgid Curry/DC/USEPA/US@EPA, JohnB Chamberlin/DC/USEPA/US@EPA, Sarah Rees/DC/USEPA/US@EPA
Cc: Lesley Schaaff/DC/USEPA/US@EPA
Date: 03/28/2012 03:58 PM
Subject: Quick turn-around on rules

Michael has a meeting tomorrow at 1:15 with Gina on rules that OP is recommending OAR delay until into 2013. Our recommendation is based on the four criteria, that you've likely heard about, for which rules can get out this year -- only those that have: 1) court deadline, 2) big benefits, 3) on the Look back, 4) programmatic necessity.

For your rules below, could you please provide a ***brief*** argument related to these four points on why the rule should or shouldn't be deferred. Obviously, the "programmatic necessity" is the most vague of the criteria ... do your best.

ASAP, or by 10:00 tomorrow if at all possible. Thanks,
Paul

Questions Over Whether OMB Criteria Are Met

5/14/2012	Hearing-Protector Regulations - Revisions; OAR/OPAR; SAN 5102; RIN 2060-AO25; Tier 3; OMB Significant; Final Action
5/23/2012	RFS2 Amendments; OAR/OTAQ; SAN 5584; RIN 2060-AR21; Tier 3; OMB Significant; NPRM

5/25/2012	*AA Signature* Revised Regulation for Environmental Radiation Protection Standard for Nuclear Power Operations - 40 CFR Part 190; OAR/ORIA/RPD; SAN 5581; RIN 2060-AR12; Tier 2; OMB Significant; ANPRM **Jan**
6/29/2012	RFS - Modification of Definition of Heating Oil; OAR/OTAQ; SAN 5614; RIN A2060; Tier 3; OMB Significant; Direct Final and NPRM
7/9/2012	Startup, Shutdown, and Malfunction Amendments to NESHAP Part 63 Standards; OAR/OAQPS/SPPD/PDG; SAN 5397; RIN 2060-AP96; Tier 3; OMB Significant; NPRM **JohnC**
7/31/2012	RFS - Summer Program Amendments; OAR/OTAQ; SAN 5613; RIN A2060; Tier 3; OMB Significant; NPRM
8/15/2012	NESHAP Amendments for Operating Uranium Mill Tailings (Subpart W); OAR/ORIA/RPD; SAN 5281; RIN 2060-AP26; Tier 2; OMB Significant; NPRM **Bridgid**
9/6/2012	VOC Exclusion for HFO (including HFO-1234ze); OAR/OAQPS/AQPD; SAN 5461; RIN 2060-AQ38; Tier 3; OMB Significant; Final Action **Sharon**
9/17/2012	Uranium Extraction Facilities; OAR/ORIA/RPD; SAN 5319; RIN 2060-AP43; Tier 2; OMB Significant; NPRM **Bridgid**
9/21/2012	Heavy-Duty Engine and Vehicle Technical Amendments; OAR/OTAQ; SAN 5618; RIN A2060; Tier 3; OMB undetermined; NPRM **Bill N.**
10/1/2012	Compliance Data Reporting Rule; OAR/OAQPS/SPPD/MPG; SAN 5357; RIN 2060-AP63; Tier 3; OMB Significant; NPRM **Sarah**
12/10/2012	RFS2 Amendments; OAR/OTAQ; SAN 5584; RIN 2060-AR21; Tier 3; OMB undetermined; Final Action
12/20/2012	Report to Congress: Energy Policy Act of 2005 Aviation Fuel Conservation and Emissions; OAR/OPAR; SAN 5096; RIN NA2060; Tier 3; Final
1/7/2013	Protection of Stratospheric Ozone: Certification of Recovery and Recovery/Recycling Equipment Intended for Use with Substitute Refrigerants; OAR/OAP/SPD; SAN 4916; RIN 2060-AM49; Tier 3; OMB Significant; NPRM **JohnC**
1/14/2013	Fire Truck Rule; OAR/OTAQ; SAN 5616; RIN A2060; Tier 3; OMB undetermined; Final Action **Jan**

EPA-277

Barry Elman/DC/USEPA/US		To	Reid Rosnick
03/28/2012 05:20 PM		cc	
		bcc	
		Subject	Quick question on Subpart W FAR

Hi Reid,

I have in my notes that EPA has entered into a consent decree with two Colorado environmental groups that prescribes when the proposed and final standard will be issued. Is that correct? And if so, what are the deadlines that we are subject to under the consent decree? If you could let me know this evening or first thing in the morning, I'd appreciate it.

Thanks,

Barry

EPA-6418

Barry Elman/DC/USEPA/US
03/28/2012 05:20 PM

To Reid Rosnick
cc
bcc
Subject Quick question on Subpart W FAR

Hi Reid,

I have in my notes that EPA has entered into a consent decree with two Colorado environmental groups that prescribes when the proposed and final standard will be issued. Is that correct? And if so, what are the deadlines that we are subject to under the consent decree? If you could let me know this evening or first thing in the morning, I'd appreciate it.

Thanks,

Barry

EPA-6459

Barry Elman/DC/USEPA/US
03/28/2012 11:17 PM

To Reid Rosnick
cc
bcc
Subject Quick question on Subpart W FAR

Thanks Reid. That's all I need to know for now.

Barry

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Barry Elman/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/28/2012 07:22PM
Subject: Quick question on Subpart W FAR

Hi Barry,

Yes, we entered into a settlement agreement (not a consent decree) with 2 environmental groups in Colorado. The agreement stated that, among other things, we would create a website, put all the documents available on the web site, hold 3 public meetings and a webinar, have quarterly stakeholder conference calls, and post the date on the website when we anticipated that we would propose the rule. We did NOT agree to dates when the rule would be proposed or go final. I have attached the settlement agreement for your information. I'm at home right now, but if you have any questions, please call me tomorrow morning. Hope this helps.

Reid

Reid J. Rosnick
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U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

-----Barry Elman/DC/USEPA/US wrote: -----
To: Reid Rosnick/DC/USEPA/US@EPA
From: Barry Elman/DC/USEPA/US
Date: 03/28/2012 05:20PM
Subject: Quick question on Subpart W FAR

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Thanks,

Barry

[attachment "settlementagreement.pdf" removed by Barry Elman/DC/USEPA/US]

EPA-517

Barry Elman/DC/USEPA/US		To	Reid Rosnick
03/28/2012 11:17 PM		cc	
		bcc	
		Subject	Quick question on Subpart W FAR

Thanks Reid. That's all I need to know for now.

Barry

-----Reid Rosnick/DC/USEPA/US wrote: -----
To: Barry Elman/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/28/2012 07:22PM
Subject: Quick question on Subpart W FAR

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-----Barry Elman/DC/USEPA/US wrote: -----
To: Reid Rosnick/DC/USEPA/US@EPA
From: Barry Elman/DC/USEPA/US
Date: 03/28/2012 05:20PM
Subject: Quick question on Subpart W FAR

Hi Reid,

I have in my notes that EPA has entered into a consent decree with two Colorado environmental groups that prescribes when the proposed and final standard will be issued. Is that correct? And if so, what are the deadlines that we are subject to under the consent decree? If you could let me know this evening or first thing in the morning, I'd appreciate it.

Thanks,

Barry

[attachment "settlementagreement.pdf" removed by Barry Elman/DC/USEPA/US]

EPA-898

Reid Rosnick/DC/USEPA/US	To	"Darrell Liles"
03/29/2012 08:57 AM	cc	
	bcc	
	Subject	Re: EPA Subpart W Website

Darrell,

No radon monitoring at evaporation ponds required. We did that a couple of years ago through section 114 letters to get an idea of radon flux at ponds, which is minimal.

Reid J. Rosnick
Radiation Protection Division (6608J)
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1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

"Darrell Liles" Hey Reid, Thanks for sending me this. ... 03/28/2012 10:33:37 AM

From: "Darrell Liles" <dliles@senesusa.com>
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/28/2012 10:33 AM
Subject: EPA Subpart W Website

Hey Reid,

Thanks for sending me this.   I noticed the letters EPA sent out to have radon flux measured over the evap ponds. Will we have to include flux monitoring over evap ponds in our application? I knew we would for the tailings cell to comply with NESHAPS but didn't think we would over the Evap pond(s).

Talked to the engineers about the continous disposal option. They realize that there will be some operational issues (i.e only ten acres uncover/operational). They are exploring options but have several ideas that seem viable to me.

Darrell

On Tue, 27 Mar 2012 10:22:07 -0400, Reid Rosnick <Rosnick.Reid@epamail.epa.gov> wrote:

http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

----

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Darrell Liles, CHP, PE
Sr. Health Physicist
SENES Consultants Limited
8310 South Valley HighwaySuite 3014
Englewood, Colorado, USA80112
email: dliles@senesusa.com
phone: 303 524 1406
cell: 303 717 3257

EPA-581

Reid Rosnick/DC/USEPA/US	To	Susan Stahle
03/29/2012 08:59 AM	cc	
	bcc	
	Subject	Re: Fw: Final Agency Review, Subpart W Proposed Rule

Sue,

No problem. We had actually been shooting for April 17, but we were told that the 15 business days between the FAR announcement could not include the day of the announcement of the day of FAR. Ah, process!

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Susan Stahle Reid - I am putting this on my calendar,... 03/28/2012 03:05:25 PM

From: Susan Stahle/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Cc: Wendy Blake/DC/USEPA/US@EPA
Date: 03/28/2012 03:05 PM
Subject: Fw: Final Agency Review, Subpart W Proposed Rule

Reid - I am putting this on my calendar, but I am actually out this day (it is my compressed day), and not able to call in at this time. Would you please invite Wendy Blake to this meeting so she can represent OGC at the meeting (assuming she is available)? Thanks.

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
ph: (202) 564-1272
fax: (202) 564-5603
stahle.susan@epa.gov

----- Forwarded by Susan Stahle/DC/USEPA/US on 03/28/2012 03:04 PM -----

Final Agency Review, Subpart W Proposed Rule

Thu 04/19/2012 1:00 PM - 2:00 PM

Attendance is for Susan Stahle

Chair: **Reid Rosnick/DC/USEPA/US**

Location: Call-in number - 866-299-3188 Rooms: 1310L Room 502/DC-1310L-OAR@EPA

Conference Code 2023439563

Required:	Angelique Diaz/R8/USEPA/US@EPA, Barry Elman/DC/USEPA/US@EPA, CharlesA Hooper/R7/USEPA/US@EPA, Charlie Garlow/DC/USEPA/US@EPA, Davis Zhen/R10/USEPA/US@EPA, George Brozowski/R6/USEPA/US@EPA, Marilyn Ginsberg/DC/USEPA/US@EPA, Nicole Owens/DC/USEPA/US@EPA, Robert Dye/R7/USEPA/US@EPA, Stephen Hoffman/DC/USEPA/US@EPA, Stuart Walker/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tim Benner/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Wanda Farrar/DC/USEPA/US@EPA
Optional:	Alan Perrin/DC/USEPA/US@EPA, Andrea Cherepy/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Mariana Cubeddu/DC/USEPA/US@EPA, Philip Egidi/DC/USEPA/US@EPA, Raymond Lee/DC/USEPA/US@EPA, Tom Eagles/DC/USEPA/US@EPA

Description

[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev15.docx" deleted by Reid Rosnick/DC/USEPA/US] [attachment "Workgroup Members and Contact Information.docx" deleted by Reid Rosnick/DC/USEPA/US] [attachment "Draft Action MEMO Subpart W.docx" deleted by Reid Rosnick/DC/USEPA/US] [attachment "FAR Memo -- Subpart W.pdf" deleted by Reid Rosnick/DC/USEPA/US] All, Attached for the FAR meeting are the announcement memo, the draft action memo, a list of workgroup members and the draft preamble and rule language. Please let me know if you have any questions or comments. Thanks.

Personal Notes

EPA-5093

Carl Daly/R8/USEPA/US

03/29/2012 12:13 PM

To Angelique Diaz

cc

bcc

Subject Accepted: Subpart W FAR Briefing

EPA-5075

Deborah Lebow-Aal/R8/USEPA/US	To	Angelique Diaz
03/29/2012 12:18 PM	cc	
	bcc	
	Subject	Accepted: Subpart W FAR Briefing

EPA-6255

Marilyn Ginsberg/DC/USEPA/US

03/29/2012 07:15 PM

To Reid Rosnick

cc

bcc

Subject Subpart W Final Agency review

Hi Reid,

I'm pretty sure that my Office (OGWDW) won't have any comments. I'm looking at one final doc from you and then I'll let my management know what I think. Three questions, please, it appears that the April 19 meeting is for workgroup members, but when is the meeting for senior managers? Also, if we have no comments and no need to have a senior manager involved, how do I formally let the right person know? Lastly, is there another OW workgroup member, one form another office in OW?

Thanks, Marilyn

EPA-5880

Marilyn Ginsberg/DC/USEPA/US

03/30/2012 06:41 PM

To Ann Codrington, Ronald Bergman

cc

bcc GINSBERG.MARILYN

Subject Subpart W -- Final Agency review

Hi Ann and Ron,

I have received notice that the Final Agency Review for revisions to National Emissions Standards for Operating Mill Tailings (Tier 2; SAN 5281) will be held on April 19. I think that although I represent OGWDW, I'm technically not on the workgroup, because the rule doesn't really affect us (OGWDW, and likely the rest of OW). I've dutifully read all the materials that have been circulated for comment (they were thrilling and had a great plot) to make sure that we didn't miss a chance to make necessary comments, and I did make some to add clarity and consistency with existing terminology. If I briefed you, that's about all that I'd say. I certainly don't think that the OD or AA needs to get involved, or, for that matter, anyone in our management chain. If you agree that National Emissions Standards for Operating Mill Tailings is not a high priority for our management, please let me know, because I have to send out a formal e-mail -- we were notified that:

> **"If a participating Office or Region is not represented at the FAR meeting and has not previously contacted the Workgroup Chair and Nicole Owens in writing with his or her AA 's or RA's position prior to the meeting , "concurrence without comment " will be assumed ."**

Thanks, MG

EPA-5772

Marilyn Ginsberg/DC/USEPA/US	To	Reid Rosnick
03/30/2012 06:41 PM	cc	
	bcc	
	Subject	Re: Subpart W Final Agency review

Hi Reid,
The one remaining question is, am I correct that the April 19 meeting is not for senior mangers, but, rather, for workgroup members who are representing the AA or RA? Thanks, M

Reid Rosnick	Hi Marilyn, I appreciate the fact that yo...	03/30/2012 07:18:52 AM

From: Reid Rosnick/DC/USEPA/US
To: Marilyn Ginsberg/DC/USEPA/US@EPA
Date: 03/30/2012 07:18 AM
Subject: Re: Subpart W Final Agency review

Hi Marilyn,

I appreciate the fact that your office might not have comments. You are the only representative from OW on the workgroup. The FAR process works as follows:

Nicole Owens of OPEI's Regulatory Management Division (RMD) will chair the FAR meeting and distribute a memorandum following the meeting that documents all positions provided and any further action agreed upon at the meeting.

Each lead workgroup member is expected to represent the position of his or her Assistant/Associate/Regional Administrator (AA or RA) at FAR (so you will need to brief your management), and may take one of the following three positions:

1). If an office has minor, *non-substantive comments,* they may **concur without comment**.

2). If an office has *substantive comments*, they may **concur with comment**. While the lead program should try to resolve the issue(s) raised by the comments, it may choose to go forward to OMB for review, or to the Administrator for signature, without resolving the issues. The lead office is responsible for working with all of the offices that provided substantive comments to determine how to address the comments. If the offices cannot agree on a way to address the comments, the lead office must include the comments in the action memorandum with an explanation of why it cannot satisfactorily address the comments.

3). If an office feels that *a major issue remains unresolved* (e.g., the action lacks legal authority or conflicts with other EPA rules or policies), it may **non-concur**. Non-concurrence indicates that the AA or RA objects to the action being forwarded to OMB, or to the Administrator for signature.

If a participating Office or Region is not represented at the FAR meeting and has not previously contacted the Workgroup Chair and Nicole Owens in writing with his or her AA's or RA's position prior to the meeting, "concurrence without comment" will be assumed.

I have attached the FAR announcement memo that was distributed with the meeting invitation that outlines the process in more detail. Please let me know if you have additional questions. Thanks

Reid

[attachment "FAR Memo -- Subpart W.pdf" deleted by Marilyn Ginsberg/DC/USEPA/US]

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Marilyn Ginsberg Hi Reid, I'm pretty sure that my Of... 03/29/2012 07:15:55 PM

From: Marilyn Ginsberg/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/29/2012 07:15 PM
Subject: Subpart W Final Agency review

Hi Reid,
I'm pretty sure that my Office (OGWDW) won't have any comments. I'm looking at one final doc from you and then I'll let my management know what I think. Three questions, please, it appears that the April 19 meeting is for workgroup members, but when is the meeting for senior managers? Also, if we have no comments and no need to have a senior manager involved, how do I formally let the right person know? Lastly, is there another OW workgroup member, one form another office in OW?
Thanks, Marilyn

EPA-5881

Ronald Bergman/DC/USEPA/US

03/30/2012 10:30 PM

To Marilyn Ginsberg

cc

bcc

Subject Re: Subpart W -- Final Agency review

Hi Marilyn,

I agree that this doesn't have a significant impact on us, so I'm okay with you saying we have no comment. Are you the only OW representative on the workgroup?

-----Marilyn Ginsberg/DC/USEPA/US wrote: -----
To: Ann Codrington/DC/USEPA/US@EPA, Ronald Bergman/DC/USEPA/US@EPA
From: Marilyn Ginsberg/DC/USEPA/US
Date: 03/30/2012 06:41PM
Subject: Subpart W -- Final Agency review

Hi Ann and Ron,

I have received notice that the Final Agency Review for revisions to National Emissions Standards for Operating Mill Tailings (Tier 2; SAN 5281) will be held on April 19. I think that although I represent OGWDW, I'm technically not on the workgroup, because the rule doesn't really affect us (OGWDW, and likely the rest of OW). I've dutifully read all the materials that have been circulated for comment (they were thrilling and had a great plot) to make sure that we didn't miss a chance to make necessary comments, and I did make some to add clarity and consistency with existing terminology. If I briefed you, that's about all that I'd say. I certainly don't think that the OD or AA needs to get involved, or, for that matter, anyone in our management chain. If you agree that National Emissions Standards for Operating Mill Tailings is not a high priority for our management, please let me know, because I have to send out a formal e-mail -- we were notified that:

> **"If a participating Office or Region is not represented at the FAR meeting and has not previously contacted the Workgroup Chair and Nicole Owens in writing with his or her AA's or RA's position prior to the meeting, "concurrence without comment" will be assumed."**

Thanks, MG

EPA-1704

Reid Rosnick/DC/USEPA/US		To	Beth Miller
01/17/2012 08:39 AM		cc	
		bcc	
		Subject	Fw: WA 1-04 Task 3 Draft Report

Reid J. Rosnick
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rosnick.reid@epa.gov

----- Forwarded by Reid Rosnick/DC/USEPA/US on 01/17/2012 08:39 AM -----

From: Brian Littleton/DC/USEPA/US
To: Steve Marschke <smarschke@scainc.com>
Cc: <LSkoski@aol.com>, "Abe Zeitoun" <azeitoun@scainc.com>, "Bob Barton, SC&A" <bbarton@scainc.com>, Reid Rosnick/DC/USEPA/US@EPA
Date: 09/07/2010 02:12 PM
Subject: Fw: WA 1-04 Task 3 Draft Report

Steve et al,

Please review the comment that Reid had regarding the Task 3 deliverable and be prepared to discuss it at our next conference call. I recommend moving the conference call to Sept 23, 2010 at 11:00 am. My understanding is that work is proceeding on the other tasks for this work assignment and you don't need any immediate direction to continue working. Reid is out next week and I would like him to be available for any of our calls, since any changes affect his project schedule.

Thanks,
Brian
****

Brian Littleton
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1200 Pennsylvania Avenue, NW - Mailcode 6608J
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(202) 343-9216

----- Forwarded by Brian Littleton/DC/USEPA/US on 09/07/2010 01:57 PM -----

From: Reid Rosnick/DC/USEPA/US
To: Brian Littleton/DC/USEPA/US@EPA
Date: 09/07/2010 08:48 AM
Subject: Fw: WA 1-04 Task 3 Draft Report

Hi Brian,

I have reviewed the draft report, and, really, I thought it looked OK. I have just one comment:

Two of the evaluation criteria that SC&A listed (although neither one had much of a weight factor) as relevant were 1) Input parameter sensitivity analysis and 2) Probabilistic analysis capability. When the final recommendation for the code was made, and CAP88 was chosen, SC&A states that the code lacks the capability to perform sensitivity and probability analyses. They then state that it is not anticipated that either of these analyses will play a major role in the use of the code. So my question is, why then, were these listed as relevant criteria? Also, I think SC&A should expand on the discussion of why these two parameters will not play a major role in the work, so as to remove doubt that by lacking these capabilities we are not hurting our efforts by using CAP88.

That's all I could find, please let me know if you need more information. Thanks

Reid

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----- Forwarded by Reid Rosnick/DC/USEPA/US on 09/07/2010 08:32 AM -----

From:	"Steve Marschke" <stevemarschke@frontiernet.net>
To:	Reid Rosnick/DC/USEPA/US@EPA, Brian Littleton/DC/USEPA/US@EPA
Cc:	"Steve Ostrow" <sostrow@scainc.com>, <LSkoski@aol.com>, "Judy Eley" <jeley@scainc.com>, "Bob Barton, SC&A" <bbarton@scainc.com>, "Abe Zeitoun" <azeitoun@scainc.com>
Date:	08/31/2010 10:53 AM
Subject:	WA 1-04 Task 3 Draft Report

Good morning Brian,

Attached for EPA's review is the draft report for WA 1-04, Task 3.

Steve WA 1-04 Task 3 - Draft.pdf

Risk Assessment Revision for 40 CPR Part 61 Subpart W – Radon Emissions from Operating Mill Tailings

Task 3 – Risk Assessment Model

Prepared by:

S. Cohen & Associates
1608 Spring Hill Road, Suite 400
Vienna, VA 22182

under

Contract Number EP-D-10-042
Work Assignment No. 1-06, Task 5

Prepared for:

U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Brian Littleton
Work Assignment Manager

August 31, 2010

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EXECUTIVE SUMMARY

The Office of Radiation and Indoor Air (ORIA) promulgated National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for radon emissions from operating uranium mill tailings impoundments (Subpart W) on December 15, 1989. In support of Subpart W, as well as other portions of radiolonuclide NESHAP, ORIA published a Final Environmental Impact Statement (FEIS) and a three volume Background Information Document (BID), that provided 1) a detailed description of the Agency's procedures and methods for estimating radiation dose and risk due to radionuclide emissions to the air, 2) detailed risk estimates for each source of emissions, and 3) detailed economic assessments for each source of emissions.

The purpose of this Work Assignment is to revise the risk assessment for the NESHAP for Radionuclides from uranium mill tailing facilities. The information developed in this Work Assignment will be used by the Agency in the determination of whether the existing standards for Subpart W need revising, and, if so, what may represent reasonable revisions to the standard.

As documented in the BID, the FEIS used AIRDOS to calculate dose and risk to the public. This report reviews the appropriateness of using AIRDOS to calculate individual and population dose and risk. Currently available computer models have been reviewed to determine whether models other than AIRDOS exist for calculating dose and risk from the management of uranium byproduct materials from the processing of uranium ores. The atmospheric release risk assessment models reviewed for this Work Assignment were:

- **AIRDOS**: The AIRDOS computer code was developed at Oak Ridge National Laboratory (ORNL) to estimate individual (rem/year) and population (man-rem/year) doses resulting from the atmospheric release of radionuclides from a nuclear facility. Atmospheric dispersion and surface deposition of released radionuclides are estimated as a function of direction and distance from a nuclear power plant or fuel-cycle facility, and doses to man through inhalation, air immersion, exposure to contaminated ground, food ingestion, and water immersion are estimated in the surrounding area. Radionuclide concentrations in food products are estimated from the output of the atmospheric transport model using the terrestrial transport model described in U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.109. Annual doses are estimated for total body, GI tract, bone, thyroid, lungs, muscle, kidneys, liver, spleen, testes, and ovaries.
- **CAP88**: The CAP88 (which stands for Clean Air Act Assessment Package - 1988) computer model is a set of computer programs, databases and associated utility programs for estimation of dose and risk from radionuclide emissions to air. CAP88 is composed of modified versions of AIRDOS-EPA and DARTAB. CAP88-PC Version 3 incorporates dose and risk factors from Federal Guidance Report 13. CAP88-PC is a U.S. Environmental Protection Agency (EPA) approved system for demonstrating compliance with 40 CFR 61 Subpart H, the Clean Air Act standard which applies to U.S. Department of Energy (DOE) facilities that emit radionuclides to air. EPA will provide the latest version of CAP88 to SC&A for evaluation, otherwise, SC&A will evaluate Revision 3, currently available from the EPA website: http://www.epa.gov/radiation/assessment/CAP88/.

- **GENII**: The GENII system, developed by the Pacific Northwest National Laboratory (PNNL), includes the capabilities for calculating radiation doses following chronic and acute releases. Radionuclide transport via air, water, or biological activity may be considered. Air transport options include both puff and plume models. Building wake effects can be included in acute atmospheric release scenarios. The code provides risk estimates for health effects to individuals or populations; these can be obtained using the code by applying appropriate risk factors to the effective dose equivalent or organ dose. In addition, GENII Version 2 uses cancer risk factors from Federal Guidance Report 13 to estimate risk to specific organs or tissues.
- **RESRAD**: RESRAD is a computer model developed by Argonne National Laboratory to estimate radiation doses and risks from RESidual RADioactive materials. Since 1989, RESRAD has been used widely by DOE, its operations and area offices, and its contractors for deriving limits for radionuclides in soil. RESRAD has also been used by EPA, U.S. Army Corps of Engineers, NRC, industrial firms, universities, and foreign government agencies and institutions.
- **MILDOS-AREA**: The Argonne National Laboratory also developed MILDOS-AREA, a computer code that calculates the radiological dose commitments received by individuals and the general population within an 80-km radius of an operating uranium recovery facility. The transport of radiological emissions from point and different area sources is predicted with a sector-averaged Gaussian plume dispersion model. Mechanisms such as radioactive decay, plume depletion by deposition, in-growth of decay products, and resuspension of deposited radionuclides are included in the transport model. Alterations in operation throughout the facility's lifetime can be accounted for in the input stream. The exposure pathways considered are: inhalation; external exposure from groundshine and cloud immersion; and ingestion of vegetables, meat, and milk. Dose commitments are calculated primarily on the basis of the recommendations of the International Commission on Radiological Protection (ICRP). Only airborne releases of radioactive materials are considered in MILDOS-AREA; releases to surface water and to groundwater are not addressed in MILDOS-AREA. MILDOS-AREA is a multi-purpose code that can be used to evaluate population doses for NEPA assessments, maximum individual doses for predictive 40 CFR 190 compliance evaluations, or maximum offsite air concentrations for predictive evaluations of 10 CFR 20 compliance.
- **MEPAS**: Multimedia Environmental Pollutant Assessment System (MEPAS), developed by the Pacific Northwest Laboratory (PNL), is a suite of integrated impact assessment software comprising physics-based fate and environmental transport models of air, soil, and water media. MEPAS simulates the release of contaminants from a source; transport through the air, groundwater, surface water, and/or overland pathways; and transfer through food chains and exposure pathways to the exposed individual or population. For human health impacts, risks are computed for carcinogens and hazard quotients for noncarcinogens.
- **AERMOD**: AERMOD was developed by the AERMIC (American Meteorological Society (AMS)/U.S. Environmental Protection Agency (EPA) Regulatory Model Improvement Committee) as a state-of-the-practice Gaussian plume dispersion model whose formulation is based on planetary boundary layer principles. The AERMOD model utilizes a probability density function and the superposition of several Gaussian

plumes to characterize the distinctly non-Gaussian nature of the vertical pollutant distribution for elevated plumes during convective conditions; otherwise the distribution is Gaussian. Also, nighttime urban boundary layers (and plumes within them) have the turbulence enhanced by AERMOD to simulate the influence of the urban heat island. The AERMOD model is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area and volume sources).

Each of the above computer models was described and discussed in detail, including the results of any benchmarks that were performed between the models. During this phase of the review, four of the models (AIRDOS, GASPAR, GENII-NESHAPS, and AERMOD) were eliminated from further evaluation. Next, a detailed evaluation of the remaining five atmospheric release risk assessment models was performed. The criteria used in the detailed evaluation are shown in Table ES-1. To account for the fact that not all of the criteria were considered to be of equal importance, weight factors were assigned to each of the criteria, as shown in Table ES-1.

Table ES-1. Evaluation Criteria

Evaluation Criteria	Weight Factor
Exposure Pathways Modeled	2
Population Dose/Risk Capability	2
Dose Factors Used	1.75
Risk Factors Used	1.75
Meteorological Data Processing	1.5
Source Term Calculations	1.5
Verification and Validation	1.25
Ease of Use/User Friendly	1.25
Documentation	1
Sensitivity Analysis Capability	1
Probabilistic Analysis Capability	1

The results of the detailed evaluation are shown in Table ES-2.

Table ES-2. Evaluation Results

Evaluation Criteria	Score
RESRAD-OFFSITE	66.25
CAP88	65.5
GENII	61.75
MEPAS	57
MILDOS-AREA	48

As Table ES-2 shows, RESRAD-OFFSITE was the highest scoring of the five codes, narrowly edging out CAP88. However, it is recommended that CAP88, and not RESRAD-OFFSITE, be used to perform the dose and risk calculations required for this Work Assignment. The reasons for this recommendation include:

- RESRAD-OFFSITE does not include the ability to perform population dose and risk estimates, which means that the RESRAD-OFFSITE results would need to be supplemented with population dose and risk estimates from another source. CAP88, on the other hand, is specifically designed to assess radiological emissions to the public.
- The major area where CAP88 is lacking is sensitivity and probability analyses. For this Work Assignment, it is not anticipated that sensitivity or probability analysis will play a major role.
- RESRAD-OFFSITE incorporates CAP88 air dispersion modeling, which means that there are no significant technical differences between the two codes for the purpose of this Work Assignment.
- CAP88 was developed as a predecessor to AIRDOS which was the original code used in the evaluation of mill tailing impoundments during the development of the NESHAPs for radon emissions in 1989.

1.0 INTRODUCTION AND BACKGROUND

The Office of Radiation and Indoor Air (ORIA) promulgated National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for radon emissions from operating uranium mill tailings impoundments (Subpart W) on December 15, 1989. In support of Subpart W, as well as other portions of radiolonuclide NESHAPs, ORIA published a Final Environmental Impact Statement (FEIS) and a three volume Background Information Document (BID) that provided 1) a detailed description of the Agency's procedures and methods for estimating radiation dose and risk due to radionuclide emissions to the air, 2) detailed risk estimates for each source of emissions, and 3) detailed economic assessments for each source of emissions.

The purpose of this Work Assignment is to revise the risk assessment for the NESHAPs for radionuclides from uranium mill tailing facilities. The information developed in this Work Assignment will be used by the Agency in the determination of whether the existing standards for Subpart W need revising, and, if so, what may represent reasonable revisions to the standard.

As documented in the BID, the FEIS used AIRDOS to calculate dose and risk to the public. This report reviews the appropriateness of using AIRDOS to calculate individual and population dose and risk. Currently available computer models have been reviewed to determine whether models other than AIRDOS exist for calculating dose and risk from the management of uranium byproduct materials from the processing of uranium ores. The report examines the applicability of available models to evaluate radon emissions from operating mill tailings impoundments. By evaluating the various modeling codes against a set of predetermined criteria (outlined in Section 3), it will be determined which code is most suitable for the purposes of determining current dose and risk conditions at these operating sites. The modeling codes will be considered based on their applicability to the problem, whether current analytical methods are employed (such as dose and risk factors), the ability to process population and meteorological data, to what extent the code is documented/validated, and finally, how user friendly and intuitive the code is.

The report is organized into three main sections (Sections 2-4): Section 2 provides a description of the computer models that were evaluated, Section 3 presents the evaluation criteria and results of the evaluation for the main codes selected, and the final section summarizes the results of the evaluation and recommends which code should be used for the individual and population dose and risk analysis, which will be performed as part of Task 4 of this Work Assignment.

2.0 RISK ASSESSMENT MODELS

2.1 AIRDOS, AIRDOS-II, and AIRDOS-EPA

The AIRDOS computer code was developed at Oak Ridge National Laboratory (ORNL) to estimate individual (rem/year) and population (man-rem/year) doses resulting from the atmospheric release of radionuclides from a nuclear facility. Atmospheric dispersion and surface deposition of released radionuclides are estimated as a function of direction and distance from a nuclear power plant or fuel-cycle facility, and doses to man through inhalation, air immersion, exposure to contaminated ground, food ingestion, and water immersion are estimated in the surrounding area. Radionuclide concentrations in food products are estimated from the output of the atmospheric transport model using the terrestrial transport model described in U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.109. Annual doses are estimated for total body, GI tract, bone, thyroid, lungs, muscle, kidneys, liver, spleen, testes, and ovaries. For additional information regarding the development of AIRDOS, refer to Moore 1975, Moore 1977, and Moore, et al. 1979.

Of particular interest to this Work Assignment, in 1978, the NRC used AIRDOS-II to perform a detailed analysis of the radiological impact of the Irigaray project of solution mining (in situ leaching) operations involving uranium ore deposits in Johnson County, Wyoming. The results of the NRC's AIRDOS-II analysis are presented in the Final Environmental Statement for the Irigaray project (NUREG-0481).

For the NESHAPs for Radionuclides, EIS risk assessment (EPA/520/1-89-005), EPA used AIRDOS-EPA to calculate environmental concentrations resulting from radionuclide emissions into air. The results of the AIRDOS-EPA analysis were estimates of air and ground surface radionuclide concentrations; intake rates via inhalation of air; and ingestion of radioactivity via meat, milk, and fresh vegetables. The AIRDOS-EPA calculated concentration and intake rates, as well as other parameters (such as particle size, respiratory clearance class, and gastrointestinal absorption factor), were passed on to the DARTAB computer program for dose and risk assessments. The DARTAB computer program provides an estimate of the impact of radionuclide emissions by combining information on the amounts of radionuclides inhaled and/or ingested with dosimetric and health effect data for a given quantity of each radionuclide. In addition to the AIRDOS-EPA provided data, the DARTAB NESHAPs for Radionuclides, EIS assessment utilized dosimetric and health effect data that were calculated by RADRISK. The RADRISK program calculates the dose rate to organs resulting from the inhalation or ingestion of a given quantity of a radionuclide. The organ dose rates are then processed by RESRAD to calculate the risk of fatal cancer to a cohort of people. For approximately 500 radionuclides, the calculated risks (i.e., the probability of premature death for a member of the cohort due to inhalation or ingestion of a given quantity of each radionuclide) are written to a data file by RADRISK so that they can be accessed by other computer programs (e.g., DARTAB).

On October 31, 1989, under 40 CFR Part 61, NESHAPs, the EPA issued the final rules for radionuclide emissions to air. AIRDOS-EPA, DARTAB, and the RADRISK dose and risk factors were combined into the Clean Air Act Assessment Package-1988 (CAP88) and used to generate risk estimates for the risk assessment supporting this rule. With the issuance of CAP88, AIRDOS-EPA, DARTAB, and RADRISK ceased to exist as standalone computer programs. CAP88 is discussed below.

2.2 CAP88

As stated above in the AIRDOS discussion, the CAP88 was developed in 1988 from the AIRDOS, RADRISK, and DARTAB computer programs. The initial version of CAP88 ran on large mainframe computers at ORNL, however, in the late 1980s, the EPA and the U.S. Department of Energy (DOE) began a cooperative project to produce a personal computer version of CAP88 — CAP88-PC, which was released in March 1992. CAP88 implements the NRC's Regulatory Guide 1.109 methodology for calculating doses from the terrestrial food pathways.

Among the modifications and enhancements made to CAP88 during its conversion to CAP88-PC include the fact that CAPP88-PC estimates risk as well as dose. CAP88-PC was modified to perform either "Radon-only" or "Non-Radon" runs, to conform to the format of the 1988 Clean Air Act NESHAPs Rulemaking. "Radon-only" assessments, which only have Rn-222 in the source term, automatically include working level calculations; all other source terms ignore working levels. Also, the organs and weighting factors are modified to follow the ICRP 26/30 Effective Dose Equivalent calculations, which eliminates flexibility on specifying organs and weighting factors. In February 1992, CAP88-PC, Version 2.0 was approved for demonstrating compliance with 40 CFR Part 61 "Subpart H – National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities".

In March 2000, Version 2 of CAP88-PC was issued. CAP88-PC, Version 2 provided a framework for developing inputs to perform full-featured dose and risk assessments in a Windows environment, as well as some minor changes to the DOS version. Like Version 1.0, Version 2.0 of CAP88-PC was approved for demonstrating compliance with 40 CFR Part 61 in October 1999.

In May 2002, CAP88-PC, Version 2.1 was issued. Version 2.1 included changes in installation and operating environment (e.g., improvements in the Windows code error handling), as well as changes to increase the programs flexibility (e.g., site-specific humidity, site-specific distance and sector, and higher radionuclide limit).

In August 2002, CAP88-PC, Version 3.0 was issued. Version 3.0 is a significant update to Version 2.1. Some of the Version 3 enhancements include:

- Incorporated the dose and risk factors from Federal Guidance Report (FGR) 13, in place of the RADRISK data that was used in previous versions
- Expansion of the nuclide database to 825 nuclides which include all the FGR 13-based decay chains
- Eliminated calculation of genetic effects
- Dose factors are now a function of chemical form where specified in FGR 13

- Organ dose equivalent is calculated for 23 internal organs, mortality risk is calculated for 15 cancer sites
- Internal absorption class terminology updated to F (fast), M (medium), and S (slow)
- All particulates are assumed to be 1.0 micron in accordance with the FGR 13 model, with the exception of gases and vapor which are '0'
- Radionuclide transfer factors have been updated to reflect NCRP Report #123
- Version 3 has added (though not fully implemented) age dependent dose factors, cancer morbidity risk factors, additional pathways such as drinking water ingestion and external exposure from multiple depths of soil

In 1994 Maheras, et al. performed a benchmarking of CAP88 to the GENII computer program. The following is a summary of their results:

> The results of the benchmark tests were within the 95% acceptance region specified in the test protocol. CAP-88 was found to over-predict effective dose equivalent relative to GENII for elevated releases, largely because CAP-88 calculates a larger atmospheric dispersion factor (chi/Q) than does GENII using the same meteorological data. However, CAP-88 consistently under-predicted effective dose equivalent relative to GENII for ground-level releases. This was because CAP-88 accounts for the processes of plume depletion by dry and wet deposition while GENII does not account for these processes. The effect of depletion was tested and found to be most important for a ground-level release of a highly depositing species such as radioiodine which implies that acceptable benchmark results would be difficult to obtain for a highly depositing species.

ANL/ES-161 presents the results from benchmarking CAP88 against MILDOS-AREA. The ANL/ES-161 results are summarized below in the MILDOS-AREA discussion (Section 2.5).

CAP88-PC was benchmarked against RESRAD-OFFSITE and the results are presented in ANL/EVS/TM/06-3, Section 3. Four areas were tested:

- Simple dispersion model – For the simple dispersion model, ANL/EVS/TM/06-3 reported that the agreement between CAP88-PC and RESRAD-OFFSITE was good, and that the differences for all distances were approximately 6% or less, except at 100 meters where a 13% difference was found. ANL/EVS/TM/06-3 concluded that these differences can be attributed to variations in the vertical dispersion coefficient and the actual area source methodology.
- Dry deposition – For dry deposition, good agreement between the codes was obtained for receptor distances of less than 10,000 meters. After 10,000 meters, the RESRAD-OFFSITE air concentration is about 3 times larger than that from CAP88-PC.
- Wet deposition – Aside from the 100-meter location, RESRAD-OFFSITE and CAP88-PC results remain within 10% of each other out to a distance of approximately 3,000 meters. Thereafter, the CAP88-PC results become increasingly larger than the RESRAD-OFFSITE results up to 80,000 meters.

- Plume rise – The RESRAD-OFFSITE and CAP88-PC plume rise results agree to within about 15% or less for receptor distances of less than 500 meters. After 500 meters, plume rise has negligible differences between the two programs.

In DOE/ORO-2033, MEPAS was benchmarked against RESRAD-OFFSITE. Because CAP88 is linked to RESRAD to perform atmospheric dispersion calculations, DOE/ORO-2033 was in effect a benchmarking of CAP88 against MEPAS. Two comparisons were performed:

- Air concentration – A constant emission of thorium-228 was assumed. The air concentration comparisons show that nearly identical results are obtained with the models for the direct air release scenario.
- Deposition – The soil concentrations at 1 km resulting from deposition from the thorium-228 plume over the 10 years. The deposition comparisons show the models give approximately the same results. At the 1.0-km distance, the magnitude of the predicted deposition rates reflects mainly the predicted air concentrations and the deposition velocities.

Finally, Lehto, et al. (2000) state that the milk cow and meat cattle densities are entered into CAP88 in units of "per square kilometer, but this is erroneous according to [B. Parks]." If CAP88 is to be used, then the correct units for entering milk cow and meat cattle densities will need to be used.

2.3 GENII with FRAMES

The Hanford Environmental Dosimetry Upgrade Project was undertaken to incorporate the internal dosimetry models recommended by the International Commission on Radiological Protection (ICRP) into updated versions of the environmental pathway analysis models used at Hanford. The resulting second generation of Hanford environmental dosimetry computer codes was compiled in the Hanford Environmental Dosimetry System (Generation II, or GENII). The purpose of this coupled system of computer codes was to analyze environmental contamination resulting from acute or chronic releases to, or initial contamination of, air, water, or soil. This was accomplished by calculating radiation doses to individuals or populations. The GENII system was designed to provide a state-of-the-art, technically peer-reviewed, documented set of programs for calculating radiation doses from radionuclides released to the environment.

GENII was designed to include the capabilities: 1) for calculating radiation doses for acute releases, with options for annual dose, committed dose, and accumulated dose; 2) for calculating the same types of doses from chronic releases; and 3) for evaluating exposure pathways including direct exposure via water (swimming, boating, and fishing), soil (surface and buried sources), air (semi-infinite cloud and finite cloud geometries), inhalation pathways, and ingestion pathways.

The GENII release scenarios include acute releases to air from ground level or elevated sources, or to water; chronic releases to air from ground level or elevated sources, or to water; and initial contamination of soil or surfaces. GENII accounts for source term variations, including decay of radionuclides to the start of the exposure scenario, input of total radioactivity or specified fractions, and input of measured concentrations in specified environmental media. Air transport options include both puff and plume models. Building wake effects can be included in acute atmospheric release scenarios. Interfaces were provided for external calculations of atmospheric dispersion, geohydrology, biotic transport, and surface water transport. The model used by GENII to estimate radionuclide concentration in edible plant portions considers uptake from two pathways: direct deposition and absorption through roots from soil. The model is a variant of that prepared for the NRC for use in Regulatory Guide 1.109. Target populations were identified by distance and direction for individuals, populations, and for intruders into contained sources. The code provides risk estimates for health effects to individuals or populations; these can be obtained using the code by applying appropriate risk factors to the effective dose equivalent or organ dose. In addition, GENII, Version 2 implements these models plus those of ICRP Publications 56 through 72 and the related risk factors published in Federal Guidance Report 13.

The original version of GENII, released in 1988, was composed of seven interrelated computer codes and their associated data libraries. The connection between the codes is through data transfer files, i.e., the output of one code is stored in a file that can be read by the next code in the system. The environmental transport calculations were performed in ENV, while the individual and population doses were calculate in DOSE. The code DITTY was used to calculate long-term (>10,000 years) exposures. External and internal dose factors were calculated by the EXTDF and INTDF codes. Finally, two data preparation codes were provided: APPRENTICE and ENVIN. The experienced GENII user could stop the process at any point and edit the intermediate data transfer files to obtain specific information on the processes occurring or on intermediate results.

For maximum flexibility, the most current version of GENII, Version 2.10, has been divided into several interrelated, but separate, exposure and dose calculations consisting of four independent atmospheric models, one surface water model, three independent environmental accumulation models, one exposure module, and one dose/risk module, each with a specific user interface. GENII, Version 2.10 operates within the Framework for Risk Analysis in Multimedia Environmental System (FRAMES). FRAMES allows the addition of other computer modules to the GENII system. For example, GENII does not explicitly include modules for performing groundwater transport calculations, however, with FRAMES, groundwater transport models can be incorporated into the GENII model. Additional information on FRAMES is provided in Section 2.3.1.

In 1994, Maheras, et al. performed a benchmarking of CAP88 to the GENII computer program. The results of this benchmark are presented above in Section 2.2.

ANL/EAD/TM-24 benchmarked GENII against RESRAD. Unfortunately, the ANL/EAD/TM-24 benchmarking was mostly interested in comparing the two codes' ability to analyze ground contamination scenarios, rather than air release scenarios, so the ANL/EAD/TM-24 results are of little value to this Work Assignment.

2.3.1 FRAMES

Over the past 35 years, medium specific models have been and will continue to be developed in an effort to understand and predict environmental phenomena, including fluid-flow patterns (e.g., groundwater, surface water, and air), contaminant migration and fate, human or wildlife exposures, impacts from specific toxicants to specific species and their organs, cost-benefit analyses, impacts from remediation alternatives, etc. The DOE Office of Environmental Management (DOE-EM), the EPA Office of Research and Development (EPA-ORD), and the EPA Office of Radiation and Indoor Air (EPA-ORIA) have realized the need for a common platform to access and link these medium-specific models. The objective is to 1) combine existing models and approaches that assess hazardous and radioactive releases in and their impacts on the environment into a single framework and 2) structure the framework into a flexible and versatile, user-friendly tool that meets the needs of both organizations. FRAMES has been developed by Pacific Northwest National Laboratory (PNNL) to meet this need.

FRAMES is a software platform for selecting and implementing environmental software models for risk assessment and management problems. Currently, MEPAS and GENII are available in FRAMES, while other codes are scheduled to be included in the future. The FRAMES User Interface (FUI) allows users to link, select, and interact with environmental codes for environmental and human health analyses. The FUI is used to: create, access, save, and exit Global Input Data (GID) files; select module types and connections; run the scenario models in sequence; and perform several other functions. In this manner, FRAMES can be used to select the most desirable features of specific models and link them together into a superior single integrated model. For example, the output from a source term generation code (e.g., GALE) could be linked with a sophisticated atmospheric transport code (e.g., AERMOD) which is linked to an exposure pathways evaluation model (e.g., CAP88).

Unfortunately, as stated above, at this time only MEPAS and GENII are available in FRAMES, and since these two programs perform similar calculations, it's not clear that there is any advantage to the current FRAMES. Also, in order to take advantage of future FRAMES capabilities, the process necessary to setup and run a single model (i.e., GENII or MEPAS) within FRAMES is more complicated than to setup and run the same model outside of FRAMES (at least to the authors of this report). For these reasons, a wait-and-see attitude has been taken with regard to FRAMES, which will also influence the selection of GENII and MEPAS for use in this Work Assignment, since they are only available within FRAMES.

2.4 RESRAD-OFFSITE

RESRAD is a computer model developed by Argonne National Laboratory to estimate radiation doses and risks from RESidual RADioactive materials. Since its first release in 1989, RESRAD has been used widely by DOE, its operations and area offices, and its contractors for deriving limits for radionuclides in soil. RESRAD has also been used by the EPA, U.S. Army Corps of Engineers, NRC, industrial firms, universities, and foreign government agencies and institutions. RESRAD evaluates the radiological dose and excess cancer risk to an individual who is exposed while residing and/or working in an area where the soil is contaminated with radionuclides.

RESRAD-OFFSITE code is an extension of the original RESRAD code. The most current version is RESRAD-OFFSITE Version 2.6, which was released July 7, 2010.

RESRAD-OFFSITE considers initial radiological contamination in soil in settings ranging from a clean cover layer on top of it to up to five partially saturated layers below it. The code has a capability to model the radiation exposure of an individual who spends time directly above the primary contamination (onsite) and in the vicinity of the primary contamination (offsite).

Nine exposure pathways are considered in RESRAD-OFFSITE: direct exposure from contamination in soil, inhalation of particulates and radon, ingestion of plant foods, ingestion of meat, ingestion of milk, ingestion of aquatic foods, ingestion of water, and incidental ingestion of soil. By selecting different pathways, RESRAD-OFFSITE can be used to simulate various exposure scenarios, including Rural Resident Farmer, Urban Resident, Worker, and Recreationist.

The RESRAD Users Manual and the RESRAD-OFFSITE website (http://web.ead.anl.gov/resrad/home2/offsite.cfm) state that RESRAD-OFFSITE "links with the CAP88 computer code for performing air dispersion calculations".

Regarding radon, the RESRAD-OFFSITE Users Manual indicates that it uses the same model as RESRAD for onsite exposures, and the RESRAD Users Manual describes the radon model as:

> The primary environmental parameters that can influence the dispersion of radon in outdoor air are meteorological conditions, such as wind speed and stability class. The calculation of outdoor radon concentrations by using all these parameters requires a comprehensive atmospheric dispersion code such as the MILDOS-AREA code (…). These extensive computations are not practical for the purposes of the RESRAD code, because the average radon concentration outdoors on top of a radium-contaminated area would be dependent on the size of the contaminated area and the average wind speed, and it would not be very sensitive to other meteorological parameters.

In addition, RESRAD-OFFSITE includes radon transport to an offsite location. Radon offsite "concentrations are computed [by RESRAD-OFFSITE] from the flux of radon released from the primary contamination and the in-growth and decay-adjusted Chi/Q factors for radon and its short-lived progeny, computed from the atmospheric transport model." It is not clear from this if RESRAD-OFFSITE uses the CAP88 equilibrium fraction method for estimating the short-lived radon progeny concentrations (see Section 2.5), or if the progeny concentrations are calculated directly from the Bateman equation.

RESRAD-OFFSITE was benchmarked against CAP88-PC and the results are presented in ANL/EVS/TM/06-3, Section 3, and summarized above in Section 2.2.

ANL/EAD/TM-24 benchmarked RESRAD against GENII. Unfortunately, the ANL/EAD/TM-24 benchmarking was mostly interested in comparing the two codes' ability to analyze ground contamination scenarios, rather than air release scenarios, so the ANL/EAD/TM-24 results are of little value to this Work Assignment.

In 2008, as part of their verification of MILDOS-AREA, Argonne National Laboratory (ANL) compared the MILDOS-AREA air dispersion component with that of the RESRAD-OFFSITE code. The results of that comparison are summarized below in Section 2.5.

In DOE/ORO-2033, RESRAD-OFFSITE was benchmarked against MEPAS. Because CAP88 is linked to RESRAD to perform atmospheric dispersion calculations, DOE/ORO-2033 was, in effect, a benchmarking of CAP88 against MEPAS. The DOE/ORO-2033 results are summarized above in Section 2.2.

2.5 MILDOS-AREA

MILDOS estimates impacts from radioactive emissions from uranium milling facilities. These impacts are presented as dose commitments to individuals and the regional population within an 80-km radius of the facility. Only airborne releases of radioactive materials are considered: releases to surface water and to groundwater are not addressed in MILDOS, i.e., liquid exposure pathways are not treated by MILDOS. Exposure pathways of concern are assumed to be inhalation of airborne radioactive material, ingestion of vegetables, meat, and milk contaminated via deposition, and external exposure to radiation emitted by airborne activity and activity deposited on ground surfaces. MILDOS can be used to evaluate population doses for NEPA assessments, maximum individual doses for predictive 40 CFR 190 compliance evaluations, or maximum offsite air concentrations for predictive 10 CFR 20 compliance evaluations.

In the mid-1970s, UDAD (Uranium Dispersion And Dosimetry) was developed by ANL for the NRC to provide comprehensive estimates of the potential radiation dose rate and dose to the standard man and the standard population in the vicinity of a uranium processing facility, such as a uranium mill or mine. UDAD was applied, initially in 1976, for the assessment of the radiological impact of the Bear Creek uranium mining and milling project and was later expanded for generic evaluation of uranium milling in the United States. UDAD is documented in NUREG/CR-0553.

In 1981, MILDOS (NUREG/CR-2011) was developed by Pacific Northwest Laboratory (PNL) from UDAD. The models and assumptions on which the MILDOS program was based are described in the NRC Regulatory Guide 3.51 and NUREG/CR-0553. Models were included in MILDOS to consider both point sources (stacks, vents) and area sources (ore pads, tailing areas). Particulate release is limited to radionuclides of the uranium-238 decay series (i.e., U-238, Th-230, Ra-226, and Pb-210). Other radionuclides within the U-238 series are implicitly accounted for under the secular equilibrium assumption. Gaseous release was limited to consideration of Rn-222, plus ingrowth of daughters. The dose to exposed individuals is calculated for comparison with requirements of both 40 CFR 190 and 10 CFR Part 20. Ingestion dose factors were based on ICRP Publication 2 and 10A, inhalation dose factors were calculated in accordance with the ICRP's Task Group on Lung Dynamics' lung model (TGLM) (ICRP 1966 and 1972), and external dose factors were directly taken from Hones and Soldat (1977).

In 1989, Argonne National Laboratory developed the MILDOS-AREA code (ANL/ES-161) to provide enhanced capability to compute doses from large-area sources and to incorporate changes in methods for dosimetry calculations (ICRP 1979). The revised program was designed for use on IBM or IBM-compatible personal computers. MILDOS-AREA considers the same radionuclides as MILDOS. A validation study of MILDOS-AREA was conducted using measured Rn-222 concentration and flux data from the Monticello, Utah uranium mill tailings impoundment. The results of this study demonstrated that use of MILDOS-AREA can result in generally good agreement between model-generated and measured Rn-222 concentrations.

In 1997, MILDOS-AREA computer code was further updated by ANL to incorporate dose conversion factors derived by the ICRP recommendations of 1978, and to make it compatible with the January 1, 1994, revision of 10 CFR Part 20. The 1997 update also created an example problem for applying MILDOS-AREA to in-situ leach facilities.

In 1998, MILDOS-AREA was provided with the user-friendly software interface. This graphical user interface (GUI) is simple and easy to use and allows MILDOS-AREA to run under the Windows operating system.

ANL/ES-161, Appendix B presents a comparison between MILDOS-AREA and CAP88[1]. Calculated Rn-222 concentrations and working levels calculated by the two codes at 12 distances and four directions were compared. The Rn-222 concentrations calculated by the two codes are in very good agreement for distances greater than about 1 km for the release point, and, at closer distances, the CAP88 calculated Rn-222 concentrations are as much as 50% higher than the MILDOS-AREA concentrations.

However, for the working level calculations, the results are much different. Near the source (e.g., <1 km), the CAP88 calculated working levels are much greater (sometimes greater than an order of magnitude) than the MILDOS-AREA calculated working levels. At larger distances (e.g., 5 to 10 km), the working levels calculated by the two codes are about the same, and at even larger distances (e.g., 70 km), the MILDOS-AREA calculated working levels are greater (by up to about 50%) than the CAP88 calculated working levels. The reason for this is the different approaches used by the two codes to calculate radon decay product concentrations. CAP88 uses a fixed linear interpolation of the decay product equilibrium fraction beginning at 0.267 at 150 meters and reaching a final equilibrium fraction of 0.698 at 19,551 meters. MILDOS-AREA, on the other hand, directly calculates the radon daughter concentrations based on the Rn-222 concentration and plume travel time. The ANL/ES-161, Appendix B results indicate that radon daughter equilibrium factors are significantly less than 27% at small distances and greater than 70% at very large distances from the source.

In 2008, ANL prepared a limited-scope verification and benchmarking of MILDOS-AREA by comparing spreadsheet calculation results with MILDOS-AREA-generated reports. The differences between the simple spreadsheet calculations and the MILDOS-AREA-generated reports were less than 5%, and in most cases the results were within 3%. The MILDOS-AREA air dispersion component was also compared with that of the RESRAD-OFFSITE code. The major differences between the two codes that were identified by ANL are presented below:

[1] ANL/ES-161 actually compared MILDOS-AREA to AIRDOS-EPA. However, since CAP88 uses the same methodology for calculating Rn-222 air concentrations and working levels as AIRDOS-EPA, the results of the ANL/ES-161 comparison are valid for CAP88.

- Dose Outputs: Population doses and organ doses are not included in the RESRAD-OFFSITE code.

- Different Default Values:

  - The codes use different default dose conversion factors and consumption rates.
  - MILDOS-AREA assumes U-234 is in equilibrium with U-238.

- Differences in Release, Dispersion, and Deposition Models:

  - In RESRAD-OFFSITE, both dry deposition and wet deposition are considered, whereas only dry deposition is considered in MILDOS-AREA.
  - RESRAD-OFFSITE uses the average mass loading, deposition velocity, average concentration, and source area to calculate the source term (release rate), whereas MILDOS-AREA uses windblown particle emission to calculate the source term.
  - The RESRAD-OFFSITE code does not include resuspension from ground surface deposition in air concentration calculations.
  - In RESRAD-OFFSITE, accumulation in offsite surface soil includes accumulation due both to irrigation with contaminated water and to deposition of contaminated dust, whereas only deposition of contaminated dust is included in MILDOS-AREA.
  - In RESRAD-OFFSITE, the soil concentration is affected by mixing in the surface layer, erosion, and leaching, whereas in MILDOS-AREA, it is affected by the constant deposition and environmental loss.
  - RESRAD-OFFSITE calculates the average air and soil concentrations from deposition for different selected areas, whereas MILDOS-AREA calculates air concentration and ground deposition at a specified receptor location (no area associated).

- Differences in Exposure Pathways:

  - The RESRAD-OFFSITE code does not include air submersion pathway dose.
  - External pathway dose in MILDOS-AREA is calculated by assuming infinite surface source, whereas RESRAD-OFFSITE calculates it by assuming a finite volume source with uniform concentration within the mixing layer.
  - In calculating radionuclide concentration in the edible part of the plant, RESRAD-OFFSITE includes root uptake from contaminated soil, foliar uptake from overhead irrigation, and foliar uptake of dust; MILDOS-AREA does not include uptake from irrigation.
  - There are five categories of plants in MILDOS-AREA: edible above-ground vegetables, potatoes, other edible below-ground vegetables, pasture grass, and

hay. The edible above-ground vegetables, potatoes, and below-ground vegetables are for human consumption, and pasture grass and hay are for animal consumption. There are four categories of plants in RESRAD-OFFSITE: fruit, grain, nonleafy vegetables; leafy vegetables; pasture and silage; and hay. The fruit, grain, nonleafy vegetables and leafy vegetables are for human consumption, and pasture, silage and hay are for animal consumption.

- In RESRAD-OFFSITE, it is assumed that ingestion of contaminated plants, soil, and water all contribute to meat and milk contamination. In MILDOS-AREA, contaminated soil and water ingestion is not included.

2.6 MEPAS with FRAMES

The Mu1timedia Environmental Pollutant Assessment System (MEPAS) is an integrated software implementation of physics-based fate and transport models for health and environmental risk assessments of both radioactive and hazardous pollutants. MEPAS is a "multimedia" model in that pollutant transport is modeled within, through, and between multiple media (air, soil, groundwater, and surface water). The estimated concentrations in the various media are used to compute exposures and impacts to the environment, to maximum individuals, and to populations. Of most import to this Work Assignment, the MEPAS atmospheric component for the air media includes models for emission from a source to the air, initial plume rise and dispersion, airborne pollutant transport and dispersion, and deposition to soils and crops.

MEPAS, developed by PNL, is a suite of integrated impact assessment software comprising physics-based fate and environmental transport models of air, soil, and water media. MEPAS simulates the release of contaminants from a source; transport through the air, groundwater, surface water, and/or overland pathways; and transfer through food chains and exposure pathways to the exposed individual or population. For human health impacts, risks are computed for carcinogens and hazard quotients for noncarcinogens.

In DOE/ORO-2033, MEPAS was benchmarked against RESRAD-OFFSITE. Because CAP88 is linked to RESRAD to perform atmospheric dispersion calculations, DOE/ORO-2033 was, in effect, a benchmarking of CAP88 against MEPAS. The DOE/ORO-2033 results are summarized above in Section 2.2.

The most current version of MEPAS operates within FRAMES. FRAMES allows the addition of other computer modules to MEPAS. Additional information on FRAMES is provided in Section 2.3.1.

2.7 AERMOD

The American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) was formed to introduce state-of-the-art modeling concepts into the EPA's air quality models. Through AERMIC, a modeling system, AERMOD, was developed as a state-of-the-practice Gaussian plume dispersion model whose formulation is based on planetary boundary layer principles. The AERMOD model utilizes a probability density function and the superposition of several Gaussian plumes to characterize the distinctly non-Gaussian nature of the vertical pollutant distribution for elevated plumes during convective conditions; otherwise the distribution is Gaussian. Also, nighttime urban boundary layers (and plumes within them) have the turbulence enhanced by AERMOD to simulate the influence of the urban heat island. The AERMOD model is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area and volume sources).

The development of AERMOD began in 1991 and underwent seven steps: initial model formulation, developmental evaluation, internal peer review/beta testing, revised model formulation, performance evaluation and sensitivity testing, external peer review, and submission to the EPA for consideration as a regulatory model. On November 9, 2005, EPA issued the final rule to replace the widely used Industrial Source Complex (ISC) air dispersion model with the state-of-practice air dispersion model AERMOD in many air quality impact assessments.

Because AERMOD only calculates atmospheric dispersion and deposition, but not dose to individual and the population through the exposure pathways, it would be necessary to link AERMOD to either an existing or custom designed and developed program in order to evaluate dose and risk. Although it may be a worthwhile effort to upgrade the atmospheric dispersion capabilities of a dose evaluation program (such as CAP88) to include the AERMOD dispersion models, it is beyond the scope of this Work Assignment, and AERMOD will not be evaluated further.

2.8 GASPAR-II

The GASPAR code was written in 1977 by Oak Ridge National Laboratory for the NRC. GASPAR is an air release dose code that models the release of noble gases in a semi-infinite plume, radioiodine and particulate emissions using the release model described in NRC Regulatory Guide 1.109 (NRC 1977). The code was developed mainly to analyze effluent releases from nuclear power operations. GASPAR considers such pathways as inhalation, plume-immersion, ground-shine, and ingestion of various contaminated media (meat, milk, vegetation, etc.). Dose calculations can be applied to a defined population or an individual who are evaluated for four age groups: infants (0-1 years), children (1-11 years), teens (12-18 years), and adults (over 18 years). Each calculation considers seven organs (bone, G.I. tract, kidney, liver, lung, skin, and thyroid) as well as the whole body dose.

In 1987, GASPAR-II was developed by PNL, however, while changes were made to the values of some parameters and dose factors used in the code, no changes were made to the mathematical models used by GASPAR.

GASPAR was eliminated from further consideration in this Work Assignment for the following reasons:

- Dose factors – GASPAR-II utilizes the inhalation and ingestion dose factors from ICRP Publication 2, as modified slightly in later ICRP documents. Since ICRP Publication 2 was published in 1959, the ICRP has issued two major updates of its dosimetric guidance. The details of these ICRP updates have been provided in SC&A 2009. Thus, the dosimetry used by GASPAR-II is out-of-date and cannot be readily updated.

- Atmospheric dispersion – GASPAR-II does not calculate atmospheric dispersion, therefore it would be necessary to utilize a separate program (such as XOQDOQ) to process the raw meteorological data and generate atmospheric dispersion and deposition factors for input into GASPAR-II.
- Risk factors – GASPAR-II only calculates radiological dose, and does not calculate risk. Although it is possible to convert the doses reported by GASPAR-II into risk by designing and using a post-processor, it is believed that such an approach would not be practicable for various reasons, including the fact that the GASPAR-II doses are based on ICRP Publication 2.

2.9 GENII-NESHAPS

GENII-NESHAPS is a modified version of the more general GENII code which was designed to help site managers plan and improve compliance with 40 CFR 61, Subparts H and I. The code implements the same methods as the original GENII code, except it hardwires certain parameters so that they cannot be changed by the user. This was done so that the code would automatically incorporate certain elements necessary to the NESHAPS regulation.

The following statement is currently being displayed on the EPA website (http://www.epa.gov/rpdweb00/neshaps/models.html):

> EPA does not presently support GENII-NESHAPs, and there is no intention to do so.

Because of this and the fact that GENII is being evaluated for use, GENII-NESHAPS was eliminated from further consideration in this Work Assignment.

3.0 DETAILED MODEL EVALUATIONS

3.1 Evaluation Criteria

The evaluation criteria used were:

- **Exposure Pathways Modeled (2)**: Are all of the exposure pathways that are essential to this analysis included in the code? Additionally, does the code allow for exposures to different age groups (i.e., adults, teens, children, infants) and/or sexes to be calculated?
- **Population Based Dose/Risk Capability (2)**: Does the code allow for the calculation of a population dose/risk based on a site-specific unique population distribution or does the code only allow the calculation of dose/risk based on a single defined receptor location?
- **Dose Factors Used (1.75)**: Does the code utilize dose conversion factors based on the most recent International Commission on Radiological Protection (ICRP) recommendations?
- **Risk Factors Used (1.75)**: Does the code utilize the most recent risk factors?
- **Processing of Meteorological Data (1.5)**: Can the code process "raw" meteorological data, or does the meteorological data need to be pre-processed prior to being entered into the code? For example, does the code accept "raw" meteorological tower data (e.g., from http://www.epa.gov/scram001/surfacemetdata.htm), or does it accept joint frequency data, or does it only accept dispersion and deposition factors? If a code does not include the capability to process "raw" meteorological data, than a separate code (e.g., STAR from http://www.epa.gov/scram001/metobsdata_procaccprogs.htm) would need to be run to generate the input necessary for the risk assessment model.
- **Source Term Calculation (1.5)**: Can the code calculate radon releases, or must the releases be pre-calculated and entered into the code? If a code does not include the capability to calculate the radon release, than an additional calculation would be needed to estimate the source term so that it can be entered into the risk assessment model. Alternatively, a code that contains an internal source term calculation would be difficult to modify should the source term model change.
- **Verification and Validation (1.25)**: Is there a readily available V&V package that supports the code? Is the V&V package complete? Has there been independent (i.e., by someone other than the code's developer) V&V performed?
- **Ease of Use/User Friendly (1.25)**: Is the code provided with a user interface that is intuitive and easy to understand and use? Alternatively, does the code require the user to manipulate structured input data files? Additionally, does the code have features not required for this analysis, but that might complicate its use?
- **Documentation (1)**: Is the code well documented? Are there User's Manuals readily available? In addition to providing instructions as to how to use the code, are the mathematical models used by the code well documented? It is expected that all of the codes selected for evaluation would have high scores for this criteria.

- **Input Parameter Sensitivity Analysis (1)**: Does the code have the capability to perform sensitivity analyses on the input data, or must parameter sensitivity be determined by multiple runs, each run varying a single parameter? EPA 1989, Section 7 describes uncertainty analyses that were performed. Although this Work Assignment does not specify them, EPA may want to perform similar uncertainty analyses for this revision in the future.
- **Probabilistic Analysis Capability (1)**: Is there a probabilistic analysis version of the code available? Although the calculations being performed for WA 1-04 are being done deterministically, at some point the EPA may desire to perform a probabilistic analysis, and it would be desirable to use the same code for both analyses.
- **SC&A Familiarity (tie breaker)**: If two or more models have identical (or nearly identical [i.e., within 10%]) scores based on the above criteria, then the SC&A recommendation will be based on how familiar SC&A is with the operation of each code.

The above list of evaluation criteria is preliminary, and SC&A will work with the Work Assignment Manager (WAM) to finalize the code evaluation criteria. As can be seen from the above list, some criteria are of greater importance that other criteria. To account for this, each criterion will be given a weighting factor ranging from 1 to 2; preliminary weighting factors are shown in parenthesis on the above list of evaluation criteria. SC&A will work with the WAM to develop the final weighting factors for each criterion. The final score of the evaluation will be the sum of each criterion's score times its weighting factor.

Table 1. Evaluation Criteria

Evaluation Criteria	Weight Factor
Exposure Pathways Modeled	2
Population Dose/Risk Capability	2
Dose Factors Used	1.75
Risk Factors Used	1.75
Meteorological Data Processing	1.5
Source Term Calculations	1.5
Verification and Validation	1.25
Ease of Use/User Friendly	1.25
Documentation	1
Sensitivity Analysis Capability	1
Probabilistic Analysis Capability	1
SC&A Familiarity	N/A

3.2 CAP88

3.2.1 Exposure Pathways Modeled (2)

Criteria: Are all of the exposure pathways that are essential to this analysis included in the code? Additionally, does the code allow for exposures to different age groups (i.e., adults, teens, children, infants) and/or sexes to be calculated?

Evaluation: CAP88 calculated dose and risk from exposure pathways including ingestion, inhalation, ground-level immersion (external), and ground-surface irradiation (external).

In cases considering Rn-222 decay products, CAP88 calculates the working levels associated with the contaminants and evaluates the risk, but not dose, from the working level calculations.

Code documentation states that current version 'contains (not implemented) data for – age dependent dose factors'. It does not appear that this is a selectable option, nor does it appear to report age-specific analyses in the output files. No mention of gender-specific analyses in the associated documentation. Previous versions of the code implemented a 'genetic effects' calculation which has been removed.

Score: 5 **Weighted Score:** 10

3.2.2 Dose Factors Used (1.75)

Criteria: Does the code utilize dose conversion factors based on the most recent International Commission on Radiological Protection (ICRP) recommendations?

Evaluation: "CAP-88 uses a database of dose and risk factors provided in Federal Guidance Report 13. Dose and risk conversion factors include the effective dose equivalent calculated according to the methods of ICRP Publication Number 72 (ICRP 72)." – User Guide 12/9/07. ICRP-72 are the most recent dose conversion factors used in the codes under evaluation.

Score: 5 **Weighted Score:** 8.75

3.2.3 Risk Factors Used (1.75)

Criteria: Does the code utilize the most recent risk factors?

Evaluation: "CAP-88 uses a database of dose and risk factors provided in Federal Guidance Report 13. Dose and risk conversion factors include the effective dose equivalent calculated according to the methods of ICRP Publication Number 72 (ICRP 72)." – User Guide 12/9/07

Score: 5 **Weighted Score:** 8.75

3.2.4 Population Based Dose/Risk Capability (2):

Criteria: Does the code allow for the calculation of a population dose/risk based on a site-specific unique population distribution or does the code only allow the calculation of dose/risk based on a single defined receptor location?

Evaluation: CAP88 allows for the calculation of dose/risk based on both a maximally exposed individual (user defined) or additionally to load population data in the form of a '.POP' file. The CAP88 software package contains 28 preloaded population files.

Score: 5 **Weighted Score:** 10

3.2.5 Meteorological Data Processing (1.5)

Criteria: Can the code process "raw" meteorological data, or does the meteorological data need to be pre-processed prior to being entered into the code? For example, does the code accept "raw" meteorological tower data, or does it accept joint frequency data, or does it only accept dispersion and deposition factors?

Evaluation: 'Wind Files' (as created by the National Weather Service) are required to run CAP88. Site-specific meteorological data can be processed using an associated 'Stability Array Distribution' module to convert the on-site data to the correctly formatted 'Wind File'. The module GETWIND allows for the conversion of STAR formatted meteorological data to the CAP88 formatted 'wind file'.

Meteorological data files from over 350 sites within the U.S. are provided as part of the CAP88 code package.

Score: 5 **Weighted Score:** 7.5

3.2.6 Source Term Calculation (1.5)

Criteria: Can the code calculate radon releases, or must the releases be pre-calculated and entered into the code?

Evaluation: Radionuclide releases are entered manually in CAP88 in the form of Curie/yr.

Score: 2 **Weighted Score:** 3

3.2.7 Verification and Validation (1.25)

Criteria: Is there a readily available V&V package that supports the code? Is the V&V package complete? Has there been independent (i.e., by someone other than the code's developer) V&V performed?

Evaluation: Main QA Documents:

Maheras, S.J.; Ritter, P.D.; Leonard, P.R.; and Moore, R. *Benchmarking of the CAP-88 and GENII Computer Codes Using 1990 and 1991 Monitored Atmospheric Releases from the Idaho National Engineering Laboratory*, Health Physics 67:509-517; November 1994.

Fields, D.E.; Miller, C.W.; Cotter, S.J. *Validation of the AIRDOS-EPA Computer Codes by Simulating Intermediate Range Transport of Kr-85 from the Savannah River Plant*. Atmos. Environ. 18:2029-2036; 1984.

Score: 5 **Weighted Score:** 6.25

3.2.8 Ease of Use/User Friendly (1.25)

Criteria: Is the code provided with a user interface that is intuitive and easy to understand and use? Alternatively, does the code require the user to manipulate structured input data files? Additionally, does the code have features not required for this analysis, but that might complicate its use?

Evaluation: Code contains very intuitive menus which prompt the user in a linear fashion to enter all pertinent model data. Of the five main codes analyzed in detail, CAP88 is the easiest to implement and most user friendly.

Score: 5 **Weighted Score:** 6.25

3.2.9 Documentation (1)

Criteria: Is the code well documented? Are there User's Manuals readily available? In addition to providing instructions as to how to use the code, are the mathematical models used by the code well documented?

Evaluation: The mathematical models and equations used by the code are presented in Chapter 12 of the user's guide.

"Mathematical Models in CAP88-PC" (Parks, DOE, 1997) provides additional documentation beyond the User's Manual.

Score: 5 **Weighted Score:** 5

3.2.10 Sensitivity Analysis Capability (1)

Criteria: Does the code have the capability to perform sensitivity analyses on the input data, or must parameter sensitivity be determined by multiple runs, each run varying a single parameter?

Evaluation: Sensitivity analyses can only be carried out using individual runs.

Score: 0 **Weighted Score:** 0

3.2.11 Probabilistic Analysis Capability (1)

Criteria: Is there a probabilistic analysis version of the code available?

Evaluation: Probabilistic analysis is not available for this code.

Score: 0 **Weighted Score:** 0

3.2.12 SC&A Familiarity (N/A)

Criteria: To be used as a tiebreaker when the top two codes have a final score within 10% of each other.

Evaluation: SC&A has very good overall familiarity with the CAP88 code, as SC&A helped assist EPA in the development of the mainframe version of the code, as well as assisted in writing the User's Manual. Since that time, SC&A has continued to use CAP88 in our consulting work for various clients.

3.3 GENII with FRAMES

3.3.1 Exposure Pathways Modeled (2)

Criteria: Are all of the exposure pathways that are essential to this analysis included in the code? Additionally, does the code allow for exposures to different age groups (i.e., adults, teens, children, infants) and/or sexes to be calculated?

Evaluation: Exposure pathways include: external (air immersion, ground-shine, recreational swimming/boating/shoreline exposure), ingestion (food crops, animal products, aquatic food, inadvertent soil, drinking water), and inhalation (air, resuspended soil, inhalation of waterborne contaminants).

Radon is considered a special radionuclide model for GENII along with tritium and carbon-14.

Score: 5 **Weighted Score:** 10

3.3.2 Dose Factors Used (1.75)

Criteria: Does the code utilize dose conversion factors based on the most recent International Commission on Radiological Protection (ICRP) recommendations?

Evaluation: "The GENII computer code was developed for the Environmental Protection Agency (EPA) at Pacific Northwest National Laboratory (PNNL) to incorporate the internal dosimetry models recommended by the International Commission on Radiological Protection (ICRP) and radiological risk estimating procedures of Federal Guidance Report 13 into updated versions of existing environmental pathway analysis models."– GENII Users' Guide, October 2004

ICRP documents are noted as publications 56-72.

Score: 4 **Weighted Score:** 7

3.3.3 Risk Factors Used (1.75)

Criteria: Does the code utilize the most recent risk factors?

Evaluation: "The GENII computer code was developed for the Environmental Protection Agency (EPA) at Pacific Northwest National Laboratory (PNNL) to incorporate the internal dosimetry models recommended by the International Commission on Radiological Protection (ICRP) and radiological risk estimating procedures of Federal Guidance Report 13 into updated versions of existing environmental pathway analysis models."– GENII Users' Guide, October 2004

Score: 5 **Weighted Score:** 8.75

3.3.4 Population Based Dose/Risk Capability (2):

Criteria: Does the code allow for the calculation of a population dose/risk based on a site-specific unique population distribution or does the code only allow the calculation of dose/risk based on a single defined receptor location?

Evaluation: GENII within FRAMES can perform calculations for populations but must have population distributions that match the format of the meteorological data and must be constructed in ASCII format by the user. GENII does not have any preloaded population files available.

Score: 3 **Weighted Score:** 6

3.3.5 Meteorological Data Processing (1.5)

Criteria: Can the code process "raw" meteorological data, or does the meteorological data need to be pre-processed prior to being entered into the code? For example, does the code accept "raw" meteorological tower data, or does it accept joint frequency data, or does it only accept dispersion and deposition factors?

Evaluation: GENII uses its own specific format for meteorological data, but contains modules to convert some different data types such as:

- two different types of JFD (Joint Frequency Data) data: EPA's Industrial Source Complex model (ISC3 also known as STAR summary), and the format used by the original GENII (1988).
- "Card Deck 144 format" (CD-144) and SAMSON data format: available from the National Climatic Data Center (NCDC).

Score: 5 **Weighted Score:** 7.5

3.3.6 Source Term Calculation (1.5)

Criteria: Can the code calculate radon releases, or must the releases be pre-calculated and entered into the code?

Evaluation: All radionuclide releases, whether acute or chronic, must be entered into GENII by the user. GENII does not have any capability to calculate the airborne release of radon.

Score: 2 **Weighted Score:** 3

3.3.7 Verification and Validation (1.25)

Criteria: Is there a readily available V&V package that supports the code? Is the V&V package complete? Has there been independent (i.e., by someone other than the code's developer) V&V performed?

Evaluation: "Both GENII versions were developed under QA plans based on the American National Standards Institute (ANSI) standard NQA-1 as implemented in the PNNL Quality Assurance Manual. All steps of the code development have been documented and tested, and hand calculations have verified the code's implementation of major transport and exposure pathways for a subset of the radionuclide library. A collection of hand calculations and other verification activities is available… The code has been reviewed by the EPA Science Advisory Board and a separate EPA-sponsored, independent peer review panel. The QA of both GENII Version 1.485 and Version 2 have been reviewed by the US Department of Energy." – GENII Users' Guide, October 2004

Score: 5 **Weighted Score:** 6.25

3.3.8 Ease of Use/User Friendly (1.25)

Criteria: Is the code provided with a user interface that is intuitive and easy to understand and use? Alternatively, does the code require the user to manipulate structured input data files? Additionally, does the code have features not required for this analysis, but that might complicate its use?

Evaluation: GENII Version 2 functions within FRAMES which allows the code to run in conjunction with, and provide input to, other modeling codes (such as MEPAS). While this allows for more dynamic modeling efforts using GENII with other codes, the strict use of GENII is not as straightforward because of the complexity of integrating the different codes and executing the FRAMES system itself.

Score: 1 **Weighted Score:** 1.25

3.3.9 Documentation (1)

Criteria: Is the code well documented? Are there User's Manuals readily available? In addition to providing instructions as to how to use the code, are the mathematical models used by the code well documented?

Evaluation: User manuals and input guidance reports are readily available on the Internet from various reputable sources. Equations and methodology underlying the code is well documented in:

Napier, B.A.; Strenge, D.L.; Ramsdell Jr., J.V.; Eslinger, P.W.; Fosmire, C. GENII Version 2 Software Design Document. Prepared for U.S. Environmental Protection Agency. November 2004.

Score: 5 **Weighted Score:** 5

3.3.10 Sensitivity Analysis Capability (1)

Criteria: Does the code have the capability to perform sensitivity analyses on the input data, or must parameter sensitivity be determined by multiple runs, each run varying a single parameter?

Evaluation: GENII does include a 'Sensitivity and Uncertainty' module as described in the following: "FRAMES is currently designed for deterministic environmental and human health impact models. The Sensitivity/Uncertainty Multimedia Modeling Module (SUM3) software product was designed to allow statistical analysis using the existing deterministic models available in FRAMES. SUM3 randomly samples input variables and preserves the associated output values in an external file available to the user for evaluation."

Score: 4 **Weighted Score:** 4

3.3.11 Probabilistic Analysis Capability (1)

Criteria: Is there a probabilistic analysis version of the code available?

Evaluation: The GENII Sensitivity and Analysis module allows the user to specify probabilistic distributions to various deterministic parameters; this feature appears to be used only for determining which parameters contribute the most to the uncertainty of the output, but not necessarily allow the user to run a probabilistic simulation which produces a distribution of output values.

Score: 4 **Weighted Score:** 4

3.3.12 SC&A Familiarity (N/A)

Criteria: To be used as a tiebreaker when the top two codes have a final score within 10% of each other.

Evaluation: SC&A has previously used GENII to support EPA's evaluation of the technical and regulatory issues associated with the disposition of scrap metal from nuclear facilities, as well as to support EPA in the development of radiological exposure standards for the Yucca Mountain high-level waste disposal facility. However, although we have obtained and installed FRAMES-based GENII for this Work Assignment, to date, SC&A has not had the opportunity to use FRAMES-based GENII in any of our work.

3.4 RESRAD-OFFSITE

3.4.1 Exposure Pathways Modeled (2)

Criteria: Are all of the exposure pathways that are essential to this analysis included in the code? Additionally, does the code allow for exposures to different age groups (i.e., adults, teens, children, infants) and/or sexes to be calculated?

Evaluation: RESRAD is designated to evaluate ground contamination with residual radioactivity, not the airborne release pathways, although it does contain a radon model. It is important to note that RESRAD's offsite air transport model utilizes the CAP88 methodology.

Exposure pathways evaluated by RESRAD-OFFSITE include external gamma, inhalation, ingestion (plant, meat, milk, aquatic, inadvertent soil, drinking water), and radon. Internal dose conversion factors for ICRP-72 include factors by age (infant, 1, 5, 10, 15, and adult). No gender-specific analysis is available.

Score: 5 **Weighted Score:** 10

3.4.2 Dose Factors Used (1.75)

Criteria: Does the code utilize dose conversion factors based on the most recent International Commission on Radiological Protection (ICRP) recommendations?

Evaluation: Selectable between FGR 11 and ICRP-72 for internal exposures, FGR 12 and ICRP-60 for external exposures.

Score: 5 **Weighted Score:** 8.75

3.4.3 Risk Factors Used (1.75)

Criteria: Does the code utilize the most recent risk factors?

Evaluation: Risk factors are selectable between FGR 13 (morbidity/mortality) and Heast (2001) morbidity coefficients.

Score: 5 **Weighted Score:** 8.75

3.4.4 Population Based Dose/Risk Capability (2):

Criteria: Does the code allow for the calculation of a population dose/risk based on a site-specific unique population distribution or does the code only allow the calculation of dose/risk based on a single defined receptor location?

Evaluation: RESRAD can only calculate dose to an individual receptor as defined by the user. Population-based dose and risk calculations are not available with RESRAD- OFFSITE.

Score: 0 **Weighted Score:** 0

3.4.5 Meteorological Data Processing (1.5)

Criteria: Can the code process "raw" meteorological data, or does the meteorological data need to be pre-processed prior to being entered into the code? For example, does the code accept "raw" meteorological tower data, or does it accept joint frequency data, or does it only accept dispersion and deposition factors?

Evaluation: Joint frequency data can be input manually into the code or can also be read from a 'STAR' file. A single stability class/wind speed can also be used in place of the joint frequency data.

Meteorological data (in the STAR format) for 267 U.S. sites are provided with the code package.

Score: 5 **Weighted Score:** 7.5

3.4.6 Source Term Calculation (1.5)

Criteria: Can the code calculate radon releases, or must the releases be pre-calculated and entered into the code?

Evaluation: The code requires input of diffusion coefficients (from soil/cover, floor of a building, etc.) and other properties of radon, such as an emanation coefficient which will define the radon release value.

Score: 4 **Weighted Score:** 6

3.4.7 Verification and Validation (1.25)

Criteria: Is there a readily available V&V package that supports the code? Is the V&V package complete? Has there been independent (i.e., by someone other than the code's developer) V&V performed?

Evaluation: The V&V package is contained in the document:

Yu, C.; Gnanapragasam, E.; Cheng, J.J.; Biwer, B. Benchmarking of RESRAD-OFFSITE: Transition from RESRAD (onsite) to RESRAD-OFFSITE and Comparison of the RESRAD-OFFSITE Predictions with Peer Codes. Environmental Science Division of Argonne National Laboratory.

The document compares the code against CAP88 and ISCLT3 for atmospheric transport calculations and also against the base RESRAD code for onsite calculations, which itself was benchmarked against GENII-S, DECOM, PRESTO-EPA-CPG, and the NUREG/CR-5512 methodology.

Score: 5 **Weighted Score:** 6.25

3.4.8 Ease of Use/User Friendly (1.25)

Criteria: Is the code provided with a user interface that is intuitive and easy to understand and use? Alternatively, does the code require the user to manipulate structured input data files? Additionally, does the code have features not required for this analysis, but that might complicate its use?

Evaluation: The code brings the user in a linear fashion through each of the input screens and provides a default value which will fit most situations. If the user tries to input a value that is outside the theoretical range for a given parameter, the code notifies the user and blocks them from entering the given value.

Score: 4 **Weighted Score:** 2.5

3.4.9 Documentation (1)

Criteria: Is the code well documented? Are there User's Manuals readily available? In addition to providing instructions as to how to use the code, are the mathematical models used by the code well documented?

Evaluation: The main User Manual is available on the main code's website which includes both a User's Guide (Appendix A of the document) and the methods and equations used by the code (main body of the User Manual).

Score: 5 **Weighted Score:** 5

3.4.10 Sensitivity Analysis Capability (1)

Criteria: Does the code have the capability to perform sensitivity analyses on the input data, or must parameter sensitivity be determined by multiple runs, each run varying a single parameter?

Evaluation: RESRAD-OFFSITE contains a sensitivity module that (unlike the basic RESRAD code) does not limit the number of parameters subjected to sensitivity in any given run. The sensitivity module can be run either by dividing/multiplying an input value by a discreet number.

Score: 5 **Weighted Score:** 5

3.4.11 Probabilistic Analysis Capability (1)

Criteria: Is there a probabilistic analysis version of the code available?

Evaluation: RESRAD-OFFSITE contains a probabilistic analysis feature that allows the user to specify a given distribution type (from 35 different choices: normal, lognormal, truncated lognormal, etc.) and specify the characteristics of the distribution. RESRAD-OFFSITE provides a default probabilistic distribution for each parameter which is documented in the RESRAD-OFFSITE user guide.

Score: 4 **Weighted Score:** 4

3.4.12 SC&A Familiarity (N/A)

Criteria: To be used as a tiebreaker when the top two codes have a final score within 10% of each other.

Evaluation: SC&A is very familiar with RESRAD and RESRAD-OFFSITE. We have run the code on numerous occasions, and in addition have used the RESRAD methodology as provided in the User's Manual in our own analyses (e.g., the development of NUREG-1640).

3.5 MILDOS-AREA

3.5.1 Exposure Pathways Modeled (2)

Criteria: Are all of the exposure pathways that are essential to this analysis included in the code? Additionally, does the code allow for exposures to different age groups (i.e., adults, teens, children, infants) and/or sexes to be calculated?

Evaluation: MILDOS-AREA considers inhalation, external (groundshine and cloud immersion), and ingestion (vegetables, meat and milk).

Score: 5 **Weighted Score:** 10

3.5.2 Population Based Dose/Risk Capability (2):

Criteria: Does the code allow for the calculation of a population dose/risk based on a site-specific unique population distribution or does the code only allow the calculation of dose/risk based on a single defined receptor location?

Evaluation: MILDOS-AREA allows the user to load in a '.pop' file similar to CAP88. MILDOS does not have any preloaded population distributions. Users can also create their own population files with properly formatted ASCII text documents.

Score: 4 **Weighted Score:** 8

3.5.3 Dose Factors Used (1.75)

Criteria: Does the code utilize dose conversion factors based on the most recent International Commission on Radiological Protection (ICRP) recommendations?

Evaluation: Dose conversion factors are based on ICRP 26 (1978) recommendations.

Score: 2 **Weighted Score:** 3.5

3.5.4 Risk Factors Used (1.75)

Criteria: Does the code utilize the most recent risk factors?

Evaluation: MILDOS-AREA appears to only calculate dose and not incorporate risk calculations into its output.

Score: 0 **Weighted Score:** 0

3.5.5 Meteorological Data Processing (1.5)

Criteria: Can the code process "raw" meteorological data, or does the meteorological data need to be pre-processed prior to being entered into the code? For example, does the code accept "raw" meteorological tower data, or does it accept joint frequency data, or does it only accept dispersion and deposition factors?

Evaluation: Joint frequency data can be input manually into the code or can also be read from a 'STAR' file. Although meteorological data is not provided with MILDOS-AREA, the CAP88 supplied meteorological data is in the STAR format and can be used with MILDOS-AREA. Alternatively, the RESRAD-OFFSITE supplied joint frequency data can be converted to the STAR format and used with MILDOS-AREA.

Score: 4 **Weighted Score:** 6

3.5.6 Source Term Calculation (1.5)

Criteria: Can the code calculate radon releases, or must the releases be pre-calculated and entered into the code?

Evaluation: MILDOS-AREA is limited to only analyzing the U-238 decay series, specifically, U-238, Th-230, Ra-226, Pb-210, and Rn-222. MILDOS-AREA gives the user the option of entering the particulate release rates or of having the code calculate them.

Score: 2 **Weighted Score:** 3

3.5.7 Verification and Validation (1.25)

Criteria: Is there a readily available V&V package that supports the code? Is the V&V package complete? Has there been independent (i.e., by someone other than the code's developer) V&V performed?

Evaluation: The document: 'Verification and Benchmarking of the MILDOS-Area Code' is available on the MILDOS-AREA website and contains internal quality assurance studies, benchmarking of the air release model against RESRAD-OFFSITE, and also verifications of modeled results against 'spreadsheet calculations' based on NUREG 1569 for a select ISL facility.

Score: 5 **Weighted Score:** 6.25

3.5.8 Ease of Use/User Friendly (1.25)

Criteria: Is the code provided with a user interface that is intuitive and easy to understand and use? Alternatively, does the code require the user to manipulate structured input data files? Additionally, does the code have features not required for this analysis, but that might complicate its use?

Evaluation: MILDOS-AREA is one of the most user-friendly of the main codes under assessment with simplistic data inputs that lead the user through each of the menus before running the code.

Score: 5 **Weighted Score:** 6.25

3.5.9 Documentation (1)

Criteria: Is the code well documented? Are there User's Manuals readily available? In addition to providing instructions as to how to use the code, are the mathematical models used by the code well documented?

Evaluation: User's Guide is readily available for the MILDOS-AREA code along with a User's Manual which describes the underlying methods and equations used. Both can be found on the main website for MILDOS-AREA.

Score: 5 **Weighted Score:** 5

3.5.10 Sensitivity Analysis Capability (1.5)

Criteria: Does the code have the capability to perform sensitivity analyses on the input data, or must parameter sensitivity be determined by multiple runs, each run varying a single parameter?

Evaluation: MILDOS-AREA does not have a sensitivity feature.

Score: 0 **Weighted Score:** 0

3.5.11 Probabilistic Analysis Capability (1)

Criteria: Is there a probabilistic analysis version of the code available?

Evaluation: MILDOS-AREA does not have a probabilistic analysis feature.

Score: 0 **Weighted Score:** 0

3.5.12 SC&A Familiarity (N/A)

Criteria: To be used as a tiebreaker when the top two codes have a final score within 10% of each other.

Evaluation: Although we have obtained and installed MILDOS-AREA for this Work Assignment, to date, SC&A has not had the opportunity to use MILDOS-AREA in any of our work.

3.6 MEPAS with FRAMES

3.6.1 Exposure Pathways Modeled (2)

Criteria: Are all of the exposure pathways that are essential to this analysis included in the code? Additionally, does the code allow for exposures to different age groups (i.e., adults, teens, children, infants) and/or sexes to be calculated?

Evaluation: MEPAS models inhalation, ingestion, external exposure and dermal contact.

Score: 5 **Weighted Score:** 10

3.6.2 Population Based Dose/Risk Capability (2):

Criteria: Does the code allow for the calculation of a population dose/risk based on a site-specific unique population distribution or does the code only allow the calculation of dose/risk based on a single defined receptor location?

Evaluation: Similar to GENII, MEPAS within FRAMES can perform calculations for populations but must have population distributions that match the format of the meteorological data and must be constructed in ASCII format by the user. Also like GENII, there do not appear to be any preloaded population files present with the software.

Score: 3 **Weighted Score:** 6

3.6.3 Dose Factors Used (1.75)

Criteria: Does the code utilize dose conversion factors based on the most recent International Commission on Radiological Protection (ICRP) recommendations?

Evaluation: Per the MEPAS website: "Health impacts from exposure to radiation are estimated using health effects conversion factors or USEPA slope factors… values are based on recommendation given in the BEIR V report (NAS 1990) and International Commission on Radiological Protection (ICRP) Publication 60 (ICRP 1990)."

Score: 4 **Weighted Score:** 7

3.6.4 Risk Factors Used (1.75)

Criteria: Does the code utilize the most recent risk factors?

Evaluation: Per the MEPAS website: "Two methods are available to estimate the risk of cancer fatalities: use of health- effects conversion factors and use of USEPA slope factors." Slope factors are based on USEPA (U.S. Environmental Protection Agency). 1994. Health Effects Assessment Summary Tables FY 1994 - Supplement Number 2. EPA/540/R-94/114. Office of Emergency and Remedial Response, Washington, D.C.

Score: 5 **Weighted Score:** 8.75

3.6.5 Meteorological Data Processing (1.5)

Criteria: Can the code process "raw" meteorological data, or does the meteorological data need to be pre-processed prior to being entered into the code? For example, does the code accept "raw" meteorological tower data, or does it accept joint frequency data, or does it only accept dispersion and deposition factors?

Evaluation: MEPAS accepts joint frequency data as a user input. It has not been established whether modules exist in the MEPAS suite of tools to convert and analyze meteorological data in other formats, as GENII contains.

Score: 4 **Weighted Score:** 6

3.6.6 Source Term Calculation (1.5)

Criteria: Can the code calculate radon releases, or must the releases be pre-calculated and entered into the code?

Evaluation: Contaminant releases are provided by the AFF file; it is not clear from associated documentation whether releases are manually input by the user. Inspection of example problems provided with code package, indicate that the release data are likely a user input.

Score: 2 **Weighted Score:** 3

3.6.7 Verification and Validation (1.25)

Criteria: Is there a readily available V&V package that supports the code? Is the V&V package complete? Has there been independent (i.e., by someone other than the code's developer) V&V performed?

Evaluation: No V&V package has been located with the MEPAS documentation available on the main website, though certain documents that appear to benchmark the code are listed as a reference on the main site.

Score: 4 **Weighted Score:** 6

3.6.8 Ease of Use/User Friendly (1.25)

Criteria: Is the code provided with a user interface that is intuitive and easy to understand and use? Alternatively, does the code require the user to manipulate structured input data files? Additionally, does the code have features not required for this analysis, but that might complicate its use?

Evaluation: MEPAS functions within FRAMES which allows the code to run in conjunction with, and provide input to, other modeling codes (such as GENII). While this allows for more dynamic modeling efforts, the strict use of MEPAS is not as straightforward because of the complexity of integrating the different codes and executing the FRAMES system itself.

Score: 1 **Weighted Score:** 1.25

3.6.9 Documentation (1)

Criteria: Is the code well documented? Are there User's Manuals readily available? In addition to providing instructions as to how to use the code, are the mathematical models used by the code well documented?

Evaluation: User manuals are presented in html form via the MEPAS website; no current hardcopy versions (PDF) have been located. Website contains methodology and equations used by the code. A user guide presenting data input processes or example problems was not located.

Score: 3 **Weighted Score:** 3

3.6.10 Sensitivity Analysis Capability (1)

Criteria: Does the code have the capability to perform sensitivity analyses on the input data, or must parameter sensitivity be determined by multiple runs, each run varying a single parameter?

Evaluation: MEPAS does include a 'Sensitivity and Uncertainty' module as described in the following: "FRAMES is currently designed for deterministic environmental and human health impact models. The Sensitivity/Uncertainty Multimedia Modeling Module (SUM3) software product was designed to allow statistical analysis using the existing deterministic models available in FRAMES. SUM3 randomly samples input variables and preserves the associated output values in an external file available to the user for evaluation."

Score: 4 **Weighted Score:** 4

3.6.11 Probabilistic Analysis Capability (1)

Criteria: Is there a probabilistic analysis version of the code available?

Evaluation: From the main MEPAS website: "MEPAS is implemented on a desktop computer with a user-friendly interface that allows the user to define the problem, input the required data, and execute the appropriate models for both deterministic and probabilistic analyses."

Score: 4 **Weighted Score:** 4

3.6.12 SC&A Familiarity (N/A)

Criteria: To be used as a tiebreaker when the top two codes have a final score within 10% of each other.

Evaluation: Although we have obtained and installed FRAMES-based MEPAS for this Work Assignment, to date, SC&A has not had the opportunity to use FRAMES-based MEPAS in any of our work.

4.0 RESULTS AND RECOMMENDATIONS

Table 2 summarizes the results of the code evaluation as presented in Section 3. As shown, RESRAD-OFFSITE was the highest scoring of the five codes, narrowly edging out CAP88. However, it is recommended that CAP88, and not RESRAD-OFFSITE, be used to perform the dose and risk calculations required for this Work Assignment. The reasons for this recommendation include:

- RESRAD-OFFSITE does not include the ability to perform population dose and risk estimates, which means that the RESRAD-OFFSITE results would need to be supplemented with population dose and risk estimates from another source. CAP88, on the other hand, is specifically designed to assess radiological emissions to the public.
- The major area where CAP88 is lacking is sensitivity and probability analyses. For this Work Assignment, it is not anticipated that sensitivity or probability analysis will play a major role.
- RESRAD-OFFSITE incorporates CAP88 air dispersion modeling, which means that there are no significant technical differences between the two codes for the purpose of this Work Assignment.
- CAP88 was developed as a predecessor to AIRDOS, which was the original code used in the evaluation of mill tailing impoundments during the development of NESHAPs for radon emissions in 1989.

GENII also finished high in the detailed evaluation; however, the main concern with GENII is that it currently is only available within FRAMES. As stated in Section 2.3.1, it was found that the process necessary to setup and run GENII within FRAMES was complicated relative to setting up and running pre-FRAMES GENII, and the present FRAMES GENII combination does not provide any technical advantage over the pre-FRAMES GENII. There are similar concerns regarding using MEPAS within FRAMES. The concern with FRAMES resulted in both GENII and MEPAS receiving low Ease of Use/User Friendly scores, which resulted in neither of them being selected for use.

MILDOS-AREA received the lowest ranking in the detailed evaluation, primarily due to its inability to perform risk calculations, which is a major component of this Work Assignment. Although it does not impact this Work Assignment, MILDOS-AREA is limited to evaluating only the isotopes of the U-238 decay series, which means that another code would be required if other nuclear fuel cycle facilities were to be evaluated, such as was done in the 1989 analysis.

Table 2. Summary of Suitability Review for Five Codes Under Evaluation

Evaluation Criteria	CAP88	GENII via FRAMES	RESRAD-OFFSITE	MILDOS-AREA	MEPAS via FRAMES
Exposure Pathways Modeled	10	10	10	10	10
Population Dose/ Risk Capability	10	6	0	8	6
Dose Factors Used	8.75	7	8.75	3.5	7
Risk Factors Used	8.75	8.75	8.75	0	8.75
Meteorological Data Processing	7.5	7.5	7.5	6	6
Source Term Calculations	3	3	6	3	3
Verification and Validation	6.25	6.25	6.25	6.25	5
Ease of Use/ User Friendly	6.25	1.25	5	6.25	1.25
Documentation	5	5	5	5	3
Sensitivity Analysis Capability	0	4	5	0	4
Probabilistic Analysis Capability	0	3	4	0	3
Totals	65.5	61.75	66.25	48	57

5.0 REFERENCES

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EPA-2879

Reid Rosnick/DC/USEPA/US

01/17/2012 02:36 PM

To Beth Miller

cc

bcc

Subject Website

Hi Beth,

Attached is the draft of the stakeholder conference call notes from the January 5, 2012 Subpart W conference call. Will you please post these on the website? Thanks

SubpartW_1-5-2012_QuarterlyConfCall.docx

Reid J. Rosnick
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Subpart W Quarterly Conference Call
January 5, 2012, 11:00 am – 12:00 pm
1310 L Street NW, Room 502, Washington, DC

[DRAFT] Conference Call Notes

<u>Meeting Participants</u>:

EPA HQ:	Reid Rosnick, Phil Egidi, Dan Schultheisz, Emily Atkinson, Su~~e~~e Stahle
EPA Regions:	Angelique Diaz, Region 8
CCAT:	Sharyn Cunningham
Sheep Mountain Alliance: Jennifer Thurston	
Industry:	Oscar Paulson (Kennecott), Jeff Kelsey (UR Energy), Rita Myer (U235), Joanne Tischler (Denison), John Schwenk(?) (Cameco), John Cash (UR Energy), Mike Newman (Neutron Energy), Jan Johnson (TetraTech)
Other:	Travis Stills (Energy Minerals Law Center), Katie Sweeney (National Mining Association)

R. Rosnick: Happy new year to everyone. This is our regularly scheduled quarterly stakeholder conference call.

I can give you a brief update with regard to the proposed rule. We are at the end of the work group process; we have had some back and forth on language changes and ideas into the preamble and wording of the proposed regulatory language. We have had interesting discussions on these things as well as legal issues in the preamble to the proposed rule.

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Does anyone have any questions about the process or timeline?

T. Stills: I guess it's a year and a half later than the dates in the settlement. We are not seeing any technical documentation, as we had expected to. It is my quarterly request to bring up that you need to engage more in publishing the technical information and engage the public. Is there a plan to publish more technical information in the next week or so?

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T. Stills: It doesn't seem credible that only 2 documents were releasable in 2011. It seems unacceptable that there are so few releasable documents.

R. Rosnick: Any other question about general rulemaking?

O. Paulson: I have reviewed the risk assessment distributed in November. It talks about a number of sites. How were certain things done in the risk assessments related to Sweetwater? Population data – table 4 – you go from 0 to 8 km on the site. These population numbers, because I know for a fact the nearest town in NE of here Bairoil with only 10 people and is not within the 30 mile distance. Also listed at NNE are 3 people living within 3 km. I am around here a lot and there are no people that close. It seems to show people that aren't here.

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O. Paulson: My second question is in table 8 – radon flux test results. We have submitted more recent 2011 results and the information in the report is from NRC data that is much older.

R. Rosnick: I will look into this and post the results to the website. COMPLETED

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M. Newman: What is the deadline for getting a response on the risk assessment?

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K. Sweeney: How long will the comment period be?

R. Rosnick: Historically we provide 60 days.

K. Sweeney: This is a rule where we may need 90 days.

R. Rosnick: That is a good proposal and a longer comment period may be preferable for everyone involved. That is noted and Sue is on the line, so we can discuss this with our AA on Tuesday.

S. Cunningham: I would like to say I have the same concern Oscar has about the population chart. I think that population number is low there. 0-20 miles would include Canyon City with a population of 20,000 people.

Also, why didn't they use the 2010 census data, because that data is out now. Our community grew a lot in the 10 years.

R. Rosnick: At the time we started this process, the 2010 census data had not been published yet. So we used the 2000 census data and then model it with a program to help establish the population numbers.

S. Cunningham: Population is such an important part of the risk assessment; I would have thought EPA would have used the most recent 2010 census data.

R. Rosnick: I will look into this and post my findings on the website.

It was desired to use 2010 population data rather than the 2000 census data available in SECPOP, but the analysis was performed before the 2010 data were released. The U.S. Census Bureau has estimates of the population in every county for each year from 2001 through 2009 (http://www.census.gov/popest/counties/files/CO-EST2009-ALLDATA.csv). For each uranium site, the 2000 census data and 2009 estimate were used to calculate an annual population adjustment factor specific for the county in which the site is located. That annual adjustment factor was then used to calculate an adjustment factor to bring the SECPOP population distribution from 2000 to 2010.

Johnson: I haven't had a chance to go through the entire report. What was the rationale for the CAP88 and low dose?

R. Rosnick: At the end of the analysis CAP88 was determined to give the most bang for the buck and realistic tracking of radon movement. We were also the most familiar with it.

O. Paulson: We have found some problems with CAP88 and found that MILDOS was vastly superior.

R. Rosnick: I don't have an answer beyond what I said previously. SEE METHODOLOGY FOR CHOOSING RISK ASSESSMENT MODEL DOCUMENT, NOW ON WEBSITE.

S. Cunningham: Are you going to put comments on the website?

R. Rosnick: I suspect what we will do is, since we always post minutes from these meetings I will plan on delaying posting them until I can get responses to these issue there.

S. Cunningham: We have never seen any of the emailed inquiries and responses posted to the website. This is being done for other rulemaking activities. If you have received question or comments, that it be made available to the public so we can see what the comments are. Especially for comments on the risk assessment. I

would prefer to see the minutes go up first and then when you begin to get comments on the risk assessment, put them up on the website as they come in.

R. Rosnick: I meant delaying posting the meeting minutes only to addressed comments brought up on today's call, so answers to those can be placed in context. Outside of our calls, I have only received two emailed comments. I can get those posted.

Any other questions today?

Feel free to contact me directly should there be anything between now and our next conference call on April 5, 2012 at 11am.

T. Stills: One more thing – Task 5 is the risk assessment. Task 3 report is the methodology for choosing CAP88. We would hope it will be posted. COMPLETED

R. Rosnick: That is it for today. We will talk again April 5, 2012 at 11am.

EPA-4701

Travis Stills <stills@frontier.net>

01/20/2012 05:37 PM

To Susan Stahle

cc

bcc

Subject EPA Meetings

1 attachment

subpartw_1-5-2012_quarterlyconfcall.pdf

Sue,
It appears that EPA tape recorded the phone conference of January 5, 2012 where both you and I were participants.

Please note that I was not given prior notice of the EPA's intention to tape record this or any other call. I must object to EPA tape recording phone calls where I am a participant without my prior knowledge and consent.

Please confirm the steps that EPA and EPA OGC intend to take to address/remedy this serious matter.

Sincerely,
Travis Stills
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R. Rosnick: That is it for today. We will talk again April 5, 2012 at 11am.

EPA-4701

Travis Stills <stills@frontier.net>

01/20/2012 05:37 PM

To Susan Stahle

cc

bcc

Subject EPA Meetings

1 attachment

subpartw_1-5-2012_quarterlyconfcall.pdf

Sue,
It appears that EPA tape recorded the phone conference of January 5, 2012 where both you and I were participants.

Please note that I was not given prior notice of the EPA's intention to tape record this or any other call. I must object to EPA tape recording phone calls where I am a participant without my prior knowledge and consent.

Please confirm the steps that EPA and EPA OGC intend to take to address/remedy this serious matter.

Sincerely,
Travis Stills
--
\~~~~~~

Travis E. Stills
Energy & Conservation Law
1911 Main Avenue, Suite 238
Durango, Colorado 81301
stills@frontier.net
phone:(970)375-9231

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Subpart W Quarterly Conference Call
January 5, 2012, 11:00 am – 12:00 pm
1310 L Street NW, Room 502, Washington, DC

[DRAFT] Conference Call Notes

<u>Meeting Participants</u>:

EPA HQ:	Reid Rosnick, Phil Egidi, Dan Schultheisz, Emily Atkinson, Sue Stahle
EPA Regions:	Angelique Diaz, Region 8
CCAT:	Sharyn Cunningham
Sheep Mountain Alliance: Jennifer Thurston	
Industry:	Oscar Paulson (Kennecott), Jeff Kelsey (UR Energy), Rita Myer (U235), Joanne Tischler (Denison), John Schwenk(?) (Cameco), John Cash (UR Energy), Mike Newman (Neutron Energy), Jan Johnson (TetraTech)
Other:	Travis Stills (Energy Minerals Law Center), Katie Sweeney (National Mining Association)

R. Rosnick: Happy new year to everyone. This is our regularly scheduled quarterly stakeholder conference call.

I can give you a brief update with regard to the proposed rule. We are at the end of the work group process; we have had some back and forth on language changes and ideas into the preamble and wording of the proposed regulatory language. We have had interesting discussions on these things as well as legal issues in the preamble to the proposed rule.

On Tuesday we are briefing our Assistant Administrator Gina McCarthy on the status of the rule and requesting the go ahead for the Final Agency Review (FAR) (Note that this meeting was postponed until a later date yet to be determined). All the workgroup representatives and their higher level management would give the go ahead and say they have no major issues and that they feel we have a legally defensible proposed rule. After that meeting we wrap the package of the preamble, rule and other documents with the rule and it is sent to the EPA Office of Policy and it then goes to OMB for no more than 90 days for review. When it comes back from OMB we would make any changes they recommend or explain why not and then it goes to the EPA Administrator for signature and publishing in the Federal Register. The tentative release to the Federal Register would be April/May 2012.

Does anyone have any questions about the process or timeline?

T. Stills: I guess it's a year and a half later than the dates in the settlement. We are not seeing any technical documentation, as we had expected to. It is my quarterly request to bring up that you need to engage more in publishing the technical information and engage the public. Is there a plan to publish more technical information in the next week or so?

R. Rosnick: After your request during the last call, your request for the risk assessment document, it was posted several days later.

T. Stills: From what I see posted on the website, EPA hasn't posted enough information.

R. Rosnick: I assume you are looking for other types of technical documents. We have several different types of technical documents up on the website and we feel what is posted is sufficient technical materials.

T. Stills: What I am talking about is the public would have access to technical information, not just the industry officials. We would like to see the documents the EPA is using for the rulemaking to be posted to the website during this process for our review. We would like more information and it is what was envisioned during the settlement. It is a repeated request to have more technical information posted for review. This is a request also to the Office of General Counsel because RPD is not doing what we expected it would do.

R. Rosnick: I feel we have met the standard as agreed upon in our settlement.

K. Sweeney: Can you be more specific about what you have requested from EPA?

T. Stills: Anything technical in nature that is not privileged that the workgroup has worked with to write the preamble and rule.

S. Stahle: I would be happy to have a conversation about the settlement agreement at a separate time with our DOJ counsel. The website does contain all of the documents that are appropriate for posting. As I know you appreciate, under the terms of the settlement agreement, we cannot post documents that do not exist and we will not post documents that are deliberative or privileged in any way. Once the rule is proposed, we will include in the public docket all of the information we relied upon for this rulemaking so that the public can review and comment on all of this information at that time. I appreciate that we have a difference of opinion about the settlement agreement, but let's schedule another time for a conversation regarding the settlement agreement so that we can include our DOJ counsel and so that others on this call can ask their questions about the Subpart W rulemaking.

T. Stills: It doesn't seem credible that only 2 documents were releasable in 2011. It seems unacceptable that there are so few releasable documents.

R. Rosnick: Any other question about general rulemaking?

O. Paulson: I have reviewed the risk assessment distributed in November. It talks about a number of sites. How were certain things done in the risk assessments related to Sweetwater? Population data – table 4 – you go from 0 to 8 km on the site. These population numbers, because I know for a fact the nearest town in NE of here Bairoil with only 10 people and is not within the 30 mile distance. Also listed at NNE are 3 people living within 3 km. I am around here a lot and there are no people that close. It seems to show people that aren't here.

R. Rosnick: I believe in the document itself, there is a description of how we went through the census data from 2000 and it was increased by using a model to increase it. This allowed us to get what we thought was a realistic idea of the population within 80 km. We did not go out and drive around to get data.

O. Paulson: My second question is in table 8 – radon flux test results. We have submitted more recent 2011 results and the information in the report is from NRC data that is much older.

R. Rosnick: I will look into this and post the results to the website. COMPLETED

O. Paulson: I may be able to look at the Adams database to see if the data from the NRC is what was used from our submission to them. If I find something there I will send you a link to it.

M. Newman: What is the deadline for getting a response on the risk assessment?

R. Rosnick: It is a public document out there. I am happy to take comments on it through the proposed rule timeline, so that gives you several months.

K. Sweeney: How long will the comment period be?

R. Rosnick: Historically we provide 60 days.

K. Sweeney: This is a rule where we may need 90 days.

R. Rosnick: That is a good proposal and a longer comment period may be preferable for everyone involved. That is noted and Sue is on the line, so we can discuss this with our AA on Tuesday.

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EPA-3345

Philip Egidi/DC/USEPA/US		To	Reid Rosnick
01/24/2012 11:10 AM		cc	
		bcc	
		Subject	Emailing: Appendix F 2009 Radon Flux Measurement Report

fyi
pve

Philip Egidi
Environmental Scientist
U.S. Environmental Protection Agency
Office of Radiation and Indoor Air
Radiation Protection Division
Center for Waste Management and Regulations
Washington, DC

phone: 202-343-9186
email: egidi.philip@epa.gov
cell: 970-209-2885

- Appendix F 2009 Radon Flux Measurement Report.pdf

CALENDAR YEAR 2009

APPENDIX F

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS 2009 RADON FLUX MEASUREMENT PROGRAM

PRIMARY TAILINGS IMPOUNDMENT

CANON CITY MILLING FACILITY

Canon City, Colorado

June 30, 2010

National Emission Standards for Hazardous Air Pollutants
2009 Radon Flux Measurement Program
Cañon City Milling Facility
0502 County Road 68
Cañon City, Colorado

Primary Tailings Impoundment

Prepared for: Cotter Corporation
7800 E. Dorado Place, Suite 210
Englewood, Colorado 80111

Prepared by: Tellco Environmental
P.O. Box 3987
Grand Junction, Colorado 81502

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Appendix A. Charcoal Canister Analyses Support Documents

Appendix B. Recount Data Analyses

Appendix C. Radon Flux Sample Laboratory Data, Including Blanks

Appendix D. Map (Figure 2)

1. INTRODUCTION

During June 2009, Tellco Environmental, LLC (Tellco) of Grand Junction, Colorado, provided support to Cotter Corporation (Cotter) regarding the required National Emission Standards for Hazardous Air Pollutants (NESHAPs) Radon Flux Measurements. These measurements, collected at Cotter's primary tailings impoundment near Cañon City, Colorado, are required to show compliance with the regulations. The regulations limit the amount of radon that can be emitted per unit area (m^2) per unit of time (s). This standard is not an average per facility, but is an average per radon source.

Tellco was contracted to provide radon collectors and lab analysis for calendar year 2009. Cotter personnel performed the on-site placement and retrieval of the canisters. This report addresses the procedures employed by Cotter and Tellco to obtain the results presented in Section 9.0 of this report.

2. SITE DESCRIPTION

The Canon City Milling Facility is located in Fremont County in the south central part of Colorado, approximately 96 miles south of Denver and approximately 36 miles west of Pueblo. The mill site lies in a topographic bowl known as the Wolf Park Basin about 3.5 miles south of Cañon City, in a semi-rural area. The site includes approximately 1520 acres, which contains an active mill currently in stand down and an active tailings (main consisting of a primary and secondary) impoundment. Cotter's active mill began operation in 1979 and has operated periodically until 2006 when it was placed in a standown condition. Processing circuits were cleaned out for hazard reduction and resulting solids and liquids were sent to the active tailings impoundment.

An inactive (1956-1979) alkaline leach mill has been dismantled, removed to a disposal site in the primary impoundment, and partially covered with soil. Approximately 230,000 cubic yards of soil materials were moved into the southwest corner of the primary impoundment from May to September 2008. In addition, a kiln, an associated building and equipment were dismantled, sized and placed in the primary impoundment along with previously dismantled equipment.

Approximately 8,800 cubic yards of soil cover averaging four (4) feet in depth was placed on approximately one (1) acre of the northwest corner of the exposed tailings beach in the latter part of 2008. Soil cover for an additional one (1) acre was placed on the exposed tailings beaches and at dirt-covered locations during the first part of 2009. These actions were taken to reduce areas of elevated flux as part of the As Low as Reasonably Achievable (ALARA) Program. During May 2009, radon flux monitoring was performed from a portion of the dirt-covered area and exposed tailings beaches where previous measurements collected during 2008 had indicated the higher flux concentrations. This preliminary monitoring was performed to confirm as expected that the additional soil cover placed during the latter part of 2008 and early 2009 was effective in reducing the radon flux as part of the As Low as Reasonably Achievable (ALARA) Program.

The active tailings impoundment (primary impoundment) is the subject of this flux monitoring report. The primary impoundment had a total area of approximately 106.73 acres according to estimates of the water solution boundary using the July 2009 aerial photography base map and was comprised of two source regions. The primary impoundment had a total of approximately 59.91

acres with a surface covered by various types of soils of varying thickness (Covered Region), and approximately 27.64 acres of tailings beaches (Beaches Region), with the remaining 19.18 acres covered by standing liquid in low elevation areas.

3. REGULATORY REQUIREMENTS FOR THE SITE

Radon emissions from this site are regulated under applicable standards set by the Environmental Protection Agency (EPA) for Operating Mills. Applicable regulations are specified in 40 CFR Part 61, Subpart W with technical procedures in Appendix B. These regulations are a subset of the National Emission Standards for Hazardous Air Pollutants (NESHAPs). According to subsection 61.252 Standard, (a) radon-222 emissions to ambient air from an existing uranium mill tailings pile shall not exceed an average of 20 picoCuries per square meter per second (pCi/ m^2-s) for each pile.

4. SAMPLING METHODOLOGY

Radon emissions were measured using Large Area Activated Charcoal Canisters (LAACCs) in conformance with 40 CFR, Part 61, Appendix B, Method 115, Restrictions to Radon Flux Measurements, (EPA, 2008). These are passive gas adsorption sampling devices used to determine the flux rate of radon-222 gas from a surface. The LAACCs were constructed using a 10-inch diameter PVC end cap containing a bed of 180 grams of activated, granular charcoal. The prepared charcoal was placed in the LAACCs on a support grid on top of a ½ inch thick layer of foam and secured with a retaining ring under 1½ inches of foam (see Figure 1, page 10).

The canister placement and retrieval effort for the primary impoundment commenced on June 22, 2009 and was concluded on June 26, 2009. One hundred collectors were placed in each region. Due to worker health and safety concerns, measurement of the wet beach areas was limited to areas readily accessible by foot near the toe of the soil cover. Each charged collector was placed directly onto the surface (open face down) and exposed to the surface for 24 hours. Radon gas adsorbed onto the charcoal and the subsequent radioactive decay of the entrained radon resulted in radioactive lead-214 and bismuth-214. These radon progeny isotopes emit characteristic gamma photons that can be detected through gamma spectroscopy. The original total activity of the adsorbed radon was calculated from these gamma ray measurements using calibration factors derived from cross-calibration of standard sources containing known total activities of radium-226 with geometry identical to the counted samples and from the principles of radioactive decay.

After 24 hours, the exposed charcoal was transferred to a sealed plastic sample container (to prevent radon loss or charcoal spillage during transport), identified and labeled, and transported via common carrier to the Tellco laboratory in Grand Junction, Colorado for analysis. Upon completion of on-site activities, the field equipment was alpha and beta-gamma scanned for possible contamination resulting from fieldwork activities. All field equipment was surveyed by Cotter Radiation Safety personnel and released for unrestricted use. Tellco personnel maintained custody of the samples from receipt at the analytical laboratory through analysis.

5. FIELD OPERATIONS

5.1 Equipment Preparation

All charcoal was dried at 110°C before use in the field. Unused charcoal and recycled charcoal were treated the same. 180-gram aliquots of dried charcoal were weighed and placed in sample containers.

Proper balance operation was verified daily by checking a standard weight. The balance readout agreed with the known standard weight to within ± 0.1 percent. (Appendix A).

After acceptable balance check, empty containers were individually placed on the balance and the scale was re-zeroed with the container on the balance. Unexposed and dried charcoal was carefully added to the container until the readout registered approximately 180 grams. The lid was immediately placed on the container and sealed with plastic tape. The balance was checked for readout drift between readings.

Sealed containers with unexposed charcoal were placed individually in the shielded counting well, with the bottom of the container centered over the detector and the background count rate was documented. Three five-minute background counts were conducted on ten percent of the containers, selected at random to represent the "batch". If the background counts were too high to achieve an acceptable lower limit of detection (LLD), the entire charcoal batch was labeled non-conforming and recycled through the heating/drying process.

5.2 Sample Locations, Identification, and Placement

Designated sample point locations were established within the region and marked with pin flags. A sample identification number (ID) was assigned to every sample point, using a sequential alpha-numeric system indicating the charcoal batch and physical location within the region (e.g., A01...A110). This ID was written on an adhesive label and affixed to the top of the collector. The sample ID, date, and time of placement were recorded on the radon flux measurements data sheets for the set of one hundred five measurements.

The sampling locations were spread out as evenly as feasible throughout each region. Prior to placing a collector at each sample location, the retaining ring, screen, and foam pad of each collector were removed to expose the charcoal support grid. A pre-measured charcoal charge was selected from a batch, opened and distributed evenly across the support grid. The collector was then reassembled and placed face down on the surface at each pin flagged sampling location. Care was exercised not to push the device into the soil surface. The collector rim was "sealed" to the surface using a berm of local borrow material.

Five blank collectors for each region were also collected during this sampling effort. The charcoal blanks remained inside an airtight plastic bag in the collector during the 24-hour testing period.

5.3 Sample Retrieval

At the end of the 24-hour testing period, all collectors were disassembled and each sample was individually poured through a funnel into a container. Identification numbers were transferred to the appropriate container, which was sealed and placed in a box for transport. Retrieval date and time were recorded on the same data sheet as the sample placement information. The blank samples were similarly processed.

5.4 Environmental Conditions

A rain gauge and a minimum/maximum thermometer at Cotter's on-site meteorological station were used to monitor rainfall and air temperatures during sampling in order to ensure compliance with the regulatory measurement criteria.

In accordance with 40 CFR, Part 61, Appendix B, Method 115:

- Measurements were not initiated within 24 hours of a rainfall.
- Approximately 0.10 inches of rainfall occurred after the completion of placement of canisters on the Beach Region on June 25, 2009. None of the earthen seals around any canister were compromised and none of the canisters were surrounded by water.
- The measurements presented in this report were not performed during temperatures below 35°F or on frozen ground (the minimum air temperature recorded at the site during the primary impoundment measurement periods was 65°F).

6. SAMPLE ANALYSIS

6.1 Apparatus

Apparatus used for the analysis:

- Single- or multi-channel pulse height analysis system, Ludlum Model 2200 with a Teledyne 3" x 3" sodium iodide, thallium-activated (NaI(Tl)) detector.
- Lead shielded counting well approximately 40 cm deep with 5-cm thick lead walls and a 7-cm thick base and 5 cm thick top.
- National Institute of Standards and Technology (NIST) traceable aqueous solution radium-226 absorbed onto 180 grams of activated charcoal.
- Ohaus Model C501 balance with 0.1-gram sensitivity.

6.2 Sample Inspection and Documentation

Once in the laboratory, the integrity of each charcoal container was verified by visual inspection of the plastic container. Laboratory staff documented damaged or unsealed containers and verified that the data sheet was complete.

All of the sample containers received from the primary impoundment were found to be properly sealed and in good condition upon inspection at the Tellco analytical laboratory.

The sample IDs, regions, and sampling times were complete on the radon flux measurements data sheets.

6.3 Background and Sample Counting

The gamma ray counting system was checked daily, including background and radium-226 source measurements prior to and after each counting session. Based on calibration statistics, using sources with known radium-226 content, background and source control limits were established for each Ludlum/Teledyne counting system with shielded well (Appendix A).

Gamma ray counting of exposed charcoal samples included the following steps:

- The length of count time was determined by the activity of the sample being analyzed, according to a data quality objective of a minimum of 1,000 accrued counts for any given sample.
- The sample container was centered on the NaI detector and the shielded well door was closed.
- The sample was counted over the determined period and then the mid-sample count time, date, and counts were documented on the radon flux measurements data sheet(s) and used in the calculations.
- The above steps were repeated for each exposed charcoal sample.
- Approximately 10 percent of the containers counted were selected for recounting. These containers were recounted the next day following the original count.

7. QUALITY CONTROL (QC) AND DATA VALIDATION

Charcoal flux measurement QC samples included the following intra-laboratory analytical frequency objectives:

- Recounts, 10 percent, and
- Blanks, 5 percent

All sample data were subjected to validation protocols that included assessments of sensitivity, precision, accuracy, and completeness. All method-required data quality objectives (EPA, 2008) were attained.

7.1 Sensitivity

A total of ten blanks were analyzed by measuring the radon progeny activity in samples subjected to all aspects of the measurement process, excepting exposure to the source region (see Appendix C). These blank sample measurements comprised approximately 5 percent of the field measurements. The results of the blank sample analyses measured radon flux rates that ranged from approximately

0.01 to 0.10 pCi/m^2-s, with an average of approximately 0.05 pCi/m^2-s.

7.2 Precision

Twenty recount measurements, distributed throughout the sample sets, were performed by replicating analyses of individual field samples (see Appendix B). These recount measurements comprised approximately 10 percent of the total number of samples analyzed. The precision of these recount measurements, expressed as relative percent difference (RPD), ranged from less than 0.1 percent to 15.4 percent, with an overall average precision of approximately 3.2 percent.

7.3 Accuracy

Accuracy of field measurements was assessed daily by counting two laboratory control samples with known Ra-226 content. Accuracy of these lab control sample measurements, expressed as percent bias, ranged from -2.2 percent to +1.9 percent. The arithmetic average bias of the lab control sample measurements was approximately -0.1 percent (see Appendix A).

7.4 Completeness

All one hundred samples from the Beaches Region were verified during this sampling program, representing 100 percent completeness for that region.

All one hundred samples from the Covered Region were ultimately verified, representing 100 percent completeness for that region.

8. CALCULATIONS

Radon flux rates were calculated for charcoal collection samples using calibration factors derived from cross-calibration to sources with known total activity with identical geometry as the charcoal containers. A yield efficiency factor was used to calculate the total activity of the sample charcoal containers. Individual field sample result values presented were not reduced by the results of the field blank analyses.

In practice, radon flux rates were calculated by a database computer program. The algorithms utilized by the data base program were as follows:

Equation 8.1:

$$\text{pCi Rn-222/m}^2\text{sec} = \frac{N}{[Ts*A*b*0.5^{(d/91.75)}]}$$

where: N = net sample count rate, cpm under 220-662 keV peak
Ts = sample duration, seconds
b = instrument calibration factor, cpm per pCi; values used:
0.1718, for M-01/D-21 and
0.1731, for M-02/D-20
d = decay time, elapsed hours between sample mid-time and count mid-time
A = area of the collector, m^2

Equation 8.2:

$$\text{Error}, 2\sigma = 2 \times \frac{\sqrt{\dfrac{\text{Gross Sample, cpm}}{\text{Sample Count, t, min}} + \dfrac{\text{Background Sample, cpm}}{\text{Background Count, t, min}}}}{\text{Net, cpm}} \times \text{Sample Concentration}$$

Equation 8.3:

$$\text{LLD} = \frac{2.71 + (4.65)(S_b)}{[Ts*A*b*0.5^{(d/91.75)}]}$$

where: 2.71 = constant
4.65 = confidence interval factor
S_b = standard deviation of the background count rate
Ts = sample duration, seconds
b = instrument calibration factor, cpm per pCi; values used:
0.1718, for M-01/D-21 and
0.1731, for M-02/D-20
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9. RESULTS

9.1 Mean Radon Flux

Referencing 40 CFR, Part 61, Subpart W, Appendix B, Method 115 - Monitoring for Radon-222 Emissions, Subsection 2.1.7 - Calculations, "the mean radon flux for each region of the pile and for the total pile shall be calculated and reported as follows:

(a) The individual radon flux calculations shall be made as provided in Appendix A EPA 86(1). The mean radon flux for each region of the pile shall be calculated by summing all individual flux measurements for the region and dividing by the total number of flux measurements for the region.

(b) The mean radon flux for the total uranium mill tailings pile shall be calculated as follows:

$$J_s = \frac{J_1A_1 + \ldots J_2A_2 [+] \ldots J_iA_i}{A_t}$$

Where: J_s = Mean flux for the total pile (pCi/m^2-s)
J_i = Mean flux measured in region i (pCi/m^2-s)
A_i = Area of region i (m^2)
A_t = Total area of the pile (m^2)

2.1.8 Reporting. The results of individual flux measurements, the approximate locations on the pile, and the mean radon flux for each region and the mean radon flux for the total stack [pile] shall be included in the emission test report. Any condition or unusual event that occurred during the measurements that could significantly affect the results should be reported."

9.2 Site Results

Site Specific Sample Results (reference Figure 2 and Appendix C)

(a) The mean radon flux rate for each region within the Primary Impoundment is as follows:

Tailings Beaches	=	25.5 pCi/m^2-s (based on 111,859 m^2 area)
Dirt Cover	=	12.1 pCi/m^2-s (based on 242,456 m^2 area)
Standing Liquid Areas	=	0 pCi/m^2-s (based on 77,621 m^2 area)

(b) Using the data presented above, the calculated mean radon flux rate for the total pile (cell), known as the Primary Impoundment, is 13.4 pCi/m^2-s, is as follows:

$$\frac{(25.5)(111{,}859) + (12.1)(242{,}456) + (0)(77{,}621)}{431{,}936} = 13.4$$

As shown above, the arithmetic mean radon flux for the Primary Impoundment at Cotter Corporation's Cañon City Milling facility is below the NRC and EPA standard of 20 pCi/m^2-s. No condition or unusual event occurred during the measurements that could significantly affect the reported results. Appendix C is a summary of individual measurement results, including blank sample analysis. Sample locations are depicted on Figure 2, which is included in Appendix D. The map was produced by Cotter.

References

U. S. Environmental Protection Agency, *Radon Flux Measurements on Gardinier and Royster Phosphogypsum Piles Near Tampa and Mulberry, Florida*, EPA 520/5-85-029, NTIS #PB86-161874, January 1986.

U. S. Environmental Protection Agency, *Title 40, Code of Federal Regulations*, February 2008.

U. S. Nuclear Regulatory Commission, *Radiological Effluent and Environmental Monitoring at Uranium Mills*, Regulatory Guide 4.14, April 1980.

U. S. Nuclear Regulatory Commission, *Title 10, Code of Federal Regulations*, Part 40, Appendix A, January 2008.

Appendix A

Charcoal Canister Analyses Support Documents

COTTER CORPORATION
CANON CITY, COLORADO
2009 NESHAPs RADON FLUX MEASUREMENTS
PRIMARY IMPOUNDMENT

SYSTEM I.D.	DATE	Bkg Counts (1 min. each) #1	#2	#3	Source Counts (1 min. each) #1	#2	#3	AVG NET cpm	YIELD cpm/pCi	FOUND pCi	SOURCE ID	KNOWN pCi	% BIAS
M-01/D-21	6/26/2009	126	145	156	10024	10327	10202	10042	0.1718	58452	GS-04	59300	-1.4%
M-01/D-21	6/26/2009	153	121	130	10049	10358	10388	10130	0.1718	58966	GS-04	59300	-0.6%
M-01/D-21	6/27/2009	159	142	135	10100	10424	10148	10079	0.1718	58665	GS-04	59300	-1.1%
M-01/D-21	6/27/2009	146	132	141	10223	10229	10213	10082	0.1718	58685	GS-04	59300	-1.0%
M-01/D-21	7/2/2009	121	152	137	10518	10309	10282	10233	0.1718	59563	GS-04	59300	0.4%
M-01/D-21	7/2/2009	143	144	137	10310	10412	10297	10198	0.1718	59362	GS-04	59300	0.1%
M-01/D-21	7/3/2009	135	146	136	10159	10311	10356	10136	0.1718	59001	GS-04	59300	-0.5%
M-01/D-21	7/3/2009	148	140	129	10256	10268	10316	10141	0.1718	59028	GS-04	59300	-0.5%
M-01/D-21	6/26/2009	126	145	156	10416	10362	10516	10289	0.1731	59440	GS-05	59300	0.2%
M-01/D-21	6/26/2009	153	121	130	10365	10352	10160	10158	0.1731	58681	GS-05	59300	-1.0%
M-01/D-21	6/27/2009	159	142	135	10348	10377	10228	10172	0.1731	58766	GS-05	59300	-0.9%
M-01/D-21	6/27/2009	146	132	141	10370	10378	10509	10279	0.1731	59384	GS-05	59300	0.1%
M-01/D-21	7/2/2009	121	152	137	10356	10175	10365	10162	0.1731	58706	GS-05	59300	-1.0%
M-01/D-21	7/2/2009	143	144	137	10186	10169	10197	10043	0.1731	58017	GS-05	59300	-2.2%
M-01/D-21	7/3/2009	135	146	136	10441	10190	10396	10203	0.1731	58945	GS-05	59300	-0.6%
M-01/D-21	7/3/2009	148	140	129	10211	10109	10220	10041	0.1731	58007	GS-05	59300	-2.2%
M-02/D-20	6/26/2009	159	158	151	10335	10489	10407	10254	0.1718	59688	GS-04	59300	0.7%
M-02/D-20	6/26/2009	144	159	121	10401	10376	10428	10260	0.1718	59723	GS-04	59300	0.7%
M-02/D-20	6/27/2009	154	126	151	10333	10562	10460	10308	0.1718	60000	GS-04	59300	1.2%
M-02/D-20	6/27/2009	139	143	139	10581	10406	10566	10377	0.1718	60404	GS-04	59300	1.9%
M-02/D-20	7/2/2009	156	151	136	10344	10493	10319	10238	0.1718	59591	GS-04	59300	0.5%
M-02/D-20	7/2/2009	137	152	155	10443	10456	10573	10343	0.1718	60202	GS-04	59300	1.5%
M-02/D-20	7/3/2009	150	147	143	10483	10502	10377	10307	0.1718	59996	GS-04	59300	1.2%
M-02/D-20	7/3/2009	138	149	133	10294	10513	10616	10334	0.1718	60153	GS-04	59300	1.4%
M-02/D-20	6/26/2009	159	158	151	10293	10507	10395	10242	0.1731	59170	GS-05	59300	-0.2%
M-02/D-20	6/26/2009	144	159	121	10349	10359	10523	10269	0.1731	59324	GS-05	59300	0.0%
M-02/D-20	6/27/2009	154	126	151	10369	10400	10270	10203	0.1731	58941	GS-05	59300	-0.6%
M-02/D-20	6/27/2009	139	143	139	10441	10299	10527	10282	0.1731	59399	GS-05	59300	0.2%
M-02/D-20	7/2/2009	156	151	136	10453	10417	10494	10307	0.1731	59544	GS-05	59300	0.4%
M-02/D-20	7/2/2009	137	152	155	10457	10419	10564	10332	0.1731	59688	GS-05	59300	0.7%
M-02/D-20	7/3/2009	150	147	143	10414	10440	10548	10321	0.1731	59623	GS-05	59300	0.5%
M-02/D-20	7/3/2009	138	149	133	10431	10304	10257	10191	0.1731	58872	GS-05	59300	-0.7%
						AVERAGE PERCENT BIAS FOR ALL ANALYTICAL SESSIONS:							-0.1%

CHARCOAL CANISTER ANALYSIS SYSTEM

SITE LOCATION: Canon City, CO

CLIENT: Cotter Corporation

Calibration Check Log

System ID: M-02 / D-20 Calibration Date: 6/06/09 Due Date: 6/06/10

Scaler S/N: 51563 (M-02) High Voltage: 800 Window: 4.42 Thrshld: 2.20

Detector S/N: 041532 (D-20) Source ID/SN: Ra226/GS-04 Source Activity: 54.3KpCi

Blank Canister Bkgd. Range, cpm: 2 σ = 124 to 170 3 σ = 112 to 181

Gross Source Range, cpm: 2 σ = 10370 to 10563 3 σ = 10321 to 10611

Technician: DL Coog

All counts times are one minute.

	Date	By	Background Counts (1 min. each)				Source Counts (1 min. each)				ok? Y/N
			#1	#2	#3	Avg.	#1	#2	#3	Average	
Pre	6/24/09	DLCoog	159	158	151	156	10335	10489	10407	10410	Y
Post	6/24/09	DLCoog	144	159	121	141	10401	10376	10428	10402	Y
Pre	6/27/09	DLCoog	154	126	151	144	10333	10562	10460	10452	Y
Post	6/27/09	DLCoog	139	143	139	140	10581	10406	10566	10518	Y
Pre	7/02/09	DLCoog	156	151	136	148	10344	10493	10319	10385	Y
Post	7/02/09	DLCoog	137	152	155	148	10443	10456	10573	10491	Y
Pre	7/03/09	DLCoog	150	147	143	147	10483	10502	10377	10454	Y
Post	7/03/09	DLCoog	138	149	133	140	10294	10513	10616	10474	Y

Y/N: Y = average background and source cpm falls within the control limits.
N = average background and source cpm does not fall within the control limits.

The acceptable ranges were determined from prior background and source check data.

CHARCOAL CANISTER ANALYSIS SYSTEM

SITE LOCATION: Canon City, CO

CLIENT: Cotter Corporation

Calibration Check Log

System ID: M-01 / D-21 Calibration Date: 6/06/09 Due Date: 6/06/10

Scaler S/N: 51572 (M-01) High Voltage: 1150 Window: 4.42 Thrshld: 2.20

Detector S/N: 041533 (D-21) Source ID/SN: Ra^{224}/GS-05 Source Activity: 59.3 KpCi

Blank Canister Bkgd. Range, cpm: 2 σ = 107 to 156 3 σ = 95 to 168

Gross Source Range, cpm: 2 σ = ~~10160~~ 9799 DLC to ~~10617~~ 10523 DLC 3 σ = ~~10045~~ 9840 DLC to ~~10731~~ 10660 DLC

Technician: DL Cooper

All counts times are one minute.

	Date	By	Background Counts (1 min. each)				Source Counts (1 min. each)				ok?
			#1	#2	#3	Avg.	#1	#2	#3	Average	Y/N
pre	6/26/09	DL Cooper	124	145	156	142	10416	10362	10516	10431	Y
post	6/26/09	DL Cooper	153	121	130	135	10365	10352	10160	10292	Y
pre	6/27/09	DL Cooper	159	142	135	145	10348	10377	10228	10318	Y
post	6/27/09	DL Cooper	146	132	141	140	10370	10378	10509	10419	Y
pre	7/02/09	DL Cooper	121	152	137	137	10356	10175	10365	10299	Y
post	7/02/09	DL Cooper	143	144	137	141	10186	10169	10197	10184	Y
pre	7/03/09	DL Cooper	135	146	136	139	10441	10190	10396	10342	Y
post	7/03/09	DL Cooper	148	140	129	139	10211	10109	10220	10180	Y

Y/N: Y = average background and source cpm falls within the control limits.
N = average background and source cpm does not fall within the control limits.

The acceptable ranges were determined from prior background and source check data.

CHARCOAL CANISTER ANALYSIS SYSTEM

SITE LOCATION: Canon City, CO

CLIENT: Cotter Corporation

Calibration Check Log

System ID: M-02/D-20 Calibration Date: 6/06/09 Due Date: 6/06/10

Scaler S/N: 51563 (M-02) High Voltage: 800 Window: 4.42 Thrshld: 2.20

Detector S/N: 041532 (D-20) Source ID/SN: Ra 226/GS-05 Source Activity: 59.3 KpCi

Blank Canister Bkgd. Range, cpm: 2 σ = 124 to 170 3 σ = 112 to 181

Gross Source Range, cpm: 2 σ = 9970 to 10731 3 σ = 9780 to 10922

Technician: DL Coyer

All counts times are one minute.

	Date	By	Background Counts (1 min. each)				Source Counts (1 min. each)				ok?
			#1	#2	#3	Avg.	#1	#2	#3	Average	Y/N
pre	6/24/09	DL Coyer	159	158	151	156	10293	10507	10395	10398	Y
Post	6/24/09	DL Coyer	144	159	121	141	10349	10359	10523	10410	Y
pre	6/27/09	DL Coyer	154	126	151	144	10369	10400	10270	10346	Y
Post	6/27/09	DL Coyer	139	143	139	140	10441	10299	10527	10422	Y
pre	7/02/09	DL Coyer	156	151	136	148	10453	10417	10494	10455	Y
post	7/02/09	DL Coyer	137	152	155	148	10457	10419	10564	10480	Y
pre	7/03/09	DL Coyer	150	147	143	147	10414	10440	10548	10467	Y
post	7/03/09	DL Coyer	138	149	133	140	10431	10304	10257	10331	Y

Y/N: Y = average background and source cpm falls within the control limits.
N = average background and source cpm does not fall within the control limits.

The acceptable ranges were determined from prior background and source check data.

CHARCOAL CANISTER ANALYSIS SYSTEM

SITE LOCATION: Canon City, CO

CLIENT: Cotter Corporation

Calibration Check Log

System ID: M-01 / D-21 Calibration Date: 6/06/09 Due Date: 6/06/10

Scaler S/N: 51572 (M-01) High Voltage: 1150 Window: 4.42 Thrshld: 2.20

Detector S/N: 041533 (D-21) Source ID/SN: Ra^{226}/GS-04 Source Activity: 59.3KpCi

Blank Canister Bkgd. Range, cpm: 2 σ = 107 to 156 3 σ = 95 to 168

Gross Source Range, cpm: 2 σ = 10160 to 10617 3 σ = 10045 to 10731

Technician: DL Cogn

All counts times are one minute.

	Date	By	Background Counts (1 min. each)				Source Counts (1 min. each)				ok? Y/N
			#1	#2	#3	Avg.	#1	#2	#3	Average	
Pre	6/26/09	DLCogn	126	145	156	142	10024	10327	10202	10184	Y
Post	6/26/09	DLCogn	153	121	130	135	10049	10358	10388	10265	Y
Pre	6/27/09	DLCogn	159	142	135	145	10100	10424	10148	10224	Y
Post	6/27/09	DLCogn	146	132	141	140	10223	10229	10213	10222	Y
Pre	7/02/09	DLCogn	121	152	137	137	10518	10309	10282	10370	Y
Post	7/02/09	DLCogn	143	144	137	141	10310	10412	10297	10340	Y
Pre	7/03/09	DLCogn	135	146	136	139	10159	10311	10356	10275	Y
Post	7/03/09	DLCogn	148	140	129	139	10256	10268	10316	10280	Y

Y/N: Y = average background and source cpm falls within the control limits.
N = average background and source cpm does not fall within the control limits.

The acceptable ranges were determined from prior background and source check data.

BALANCE OPERATION DAILY CHECK

Balance Model: Ohaus Port-o-gram S.N. 12307

Standard Weight (g): 200.0

Date	Pre-check (g)	Post-check (g)	O.K. ± 0.1 % ?	By
6/24/09	200.0	200.0	yes	DL Cogan
6/27/09	200.0	200.0	yes	DL Cogan
7/02/09	200.0	200.0	yes	DL Cogan
7/03/09	200.0	200.0	yes	DL Cogan

Appendix B

Recount Data Analyses

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CO PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: E SURFACE: TAILINGS AIR TEMP MIN: 66°F WEATHER: Rained 0.10 inches After Placement
AREA: BEACH DEPLOYED: 6 25 9 RETRIEVED: 6 26 9 CHARCOAL BKG: 155 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D20 CAL. DUE: 6/06/10

RECOUNT CANISTER ANALYSIS:

GRID LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m^2s	± pCi/m^2s	LLD pCi/m^2s	PRECISION % RPD
TB10	E10	7	12	8	25	7	2	9	14	7	1	18090	235.2	74.0	7.4	0.08	
RECOUNT	E10	7	12	8	25	7	3	9	22	7	1	13795	235.2	72.2	7.2	0.10	2.5%
TB20	E20	7	23	8	36	7	2	9	14	14	1	7318	227.7	29.5	3.0	0.08	
RECOUNT	E20	7	23	8	36	7	3	9	22	14	1	5590	227.7	28.5	2.9	0.10	3.4%
TB30	E30	7	38	8	46	7	2	9	14	20	1	15369	230.5	62.9	6.3	0.08	
RECOUNT	E30	7	38	8	46	7	3	9	22	20	1	11924	230.5	62.4	6.2	0.10	0.8%
TB40	E40	7	57	8	57	7	2	9	14	44	6	1122	233.0	0.1	0.0	0.08	
RECOUNT	E40	7	57	8	57	7	3	9	22	44	6	1039	233.0	0.1	0.1	0.10	0.0%
TB50	E50	8	56	9	6	7	2	9	15	3	1	1243	226.0	4.7	0.5	0.08	
RECOUNT	E50	8	56	9	6	7	3	9	22	3	1	1018	226.0	4.7	0.5	0.10	0.0%
TB60	E60	9	8	9	18	7	2	9	15	21	3	1090	230.6	0.9	0.1	0.08	
RECOUNT	E60	9	8	9	18	7	3	9	22	21	4	1277	230.6	0.9	0.1	0.10	0.0%
TB70	E70	9	20	10	34	7	2	9	15	38	1	4516	227.7	17.9	1.8	0.08	
RECOUNT	E70	9	20	10	34	7	3	9	22	38	1	3650	227.7	18.3	1.8	0.10	2.2%
TB80	E80	9	33	12	5	7	2	9	15	46	1	4078	225.6	15.2	1.5	0.07	
RECOUNT	E80	9	33	12	5	7	3	9	22	46	1	3301	225.6	15.4	1.5	0.09	1.3%
TB90	E90	9	43	12	11	7	2	9	15	55	1	1409	237.4	4.9	0.5	0.07	
RECOUNT	E90	9	43	12	11	7	3	9	22	55	1	1119	237.4	4.8	0.5	0.09	2.1%
TB100	E100	9	55	12	16	7	2	9	16	2	1	1417	224.2	4.9	0.5	0.07	
RECOUNT	E100	9	55	12	16	7	3	9	22	2	1	1217	224.2	5.2	0.5	0.09	5.9%
									AVERAGE PERCENT PRECISION FOR THE PRIMARY BEACHES REGION:								1.8%

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CO PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: D SURFACE: SOIL AIR TEMP MIN: 65°F WEATHER: NO RAIN
AREA: COVER DEPLOYED: 6 22 9 RETRIEVED: 6 23 9 CHARCOAL BKG: 151 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D20 CAL. DUE: 6/06/10

RECOUNT CANISTER ANALYSIS:

GRID LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	PRECISION % RPD
DC10	D10	7	28	9	1	6	26	9	9	12	3	1380	219.9	0.7	0.1	0.04	
RECOUNT	D10	7	28	9	1	6	27	9	8	20	3	1143	219.9	0.6	0.1	0.05	15.4%
DC20	D20	7	50	9	12	6	26	9	9	28	1	3344	219.7	7.3	0.7	0.04	
RECOUNT	D20	7	50	9	12	6	27	9	8	18	1	2909	219.7	7.5	0.8	0.05	2.7%
DC30	D30	8	8	9	20	6	26	9	9	42	1	4884	219.3	10.9	1.1	0.04	
RECOUNT	D30	8	8	9	20	6	27	9	8	23	1	3956	219.3	10.5	1.1	0.05	3.7%
DC40	D40	8	52	9	25	6	26	9	9	58	3	1116	215.0	0.5	0.1	0.04	
RECOUNT	D40	8	52	9	25	6	27	9	8	26	4	1324	215.0	0.5	0.1	0.05	0.0%
DC50	D50	9	6	9	31	6	26	9	10	13	3	1119	217.9	0.5	0.1	0.04	
RECOUNT	D50	9	6	9	31	6	27	9	8	31	4	1288	217.9	0.5	0.1	0.05	0.0%
DC60	D60	9	24	9	40	6	26	9	10	28	3	1412	216.5	0.8	0.1	0.04	
RECOUNT	D60	9	24	9	40	6	27	9	8	31	3	1314	216.5	0.8	0.1	0.05	0.0%
DC70	D70	9	38	9	43	6	26	9	10	36	1	24192	214.7	57.8	5.8	0.04	
RECOUNT	D70	9	38	9	43	6	27	9	8	34	1	20150	214.7	57.2	5.7	0.05	1.0%
DC80	D80	12	5	12	18	6	26	9	10	42	1	1264	214.6	2.6	0.3	0.04	
RECOUNT	D80	12	5	12	18	6	27	9	8	35	2	1968	214.6	2.3	0.2	0.05	12.2%
DC90	D90	12	19	12	26	6	26	9	10	51	1	5958	210.2	13.7	1.4	0.04	
RECOUNT	D90	12	19	12	26	6	27	9	8	37	1	4995	210.2	13.6	1.4	0.05	0.7%
DC100	D100	12	33	12	33	6	26	9	10	59	2	1294	210.7	1.2	0.1	0.04	
RECOUNT	D100	12	33	12	33	6	27	9	8	37	2	1096	210.7	1.1	0.1	0.05	8.7%
AVERAGE PERCENT PRECISION FOR THE PRIMARY COVERED REGION:																	4.5%

Appendix C

Radon Flux Sample Laboratory Data (including Blanks)

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CC PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: E SURFACE: TAILINGS AIR TEMP MIN: 66°F WEATHER: Rained 0.10 inches After Placemen
AREA: BEACH DEPLOYED: 6 25 9 RETRIEVED: 6 26 9 CHARCOAL BKG: 155 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D2C CAL. DUE: 6/06/10

LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	COMMENTS:
TB01	E01	7	1	8	15	7	2	9	14	0	3	1347	223.7	1.2	0.12	0.08	
TB02	E02	7	2	8	17	7	2	9	14	0	2	1388	230.9	2.2	0.22	0.08	
TB03	E03	7	4	8	18	7	2	9	14	2	1	1884	234.9	7.2	0.72	0.08	
TB04	E04	7	5	8	20	7	2	9	14	2	1	2787	226.2	10.8	1.08	0.08	
TB05	E05	7	6	8	20	7	2	9	14	4	2	1157	228.0	1.8	0.18	0.08	
TB06	E06	7	8	8	23	7	2	9	14	4	1	9955	228.5	40.4	4.04	0.08	
TB07	E07	7	9	8	23	7	2	9	14	6	1	39028	239.1	161.4	16.14	0.08	
TB08	E08	7	10	8	25	7	2	9	14	6	1	37619	232.7	154.3	15.43	0.08	
TB09	E09	7	11	8	25	7	2	9	14	7	1	12427	225.2	51.0	5.10	0.08	
TB10	E10	7	12	8	25	7	2	9	14	7	1	18090	235.2	74.0	7.40	0.08	
TB11	E11	7	13	8	26	7	2	9	14	8	1	12255	228.8	50.3	5.03	0.08	
TB12	E12	7	14	8	27	7	2	9	14	8	1	24631	234.5	100.9	10.09	0.08	
TB13	E13	7	15	8	28	7	2	9	14	10	1	2140	226.7	8.2	0.82	0.08	
TB14	E14	7	16	8	28	7	2	9	14	10	1	2193	228.4	8.4	0.84	0.08	
TB15	E15	7	17	8	28	7	2	9	14	11	1	24723	226.8	102.2	10.22	0.08	
TB16	E16	7	18	8	28	7	2	9	14	11	1	18453	226.9	75.6	7.56	0.08	
TB17	E17	7	19	8	31	7	2	9	14	12	1	10396	231.0	42.6	4.26	0.08	
TB18	E18	7	20	8	32	7	2	9	14	12	1	5243	230.4	21.0	2.10	0.08	
TB19	E19	7	22	8	30	7	2	9	14	14	1	12037	234.7	49.5	4.95	0.08	
TB20	E20	7	23	8	36	7	2	9	14	14	1	7318	227.7	29.5	2.95	0.08	
TB21	E21	7	26	8	37	7	2	9	14	15	1	13387	228.5	55.0	5.50	0.08	
TB22	E22	7	27	8	37	7	2	9	14	15	1	12114	225.3	49.4	4.94	0.08	
TB23	E23	7	28	8	39	7	2	9	14	16	1	10713	237.3	43.9	4.39	0.08	
TB24	E24	7	29	8	40	7	2	9	14	16	1	4641	235.8	18.5	1.85	0.08	
TB25	E25	7	31	8	40	7	2	9	14	18	1	3075	227.8	12.2	1.22	0.08	
TB26	E26	7	33	8	43	7	2	9	14	18	1	3209	227.1	12.6	1.26	0.08	
TB27	E27	7	34	8	44	7	2	9	14	19	1	8568	224.1	35.0	3.50	0.08	
TB28	E28	7	35	8	44	7	2	9	14	19	1	10208	227.6	41.5	4.15	0.08	
TB29	E29	7	37	8	46	7	2	9	14	20	1	7333	235.6	29.9	2.99	0.08	
TB30	E30	7	38	8	46	7	2	9	14	20	1	15369	230.5	62.9	6.29	0.08	
TB31	E31	7	39	8	47	7	2	9	14	22	1	2877	234.0	11.3	1.13	0.08	
TB32	E32	7	41	8	48	7	2	9	14	22	1	2499	226.3	9.7	0.97	0.08	
TB33	E33	7	43	8	53	7	2	9	14	23	1	10194	227.3	41.7	4.17	0.08	
TB34	E34	7	49	8	55	7	2	9	14	26	5	1106	228.3	0.3	0.07	0.08	
TB35	E35	7	51	8	55	7	2	9	14	32	6	1139	227.8	0.1	0.07	0.08	
TB36	E36	7	52	8	55	7	2	9	14	30	1	1803	233.3	6.8	0.68	0.08	
TB37	E37	7	53	8	56	7	2	9	14	36	1	3957	222.9	15.9	1.59	0.08	
TB38	E38	7	54	8	56	7	2	9	14	38	3	1002	228.1	0.7	0.10	0.08	

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CC PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: E SURFACE: TAILINGS AIR TEMP MIN: 66°F WEATHER: Rained 0.10 inches After Placement
AREA: BEACH DEPLOYED: 6 25 9 RETRIEVED: 6 26 9 CHARCOAL BKG: 155 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D20 CAL. DUE: 6/06/10

LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	COMMENTS:
TB39	E39	7	55	12	23	7	2	9	14	41	2	1145	229.1	1.5	0.15	0.07	
TB40	E40	7	57	8	57	7	2	9	14	44	6	1122	233.0	0.1	0.07	0.08	
TB41	E41	7	58	8	58	7	2	9	14	49	2	1525	231.1	2.5	0.25	0.08	
TB42	E42	7	59	8	59	7	2	9	14	48	1	5131	233.2	20.7	2.07	0.08	
TB43	E43	8	0	9	2	7	2	9	14	52	3	1035	230.2	0.8	0.10	0.08	
TB44	E44	8	1	9	3	7	2	9	14	51	1	2009	241.3	7.7	0.77	0.08	
TB45	E45	8	2	9	4	7	2	9	14	57	5	1225	232.8	0.4	0.07	0.08	
TB46	E46	8	3	9	3	7	2	9	14	57	5	1187	231.7	0.3	0.07	0.08	
TB47	E47	8	4	9	4	7	2	9	15	1	1	2003	228.6	7.8	0.78	0.08	
TB48	E48	8	6	9	9	7	2	9	15	1	1	1151	226.3	4.1	0.41	0.08	
TB49	E49	8	54	9	8	7	2	9	15	4	3	1303	223.6	1.2	0.12	0.08	
TB50	E50	8	56	9	6	7	2	9	15	3	1	1243	226.0	4.7	0.47	0.08	
TB51	E51	8	57	9	8	7	2	9	15	6	1	3990	222.4	16.6	1.66	0.08	
TB52	E52	8	58	9	7	7	2	9	15	7	2	1561	228.2	2.7	0.27	0.08	
TB53	E53	9	0	9	10	7	2	9	15	9	1	1740	224.5	6.9	0.69	0.08	
TB54	E54	9	1	9	10	7	2	9	15	9	1	1031	225.8	3.8	0.38	0.08	
TB55	E55	9	2	9	11	7	2	9	15	10	1	35049	221.9	151.1	15.11	0.08	
TB56	E56	9	4	9	11	7	2	9	15	12	3	1417	227.2	1.4	0.14	0.08	
TB57	E57	9	5	9	11	7	2	9	15	16	4	1147	233.3	0.6	0.09	0.08	
TB58	E58	9	7	9	15	7	2	9	15	15	1	1055	230.9	3.9	0.39	0.08	
TB59	E59	9	8	9	16	7	2	9	15	19	1	6141	222.9	25.9	2.59	0.08	
TB60	E60	9	8	9	18	7	2	9	15	21	3	1090	230.6	0.9	0.11	0.08	
TB61	E61	9	11	10	21	7	2	9	15	27	7	1162	220.7	0.0	0.06	0.08	
TB62	E62	9	12	10	22	7	2	9	15	25	1	1306	224.1	4.7	0.47	0.08	
TB63	E63	9	14	10	25	7	2	9	15	32	1	6168	222.5	24.9	2.49	0.08	
TB64	E64	9	15	10	26	7	2	9	15	32	1	17597	226.5	71.7	7.17	0.08	
TB65	E65	9	16	10	28	7	2	9	15	33	1	3296	221.9	13.0	1.30	0.08	
TB66	E66	9	17	10	29	7	2	9	15	33	1	3236	224.5	12.7	1.27	0.08	
TB67	E67	9	17	10	30	7	2	9	15	36	3	1195	227.8	1.0	0.11	0.08	
TB68	E68	9	18	10	31	7	2	9	15	35	1	3631	221.6	14.3	1.43	0.08	
TB69	E69	9	19	10	33	7	2	9	15	38	1	3609	221.8	14.3	1.43	0.08	
TB70	E70	9	20	10	34	7	2	9	15	38	1	4516	227.7	17.9	1.79	0.08	
TB71	E71	9	22	10	35	7	2	9	15	39	1	1459	232.1	5.4	0.54	0.08	
TB72	E72	9	23	10	37	7	2	9	15	39	1	3378	227.8	13.2	1.32	0.08	
TB73	E73	9	25	12	1	7	2	9	15	41	1	5055	231.3	19.1	1.91	0.07	
TB74	E74	9	26	12	1	7	2	9	15	42	3	1207	226.1	1.0	0.10	0.07	
TB75	E75	9	27	12	2	7	2	9	15	44	1	7459	227.4	28.5	2.85	0.07	
TB76	E76	9	28	12	2	7	2	9	15	44	1	7842	233.6	29.8	2.98	0.07	

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CC PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: E SURFACE: TAILINGS AIR TEMP MIN: 66°F WEATHER: Rained 0.10 inches After Placement
AREA: BEACH DEPLOYED: 6 25 9 RETRIEVED: 6 26 9 CHARCOAL BKG: 155 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D2C CAL. DUE: 6/06/10

LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	COMMENTS:
TB77	E77	9	29	12	3	7	2	9	15	45	1	9946	229.9	38.2	3.82	0.07	
TB78	E78	9	30	12	4	7	2	9	15	45	1	5489	230.8	20.7	2.07	0.07	
TB79	E79	9	31	12	4	7	2	9	15	46	1	1317	234.0	4.5	0.45	0.07	
TB80	E80	9	33	12	5	7	2	9	15	46	1	4078	225.6	15.2	1.52	0.07	
TB81	E81	9	34	12	5	7	2	9	15	48	1	11290	229.9	43.6	4.36	0.07	
TB82	E82	9	35	12	6	7	2	9	15	48	1	2165	231.4	7.8	0.78	0.07	
TB83	E83	9	36	12	6	7	2	9	15	49	1	1082	229.8	3.6	0.36	0.07	
TB84	E84	9	37	12	7	7	2	9	15	49	1	3762	224.3	14.0	1.40	0.07	
TB85	E85	9	39	12	7	7	2	9	15	50	1	1530	231.2	5.4	0.54	0.07	
TB86	E86	9	40	12	8	7	2	9	15	50	1	1180	225.4	4.0	0.40	0.07	
TB87	E87	9	41	12	9	7	2	9	15	52	1	1617	228.4	5.7	0.57	0.07	
TB88	E88	9	41	12	9	7	2	9	15	53	2	1492	237.8	2.3	0.23	0.07	
TB89	E89	9	42	12	10	7	2	9	15	55	1	2194	229.6	8.0	0.80	0.07	
TB90	E90	9	43	12	11	7	2	9	15	55	1	1409	237.4	4.9	0.49	0.07	
TB91	E91	9	46	12	11	7	2	9	15	57	2	890	231.6	1.1	0.13	0.07	
TB92	E92	9	47	12	12	7	2	9	15	57	1	10863	232.6	41.7	4.17	0.07	
TB93	E93	9	48	12	12	7	2	9	15	59	1	4021	226.7	15.2	1.52	0.07	
TB94	E94	9	49	12	12	7	2	9	15	59	1	10168	231.4	39.1	3.91	0.07	
TB95	E95	9	50	12	13	7	2	9	16	0	1	10417	223.1	40.3	4.03	0.07	
TB96	E96	9	51	12	14	7	2	9	16	0	1	56272	225.0	218.9	21.89	0.07	
TB97	E97	9	52	12	15	7	2	9	16	1	1	1171	228.5	4.0	0.40	0.07	
TB98	E98	9	53	12	15	7	2	9	16	1	1	3566	230.5	13.3	1.33	0.07	
TB99	E99	9	54	12	15	7	2	9	16	2	1	4190	229.4	15.9	1.59	0.07	
TB100	E100	9	55	12	16	7	2	9	16	2	1	1417	224.2	4.9	0.49	0.07	
AVERAGE RADON FLUX RATE FOR THE PRIMARY BEACHES REGION:														25.5	pCi/m²s		
														0.0	pCi/m²s	MIN	
														218.9	pCi/m²s	MAX	

BLANK CANISTER ANALYSIS:

GRID LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	COMMENTS:
E BLANK 1	E101	6	13	13	11	7	2	9	13	22	10	1589	209.0	0.01	0.05	0.06	CONTROL
E BLANK 2	E102	6	35	13	12	7	2	9	13	22	10	1838	208.9	0.10	0.05	0.06	CONTROL
E BLANK 3	E103	8	30	13	12	7	2	9	13	34	10	1690	210.3	0.05	0.05	0.07	CONTROL
E BLANK 4	E104	8	33	13	13	7	2	9	13	34	10	1799	211.1	0.09	0.05	0.07	CONTROL
E BLANK 5	E105	8	38	13	14	7	2	9	13	47	10	1585	209.7	0.01	0.05	0.07	CONTROL
AVERAGE BLANK CANISTER ANALYSIS FOR THE PRIMARY BEACHES REGION:														0.05	pCi/m²s		

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CC PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: D SURFACE: SOIL AIR TEMP MIN: 65°F WEATHER: NO RAIN
AREA: COVER DEPLOYED: 6 22 9 RETRIEVED: 6 23 9 CHARCOAL BKG: 151 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D2C CAL. DUE: 6/06/10

GRID LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	COMMENTS:
DC01	D01	7	11	8	54	6	26	9	9	4	2	1007	214.7	0.8	0.08	0.04	
DC02	D02	7	13	8	55	6	26	9	9	4	2	1221	215.3	1.0	0.10	0.04	
DC03	D03	7	15	8	55	6	26	9	9	6	1	1066	215.4	2.1	0.21	0.04	
DC04	D04	7	19	8	58	6	26	9	9	6	1	8261	215.5	18.3	1.83	0.04	
DC05	D05	7	20	8	58	6	26	9	9	7	1	5351	214.1	11.8	1.18	0.04	
DC06	D06	7	21	8	59	6	26	9	9	7	1	2419	219.0	5.1	0.51	0.04	
DC07	D07	7	23	8	59	6	26	9	9	8	1	1412	216.4	2.9	0.29	0.04	
DC08	D08	7	24	9	0	6	26	9	9	9	2	1615	218.7	1.5	0.15	0.04	
DC09	D09	7	26	9	1	6	26	9	9	11	1	3458	216.6	7.5	0.75	0.04	
DC10	D10	7	28	9	1	6	26	9	9	12	3	1380	219.9	0.7	0.07	0.04	
DC11	D11	7	29	9	1	6	26	9	9	15	2	1016	214.9	0.8	0.08	0.04	
DC12	D12	7	31	9	3	6	26	9	9	14	1	6864	217.0	15.2	1.52	0.04	
DC13	D13	7	32	9	3	6	26	9	9	17	1	1601	218.5	3.3	0.33	0.04	
DC14	D14	7	33	9	4	6	26	9	9	17	1	1000	217.2	1.9	0.19	0.04	
DC15	D15	7	35	9	5	6	26	9	9	20	4	1225	218.3	0.4	0.05	0.04	
DC16	D16	7	37	9	6	6	26	9	9	20	4	1186	214.2	0.3	0.05	0.04	
DC17	D17	7	39	9	7	6	26	9	9	25	4	1251	214.5	0.4	0.05	0.04	
DC18	D18	7	41	9	9	6	26	9	9	24	2	1505	213.1	1.4	0.14	0.04	
DC19	D19	7	44	9	11	6	26	9	9	28	1	5313	218.4	11.9	1.19	0.04	
DC20	D20	7	50	9	12	6	26	9	9	28	1	3344	219.7	7.3	0.73	0.04	
DC21	D21	7	51	9	6	6	26	9	9	29	1	1500	218.7	3.1	0.31	0.04	
DC22	D22	7	53	9	7	6	26	9	9	29	1	2073	218.3	4.4	0.44	0.04	
DC23	D23	7	55	9	13	6	26	9	9	32	4	1066	218.1	0.3	0.05	0.04	
DC24	D24	7	57	9	14	6	26	9	9	32	3	1044	213.8	0.5	0.06	0.04	
DC25	D25	7	59	9	16	6	26	9	9	35	1	1062	215.7	2.1	0.21	0.04	
DC26	D26	8	2	9	17	6	26	9	9	36	3	1057	215.4	0.5	0.06	0.04	
DC27	D27	8	3	9	18	6	26	9	9	39	2	1017	220.0	0.8	0.08	0.04	
DC28	D28	8	5	9	19	6	26	9	9	39	3	1053	218.3	0.5	0.06	0.04	
DC29	D29	8	7	9	19	6	26	9	9	44	5	1222	217.9	0.2	0.04	0.04	
DC30	D30	8	8	9	20	6	26	9	9	42	1	4884	219.3	10.9	1.09	0.04	
DC31	D31	8	9	9	20	6	26	9	9	47	1	3447	218.3	7.6	0.76	0.04	
DC32	D32	8	11	9	21	6	26	9	9	47	1	1566	214.3	3.3	0.33	0.04	
DC33	D33	8	12	9	21	6	26	9	9	51	5	1188	216.8	0.2	0.04	0.04	
DC34	D34	8	13	9	22	6	26	9	9	50	3	1067	216.2	0.5	0.06	0.04	
DC35	D35	8	46	9	22	6	26	9	9	54	1	2148	218.2	4.7	0.47	0.04	
DC36	D36	8	47	9	23	6	26	9	9	54	1	8665	216.6	20.0	2.00	0.04	
DC37	D37	8	48	9	23	6	26	9	9	55	1	2831	213.5	6.4	0.64	0.04	
DC38	D38	8	50	9	23	6	26	9	9	55	1	6741	217.1	15.5	1.55	0.04	

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CC PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: D SURFACE: SOIL AIR TEMP MIN: 65°F WEATHER: NO RAIN
AREA: COVER DEPLOYED: 6 22 9 RETRIEVED: 6 23 9 CHARCOAL BKG: 151 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D2C CAL. DUE: 6/06/10

GRID	SAMPLE	DEPLOY		RETRIV		ANALYSIS			MID-TIME		CNT	GROSS	GROSS	RADON	±	LLD	
LOCATION	I. D.	HR	MIN	HR	MIN	MO	DA	YR	HR	MIN	(MIN)	COUNTS	WT IN	pCi/m²s	pCi/m²s	pCi/m²s	COMMENTS:
DC39	D39	8	51	9	24	6	26	9	9	58	4	1309	223.1	0.4	0.05	0.04	
DC40	D40	8	52	9	25	6	26	9	9	58	3	1116	215.0	0.5	0.06	0.04	
DC41	D41	8	53	9	25	6	26	9	10	1	1	2333	218.1	5.2	0.52	0.04	
DC42	D42	8	55	9	26	6	26	9	10	1	1	2724	219.0	6.1	0.61	0.04	
DC43	D43	8	56	9	26	6	26	9	10	4	4	1090	221.1	0.3	0.05	0.04	
DC44	D44	8	58	9	27	6	26	9	10	2	1	1135	217.2	2.3	0.23	0.04	
DC45	D45	8	59	9	27	6	26	9	10	7	1	4165	220.2	9.6	0.96	0.04	
DC46	D46	9	0	9	28	6	26	9	10	7	1	5133	218.3	11.8	1.18	0.04	
DC47	D47	9	2	9	29	6	26	9	10	8	1	2945	214.7	6.7	0.67	0.04	
DC48	D48	9	3	9	29	6	26	9	10	10	3	1242	211.3	0.6	0.06	0.04	
DC49	D49	9	5	9	30	6	26	9	10	13	3	1022	216.9	0.5	0.06	0.04	
DC50	D50	9	6	9	31	6	26	9	10	13	3	1119	217.9	0.5	0.06	0.04	
DC51	D51	9	7	9	31	6	26	9	10	16	1	11807	225.0	27.9	2.79	0.04	
DC52	D52	9	9	9	32	6	26	9	10	16	1	5261	213.4	12.1	1.21	0.04	
DC53	D53	9	10	9	32	6	26	9	10	17	1	5228	212.3	12.2	1.22	0.04	
DC54	D54	9	12	9	33	6	26	9	10	18	3	1271	214.9	0.6	0.06	0.04	
DC55	D55	9	17	9	34	6	26	9	10	23	4	1265	214.6	0.4	0.05	0.04	
DC56	D56	9	18	9	35	6	26	9	10	22	1	5757	218.8	13.4	1.34	0.04	
DC57	D57	9	20	9	35	6	26	9	10	26	1	26638	217.7	63.8	6.38	0.04	
DC58	D58	9	21	9	36	6	26	9	10	26	1	36439	215.9	86.7	8.67	0.04	
DC59	D59	9	22	9	38	6	26	9	10	28	3	1132	220.3	0.5	0.06	0.04	
DC60	D60	9	24	9	40	6	26	9	10	28	3	1412	216.5	0.8	0.08	0.04	
DC61	D61	9	25	9	38	6	26	9	10	31	1	5311	218.2	12.4	1.24	0.04	
DC62	D62	9	27	9	37	6	26	9	10	31	1	6297	217.5	14.7	1.47	0.04	
DC63	D63	9	28	9	37	6	26	9	10	32	1	14663	213.8	35.1	3.51	0.04	
DC64	D64	9	30	9	40	6	26	9	10	32	1	4508	211.1	10.4	1.04	0.04	
DC65	D65	9	32	9	41	6	26	9	10	33	1	6981	218.8	16.5	1.65	0.04	
DC66	D66	9	33	9	41	6	26	9	10	33	1	28639	220.4	68.4	6.84	0.04	
DC67	D67	9	34	9	42	6	26	9	10	34	1	21521	218.2	51.7	5.17	0.04	
DC68	D68	9	35	9	42	6	26	9	10	34	1	4986	221.3	11.6	1.16	0.04	
DC69	D69	9	36	9	43	6	26	9	10	36	1	3610	213.6	8.4	0.84	0.04	
DC70	D70	9	38	9	43	6	26	9	10	36	1	24192	214.7	57.8	5.78	0.04	
DC71	D71	9	40	9	44	6	26	9	10	37	1	6921	216.8	16.4	1.64	0.04	
DC72	D72	9	41	9	45	6	26	9	10	37	1	4569	216.9	10.6	1.06	0.04	
DC73	D73	9	42	9	46	6	26	9	10	38	1	7504	215.7	17.8	1.78	0.04	
DC74	D74	9	43	11	53	6	26	9	10	38	1	31326	217.5	68.5	6.85	0.04	
DC75	D75	9	45	11	54	6	26	9	10	40	1	23131	214.7	50.9	5.09	0.04	
DC76	D76	11	59	11	59	6	26	9	10	40	1	10935	212.3	25.6	2.56	0.04	

CLIENT: COTTER CORP. PROJECT: RADON FLUX MEASUREMENTS, CANON CITY, CC PROJECT NO.: 09005.00

PILE: PRIMARY BATCH: D SURFACE: SOIL AIR TEMP MIN: 65°F WEATHER: NO RAIN
AREA: COVER DEPLOYED: 6 22 9 RETRIEVED: 6 23 9 CHARCOAL BKG: 151 cpm Wt. Out: 180.0 g.
FIELD TECHNICIANS:P.Usnick, M.Currey, M.Villagrana COUNTED BY: DLC DATA ENTRY BY: DLC TARE WEIGHT: 29.2 g.
COUNTING SYSTEM I.D.: M01/D21, M02/D2C CAL. DUE: 6/06/10

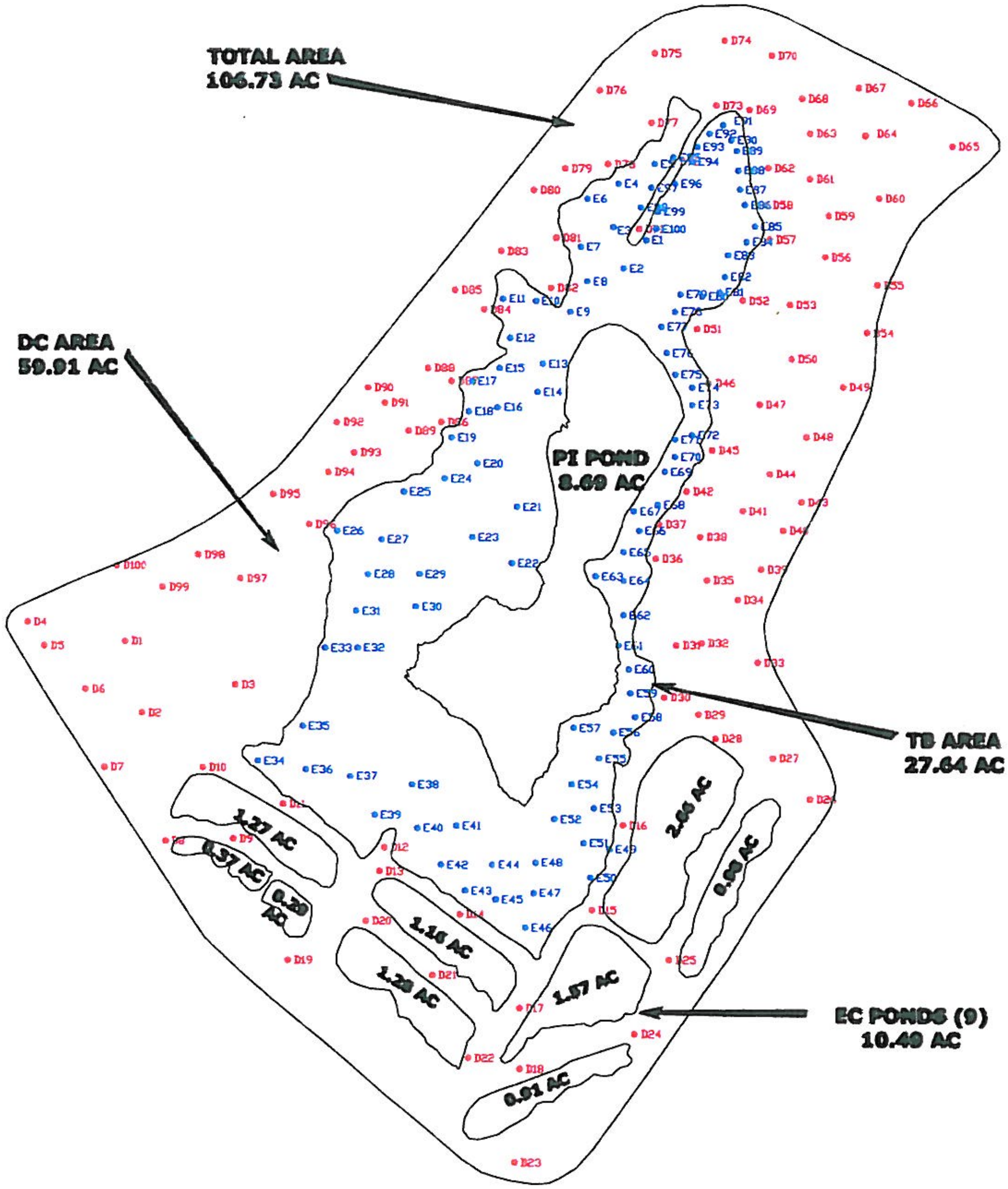
GRID LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	COMMENTS:
DC77	D77	12	0	12	16	6	26	9	10	41	1	3106	212.1	7.0	0.70	0.04	
DC78	D78	12	2	12	17	6	26	9	10	41	1	4457	214.1	10.1	1.01	0.04	
DC79	D79	12	3	12	17	6	26	9	10	42	1	3919	216.9	8.9	0.89	0.04	
DC80	D80	12	5	12	18	6	26	9	10	42	1	1264	214.6	2.6	0.26	0.04	
DC81	D81	12	6	12	18	6	26	9	10	43	1	1966	217.1	4.3	0.43	0.04	
DC82	D82	12	7	12	19	6	26	9	10	45	3	1195	212.0	0.6	0.06	0.04	
DC83	D83	12	9	12	20	6	26	9	10	48	1	14511	211.3	34.1	3.41	0.04	
DC84	D84	12	11	12	20	6	26	9	10	48	1	4072	216.9	9.2	0.92	0.04	
DC85	D85	12	12	12	24	6	26	9	10	49	1	7156	213.4	16.6	1.66	0.04	
DC86	D86	12	13	12	21	6	26	9	10	49	1	10045	215.7	23.3	2.33	0.04	
DC87	D87	12	15	12	22	6	26	9	10	50	1	3656	220.9	8.3	0.83	0.04	
DC88	D88	12	16	12	24	6	26	9	10	50	1	6764	215.3	15.6	1.56	0.04	
DC89	D89	12	17	12	25	6	26	9	10	51	1	12550	217.7	29.5	2.95	0.04	
DC90	D90	12	19	12	26	6	26	9	10	51	1	5958	210.2	13.7	1.37	0.04	
DC91	D91	12	19	12	26	6	26	9	10	53	1	4541	217.3	10.4	1.04	0.04	
DC92	D92	12	21	12	27	6	26	9	10	53	1	11814	213.8	27.5	2.75	0.04	
DC93	D93	12	22	12	28	6	26	9	10	54	1	8186	210.6	19.1	1.91	0.04	
DC94	D94	12	24	12	28	6	26	9	10	54	1	13235	215.1	30.9	3.09	0.04	
DC95	D95	12	26	12	29	6	26	9	10	55	1	2256	215.7	5.0	0.50	0.04	
DC96	D96	12	28	12	30	6	26	9	10	55	1	1175	215.2	2.4	0.24	0.04	
DC97	D97	12	29	12	31	6	26	9	10	57	2	1809	211.3	1.8	0.18	0.04	
DC98	D98	12	30	12	31	6	26	9	10	57	1	3288	214.3	7.4	0.74	0.04	
DC99	D99	12	32	12	32	6	26	9	10	59	2	1318	214.0	1.2	0.12	0.04	
DC100	D100	12	33	12	33	6	26	9	10	59	2	1294	210.7	1.2	0.12	0.04	
AVERAGE RADON FLUX RATE FOR THE PRIMARY COVERED REGION:														12.1	pCi/m²s		
														0.2	pCi/m²s	MIN	
														86.7	pCi/m²s	MAX	

BLANK CANISTER ANALYSIS:

GRID LOCATION	SAMPLE I. D.	DEPLOY HR	DEPLOY MIN	RETRIV HR	RETRIV MIN	ANALYSIS MO	ANALYSIS DA	ANALYSIS YR	MID-TIME HR	MID-TIME MIN	CNT (MIN)	GROSS COUNTS	GROSS WT IN	RADON pCi/m²s	± pCi/m²s	LLD pCi/m²s	COMMENTS:
D BLANK 1	D101	8	20	12	53	6	26	9	11	5	10	1826	212.9	0.06	0.03	0.04	CONTROL
D BLANK 2	D102	8	28	12	54	6	26	9	11	5	10	1902	208.6	0.08	0.03	0.04	CONTROL
D BLANK 3	D103	8	37	12	55	6	26	9	11	16	10	1583	209.0	0.02	0.03	0.04	CONTROL
D BLANK 4	D104	9	52	12	55	6	26	9	11	16	10	1683	211.4	0.04	0.03	0.04	CONTROL
D BLANK 5	D105	10	1	12	56	6	26	9	11	27	10	1675	208.1	0.04	0.03	0.04	CONTROL
AVERAGE BLANK CANISTER ANALYSIS FOR THE PRIMARY COVERED REGION:														0.05	pCi/m²s		

Appendix D

Map (Figure 2)



KEY:
AC = ACRES
DC = DIRT COVERED (D)
EC = EVAPORATION CELLS
TB = TAILINGS BEACHES (E)
PI = PRIMARY IMPOUNDMENT

NOTES:
RADON FLUX MEASUREMENT LOCATIONS PER GPS.
DIGITIZED MAP FROM JULY 2009 AERIAL PHOTO.

NORTH

SCALE: 0 500 1000 1500

COTTER CORPORATION **CANON CITY MILLING FACILITY** **PRIMARY TAILINGS IMPOUNDMENT** **RADON FLUX TEST CANISTER LOCATIONS (2009)**	Figure 2 Date: July 2009 Drawn by: RMD File: LowSpotRadon 2009Sketch.dwg

EPA-1908

Reid Rosnick/DC/USEPA/US

01/25/2012 01:18 PM

To Beth Miller

cc

bcc

Subject Fw: CAP88

Beth,

For the Subpart W docket

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

----- Forwarded by Reid Rosnick/DC/USEPA/US on 01/25/2012 01:17 PM -----

From: Neal Nelson/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 11/04/2011 08:37 AM
Subject: CAP88

Reid, is this what you need?

Review of CAP88 ver3 Radon runs.docx

To: Reid Rosnick

From: Neal S. Nelson

Subject: Comparison of CAP88 calculations from SC&A and the EPA web version of CAP88

As a cross check to assure that the version of CAP88 being used by SC&A is the same as the one which is downloaded from the EPA radiation website, a couple of the input data sets were obtained from SC&A.

Initially I was unable to duplicate SC&A results. Investigation of the problem revealed I had a copy of 'CAP88 ver3' which had an executable dated 02/24/07. I had downloaded it from the EPA website at some time in the past. The out put had scrambled the dose conversion files somehow.

After discussing the question with SC&A, I discovered that the current version of 'CAP88 ver3' has an executable dated 12/09/07. After I downloaded and installed a new copy of the current 'CAP88 ver3', I was able to run and duplicate the SC&A calculations.

Since the EPA website lists only 'CAP88 ver3' for downloading, and does not indicate that different builds of the program have different executables, the only way to identify different builds is to compare the executables for size and date.

Also, I was unable to run the program on a computer that had been off line for a couple of years. The error report showed that Active X was unable to do something. It would appear that the Windows program must be up to date, so the computer must be on line to get the automatic updates to Windows.

Anyway, it seems that we are running the same version of 'CAP88 ver3' as SC&A and can duplicate or extend any reports we get from them.

EPA-2802

Susan Stahle/DC/USEPA/US		To	Travis Stills
01/26/2012 11:28 AM		cc	
		bcc	Reid Rosnick
		Subject	Re: EPA Meetings

Hi Travis --

First, I apologize for my delay in getting back to you. I've been preoccupied by other deadlines and been less attentive to me email inbox, but as I was trying to clean it out today I saw your email for the first time.

I confirmed with EPA staff in ORIA that EPA did not tape record the January 5, 2012 phone conference, nor has EPA tape recorded any of the subpart W quarterly conference calls. The conference call notes you attached were prepared from notes that EPA staff notes took during the call and our memories of what was discussed on the phone call. After ORIA prepared the draft notes for this meeting, I reviewed them and offered some edits, then ORIA finalized the notes and posted them on the website. This is the procedure EPA has followed in preparing all of the conference notes for all of the subpart W quarterly conference calls.

Please let me know if you have any further questions.

Susan Stahle
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stahle.susan@epa.gov

Travis Stills   Sue, It appears that EPA tape recorded the phon...   01/20/2012 05:37:48 PM

From: Travis Stills <stills@frontier.net>
To: Susan Stahle/DC/USEPA/US@EPA
Date: 01/20/2012 05:37 PM
Subject: EPA Meetings

Sue,
It appears that EPA tape recorded the phone conference of January 5, 2012 where both you and I were participants.

Please note that I was not given prior notice of the EPA's intention to tape record this or any other call. I must object to EPA tape recording phone calls where I am a participant without my prior knowledge and consent.

Please confirm the steps that EPA and EPA OGC intend to take to address/remedy this serious matter.

Sincerely,
Travis Stills
--
~~~~~~
Travis E. Stills
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1911 Main Avenue, Suite 238
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stills@frontier.net
phone:(970)375-9231

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subpartw_1-5-2012_quarterlyconfcall.pdf

Subpart W Quarterly Conference Call
January 5, 2012, 11:00 am – 12:00 pm
1310 L Street NW, Room 502, Washington, DC

[DRAFT] Conference Call Notes

Meeting Participants:

EPA HQ:	Reid Rosnick, Phil Egidi, Dan Schultheisz, Emily Atkinson, Sue Stahle
EPA Regions:	Angelique Diaz, Region 8
CCAT:	Sharyn Cunningham
Sheep Mountain Alliance:	Jennifer Thurston
Industry:	Oscar Paulson (Kennecott), Jeff Kelsey (UR Energy), Rita Myer (U235), Joanne Tischler (Denison), John Schwenk(?) (Cameco), John Cash (UR Energy), Mike Newman (Neutron Energy), Jan Johnson (TetraTech)
Other:	Travis Stills (Energy Minerals Law Center), Katie Sweeney (National Mining Association)

R. Rosnick: Happy new year to everyone. This is our regularly scheduled quarterly stakeholder conference call.

I can give you a brief update with regard to the proposed rule. We are at the end of the work group process; we have had some back and forth on language changes and ideas into the preamble and wording of the proposed regulatory language. We have had interesting discussions on these things as well as legal issues in the preamble to the proposed rule.

On Tuesday we are briefing our Assistant Administrator Gina McCarthy on the status of the rule and requesting the go ahead for the Final Agency Review (FAR) (Note that this meeting was postponed until a later date yet to be determined). All the workgroup representatives and their higher level management would give the go ahead and say they have no major issues and that they feel we have a legally defensible proposed rule. After that meeting we wrap the package of the preamble, rule and other documents with the rule and it is sent to the EPA Office of Policy and it then goes to OMB for no more than 90 days for review. When it comes back from OMB we would make any changes they recommend or explain why not and then it goes to the EPA Administrator for signature and publishing in the Federal Register. The tentative release to the Federal Register would be April/May 2012.

Does anyone have any questions about the process or timeline?

T. Stills: I guess it's a year and a half later than the dates in the settlement. We are not seeing any technical documentation, as we had expected to. It is my quarterly request to bring up that you need to engage more in publishing the technical information and engage the public. Is there a plan to publish more technical information in the next week or so?

R. Rosnick: After your request during the last call, your request for the risk assessment document, it was posted several days later.

T. Stills: From what I see posted on the website, EPA hasn't posted enough information.

R. Rosnick: I assume you are looking for other types of technical documents. We have several different types of technical documents up on the website and we feel what is posted is sufficient technical materials.

T. Stills: What I am talking about is the public would have access to technical information, not just the industry officials. We would like to see the documents the EPA is using for the rulemaking to be posted to the website during this process for our review. We would like more information and it is what was envisioned during the settlement. It is a repeated request to have more technical information posted for review. This is a request also to the Office of General Counsel because RPD is not doing what we expected it would do.

R. Rosnick: I feel we have met the standard as agreed upon in our settlement.

K. Sweeney: Can you be more specific about what you have requested from EPA?

T. Stills: Anything technical in nature that is not privileged that the workgroup has worked with to write the preamble and rule.

S. Stahle: I would be happy to have a conversation about the settlement agreement at a separate time with our DOJ counsel. The website does contain all of the documents that are appropriate for posting. As I know you appreciate, under the terms of the settlement agreement, we cannot post documents that do not exist and we will not post documents that are deliberative or privileged in any way. Once the rule is proposed, we will include in the public docket all of the information we relied upon for this rulemaking so that the public can review and comment on all of this information at that time. I appreciate that we have a difference of opinion about the settlement agreement, but let's schedule another time for a conversation regarding the settlement agreement so that we can include our DOJ counsel and so that others on this call can ask their questions about the Subpart W rulemaking.

T. Stills: It doesn't seem credible that only 2 documents were releasable in 2011. It seems unacceptable that there are so few releasable documents.

R. Rosnick: Any other question about general rulemaking?

O. Paulson: I have reviewed the risk assessment distributed in November. It talks about a number of sites. How were certain things done in the risk assessments related to Sweetwater? Population data – table 4 – you go from 0 to 8 km on the site. These population numbers, because I know for a fact the nearest town in NE of here Bairoil with only 10 people and is not within the 30 mile distance. Also listed at NNE are 3 people living within 3 km. I am around here a lot and there are no people that close. It seems to show people that aren't here.

R. Rosnick: I believe in the document itself, there is a description of how we went through the census data from 2000 and it was increased by using a model to increase it. This allowed us to get what we thought was a realistic idea of the population within 80 km. We did not go out and drive around to get data.

O. Paulson: My second question is in table 8 – radon flux test results. We have submitted more recent 2011 results and the information in the report is from NRC data that is much older.

R. Rosnick: I will look into this and post the results to the website. COMPLETED

O. Paulson: I may be able to look at the Adams database to see if the data from the NRC is what was used from our submission to them. If I find something there I will send you a link to it.

M. Newman: What is the deadline for getting a response on the risk assessment?

R. Rosnick: It is a public document out there. I am happy to take comments on it through the proposed rule timeline, so that gives you several months.

K. Sweeney: How long will the comment period be?

R. Rosnick: Historically we provide 60 days.

K. Sweeney: This is a rule where we may need 90 days.

R. Rosnick: That is a good proposal and a longer comment period may be preferable for everyone involved. That is noted and Sue is on the line, so we can discuss this with our AA on Tuesday.

S. Cunningham: I would like to say I have the same concern Oscar has about the population chart. I think that population number is low there. 0-20 miles would include Canyon City with a population of 20,000 people.

Also, why didn't they use the 2010 census data, because that data is out now. Our community grew a lot in the 10 years.

R. Rosnick: At the time we started this process, the 2010 census data had not been published yet. So we used the 2000 census data and then model it with a program to help establish the population numbers.

S. Cunningham: Population is such an important part of the risk assessment; I would have thought EPA would have used the most recent 2010 census data.

R. Rosnick: I will look into this and post my findings on the website.

It was desired to use 2010 population data rather than the 2000 census data available in SECPOP, but the analysis was performed before the 2010 data were released. The U.S. Census Bureau has estimates of the population in every county for each year from 2001 through 2009 (http://www.census.gov/popest/counties/files/CO-EST2009-ALLDATA.csv). For each uranium site, the 2000 census data and 2009 estimate were used to calculate an annual population adjustment factor specific for the county in which the site is located. That annual adjustment factor was then used to calculate an adjustment factor to bring the SECPOP population distribution from 2000 to 2010.

Johnson: I haven't had a chance to go through the entire report. What was the rationale for the CAP88 and low dose?

R. Rosnick: At the end of the analysis CAP88 was determined to give the most bang for the buck and realistic tracking of radon movement. We were also the most familiar with it.

O. Paulson: We have found some problems with CAP88 and found that MILDOS was vastly superior.

R. Rosnick: I don't have an answer beyond what I said previously. SEE METHODOLOGY FOR CHOOSING RISK ASSESSMENT MODEL DOCUMENT, NOW ON WEBSITE.

S. Cunningham: Are you going to put comments on the website?

R. Rosnick: I suspect what we will do is, since we always post minutes from these meetings I will plan on delaying posting them until I can get responses to these issue there.

S. Cunningham: We have never seen any of the emailed inquiries and responses posted to the website. This is being done for other rulemaking activities. If you have received question or comments, that it be made available to the public so we can see what the comments are. Especially for comments on the risk assessment. I

would prefer to see the minutes go up first and then when you begin to get comments on the risk assessment, put them up on the website as they come in.

R. Rosnick: I meant delaying posting the meeting minutes only to addressed comments brought up on today's call, so answers to those can be placed in context. Outside of our calls, I have only received two emailed comments. I can get those posted.

Any other questions today?

Feel free to contact me directly should there be anything between now and our next conference call on April 5, 2012 at 11am.

T. Stills: One more thing – Task 5 is the risk assessment. Task 3 report is the methodology for choosing CAP88. We would hope it will be posted. COMPLETED

R. Rosnick: That is it for today. We will talk again April 5, 2012 at 11am.

EPA-4769

Susan Stahle/DC/USEPA/US	To	Travis Stills
01/26/2012 11:28 AM	cc	
	bcc	Reid Rosnick
	Subject	Re: EPA Meetings

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Subpart W Quarterly Conference Call

January 5, 2012, 11:00 am – 12:00 pm

1310 L Street NW, Room 502, Washington, DC

[DRAFT] Conference Call Notes

Meeting Participants:

EPA HQ: Reid Rosnick, Phil Egidi, Dan Schultheisz, Emily Atkinson, Sue Stahle
EPA Regions: Angelique Diaz, Region 8
CCAT: Sharyn Cunningham
Sheep Mountain Alliance: Jennifer Thurston
Industry: Oscar Paulson (Kennecott), Jeff Kelsey (UR Energy), Rita Myer (U235), Joanne Tischler (Denison), John Schwenk(?) (Cameco), John Cash (UR Energy), Mike Newman (Neutron Energy), Jan Johnson (TetraTech)
Other: Travis Stills (Energy Minerals Law Center), Katie Sweeney (National Mining Association)

R. Rosnick: Happy new year to everyone. This is our regularly scheduled quarterly stakeholder conference call.

I can give you a brief update with regard to the proposed rule. We are at the end of the work group process; we have had some back and forth on language changes and ideas into the preamble and wording of the proposed regulatory language. We have had interesting discussions on these things as well as legal issues in the preamble to the proposed rule.

On Tuesday we are briefing our Assistant Administrator Gina McCarthy on the status of the rule and requesting the go ahead for the Final Agency Review (FAR) (Note that this meeting was postponed until a later date yet to be determined). All the workgroup representatives and their higher level management would give the go ahead and say they have no major issues and that they feel we have a legally defensible proposed rule. After that meeting we wrap the package of the preamble, rule and other documents with the rule and it is sent to the EPA Office of Policy and it then goes to OMB for no more than 90 days for review. When it comes back from OMB we would make any changes they recommend or explain why not and then it goes to the EPA Administrator for signature and publishing in the Federal Register. The tentative release to the Federal Register would be April/May 2012.

Does anyone have any questions about the process or timeline?

T. Stills: I guess it's a year and a half later than the dates in the settlement. We are not seeing any technical documentation, as we had expected to. It is my quarterly request to bring up that you need to engage more in publishing the technical information and engage the public. Is there a plan to publish more technical information in the next week or so?

R. Rosnick: After your request during the last call, your request for the risk assessment document, it was posted several days later.

T. Stills: From what I see posted on the website, EPA hasn't posted enough information.

R. Rosnick: I assume you are looking for other types of technical documents. We have several different types of technical documents up on the website and we feel what is posted is sufficient technical materials.

T. Stills: What I am talking about is the public would have access to technical information, not just the industry officials. We would like to see the documents the EPA is using for the rulemaking to be posted to the website during this process for our review. We would like more information and it is what was envisioned during the settlement. It is a repeated request to have more technical information posted for review. This is a request also to the Office of General Counsel because RPD is not doing what we expected it would do.

R. Rosnick: I feel we have met the standard as agreed upon in our settlement.

K. Sweeney: Can you be more specific about what you have requested from EPA?

T. Stills: Anything technical in nature that is not privileged that the workgroup has worked with to write the preamble and rule.

S. Stahle: I would be happy to have a conversation about the settlement agreement at a separate time with our DOJ counsel. The website does contain all of the documents that are appropriate for posting. As I know you appreciate, under the terms of the settlement agreement, we cannot post documents that do not exist and we will not post documents that are deliberative or privileged in any way. Once the rule is proposed, we will include in the public docket all of the information we relied upon for this rulemaking so that the public can review and comment on all of this information at that time. I appreciate that we have a difference of opinion about the settlement agreement, but let's schedule another time for a conversation regarding the settlement agreement so that we can include our DOJ counsel and so that others on this call can ask their questions about the Subpart W rulemaking.

T. Stills: It doesn't seem credible that only 2 documents were releasable in 2011. It seems unacceptable that there are so few releasable documents.

R. Rosnick: Any other question about general rulemaking?

O. Paulson: I have reviewed the risk assessment distributed in November. It talks about a number of sites. How were certain things done in the risk assessments related to Sweetwater? Population data – table 4 – you go from 0 to 8 km on the site. These population numbers, because I know for a fact the nearest town in NE of here Bairoil with only 10 people and is not within the 30 mile distance. Also listed at NNE are 3 people living within 3 km. I am around here a lot and there are no people that close. It seems to show people that aren't here.

R. Rosnick: I believe in the document itself, there is a description of how we went through the census data from 2000 and it was increased by using a model to increase it. This allowed us to get what we thought was a realistic idea of the population within 80 km. We did not go out and drive around to get data.

O. Paulson: My second question is in table 8 – radon flux test results. We have submitted more recent 2011 results and the information in the report is from NRC data that is much older.

R. Rosnick: I will look into this and post the results to the website. COMPLETED

O. Paulson: I may be able to look at the Adams database to see if the data from the NRC is what was used from our submission to them. If I find something there I will send you a link to it.

M. Newman: What is the deadline for getting a response on the risk assessment?

R. Rosnick: It is a public document out there. I am happy to take comments on it through the proposed rule timeline, so that gives you several months.

K. Sweeney: How long will the comment period be?

R. Rosnick: Historically we provide 60 days.

K. Sweeney: This is a rule where we may need 90 days.

R. Rosnick: That is a good proposal and a longer comment period may be preferable for everyone involved. That is noted and Sue is on the line, so we can discuss this with our AA on Tuesday.

S. Cunningham: I would like to say I have the same concern Oscar has about the population chart. I think that population number is low there. 0-20 miles would include Canyon City with a population of 20,000 people.

Also, why didn't they use the 2010 census data, because that data is out now. Our community grew a lot in the 10 years.

R. Rosnick: At the time we started this process, the 2010 census data had not been published yet. So we used the 2000 census data and then model it with a program to help establish the population numbers.

S. Cunningham: Population is such an important part of the risk assessment; I would have thought EPA would have used the most recent 2010 census data.

R. Rosnick: I will look into this and post my findings on the website.

It was desired to use 2010 population data rather than the 2000 census data available in SECPOP, but the analysis was performed before the 2010 data were released. The U.S. Census Bureau has estimates of the population in every county for each year from 2001 through 2009 (http://www.census.gov/popest/counties/files/CO-EST2009-ALLDATA.csv). For each uranium site, the 2000 census data and 2009 estimate were used to calculate an annual population adjustment factor specific for the county in which the site is located. That annual adjustment factor was then used to calculate an adjustment factor to bring the SECPOP population distribution from 2000 to 2010.

Johnson: I haven't had a chance to go through the entire report. What was the rationale for the CAP88 and low dose?

R. Rosnick: At the end of the analysis CAP88 was determined to give the most bang for the buck and realistic tracking of radon movement. We were also the most familiar with it.

O. Paulson: We have found some problems with CAP88 and found that MILDOS was vastly superior.

R. Rosnick: I don't have an answer beyond what I said previously. SEE METHODOLOGY FOR CHOOSING RISK ASSESSMENT MODEL DOCUMENT, NOW ON WEBSITE.

S. Cunningham: Are you going to put comments on the website?

R. Rosnick: I suspect what we will do is, since we always post minutes from these meetings I will plan on delaying posting them until I can get responses to these issue there.

S. Cunningham: We have never seen any of the emailed inquiries and responses posted to the website. This is being done for other rulemaking activities. If you have received question or comments, that it be made available to the public so we can see what the comments are. Especially for comments on the risk assessment. I

would prefer to see the minutes go up first and then when you begin to get comments on the risk assessment, put them up on the website as they come in.

R. Rosnick: I meant delaying posting the meeting minutes only to addressed comments brought up on today's call, so answers to those can be placed in context. Outside of our calls, I have only received two emailed comments. I can get those posted.

Any other questions today?

Feel free to contact me directly should there be anything between now and our next conference call on April 5, 2012 at 11am.

T. Stills: One more thing – Task 5 is the risk assessment. Task 3 report is the methodology for choosing CAP88. We would hope it will be posted. COMPLETED

R. Rosnick: That is it for today. We will talk again April 5, 2012 at 11am.

EPA-1558

Reid Rosnick/DC/USEPA/US

02/01/2012 09:46 AM

To Beth Miller

cc

bcc

Subject Fw: presentation

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----- Forwarded by Reid Rosnick/DC/USEPA/US on 02/01/2012 09:46 AM -----

From: Kenneth Distler/R8/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA, Angelique Diaz/R8/USEPA/US@EPA
Date: 04/07/2011 04:35 PM
Subject: presentation

EPA 4 7 11.pdf

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SHEEP MOUNTAIN URANIUM PROJECT
CROOKS GAP, WYOMING

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US EPA Project Meeting
April 7, 2011

TSX.V - TUE FRANKFURT - T4X

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Introductions

Greg Adams – VP Development

Doug Beahm – BRS Engineering

Toby Wright – Wright Env. Services

AGENDA

Introductions

- Greg Adams/Titan Uranium, VP Development
- Deborah Lebow-Aal/EPA Region 8 Air Program

Introduction to Titan Uranium USA

Project Overview:

- Doug Beahm/BRS Engineering
- Toby Wright/Wright Env. Services

Issues for Discussion

- Status of 40 CFR 192 GW standards update
- Status of Active Heaps & Inactive Heaps
- Status of Process Ponds & Waste Storage Tanks

PROJECT OVERVIEW

- Location
- Project Scope
  - Mining
  - Milling

Sheep Mountain Project Location

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PROJECT OVERVIEW

- Site Location
  - Fremont , Wyoming
  - Existing Uranium Mine Permit 381C
- Historical Operation
  - Western Nuclear Crooks Gap Project
    - Mined 1956 – 1988, processed at Split Rock Mill
  - US Energy
    - 1988 Sheep Mountain Underground
    - Partial reclamation since 1988, no new operation


Wyoming
Gas Hill Uranium District
Jeffrey City, WY
Sheep Mountain Project
Green Mountain/Big Eagle
URE Lost Creek
Sweetwater Mill
Image USDA Farm Service Agency
Image © 2010 DigitalGlobe
© 2010 Google
13 T 271301.31 m E 4729138.97 m N elev 6273 ft
Eye alt 88.42 mi
Google

Titan Sheep Mountain Project:

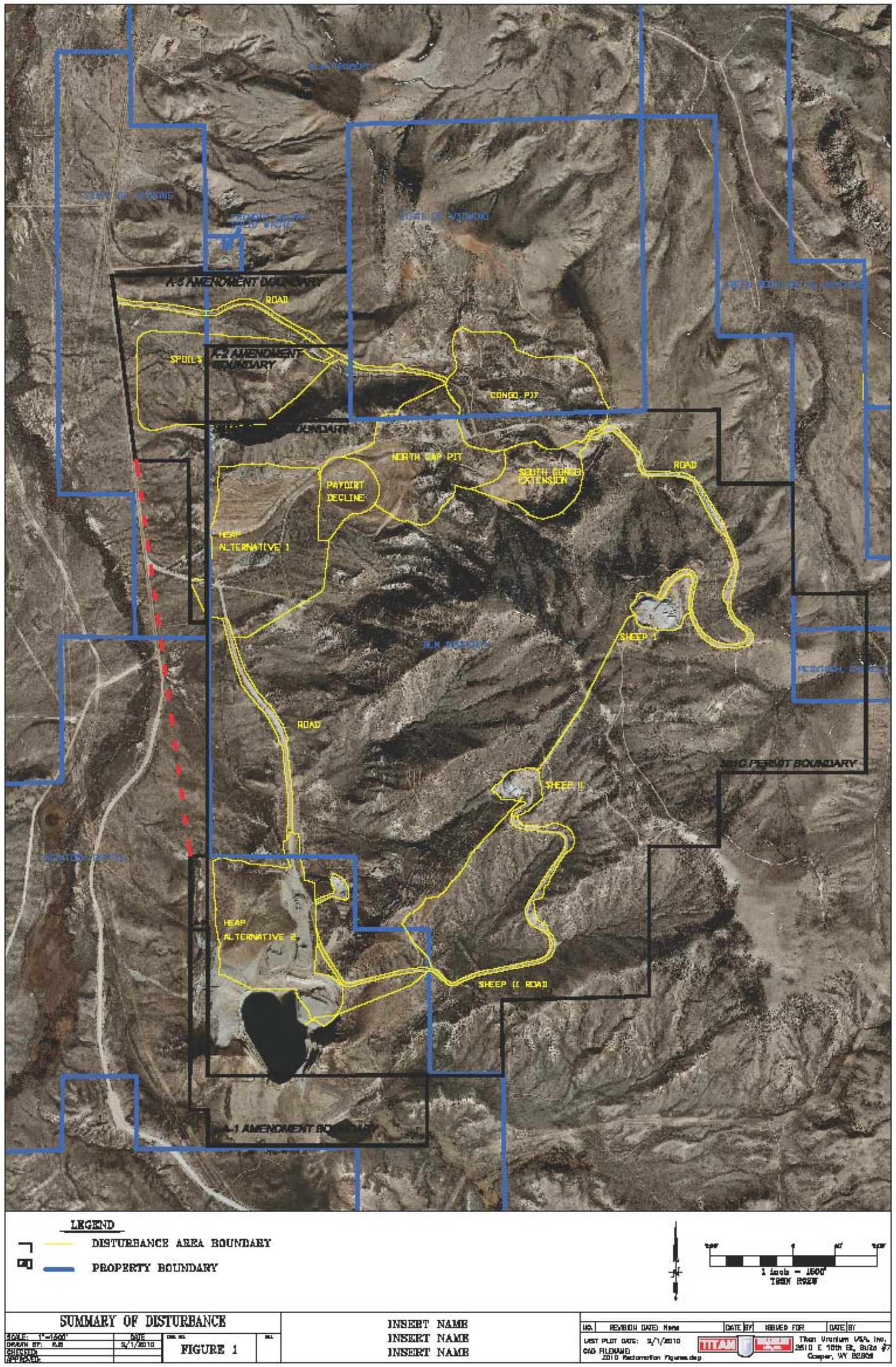
- Mine
  - Underground and Open Pit Mining
  - Current Mine Permit (381C)
    - Updating POO, Reclamation Plan & Bond
- Uranium Recovery
  - Heap Leach with Central Processing Plant
  - Within existing WDEQ Mine Permit (381C)

Project Scope:

- Mine
  - 15 Year Mine Lifecycle, may be extended
  - Congo Pit Area
    - Mine waste trucked to South and West waste piles
    - All mine waste to be returned to pit or used in reclamation
  - Sheep Mountain Underground
    - To extent possible all wastes reclaimed in old mine workings
    - Ore transported to the heap from underground via conveyors

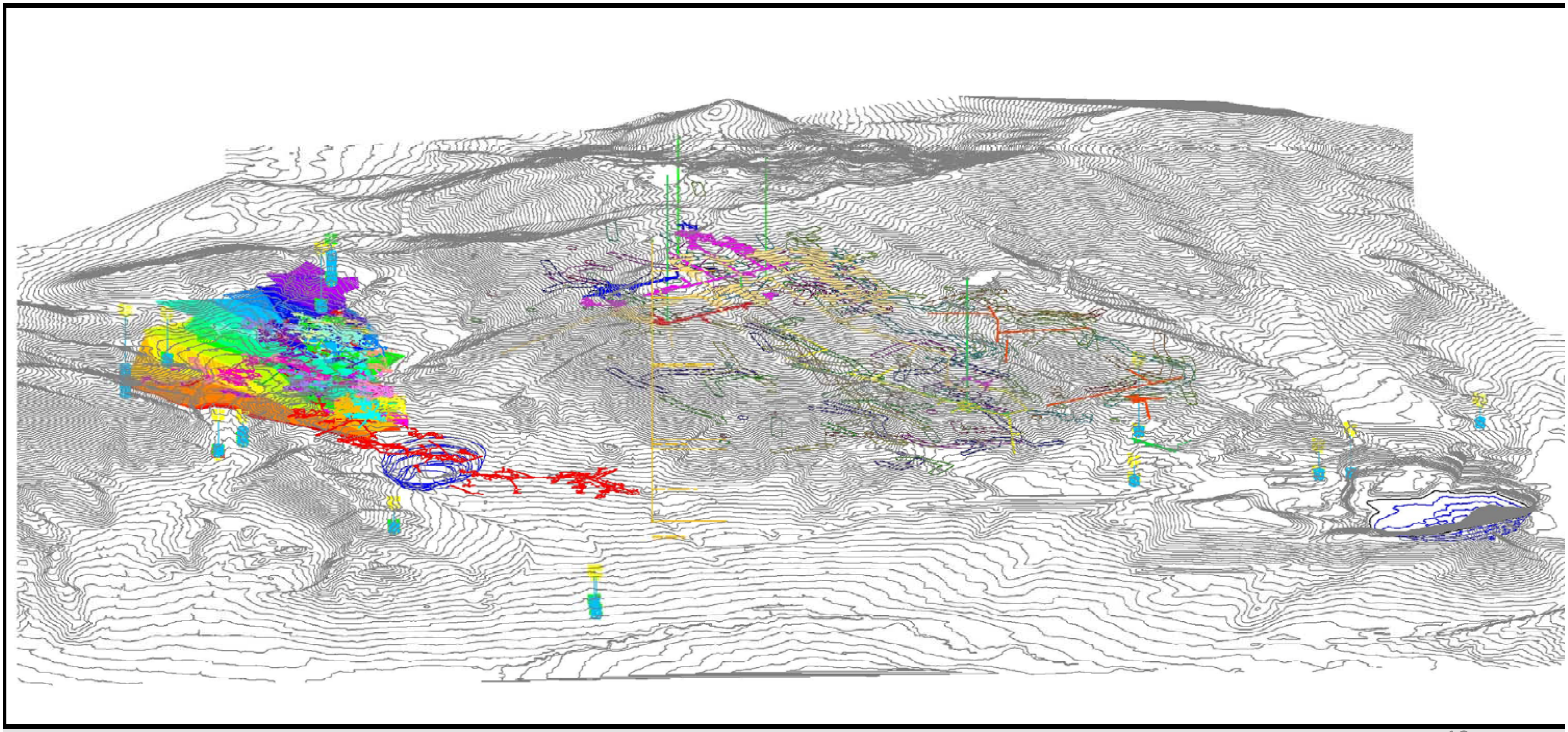
Project Scope:

- Mill
  - 15 year operational lifecycle, may be extended
  - Heap Leach Pads
    - Double lined pads with leak detection, clay underliner
    - Five 16 acre cells planned (approx. 80 acre footprint)
    - Up to 50 ft lifts being evaluated
    - Sulfuric acid lixiviant
  - Double lined process ponds with leak detection, clay underliner
    - Barren/Pregnant
    - Liquid waste in evaporation ponds
  - Central Processing Plant
    - Solvent Extraction with IX Polishing
    - Vacuum Driers
    - Final Product is drummed yellow cake



- **Existing Mine Permit 381C**
  - 3,625 acres total area
- **Proposed Disturbance (667 acres)**
  - <u>Mine:</u> 457 acres (258 Disturbed)
    - Congo/North Gap Pits
    - Sheep Mtn. Underground
    - Waste Rock/Topsoil Storage
    - Buildings & Infrastructure
    - All proposed mine disturbance on previously disturbed land
  - <u>Licensed Area:</u> 210 acres (161 Disturbed)
    - Heap Leach Pads
    - Process/Waste Ponds
    - Central Processing Plant

3D View Mining and Monitor Wells



Status of Baseline Studies

Pre-Operational Baseline Studies Status

- Cultural Resources
- Wildlife
- Vegetation & Soils
- Surface Water
- Groundwater
- Radiological Characterization

Topic Area	Status	Actions Pending
Cultural Resources	• Reviewed existing surveys • Consulted with BLM on scope of additional surveys • Completed additional surveys • Submitted findings to BLM	• BLM Review • SHPO Review • Incorporate results into ER
Wild Life	• Raptor surveys complete • Songbird surveys complete • Waterfowl surveys complete • Small mammal surveys complete	• Incorporate results into ER

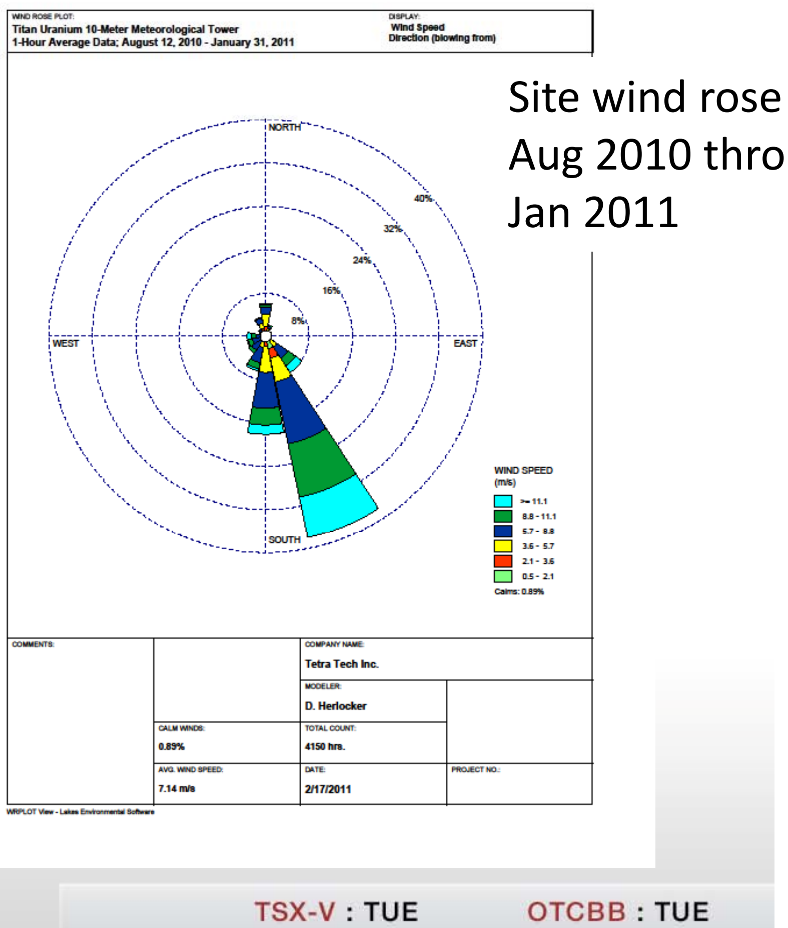
Vegetation	• Vegetation surveys complete
	• No T&E Species present
	• One BLM sensitive species found
	  o Limber Pine
	  o No impacted by proposed disturbance
	• Completed 3 rounds of veg. sampling as per Reg Guide 4.14
		• Incorporate results into ER

Soils & Sediment	• Collected soil samples as per Reg. Guide 4.14 (surface & subsurface) • Collected sediment samples as per Reg. Guide 4.14 @ SW sampling locations	• Incorporate results into ER
Surface Water	• Quarterly SW flow measurements • Monthly flowing SW quality sampling • Quarterly Pit Lake quality sampling	• Data analysis • Incorporate results into ER
Groundwater	• Quarterly Sampling • Reg. Guide 4.14 and WDEQ parameters	• Data analysis • Incorporate results into ER
Meteorological	• Continuous data since July 2010 • 2 m & 10 m instrumentation • Instrumentation meets most Reg. Guide 3.36 requirements	• MILDOSE Modeling • Update with 4 quarters of data
Air Quality	• Quarterly sampling from 5 locations since July 2010 • All parameters and reporting limits as per Reg. Guide 4.14	• Data analysis • Incorporate results into ER
Socio\Env. Justice	• Ongoing	• Complete analysis • Incorporate results into ER

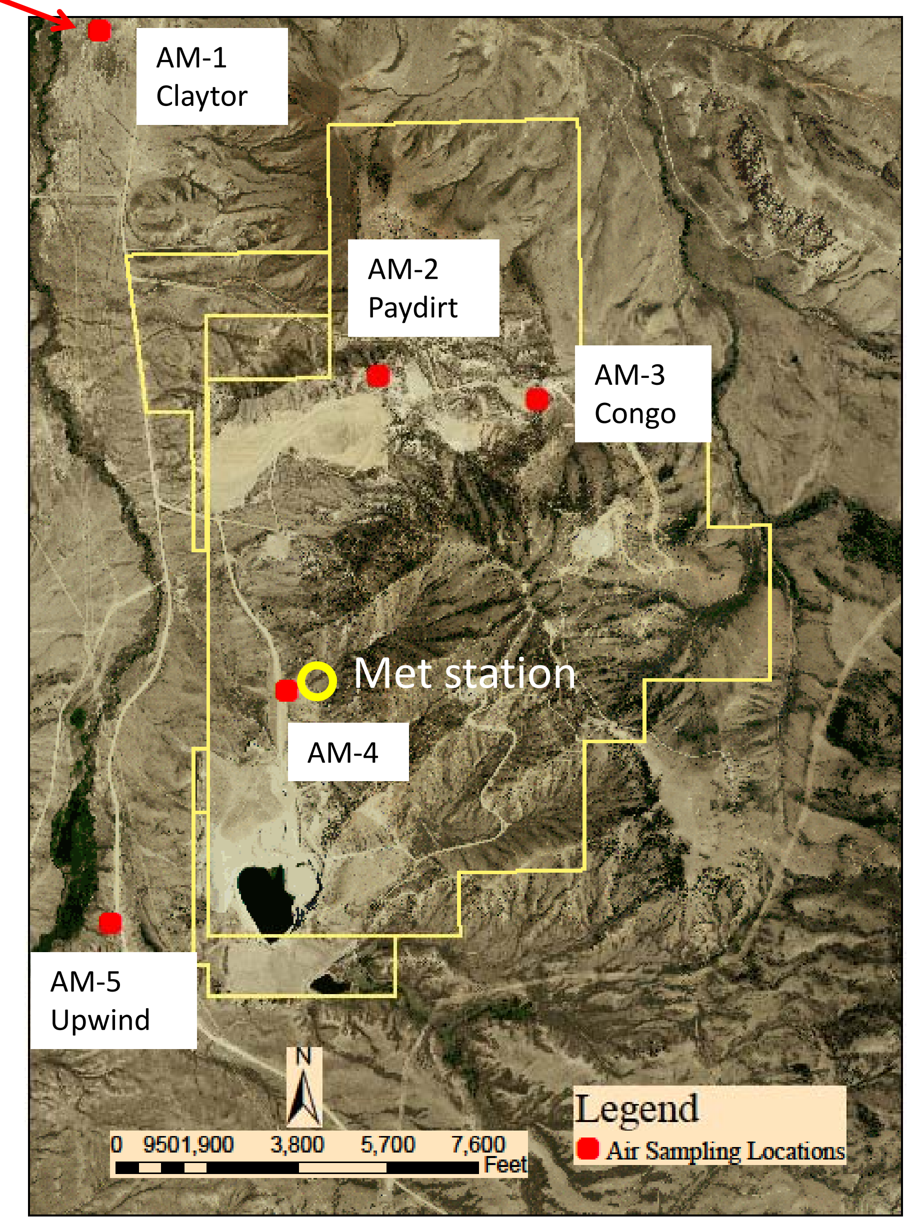
Nearest Resident

<u>Air sampler locations:</u>

Additional monitoring locations once radiation control boundary location is finalized



Site wind rose Aug 2010 through Jan 2011



Groundwater Hydrogeology

- Historical Conceptual model
  - Battle Spring Fm. host upper most aquifer
    - Fine to coarse grained sandstone with discontinuous siltstone and claystone lenses
    - Unconfined aquifer
  - Recharge from north
  - Regional discharge to south
- New Studies Ongoing
  - Sampling existing wells in place since 1988
  - Replacing historical wells abandoned in 2001
  - Evaluating aquifer properties

Status of NRC/BLM/State Permit Applications & NEPA

Coordinating Permitting & Licensing

- NRC & BLM will develop separate EIS Documents
- Titan is planning on parallel WDEQ, BLM & NRC submittals
    - Q3 2011
    - WDEQ-LQD/BLM
        - Plan of Ops, Rec. Plan & Bond Est., Env. Report
    - NRC
        - Application with Technical Report & Env. Report
- Coordinating communications w/ NRC, BLM and WDEQ

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NRC Licensing & NEPA

- Scope of NRC EIS Encompasses:
  - Milling: Heap Leach & Central Processing Plant
  - Mining is a ***Connected Action***
  - BLM would be a Cooperating Agency

Separate or combined NEPA processes require coordination and communication

- Planning Application to NRC Submittal in Q3, 2011

BLM Permitting & NEPA

- Scope of BLM EIS Encompasses:
  - Mine: open pit and underground, mine dewatering, operations, reclamation
  - Milling: Heap Leach & Central Processing Plant
    - Includes long-term disposal of 11e.(2) byproduct material, land transfer
    - BLM has indicated that they will reference rather than duplicate NEPA analyses for impacts addressed in the NRC NEPA process as much as possible
    - NRC would be Cooperating Agency
- Planning WDEQ\BLM Submittal in Q3, 2011

Separate or combined NEPA processes require coordination and communication

BLM Permitting & NEPA

- BLM anticipates publication in Q2 or Q3 2011
- Titan has submitted to BLM a draft cost recovery MOU for 3rd Party NEPA Contractor
- RFP for procurement of 3rd Party NEPA Contractor in process
    - Anticipate NEPA Contractor for bLM selection in Q2 2011

Heap Leach Process

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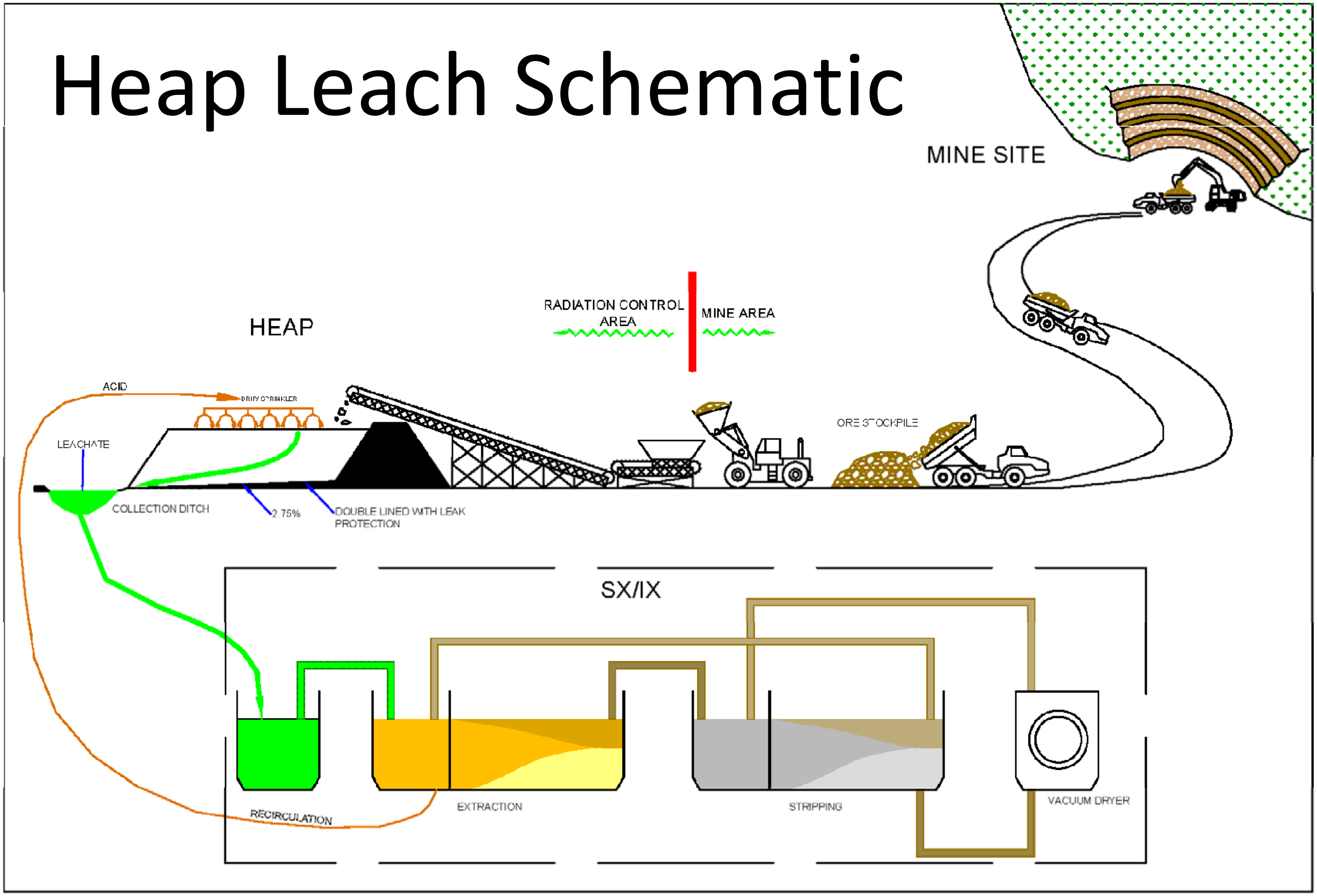
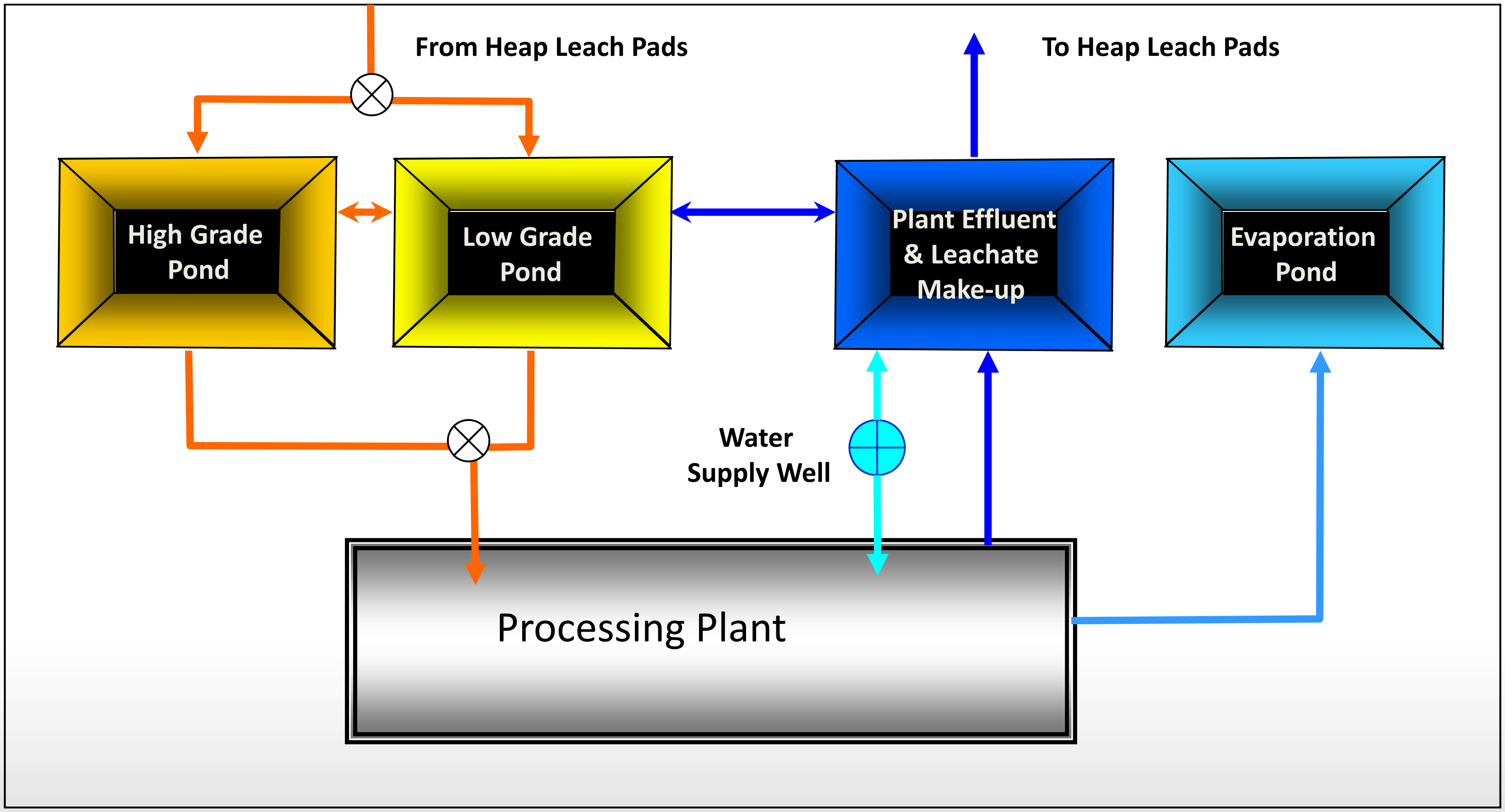
Heap Leach Schematic



Conceptual Recovery System Layout



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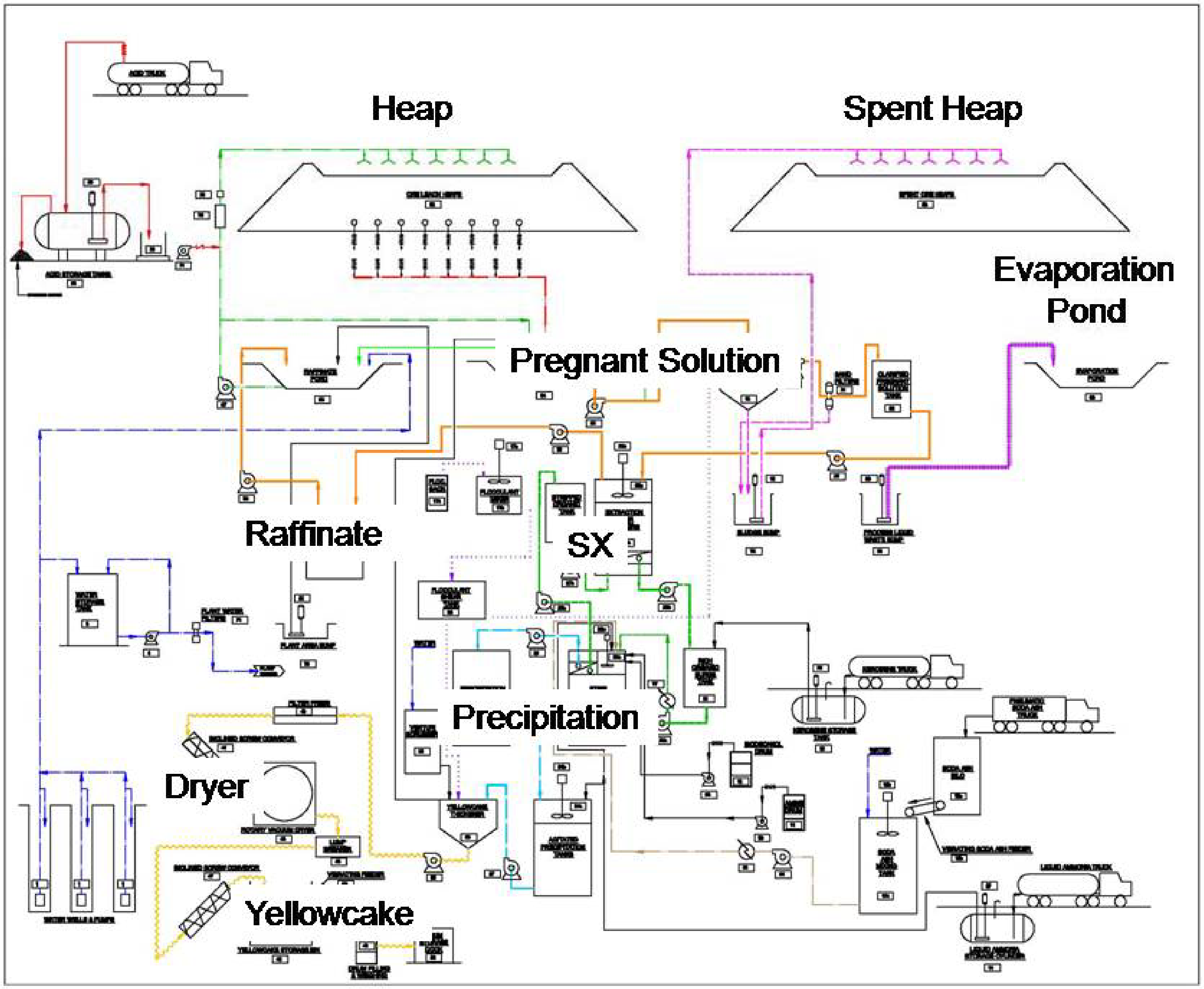


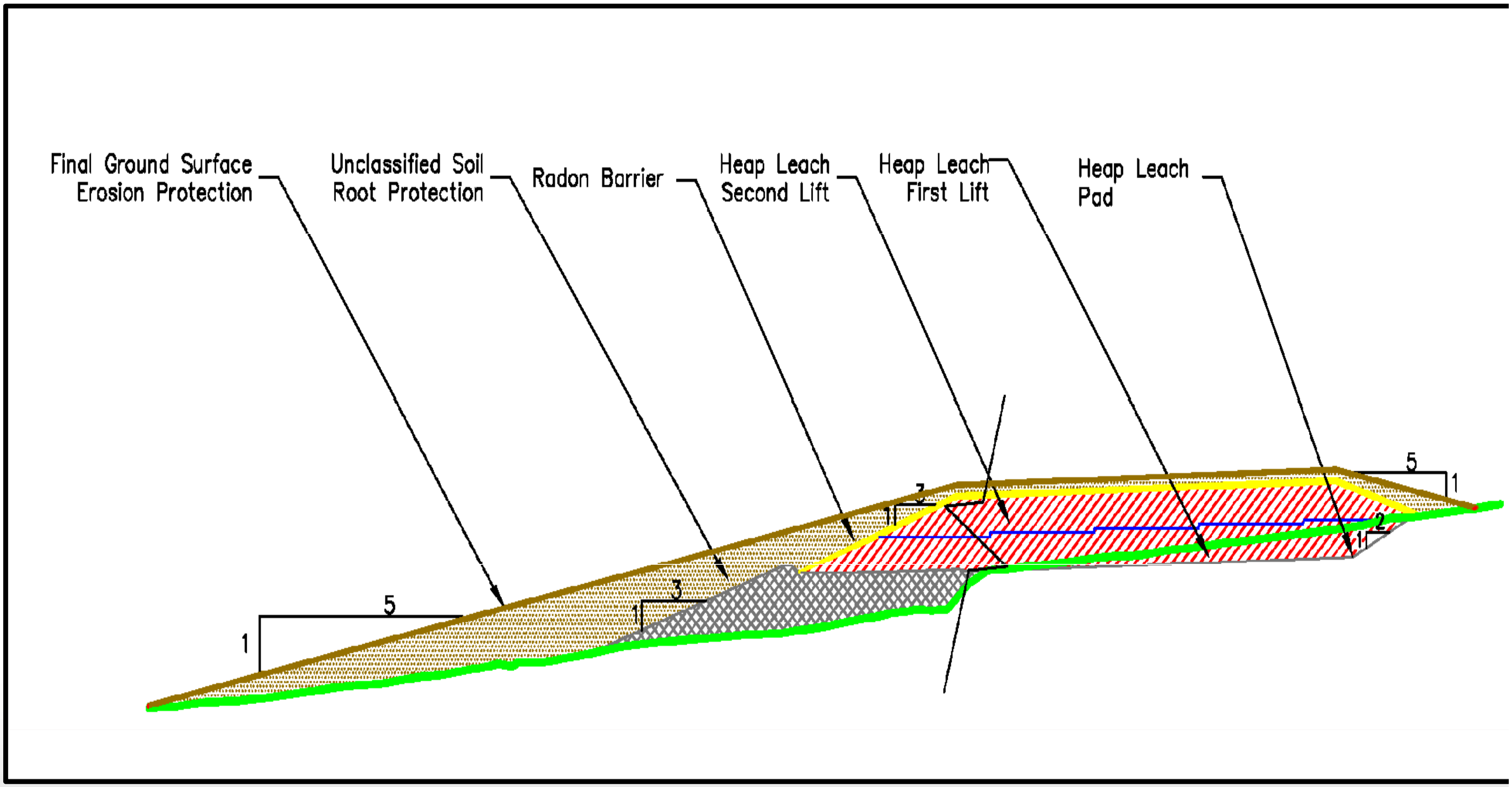
Key Points

•Active heap leach pad is part of the "mill" and the active leaching is milling

•Process Ponds are parts of the mill and will not contain any waste streams

•Milling begins with the stacking of the ore on the pad

•Milling ends when uranium recovery is complete


Final Ground Surface
Erosion Protection
Unclassified Soil
Root Protection
Radon Barrier
Heap Leach
Second Lift
Heap Leach
First Lift
Heap Leach
Pad
5
1
3
1
3
1
5
1
2
1

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Constituent	Initial Grade	Tails	Recovery	Leachate
	mg/Kg	mg/Kg		mg/L or pCi/L
Aluminum	2,920	2,810	4%	203
Arsenic	3.0	1.8	40%	1.1
Barium	10.0	10.4	-4%	0.1
Boron	4.0	3.6	10%	0.9
Cadmium	0.2	0.2	30%	0.3
Calcium	499.0	275.0	45%	445
Chromium	3.5	3.0	14%	1.1
Copper	6.0	3.4	43%	3.9
Iron	5,010	3,910	22%	498
Lead	15.0	10.9	27%	2.8
Magnesium	533	420	21%	250
Manganese	31.4	19.1	39%	10.5
Molybdenum	2.7	2.0	26%	0.0
Nickel	1.1	0.2	82%	0.8
Potassium	857	783	9%	58.0
Selenium	6.2	5.4	13%	0.0
Uranium	894	21	98%	1,047
Vanadium	4.8	3.6	25%	3
Zinc	11.3	8.6	24%	5
226Radium	237	233	2%	6,700
230Thorium	570	37	94%	587,290
210Lead	169	114	33%	29,400

Heap/ISR Comparison

- **ISR**
  - Processing brings Formation Ground Water with elevated Radon into CPP.
  - Flow rates 3,500 – 7,000 gpm
- **HEAP LEACH**
  - 98% of radium remains in the heap
  - Short lixiviant residence time in heap
  - Average Flow Rate @ Sheep 350 gpm
  - Low radon levels expected in leachate sent to plant

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Heap/Conventional Comparison

- **CONVENTIONAL MILLING PHYSICALLY ALTERS ORE**
  - Processing brings **ore** and associated **radium** into Mill
  - Grinding reduces grain size
  - Milling process separates sands and slimes
  - Slimes concentrate **radium**, retain moisture, have low strength
  - Resulting in lengthy process (decades) to stabilize and reclaim
- **HEAP LEACH DOES NOT PHYSICALLY ALTER ORE**
  - 98% of radium remains in the Heap
  - Heap remains comingled
    - No grinding; no sand slime separation; no concentration of radium
  - Built on a liner with a positive drain
  - Reclamation can proceed efficiently

Mill Details

Heap & Pond Liner Details

Heap Cap and Cover

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Heap Leach Facility

Heap Leach Pad

- Double lined, leak detection, clay amended sub grade
- Loading up to 2,600 tons/day, roughly 1,800 cy/day
- 25 ft lifts, maximum height 50 ft
- 200 ft wide by 1,600 ft long lifts installed via continuous stacker
- Stacking and leaching of lifts is phased to minimize amount of uncovered spent heap (tailings)
- Lixiviant is 1 normal H_2SO_4
  - applied at 0.005 gpm/sq ft
- Approx. 1.6 acres under primary leach at any one time
  - 360 gpm of leachate in process

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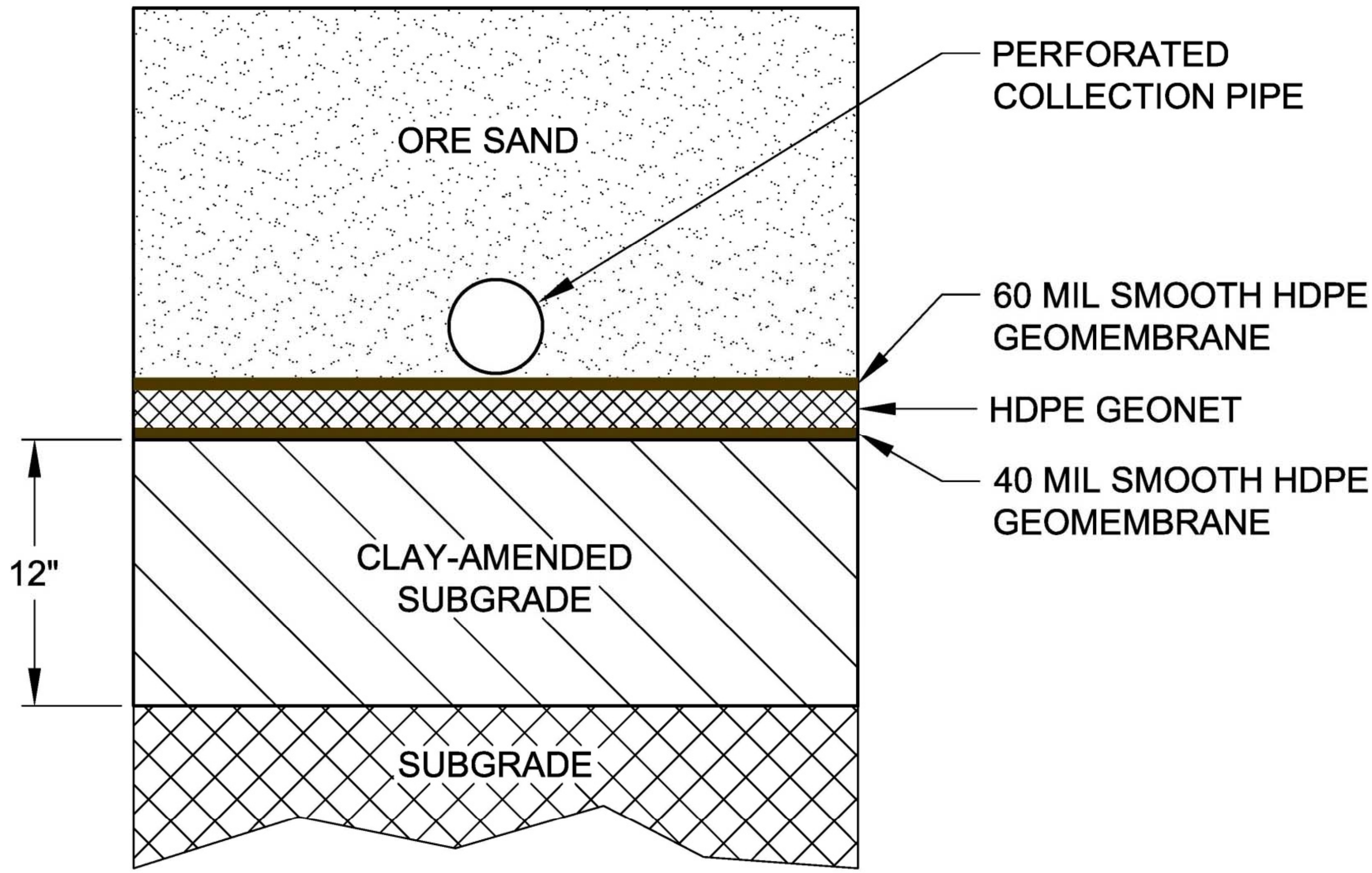


Mobile Grasshopper / Radial Stacking
Courtesy: Terra Nova Technologies, Inc.
Santee, CA
www.tnt.inc.com

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Heap Leach Facility (con't)

Active milling cycle includes:

- Stacking
- Primary leach
- "Resting" heap to enhance recovery
- Secondary leach
- Rinse
- Draindown

Once active leaching and uranium recovery is complete, heap becomes ***inactive*** tailings

Ore Stacker

Heap Leach Facility (con’t)

- Up to 45 acres of heap open at any one time
  - < 40 acres would be spent heap (tailings)
- A single heap leach pad (one continuous liner) may at any one time contain:
  - Open and unloaded pad
  - Un-leached ore
  - Ore under active leaching (milling)
  - Ore being “rested” between leach cycles (milling)
  - Ore being rinsed for final value recovery and heap detoxification (milling)
  - Spent ore (tailings) waiting to be covered
  - Spent ore (tailings) being covered
  - Covered spent ore (tailings)

Conceptual Heap Sequencing

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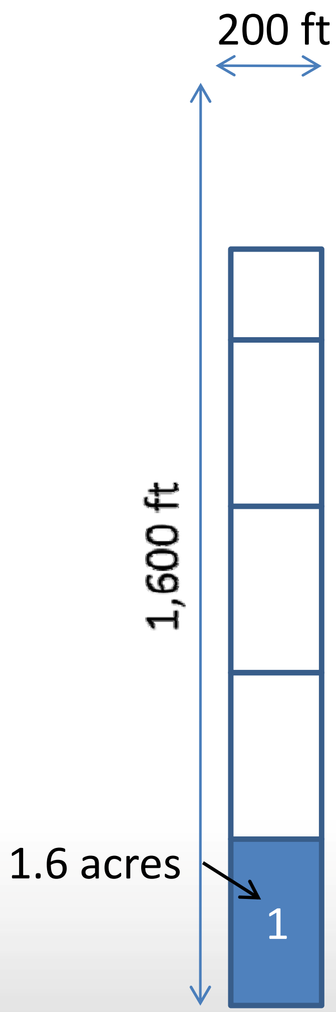
Stacking and Leaching Sequence



Placement of Ore (milling)

Leaching of Ore (milling)

Resting Ore (milling)

Spent Ore (Tailings)

Stacker loads ore on to pad

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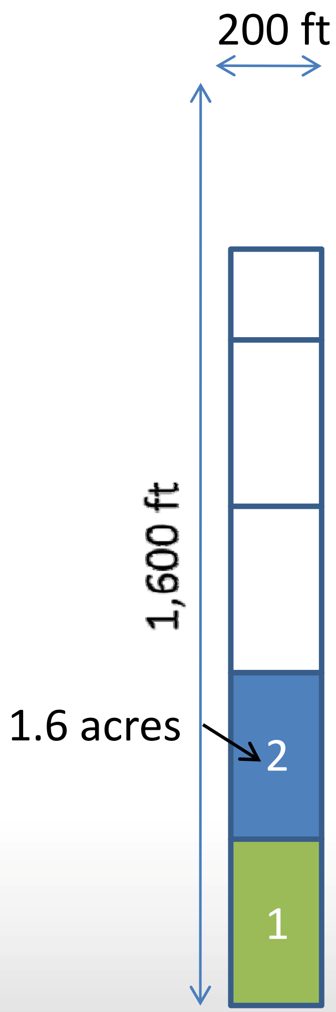
Stacking and Leaching Sequence



Placement of Ore (milling)

Leaching of Ore (milling)

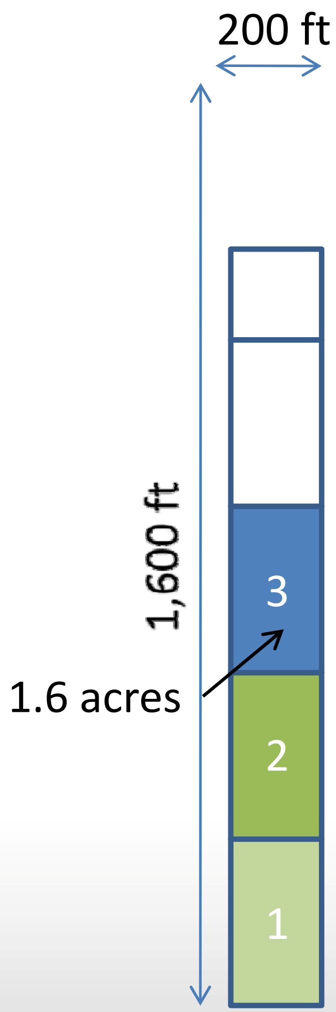
Resting Ore (milling)

Spent Ore (Tailings)

Stacker retreats as it stacks ore

Ore Leaching follows stacking in 1.6 acre increments
0.005 gpm/sq ft x 1.6 acres = 360 gpm

Stacking and Leaching Sequence



Stacker retreats as it stacks ore

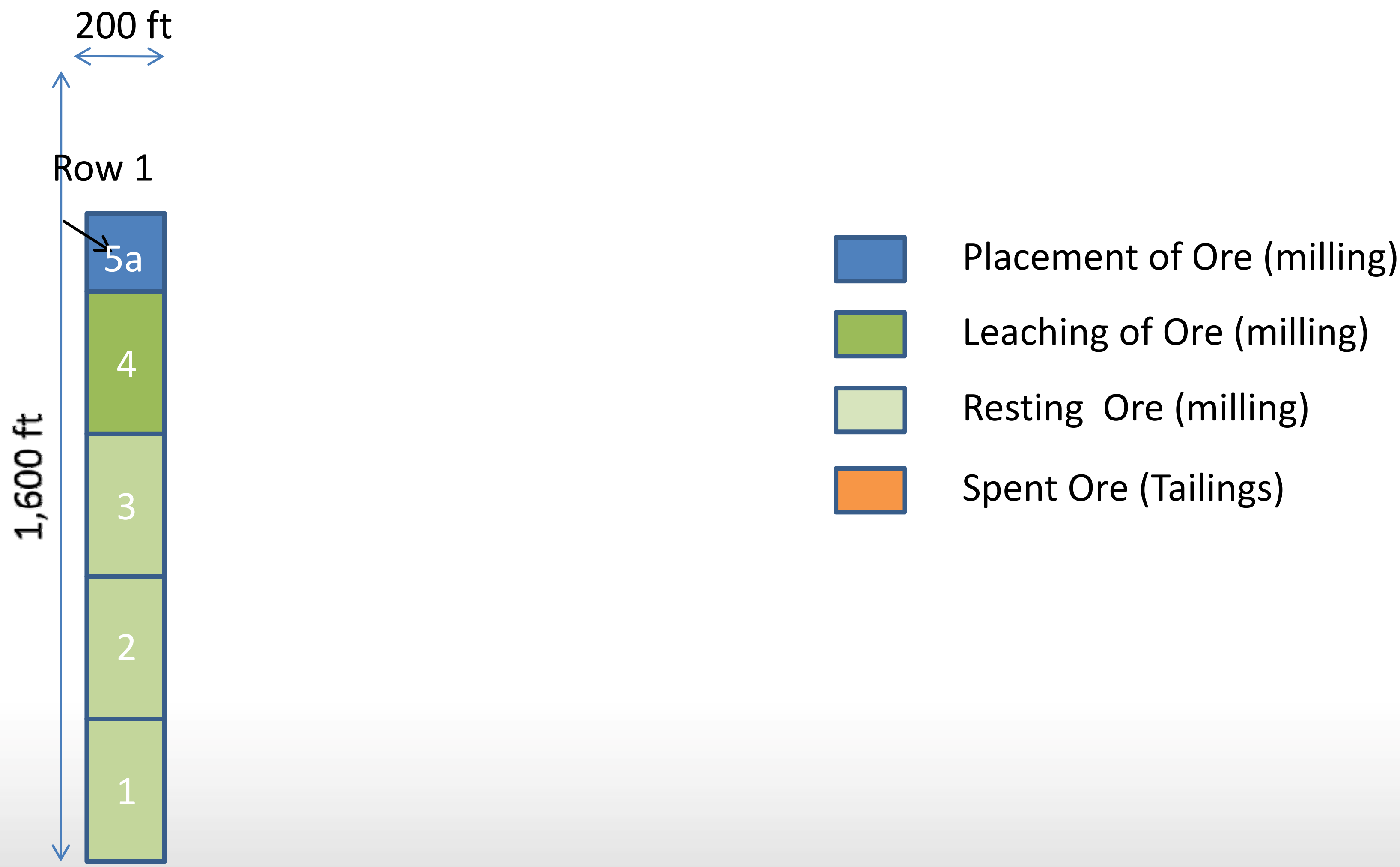
- Placement of Ore (milling)
- Leaching of Ore (milling)
- Resting Ore (milling)
- Spent Ore (Tailings)

Ore Leaching follows stacking in 1.6 acre increments
0.005 gpm/sq ft x 1.6 acres = 350 gpm

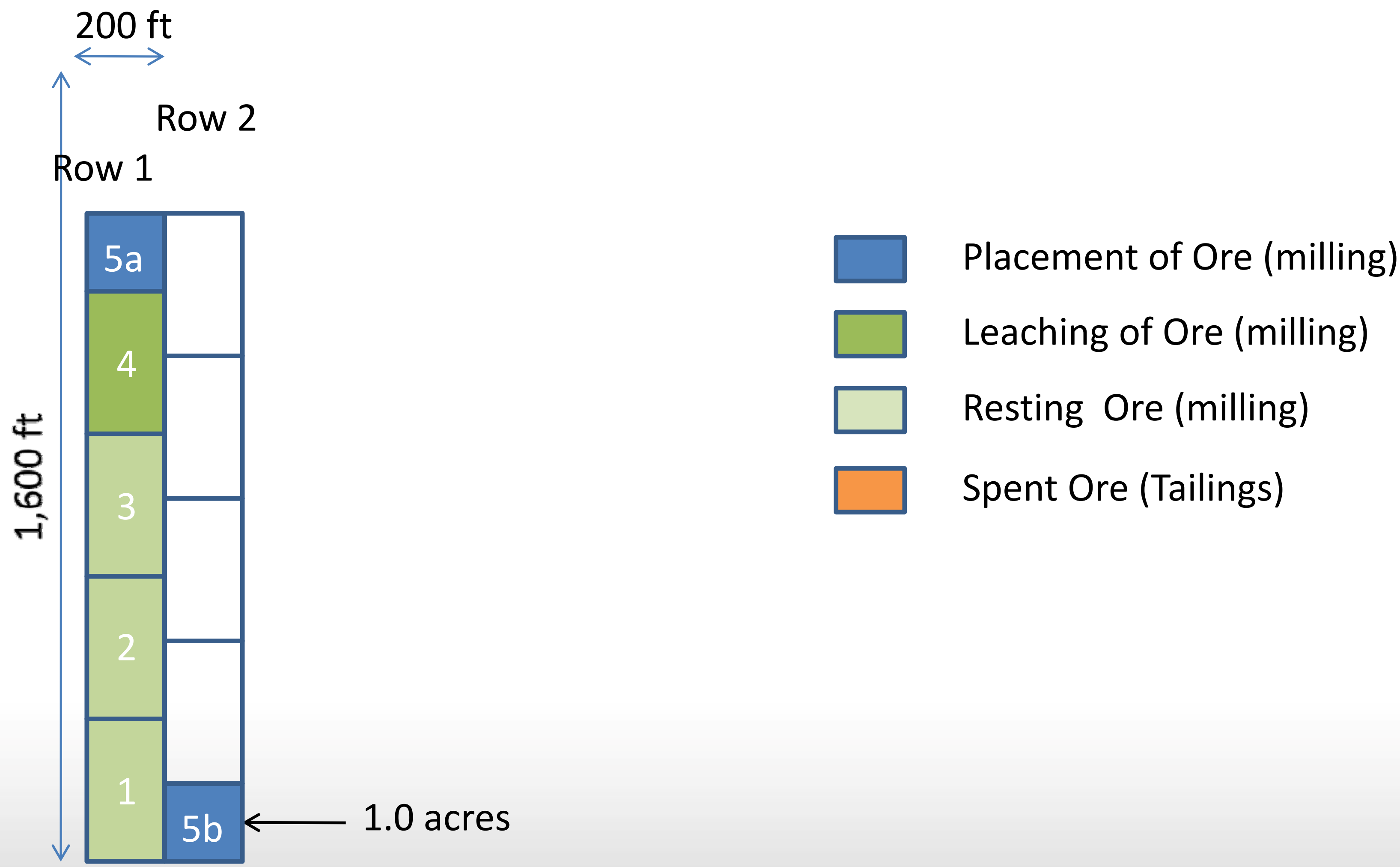
Ore is rested to allow additional oxidation


200 ft
1.6 acres
1,600 ft
4
3
2
1
Placement of Ore (milling)
Leaching of Ore (milling)
Resting Ore (milling)
Spent Ore (Tailings)

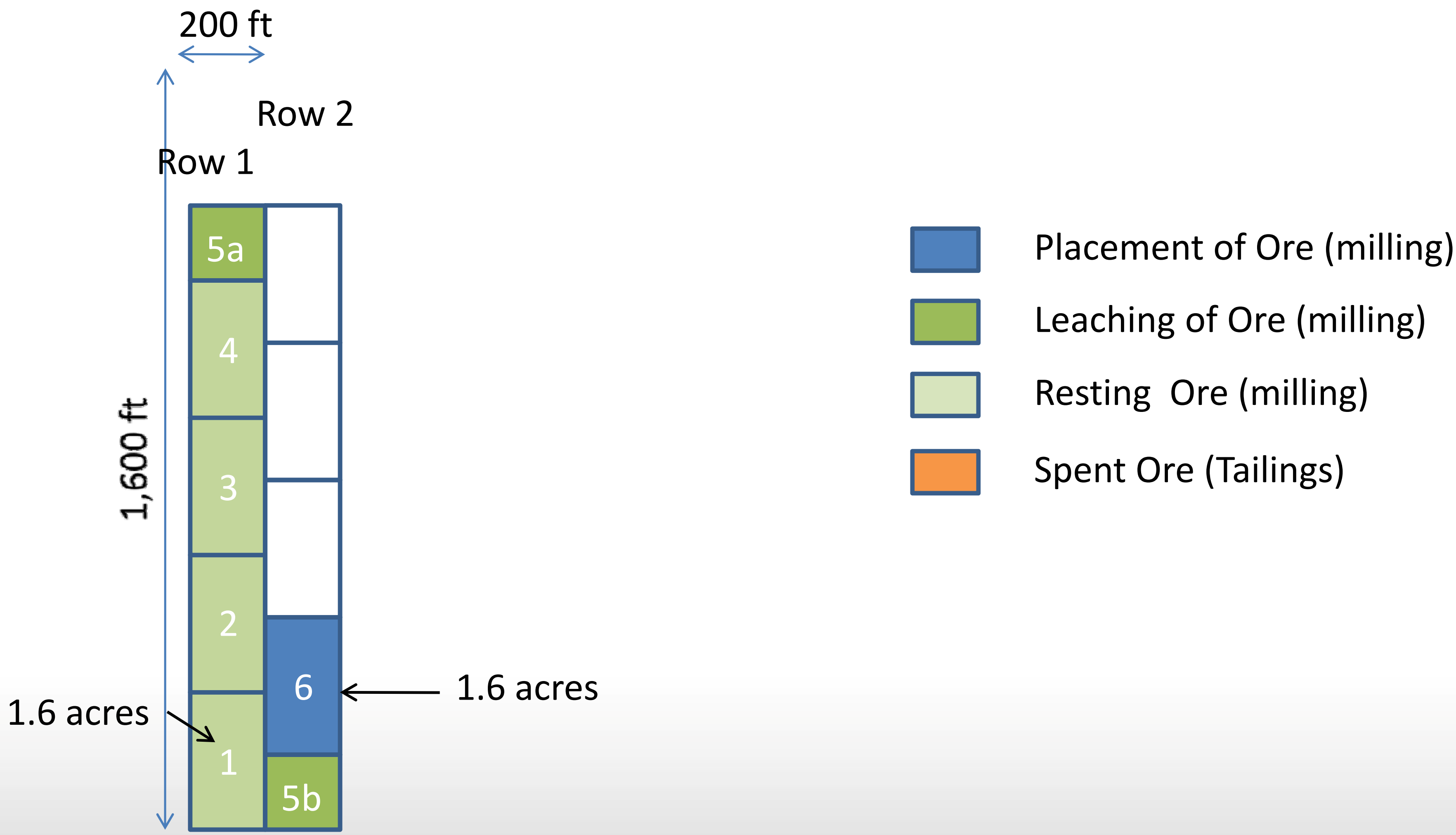
Stacking and Leaching Sequence



Stacking and Leaching Sequence



Stacking and Leaching Sequence



TITAN
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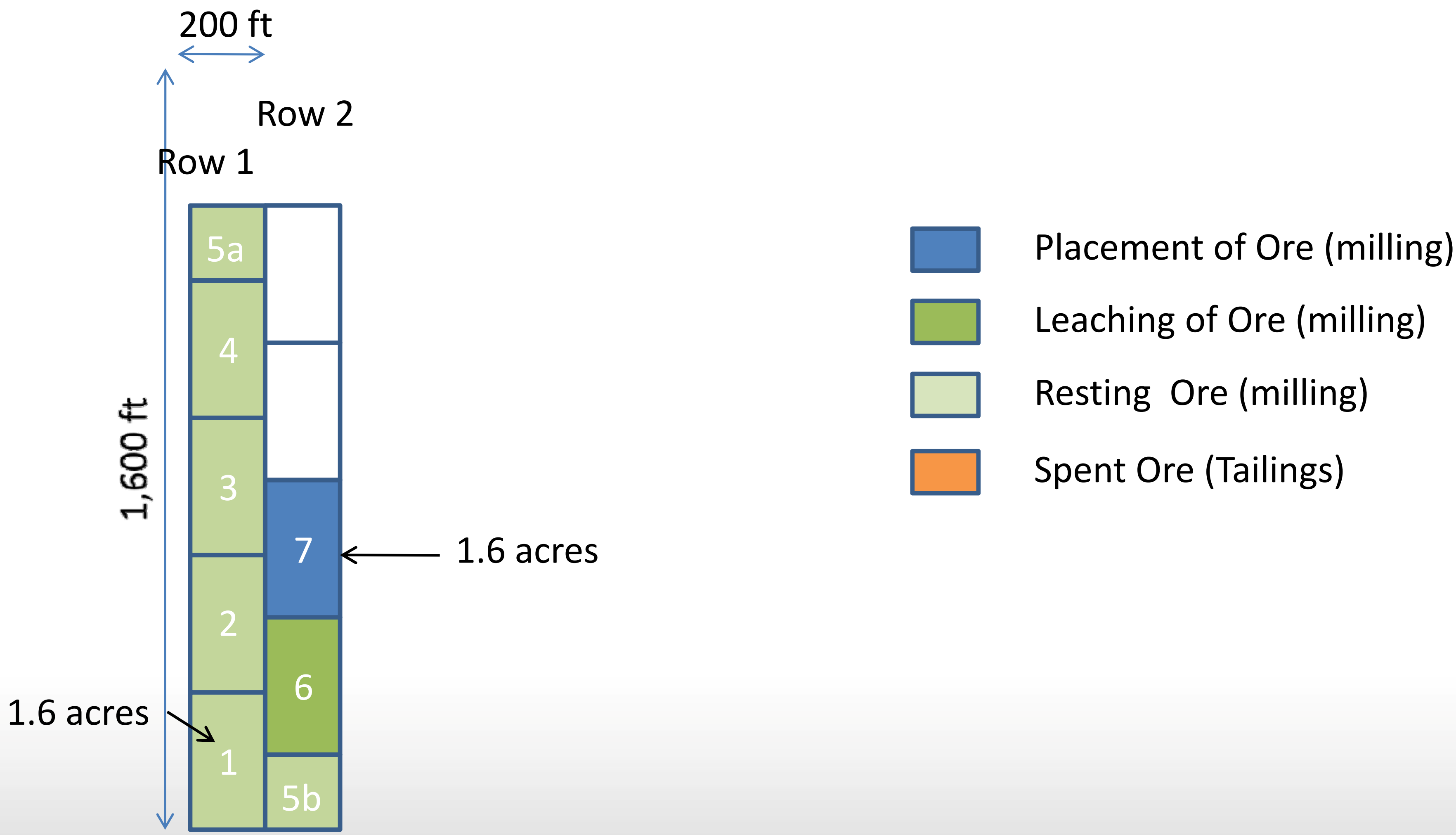
Stacking and Leaching Sequence



Stacking and Leaching Sequence

TITAN
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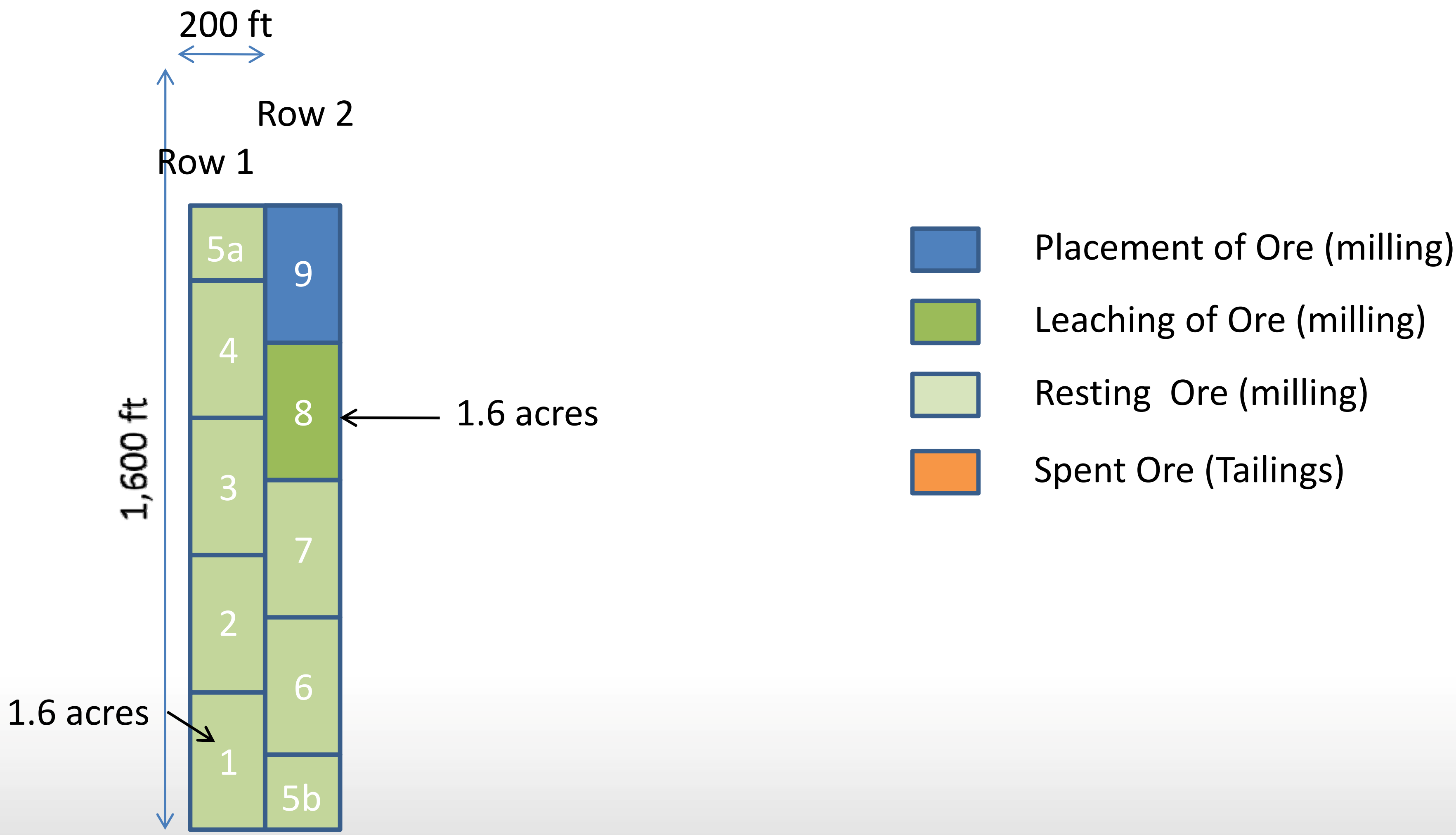
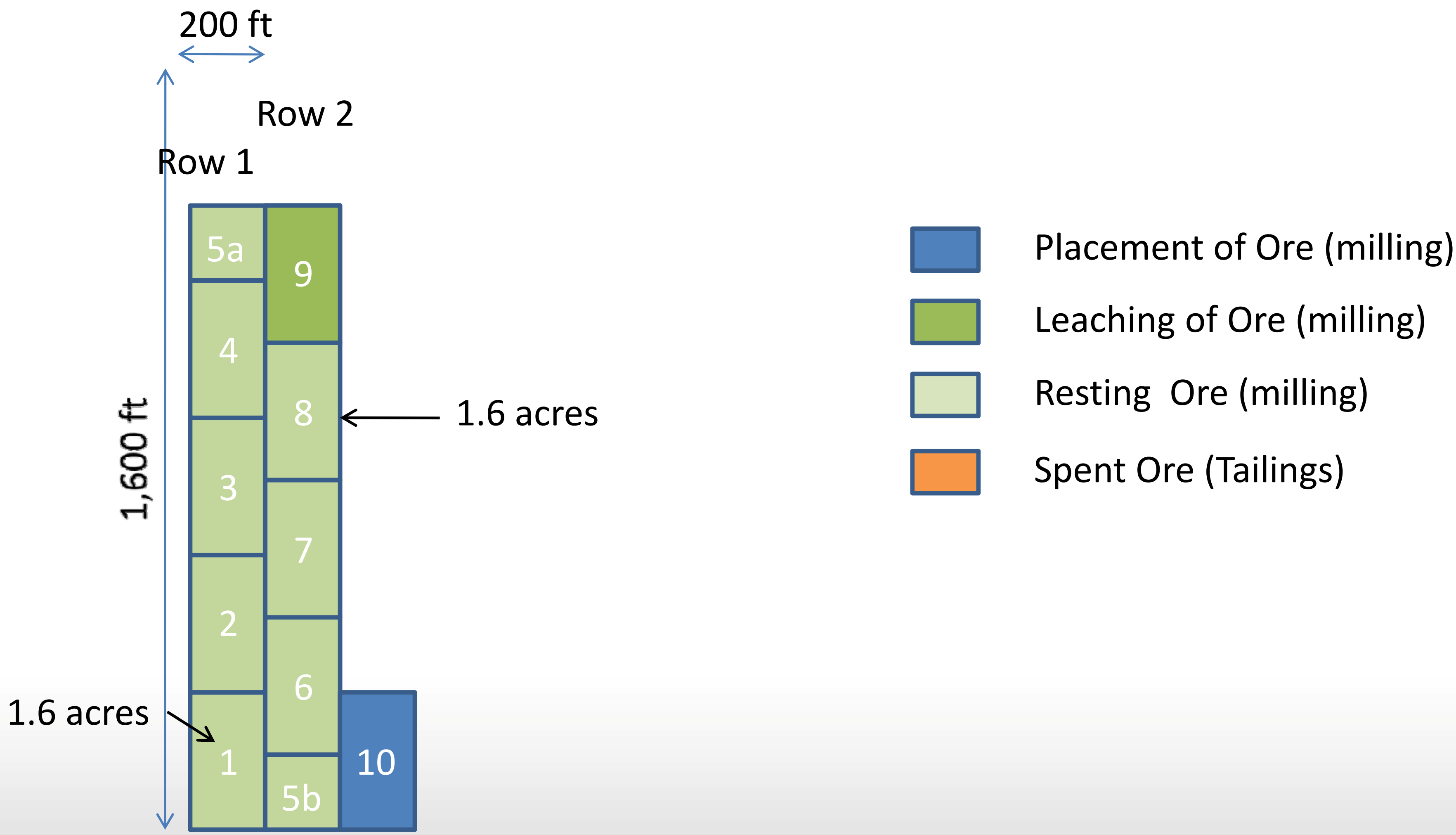
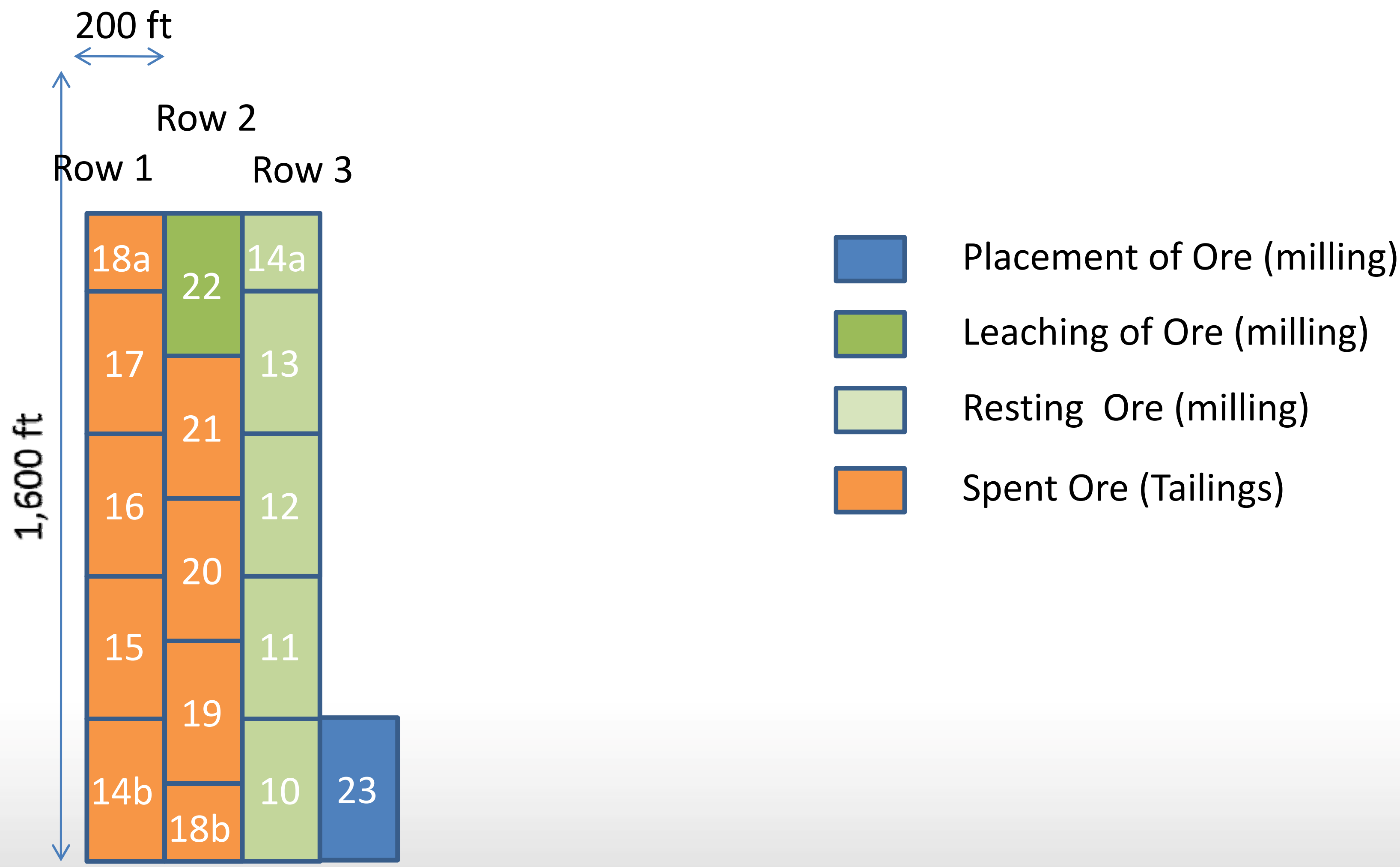
Stacking and Leaching Sequence

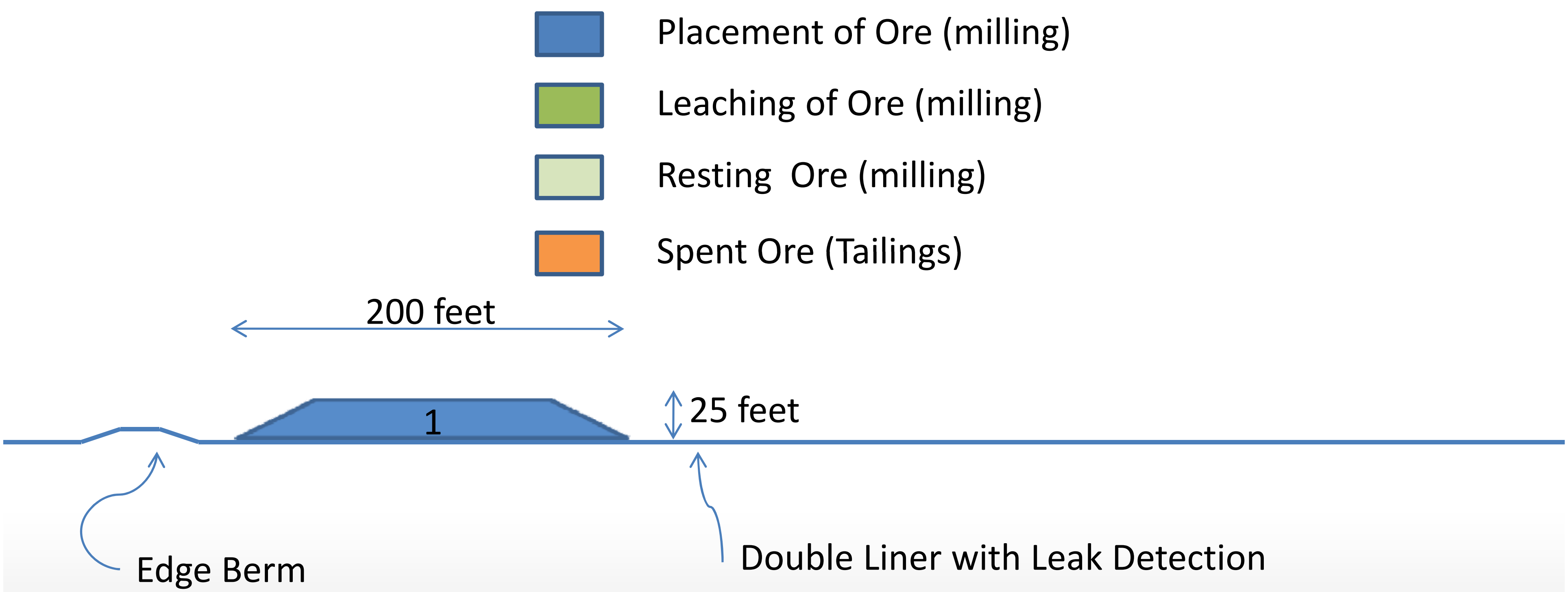


Stacking and Leaching Sequence



Stacking and Leaching Sequence




Placement of Ore (milling)
Leaching of Ore (milling)
Resting Ore (milling)
Spent Ore (Tailings)
200 feet
1
25 feet
Edge Berm
Double Liner with Leak Detection

Placement of Ore (milling)

Leaching of Ore (milling)

Resting Ore (milling)

Spent Ore (Tailings)

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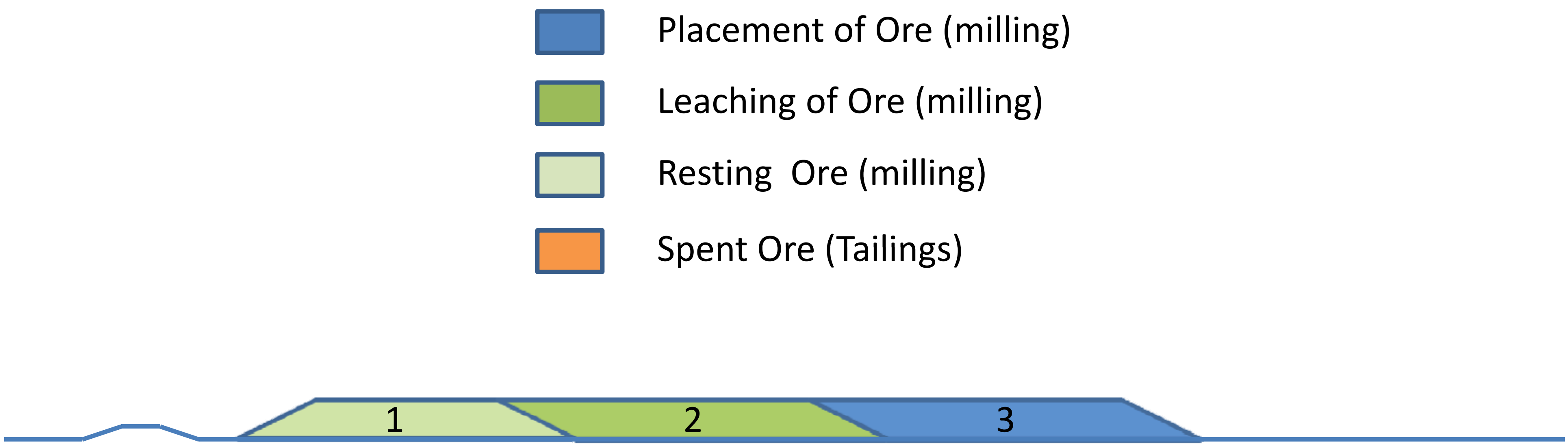

TITAN
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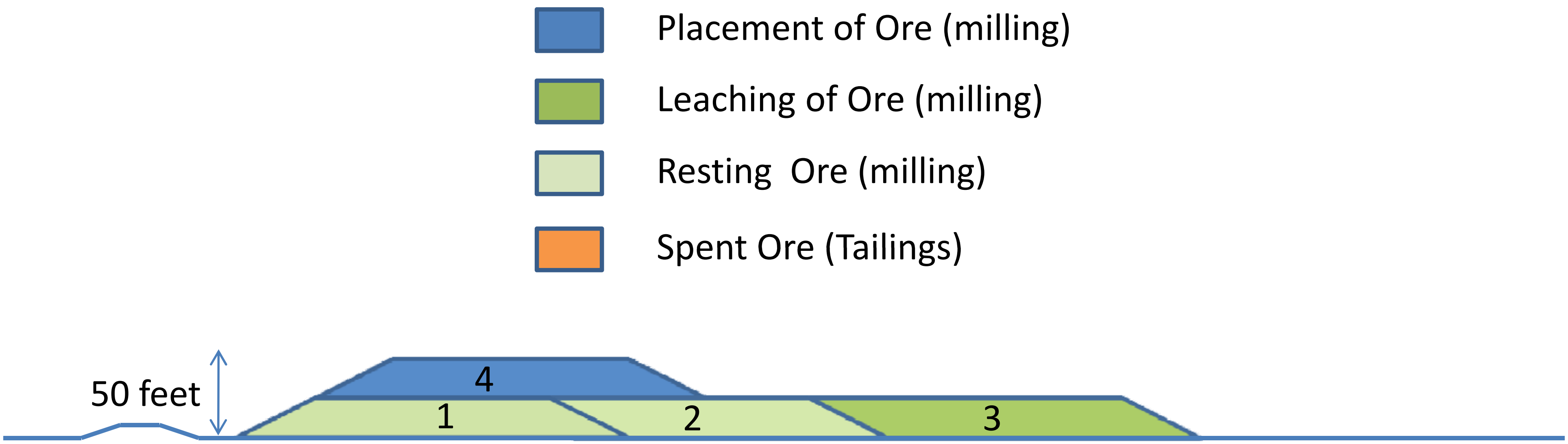
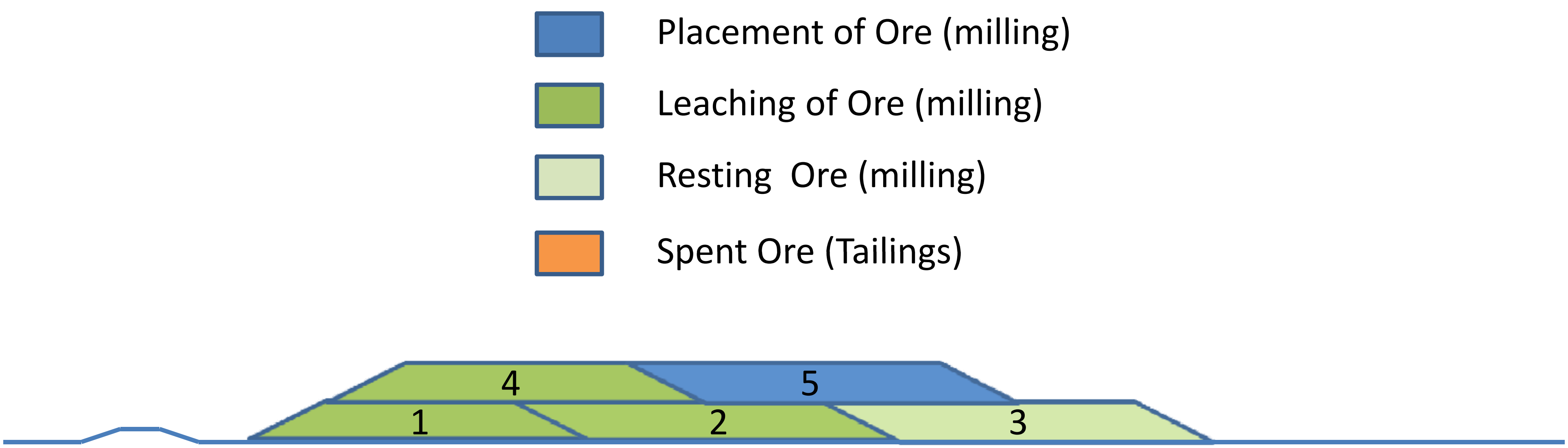
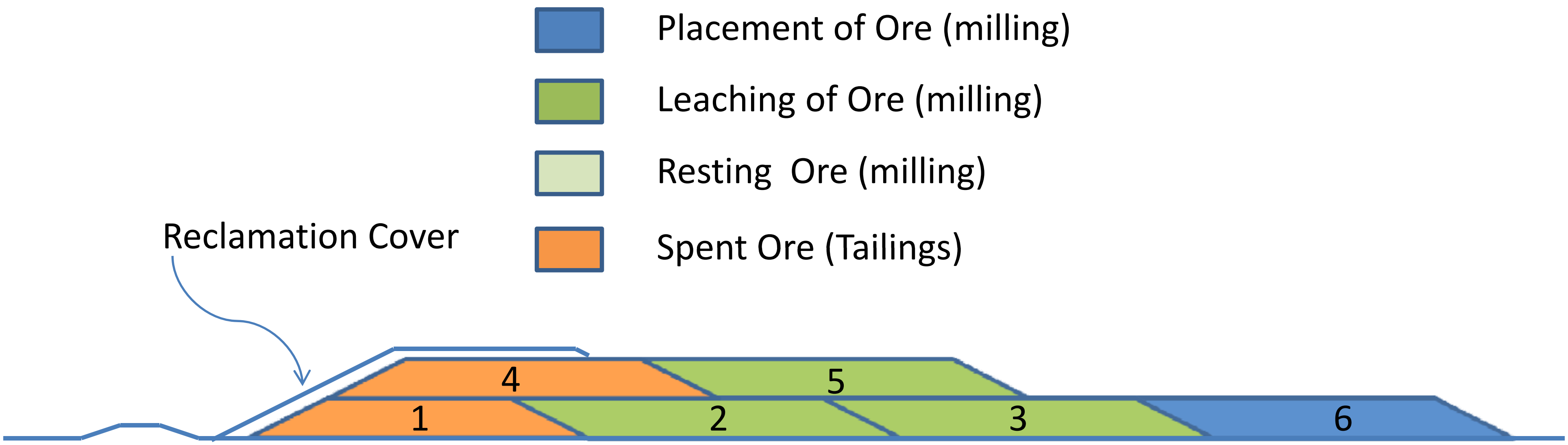
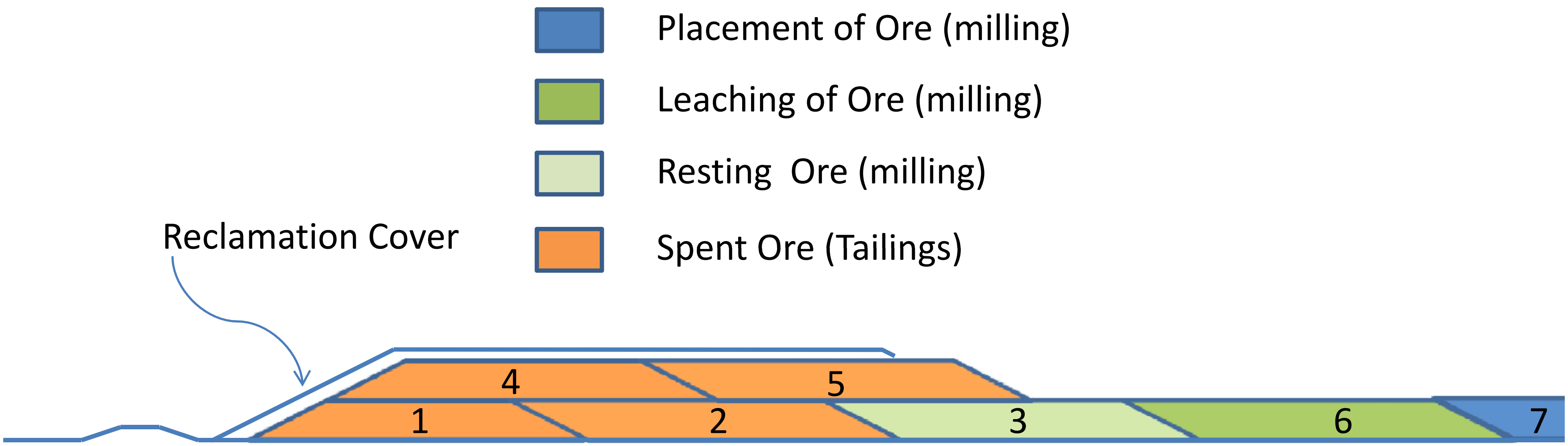
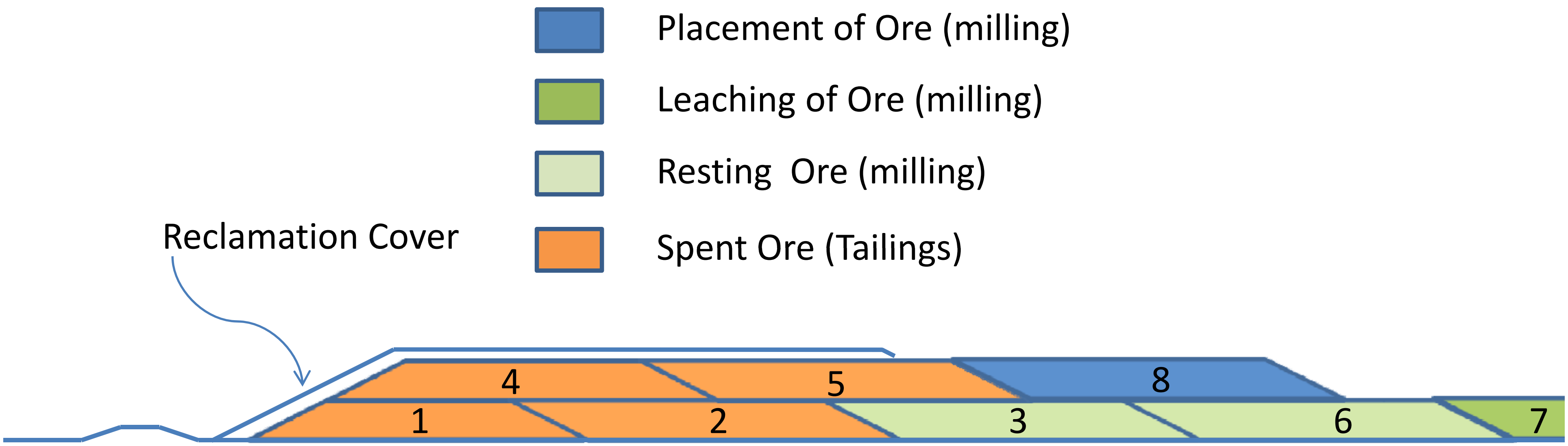
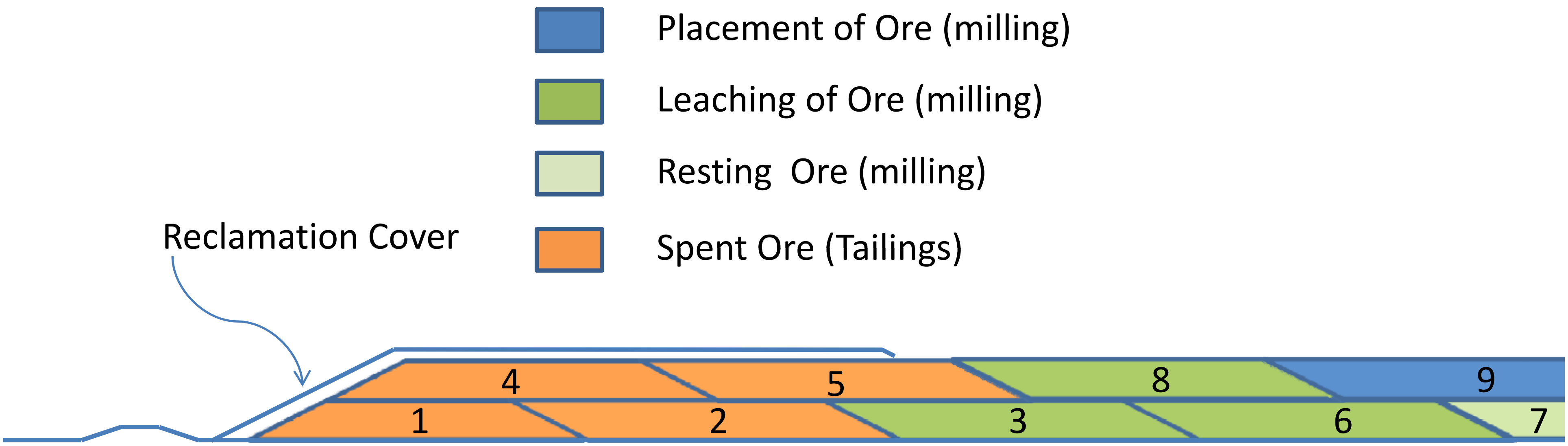



Placement of Ore (milling)
Leaching of Ore (milling)
Resting Ore (milling)
Spent Ore (Tailings)
4
5
1
2
3


Placement of Ore (milling)
Leaching of Ore (milling)
Resting Ore (milling)
Spent Ore (Tailings)
Reclamation Cover
4
5
1
2
3
6


Placement of Ore (milling)
Leaching of Ore (milling)
Resting Ore (milling)
Spent Ore (Tailings)
Reclamation Cover
4
5
1
2
3
6
7


Placement of Ore (milling)
Leaching of Ore (milling)
Resting Ore (milling)
Spent Ore (Tailings)
Reclamation Cover
4
5
8
1
2
3
6
7


Placement of Ore (milling)
Leaching of Ore (milling)
Resting Ore (milling)
Spent Ore (Tailings)
Reclamation Cover
4
5
8
9
1
2
3
6
7

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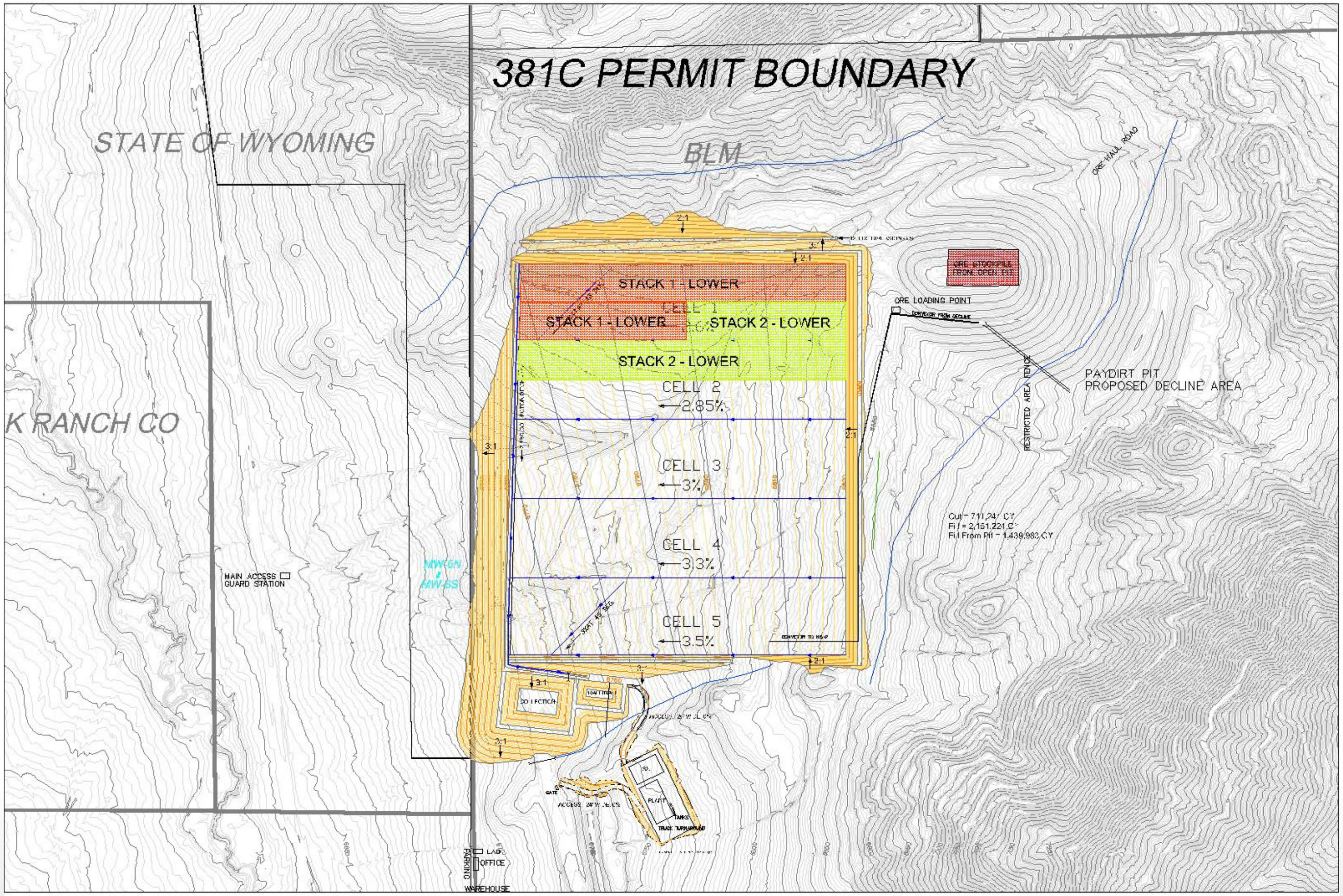
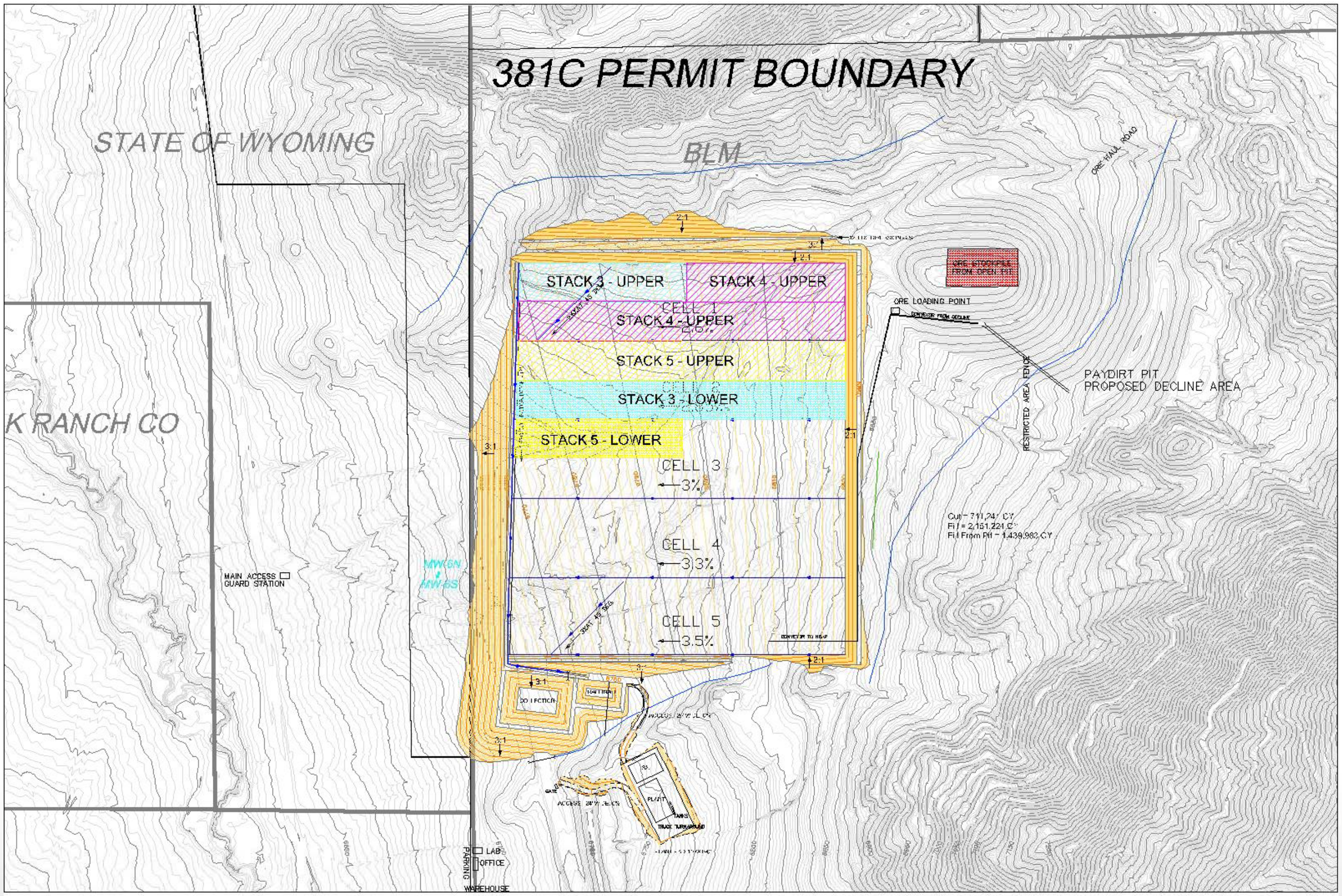
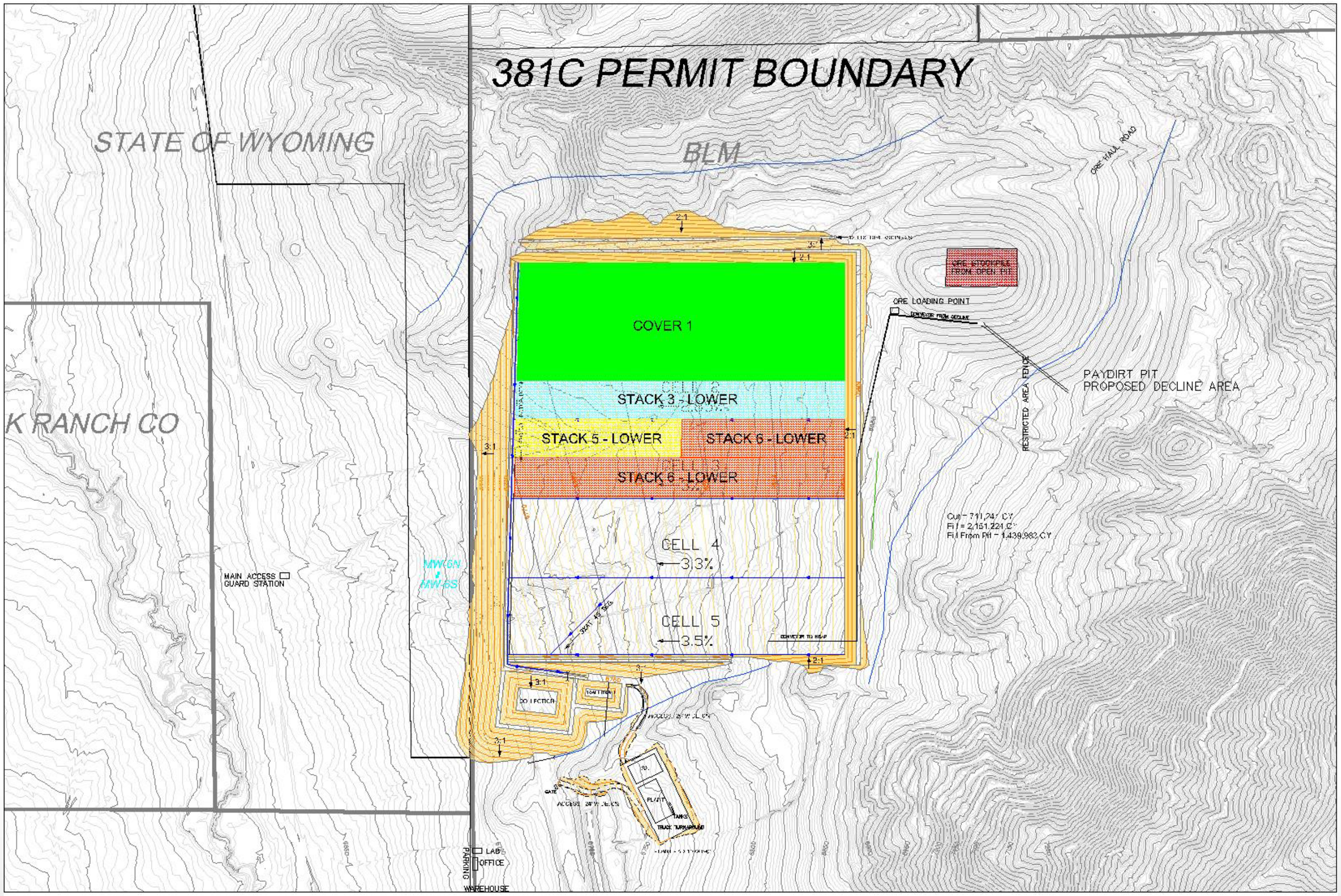
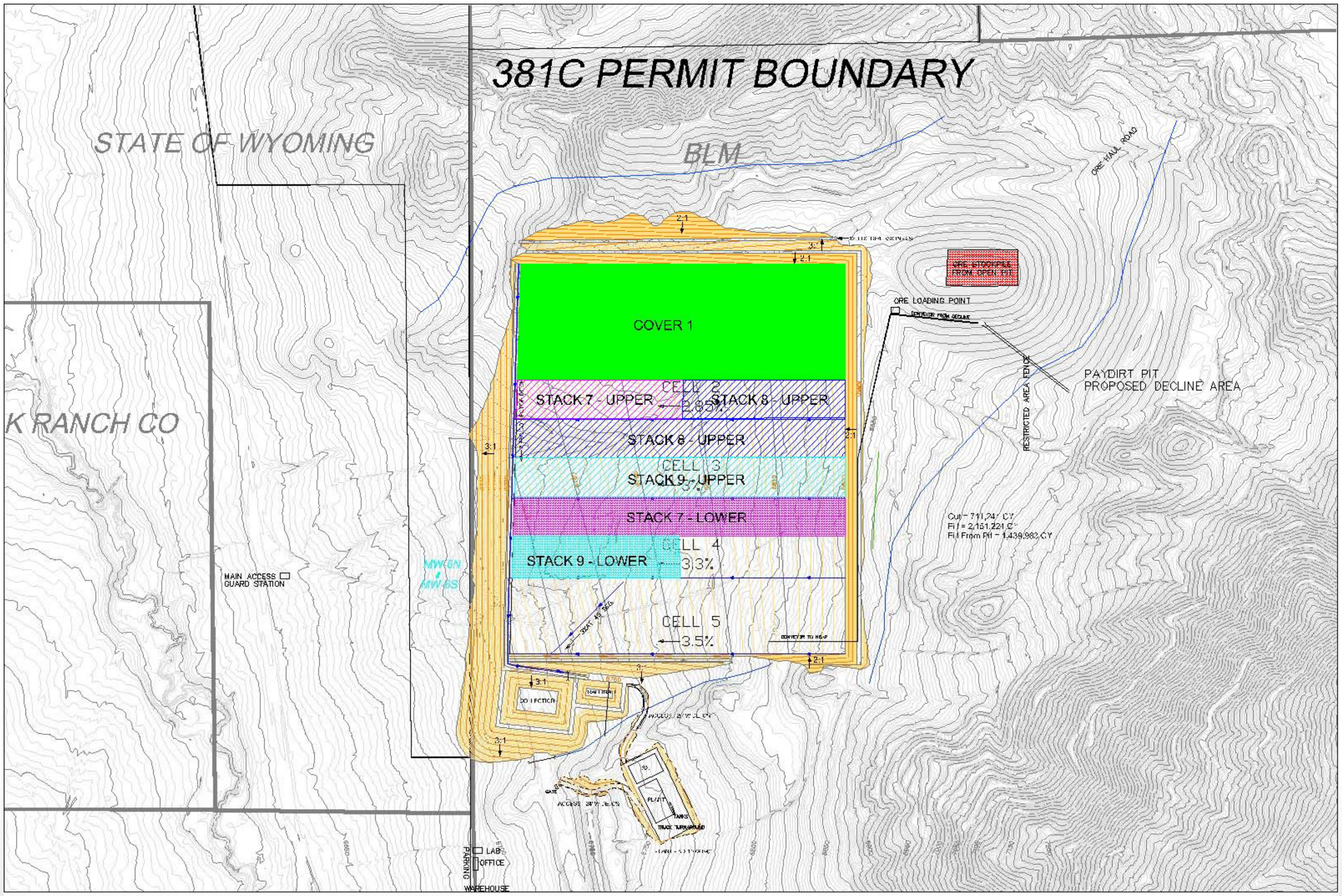


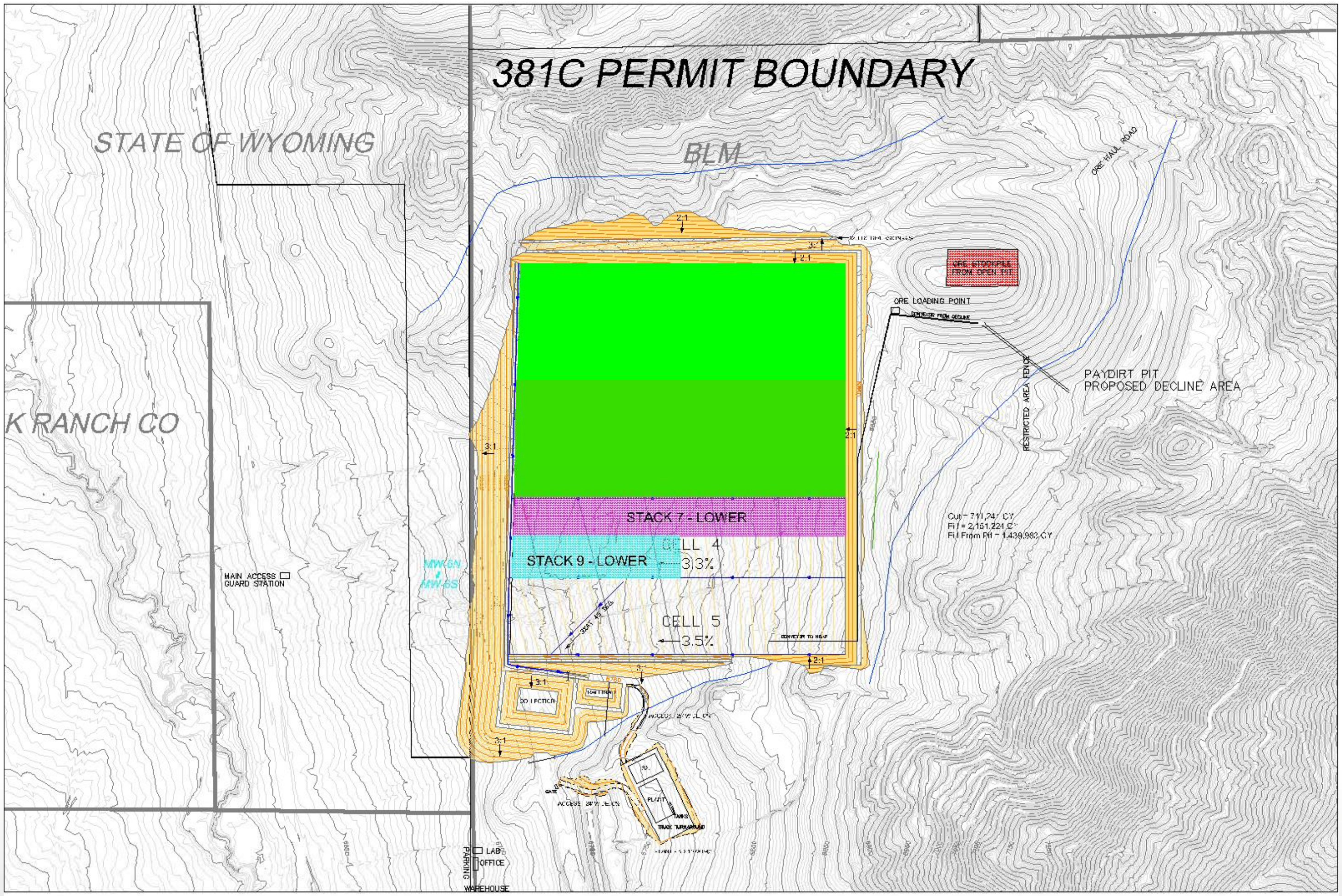
TITAN
URANIUM USA INC

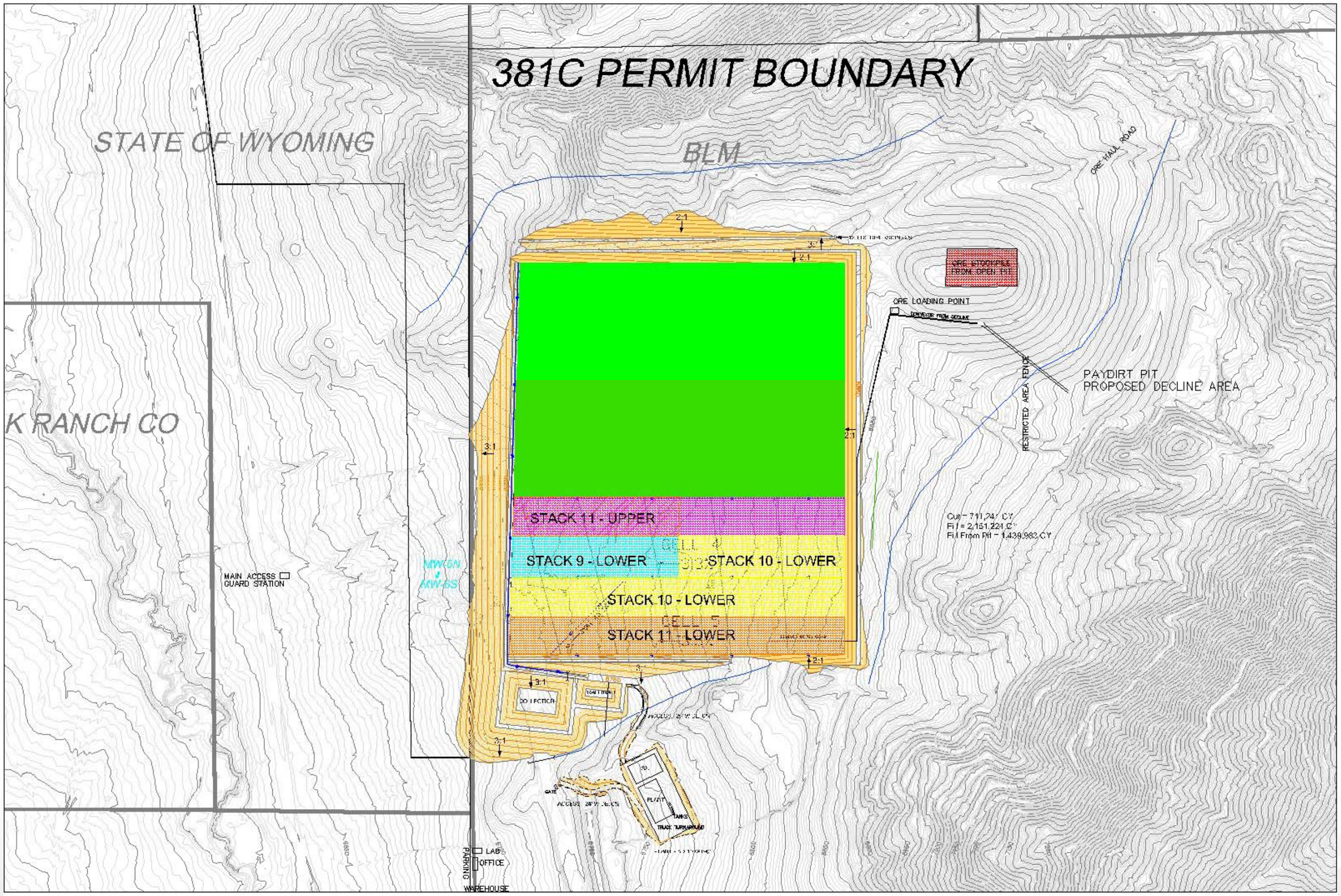


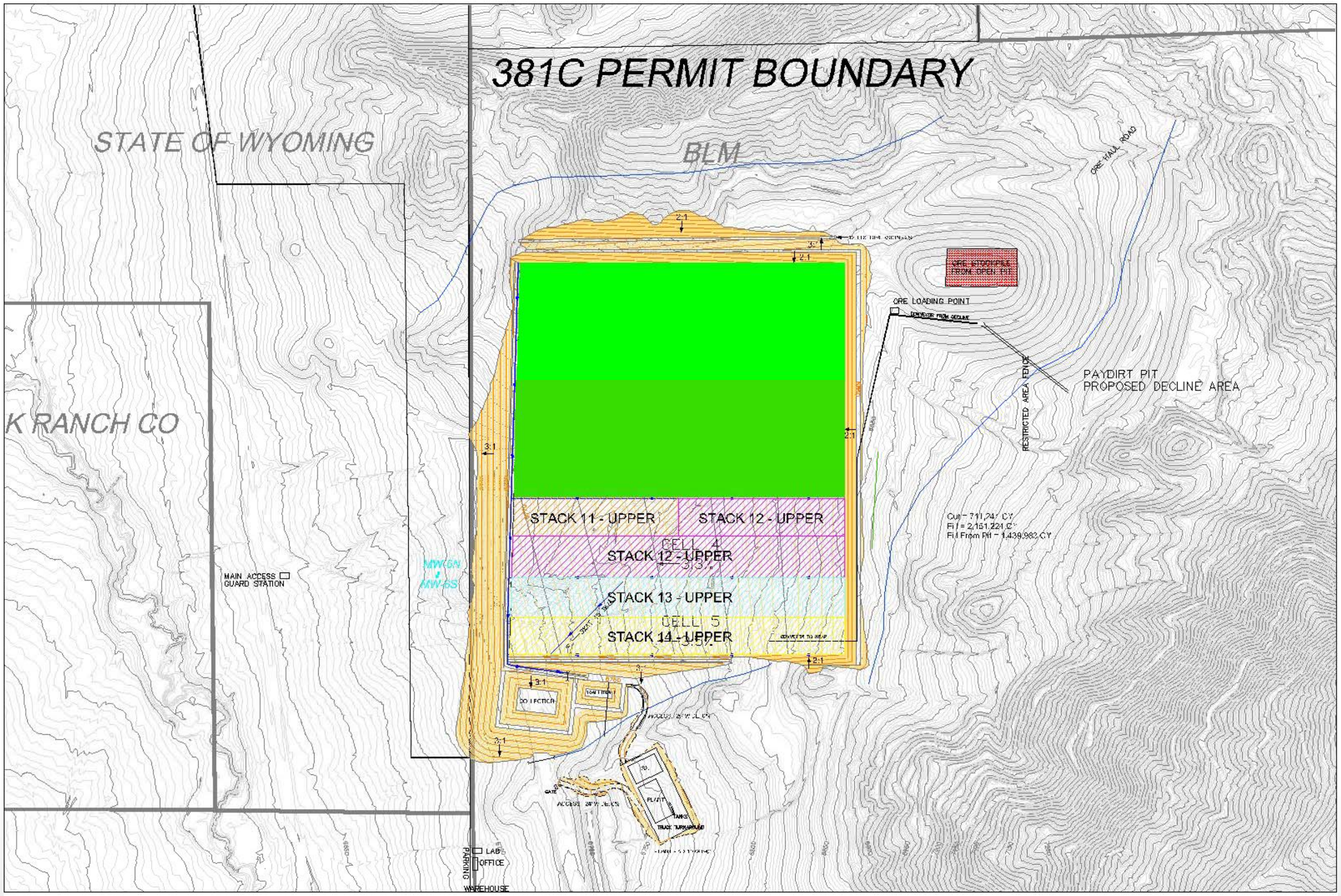
TITAN
URANIUM USA INC




381C PERMIT BOUNDARY
STATE OF WYOMING
BLM
K RANCH CO
COVER 1
CELL 2
2.85%
STACK 7 - UPPER
STACK 8 - UPPER
STACK 8 - UPPER
CELL 3
STACK 9 - UPPER
STACK 7 - LOWER
CELL 4
3.3%
STACK 9 - LOWER
CELL 5
3.5%
ORE LOADING POINT
PAYDIRT PIT
PROPOSED DECLINE AREA
RESTRICTED AREA FENCE
ORE HAUL ROAD
MAIN ACCESS
GUARD STATION
LAB
OFFICE
PARKING
WAREHOUSE

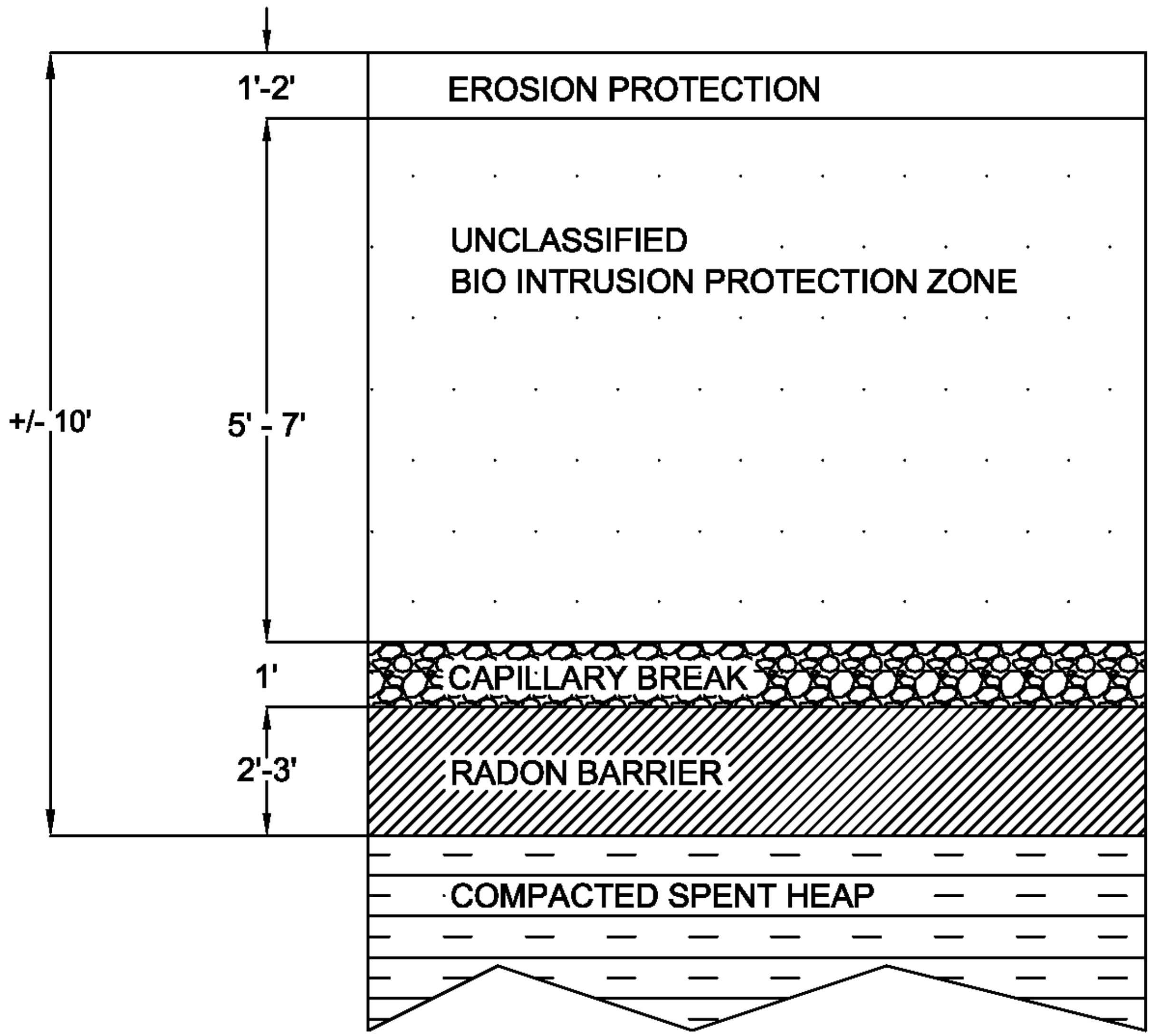

381C PERMIT BOUNDARY
STATE OF WYOMING
BLM
K RANCH CO
ORE HAUL ROAD
ORE STOCKPILE FROM OPEN PIT
ORE LOADING POINT
PAYDIRT PIT
PROPOSED DECLINE AREA
RESTRICTED AREA FENCE
STACK 7 - LOWER
STACK 9 - LOWER
CELL 4
3.3%
CELL 5
3.5%
MAIN ACCESS GUARD STATION
COLLECTION
LAB
OFFICE
PARKING
WAREHOUSE


381C PERMIT BOUNDARY
STATE OF WYOMING
BLM
K RANCH CO
ORE HAUL ROAD
ORE STOCKPILE FROM OPEN PIT
ORE LOADING POINT
CONVEYOR FROM DECLINE
RESTRICTED AREA FENCE
PAYDIRT PIT
PROPOSED DECLINE AREA
STACK 11 - UPPER
STACK 9 - LOWER
STACK 10 - LOWER
STACK 10 - LOWER
STACK 11 - LOWER
MAIN ACCESS GUARD STATION
LAB
OFFICE
PARKING
WAREHOUSE


381C PERMIT BOUNDARY
STATE OF WYOMING
BLM
K RANCH CO
STACK 11 - UPPER
STACK 12 - UPPER
CELL 4
STACK 12 - UPPER
STACK 13 - UPPER
CELL 5
STACK 14 - UPPER
PAYDIRT PIT
PROPOSED DECLINE AREA
ORE LOADING POINT
RESTRICTED AREA FENCE
MAIN ACCESS
GUARD STATION
LAB
OFFICE
WAREHOUSE
PARKING

Heap Leach Facility (con't)

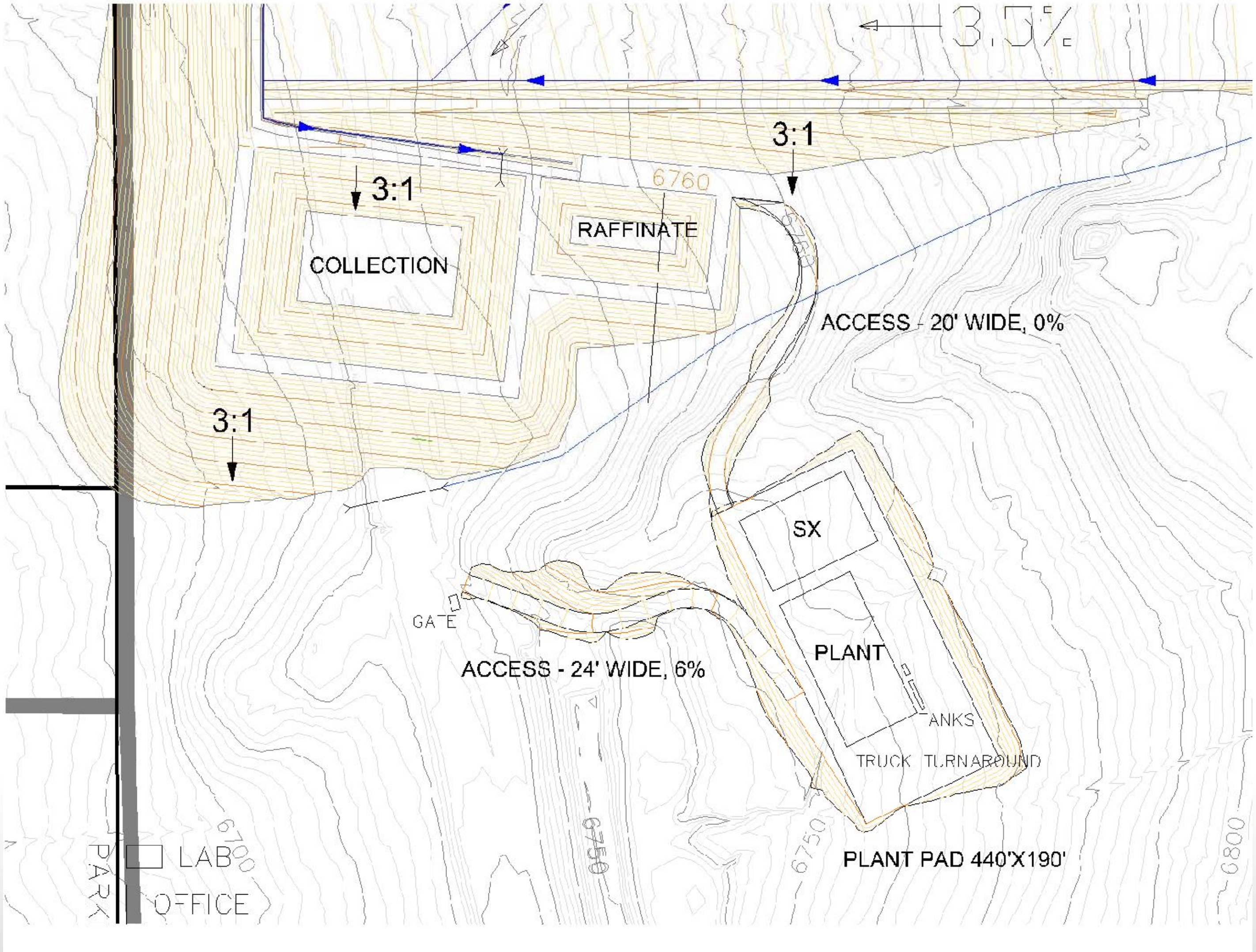
- Start reclamation of spent heap surface after uranium recovery (milling) of heap section is complete on individual stacking rows:
  - Compaction and minor grading of heap surface
  - Placement of final radon barrier
  - Biointrusion layer
  - Freeze/thaw protection
  - Radon flux verification measurements
  - Erosion protection (rip rap)

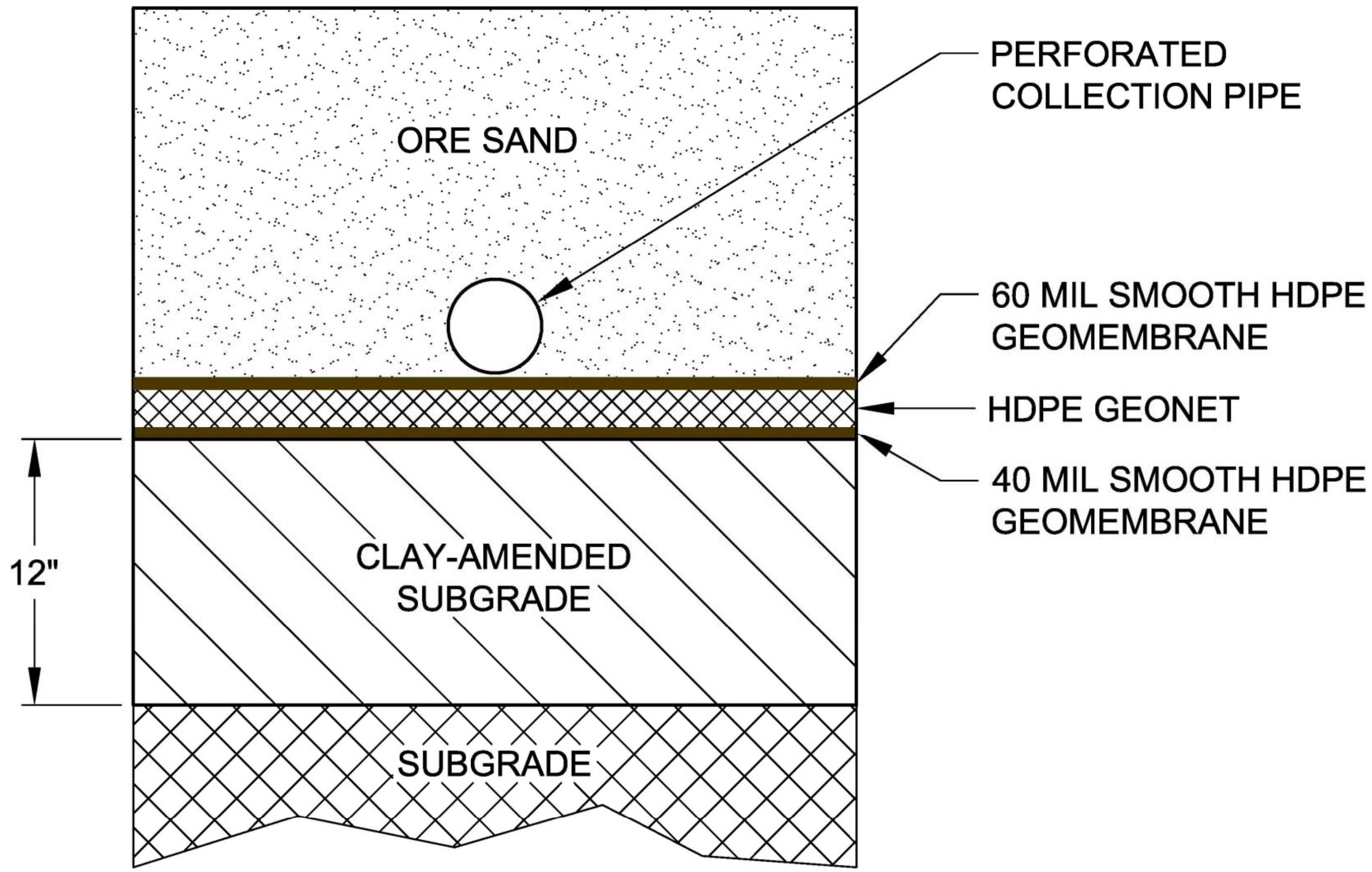


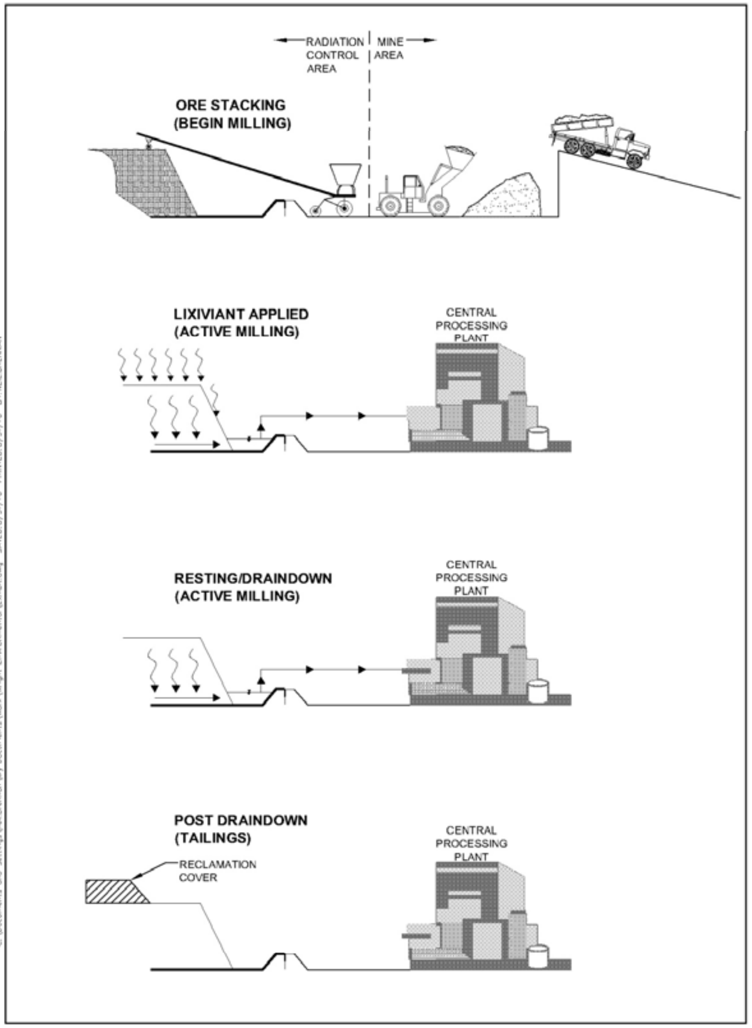
Heap Cap and Cover Detail

Heap Leach Facility (con't)
Process Ponds

- Double lined, leak detection, clay amended sub-grade
- Barren Pond (raffinate, lixiviant make up)
    - acid addition
    - make up water
- Pregnant Pond (collection)
    - Loaded raffinate
    - Blending of leachates for grade control
- Analogous to mill leach process tanks
- Will not contain any wastes or "tailings"
- ***Active*** leach pads as well as ***process*** ponds are part of the mill, no wastes ever present
- Only after uranium recovery is complete are tailings present


3.5%
3:1
6760
3:1
RAFFINATE
COLLECTION
ACCESS - 20' WIDE, 0%
3:1
SX
GATE
PLANT
ACCESS - 24' WIDE, 6%
TANKS
TRUCK TURNAROUND
6700
6750
6750
6800
PLANT PAD 440'X190'
PARK
LAB
OFFICE


PERFORATED
COLLECTION PIPE
ORE SAND
60 MIL SMOOTH HDPE
GEOMEMBRANE
HDPE GEONET
40 MIL SMOOTH HDPE
GEOMEMBRANE
12"
CLAY-AMENDED
SUBGRADE
SUBGRADE



Status of Active Heaps and 10 CFR Part 61, subpart W

•Active heap is active "milling"

•Heap material during active milling is not 11e.(2) byproduct material

•Have rad. monitoring and rad. protection programs to ensure public and occupational exposures remain ALARA

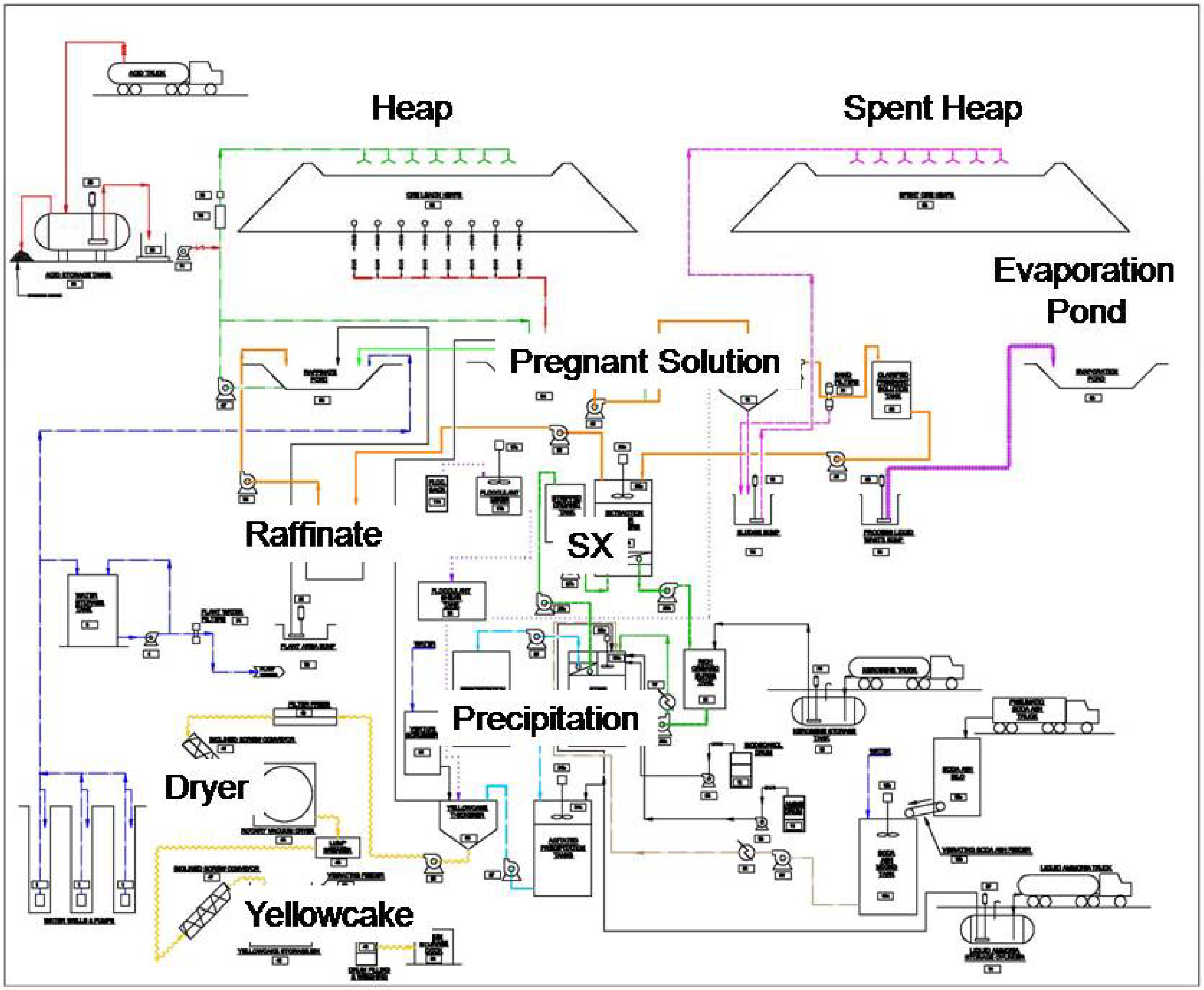
•"Resting" a heap is part of active milling

•Heap becomes 11e.(2) when drain down and recovery of values is completed and the heap is inactive

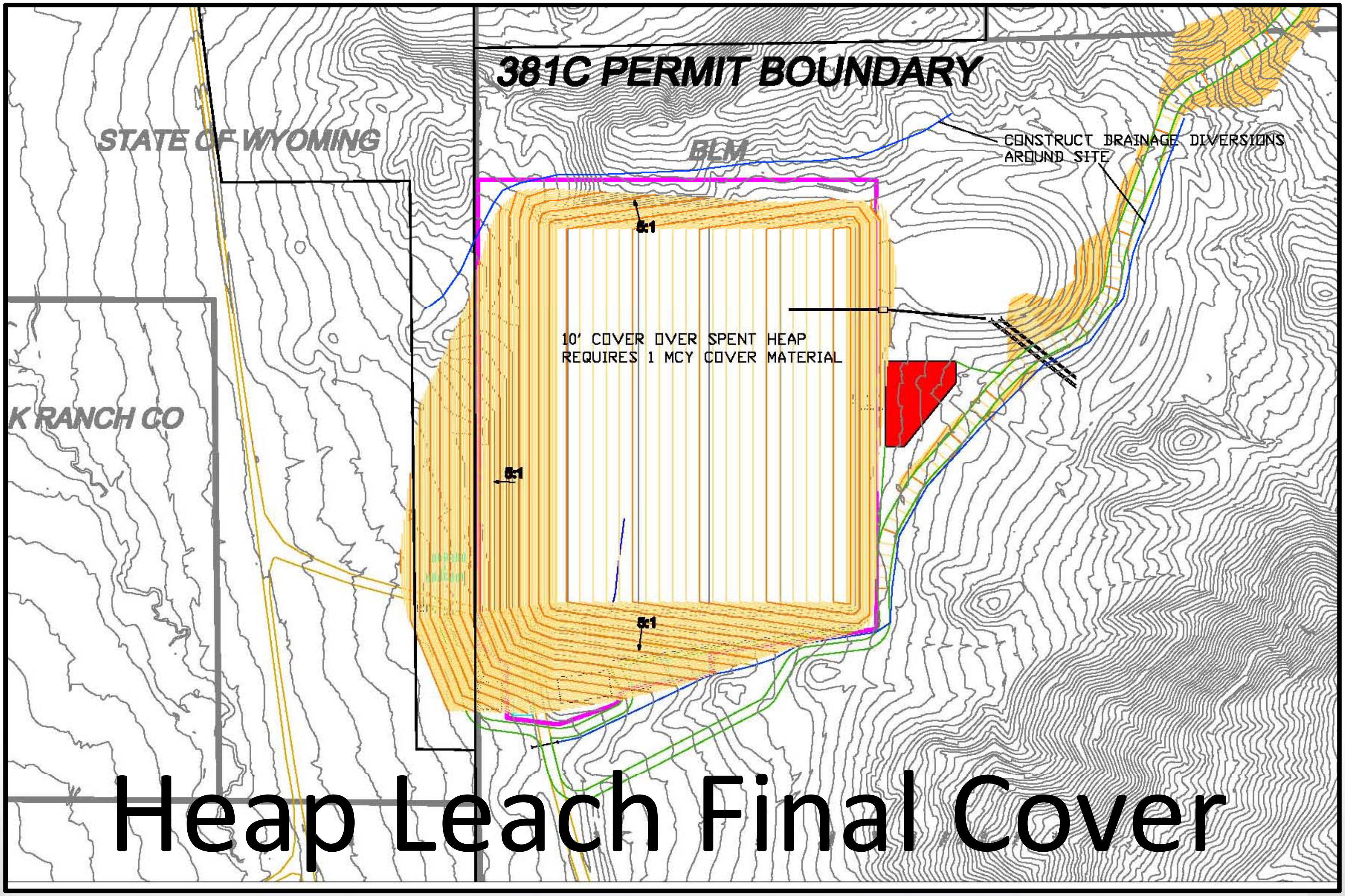
Central Processing Plant

- SX
- IX Polishing
- Precipitation
- Vacuum Drying & Drumming
- Process Bleed to Tanks

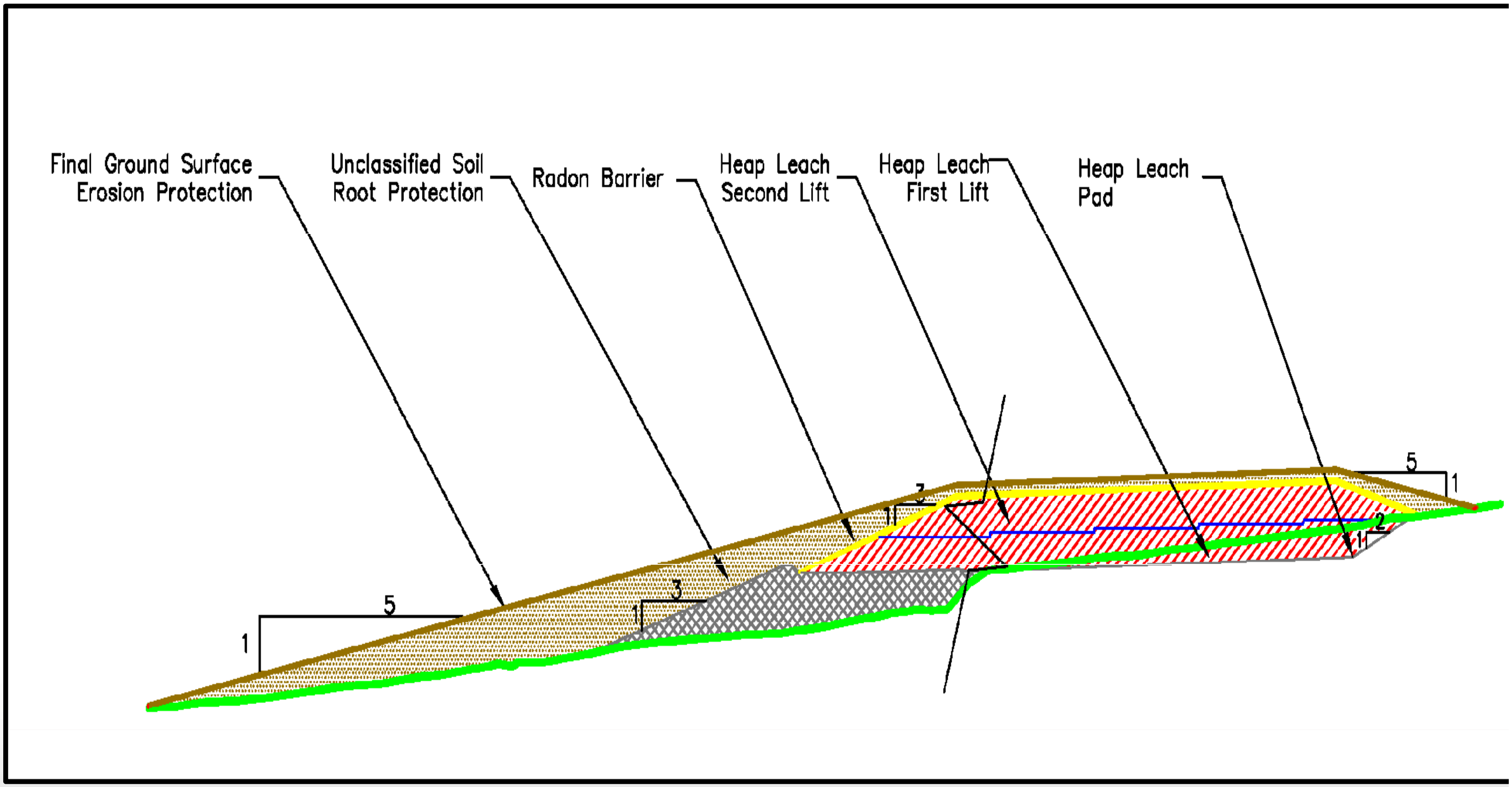
- Operations
  - Process flow rates approx. 360gpm,
    - low anticipated Rn-222 levels
  - Process bleed rates of 5% to 10%
    - 18 to 35 gpm
  - 10 gpm waste stream from precipitation circuit
  - Liquid wastes will be managed in double lined evaporation ponds with leak detection and clay subliner


Heap
Spent Heap
Evaporation Pond
Pregnant Solution
Raffinate
SX
Dryer
Precipitation
Yellowcake

Mine and Reclamation Planning



Heap Leach Final Cover


Final Ground Surface
Erosion Protection
Unclassified Soil
Root Protection
Radon Barrier
Heap Leach
Second Lift
Heap Leach
First Lift
Heap Leach
Pad
5
1
3
1
3
1
5
1
2
1

Items for Discussion

Issues for Discussion

- Status of 40 CFR 192 GW standards update
- Status of Active Heaps & Inactive Heaps
- Status of Process Ponds
- Other?

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Our Understanding

- There are no size limits on the size of ***active*** heaps
- Heap pad designs are approved solely by NRC
- Process ponds that will never contain wastes are part of the mill
- Process Pond designs are approved solely by NRC
- Heap material only become tailings (11e.(2) byproduct material) once active uranium recovery is complete

Our Understanding (con't)

- Part 61, subpart W applies only to spent heap material (tailings)
- We are practicing *phased disposal* of tailings
- We are allowed no more than two 40 acre cells in area of exposed tailings
- We will have appropriate environmental monitoring and radiation programs in place to ensure compliance with 10 CFR Part 20 subpart B and subpart C requirements

40 CFR Part 61.250 (subpart W)

- (b) *Continuous disposal* means a method of tailings management and disposal in which tailings are dewatered by mechanical methods immediately after generation. The dried tailings are then placed in trenches or other disposal areas and immediately covered to limit emissions consistent with applicable Federal standards.
- (c) *Dewatered* means to remove the water from recently produced tailings by mechanical or evaporative methods such that the water content of the tailings does not exceed 30 percent by weight.
- (e) Operational means that an impoundment is being used for the ***continued placement* of new tailings** *[emphasis added]* or is in standby status for such placement. ***An impoundment is in operation from the day that tailings are first placed in the impoundment until the day that final closure begins*** *[emphasis added]**.***
- (f) *Phased disposal* means a method of tailings management and disposal which uses lined impoundments which are filled and then immediately dried and covered to meet all applicable Federal standards.

- Section 101(8) of the Uranium Mill Tailings Radiation Control Act of 1978, 42 U.S.C. 7911(8).
  “Tailings" means the remaining portion of a metal-bearing ore after some or all of such metal, such as uranium, has been extracted.

EPA-485

Reid Rosnick/DC/USEPA/US	To	Tom Peake, Daniel Schultheisz
02/27/2012 03:28 PM	cc	
	bcc	
	Subject	Fw: Re: Preamble Rewrites - Subpart W

Bring me another rock...

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

-----Forwarded by Reid Rosnick/DC/USEPA/US on 02/27/2012 03:28PM -----
To: Reid Rosnick/DC/USEPA/US@EPA
From: Susan Stahle/DC/USEPA/US
Date: 02/27/2012 02:09PM
Subject: Re: Preamble Rewrites - Subpart W

Edits --

(See attached file: Draft Outline FR Proposal for Revision of Subpart W Rev9 (ss 022712).docx)

Susan Stahle
Air and Radiation Law Office (Rm 7502B)
Office of General Counsel
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW (ARN: MC 2344A)
Washington, D.C. 20460
ph: (202) 564-1272
fax: (202) 564-5603
stahle.susan@epa.gov

Inactive hide details for Reid Rosnick---02/27/2012 09:58:59 AM---Here you go...Thanks!
-------------------------------------Reid Rosnick---02/27/2012 09:58:59 AM---Here you go...Thanks! ---

From: Reid Rosnick/DC/USEPA/US
To: Susan Stahle/DC/USEPA/US@EPA
Date: 02/27/2012 09:58 AM
Subject: Re: Preamble Rewrites - Subpart W

Here you go...Thanks!

[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev9.docx" deleted by Susan Stahle/DC/USEPA/US]

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U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
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Inactive hide details for Susan Stahle---02/27/2012 09:42:13 AM---Why don't you drop the new section VI into this document and Susan Stahle---02/27/2012 09:42:13 AM---Why don't you drop the new section VI into this document and I'll look at it all together. I'm talk

From: Susan Stahle/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 02/27/2012 09:42 AM
Subject: Re: Preamble Rewrites - Subpart W

Why don't you drop the new section VI into this document and I'll look at it all together. I'm talking to Wendy this morning about edits to the legal sections so I can add those as well. I think I need to look at the whole package together to make sure the particular edits we're making now are appropriate as part of the whole. I'm going to try and focus on this as much as I can today.

Susan Stahle
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stahle.susan@epa.gov

Inactive hide details for Reid Rosnick---02/24/2012 04:12:51 PM---From: Reid Rosnick/DC/USEPA/US To: Susan Stahle/DC/USEPA/US@EReid Rosnick---02/24/2012 04:12:51 PM---From: Reid Rosnick/DC/USEPA/US To: Susan Stahle/DC/USEPA/US@EPA

From: Reid Rosnick/DC/USEPA/US
To: Susan Stahle/DC/USEPA/US@EPA
Cc: Tom Peake/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Alan Perrin/DC/USEPA/US@EPA, Jonathan Edwards/DC/USEPA/US@EPA
Date: 02/24/2012 04:12 PM
Subject: Preamble Rewrites - Subpart W

Sue,

Attached for your review are the rewrites to the preamble and suggested rule language based on our discussions with Gina. To make it easier for you the new language is colored red and is on the following pages:

p 27-29, Liner compatibility

p.48-Monitoring for the 3 old impoundments

p.55-56, Recordkeeping requirements

p. 97, Rule language for recordkeeping requirements

Please note that I did not incorporate the new language in section VI into this draft. I'll wait for your comments.

I know that you are busy with litigation deadlines, and can't look at this right away, but I appreciate all of the hard work you have put into this rule. Thanks

Reid

Reid J. Rosnick
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202.343.9563
rosnick.reid@epa.gov[attachment "Draft Outline FR Proposal for Revision of Subpart W Rev9.docx" deleted by Susan Stahle/DC/USEPA/US] - Draft Outline FR Proposal for Revision of Subpart W Rev9 (ss 022712).docx

ENVIRONMENTAL PROTECTION AGENCY **6560.50**

40 CFR Part 61

[EPA-HQ-OAR-2008-0218; FRL_XXXX-X]

RIN 2060-AP21

Revisions to National Emission Standards for Radon Emissions from Operating Mill Tailings

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to revise certain portions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for radon emissions from operating uranium mill tailings. The proposed emissions standards for new and existing sources are based on what constitutes the generally available control technology (GACT) or management practices for this area source category. We are also proposing to add and refine definitions and clarify that the existing rule applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method.

DATES: Comments must be received on or before **[insert date]**, days after publication in the Federal Register.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2008-0218, by one of the following methods:

- www.regulations.gov: Follow the on-line instructions for submitting comments.
- Email: a-and-r-docket@epa.gov
- Fax: 202-566-9744
- Mail: Air and Radiation Docket, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave., NW, Washington, DC 20460.
- Hand Delivery: EPA West Building, Room 3334, 1301 Constitution Ave., NW Washington, DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA-HQ-OAR-2008-0218. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other

information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through www.regulations.gov or e-mail. The www.regulations.gov website is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through www.regulations.gov your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at http://www.epa.gov/epahome/dockets.htm

Docket: All documents in the docket are listed in the www.regulations.gov index. Although listed in the index, some information is not publicly available, e.g., CBI or

other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in www.regulations.gov or in hard copy at the Office of Air and Radiation Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air and Radiation Docket is (202) 566-1792.

FOR FURTHER INFORMATION CONTACT: Reid J. Rosnick, Office of Radiation and Indoor Air, Radiation Protection Division, Mailcode 6608J, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW Washington, DC 20460; telephone number: 202-343-9290; fax number: 202-343-2304; email address: rosnick.reid@epa.gov.

SUPPLEMENTARY INFORMATION:

Outline. The information in this preamble is organized as follows:

I. General Information
- A. Does this action apply to me?
- B. What should I consider as I prepare my comments to EPA?
- C. Acronyms and abbreviations

D. Where can I get a copy of this document?
E. When would a public hearing occur?
II. Background Information for Proposed Area Source Standards
A. What is the statutory authority and regulatory approach for the proposed standards?
B. What criteria did EPA use in developing the proposed GACT standards for these area sources?
~~B~~C. What source category is affected by the proposed standards?
~~C~~D. What are the production operations, emission sources, and available controls?
~~D~~E. What are the existing requirements under Subpart W?
~~E. Legal challenge and response~~
F. How did we gather information for this proposed rule?
G. What revisions are we making to Subpart W?
~~G~~H. How does this action relate to other EPA standards?
III. Summary of the Proposed Requirements
A. What are the proposed standards?
B. What are the initial and subsequent requirements?
C. What are the monitoring requirements?
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E. Executive Order 13132: Federalism
F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments
G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks
H. Executive Order 13211: Actions Concerning Regulations
That Significantly Affect Energy Supply, Distribution or Use
I. National Technology Transfer Advancement Act
J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

I. General Information

A. Does this Action Apply to Me?

The regulated categories and entities potentially affected by the proposed standards include:

Category	NAICS code[1]	Examples of regulated Entities
Industry:		
Uranium Ores Mining and/or Beneficiating	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content
Leaching of Uranium, Radium or Vanadium Ores	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content

[1] North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this proposed action. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permit authority for the entity or your EPA regional representative as listed in 40 CFR 61.04 of subpart A (General Provisions).

B. What Should I Consider as I Prepare My Comments for EPA?

1. ***Submitting CBI.*** Do not submit this information to EPA through www.regulations.gov or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

2. ***Tips for Preparing Your Comments.*** When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, Federal Register date and page number).

- Follow directions - The agency may ask you to respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.
- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

Make sure to submit your comments by the comment period deadline identified.

C. Acronyms and Abbreviations

We use many acronyms and abbreviations in this document. These include:

AEA – Atomic Energy Act
ALARA – As low as reasonably achievable
BID – Background information document
CAA – Clean Air Act
CAAA – Clean Air Act amendments of 1990
CCAT – Colorado Citizens Against Toxic Waste
CFR – Code of Federal Regulations
Ci – Curie, a unit of radioactivity equal to the amount of a radioactive isotope that decays at the rate of 3.7×10^{10} disintegrations per second.
DOE – U.S. Department of Energy
EIA – economic impact analysis
EO – Executive Order
EPA – U.S. Environmental Protection Agency
FR – Federal Register
GACT – Generally Available Control Technology
gpm - Gallons Per Minute
HAP – Hazardous Air Pollutant
ICRP – International Commission on Radiological Protection
ISL – In-situ leach uranium recovery, also known as in-situ recovery (ISR)
NAAQS – National Ambient Air Quality Standards
NCRP – National Council on Radiation Protection and Measurements
mrem – millirem, 1×10^{-3} rem
MACT – Maximum Achievable Control Technology
NESHAP – National Emission Standard for Hazardous Air Pollutants
NRC – U.S. Nuclear Regulatory Commission
OMB – Office of Management and Budget
pCi – picocurie, 1×10^{-12} curie
Ra-226 - Radium-226
Rn-222 – Radon-222
Radon flux - A term applied to the amount of radon crossing a unit area per unit time, as in picocuries per square centimeter per second ($pCi/m^2/sec$).
RCRA – Resource Conservation and Recovery Act
Subpart W – National Emission Standards for Radon Emissions from Operating Mill Tailings at 40 CFR 61.250-61.256
TEDE – Total Effective Dose Equivalent
UMTRCA – Uranium Mill Tailings Radiation Control Act of 1978
U.S.C. – United States Code

D. Where can I get a copy of this document?

In addition to being available in the docket, an electronic copy of this proposed action will also be available on the Worldwide Web (WWW) through the Technology Transfer Network (TTN). Following signature, a copy of this proposed action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: http://www.epa.gov/ttn/oarpg/. The TTN provides information and technology exchange in various areas of air pollution control.

E. When would a public hearing occur?

If anyone contacts EPA requesting to speak at a public hearing concerning these proposed rules by [INSERT DATE DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], we will hold a public hearing on [INSERT DATE DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]. If you are interested in attending the public hearing, contact Mr. Anthony Nesky at (202) 343-9597 to verify that a hearing will be held. If a public hearing is held, it will be held at…WILL BE ADDED LATER

II. Background Information for Proposed Area Source Standards

A. What is the statutory authority ~~and regulatory approach~~ for the proposed standards?

Section 112(q)(1) of the Clean Air Act (CAA) requires that National Emissions Standards for Hazardous Air Pollutants (NESHAP) "in effect before the date of enactment of the Clean Air Act Amendments of 1990 [Nov. 15, 1990]. . . shall be reviewed and, if appropriate, revised, to comply with the requirements of subsection (d) of . . . section [112] within 10 years after the date of enactment of the Clean Air Act Amendments of 1990." EPA promulgated 40 CFR Part 61, Subpart W, "National Emission Standards for Radon Emissions From Operating Mill Tailings," ("Subpart W") on December 15, 1989, but has not previously reviewed or revised Subpart W. EPA is conducting this review of Subpart W under CAA section 112(q)(1) to determine what revisions, if any, are appropriate.

Section 112(d) of the CAA requires EPA to establish emission standards for major and area source categories that are listed for regulation under CAA section 112(c). A major source is any stationary source that emits or has the potential to emit 10 tons per year (tpy) or more of any single hazardous air pollutant (HAP) or 25 tpy or more of any combination of HAP. An area source is a stationary source that is not a major source. For the purpose of Subpart W, the HAP at issue is radon-222. Calculations of radon emissions from operating uranium recovery facilities have shown that facilities regulated under Subpart W are area sources. (REFERENCE)

Section 112(q)(1) does not dictate how EPA must conduct its review of those NESHAP issued prior to 1990. Rather, it provides that the Agency must review, and if appropriate, revise the standards to comply with the requirements of 112(d). Determining what revisions, if any, are appropriate for these NESHAP is best assessed through a case-by-case consideration of each NESHAP. As explained below, in this case, we have reviewed Subpart W and are revising the standards consistent with section 112(d)(5), which provides EPA authority to issue standards for area sources.

Under CAA section 112(d)(5), the Administrator may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants." Under section 112(d)(5), the Administrator has the discretion to use generally available control technology or management practices (GACT) in lieu of maximum achievable control technology (MACT) under section 112(d)(2) and (d)(3), which is required for major sources. Pursuant to

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section 112(d)(5), we are proposing revisions to Subpart W to reflect GACT.

B. What criteria did EPA use in developing the proposed GACT standards for these area sources?

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Additional information on the definition of GACT is found in the Senate report on the legislation (Senate Report Number 101-228, December 20, 1989), which indicates GACT means:

> * * * methods, practices and techniques which are commercially available and appropriate for application by the sources in the category considering economic impacts and the technical capabilities of the firms to operate and maintain the emissions control systems.

Consistent with the legislative history, in addition to considering technical capabilities of the facilities and the availability of control measures, we may consider costs and economic impacts in determining GACT, which is particularly important when developing regulations for source categories that may have few establishments and many small businesses.

Determining what constitutes GACT involves considering the control technologies and management practices that are generally available to the area sources in the source category. We also consider the standards applicable to

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major sources[1] in the same industrial sector to determine if the control technologies and management practices are transferable and generally available to area sources. In appropriate circumstances, we may also consider technologies and practices at area and major sources in similar categories to determine whether such technologies and practices could be considered generally available for the area source category at issue. Finally, as noted above, in determining GACT for a particular area source category, we consider the costs and economic impacts of available control technologies and management practices on that category.

~~Placeholder for section 112(q) discussion (OGC)~~

~~Section 112(d) of the Clean Air Act (CAA) requires EPA to establish national emission standards for hazardous air pollutants (NESHAP) for both major and area sources of hazardous air pollutants (HAPs) that are listed for regulation under CAA section 112(c). A major source emits or has the potential to emit 10 tons per year (tpy) or more of any single HAP or 25 tpy or more of any combination of HAP. An area source is a stationary source that is not a major source. For the purpose of Subpart W the HAP is~~

[1] None of the sources in this source category are major sources.

~~identified as radon-222. Calculations of radon emissions from operating uranium recovery facilities have shown that facilities regulated under Subpart W are area sources. (REFERENCE)~~

~~Under CAA section 112(d)(5), we may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technologies or management practices ("GACT") by such sources to reduce emissions of hazardous air pollutants." Additional information on GACT is found in the Senate report on the legislation (Senate Report Number 101-228, December 20, 1989), which describes GACT as:~~

> ~~. . . methods, practices and techniques which are commercially available and appropriate for application by the sources in the category considering economic impacts and the technical capabilities of the firms to operate and maintain the emissions control systems.~~

~~Consistent with the legislative history, we can consider costs and economic impacts in determining GACT. Determining what constitutes GACT involves considering the control technologies and management practices that are generally available to the area sources in the source category. We also consider, if appropriate, the standards applicable to major sources in the same industrial sector to determine whether the control technologies and management practices~~

~~are transferable and generally available to area sources. In appropriate circumstances, we may also consider technologies and practices at area and major sources in similar source categories to determine whether such technologies and practices could be considered generally available for the area source category at issue. Finally, as noted above, in determining GACT for a particular area source category, we consider the costs and economic impacts of available control technologies and management practices on that category.~~

~~B.~~ C. What source category is affected by the proposed standards?

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As defined by EPA pursuant to the CAA, the source category for 40 CFR Part 61, Subpart W (hereafter "Subpart W") is "facilities licensed [by the U.S. Nuclear Regulatory Commission (NRC)] to manage uranium byproduct material during and following the processing of uranium ores, commonly referred to as uranium mills and their associated tailings." 40 CFR 61.250. Subpart W defines "uranium byproduct material or tailings" as "the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content.[2]" 40

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[2] Pursuant to the Atomic Energy Act of 1954, as amended, the Nuclear Regulatory Commission defines "source material" as "(1) Uranium or thorium or any combination of uranium or thorium in any chemical or

CFR 61.251(g). For clarity, in this proposed rule we refer to this source category by the term “uranium recovery facilities” and we are proposing to add this phrase to the definitions section of the rule. Use of this term encompasses the existing universe of facilities that are currently regulated under Subpart W. Uranium recovery facilities process uranium ore to extract uranium. Any type of uranium recovery facility that manages uranium byproduct material or tailings is subject to regulation under Subpart W. This currently includes three types of uranium recovery facilities: (1) conventional uranium mills; (2) in-situ leach recovery facilities; and (3) heap leach facilities. Subpart W requirements specifically apply to the affected sources at the uranium recovery facilities that are used to manage or contain the uranium byproduct material or tailings. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for determining whether Subpart W requirements apply to that structure; rather, applicability is based on the use of

physical form; or (2) Ores that contain, by weight, one-twentieth of one percent (0.05 percent), or more, of uranium or thorium, or any combination of uranium or thorium.” (10 CFR 20.1003) these structures to manage or contain uranium byproduct material.

~~C.~~ D. What are the production operations, emission sources, and available controls?

As noted above, uranium recovery and processing currently occur by one of three methods: (1) conventional milling; (2) in-situ leach (ISL); and (3) heap leach. Below we present a brief explanation of the various uranium recovery methods and the usual structures that contain uranium byproduct materials.

(1) Conventional Mills

Conventional milling is one of the two primary recovery methods that are currently used to extract uranium from mined ore. Conventional mills are typically located in areas of low population density. Only one conventional mill in the United States is currently operating; the others are in standby, in decommissioning (closure) or have already been decommissioned.

A conventional uranium mill is a chemical plant that extracts uranium using the following process:

(A) Trucks deliver uranium ore to the mill, where it is crushed before the uranium is extracted through a

Formatted: Indent: Left: 0.25", No bullets or numbering leaching process. In most cases, sulfuric acid is the leaching agent, but alkaline solutions can also be used to leach the uranium from the ore. The process generally extracts 90 to 95 percent of the uranium from the ore.

(B) The mill then concentrates the extracted uranium to produce a uranium oxide material which is called "yellowcake" because of its yellowish color.[3]

(C) Finally, the yellowcake is transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

(D) The waste generated from this process produces both solid and liquid wastes (i.e., uranium byproduct material, or “tailings”), which are transported from the extraction location to an on-site tailings impoundment or a pond for temporary storage.

Uranium byproduct material/tailings are typically created in slurry form during processing and are then deposited in an impoundment or "mill tailings pile" which must be carefully monitored and controlled. This is because

[3] The term “yellowcake” is still commonly used to refer to this material, although in addition to yellow the uranium oxide material can also be black or grey in color.

the mill tailings contain heavy metal ore constituents, including radium. The radium decays to produce radon, which may then be released to the environment. Because radon is a radioactive gas which may be inhaled into the respiratory tract, EPA has determined that exposure to radon and its daughter products contributes to an increased risk of lung cancer. Its presence is of particular concern in confined areas (such as mines or homes).[4]

The holding or evaporation ponds at this type of facility hold liquids containing byproduct material which are also regulated under Subpart W. These ponds are discussed in more detail in the next section.

(2) In-Situ Leach/Recovery

In-situ leach or recovery sites (ISL/ISR, in this document we will use ISL) represent the majority of the uranium recovery operations that currently exist. The research and development projects and associated pilot projects of the 1980s demonstrated ISL as a viable uranium recovery technique where site conditions (e.g., geology) are amenable to its use. The economics of this technology produce a better return on the investment dollar; therefore, the cost to produce uranium is more favorable to

[4] http://www.epa.gov/radon/pdfs/citizensguide.pdf

investors. Due to this, the trend in uranium production is moving toward the ISL process.

In-situ leaching is defined as the underground leaching or recovery of uranium from the host rock (typically sandstone) by chemicals, followed by recovery of uranium at the surface. Leaching, or more correctly the re-mobilization of uranium into solution, is accomplished through the underground injection of a lixiviant into the host rock (i.e., ore body) through wells that are connected to the ore formation. A lixiviant is a chemical solution used to extract (or leach) uranium from underground ore bodies.

The injection of a lixiviant essentially reverses the geochemical reactions that resulted in the formation of the uranium deposit. The lixiviant assures that the dissolved uranium, as well as other metals, remains in the solution while it is collected from the ore zone by recovery wells which pump the solution to the surface. At the surface, the uranium is recovered in an ion exchange column and further processed into yellowcake. The yellowcake is packaged and transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

Two types of lixiviant solutions can be used, loosely defined as "acid" or "alkaline" systems. In the U.S., the geology and geochemistry of the majority of the uranium ore bodies favors the use of alkaline lixiviants or bicarbonate-carbonate lixiviant and oxygen. Other factors in the choice of the lixiviant are the uranium recovery efficiencies, operating costs, and the ability to achieve satisfactory ground water restoration.

After processing, lixiviant is recharged and pumped back down into the formation for reuse in extracting more uranium. However, a small amount of this liquid is held back from reinjection to maintain a proper pressure gradient within the wellfield. This liquid is sent to an impoundment (often called an evaporation pond or holding pond) on site or injected into a deep well for disposal. These ponds, since they contain uranium byproduct material, are subject to the requirements of Subpart W. In addition, there is a risk of the lixiviant spreading beyond the zone of the uranium deposit (excursion), and this produces a risk of ground-water contamination. The operator of the ISL facility remediates this excursion by pumping large amounts of water in and out of the formation to contain the excursion, and this water (often containing byproduct

material) is often stored in the evaporation or holding ponds. Although the excursion operation itself is not regulated under Subpart W, the ponds that contain byproduct material are regulated since they are a potential source of radon emissions. After the ore body has been depleted, restoration of the formation is accomplished by flushing the host rock with water and sometimes additional chemicals. The restoration fluids are also considered byproduct material.

(3) Heap Leaching

In addition to conventional uranium milling and ISL, some facilities may use an extraction method known as heap leaching. In some instances uranium ore is of such low grade or the geology of the ore body is such that it is not cost-effective to remove the uranium via conventional milling or through ISL. In this case a heap leaching method may be utilized.

No such facilities currently operate to recover uranium in the U.S. However, there are plans for at least one facility to open in the U.S. within the next few years.

Heap leach/ion-exchange operations involve the following process:

A. Small pieces of ore are placed in a large pile, or "heap," on an impervious pad of plastic, clay, or asphalt, with perforated pipes under the heap.
B. An acidic solution is then sprayed[5] over the ore to dissolve the uranium it contains.
C. The uranium-rich solution drains into the perforated pipes, where it is collected and transferred to an ion-exchange system.
D. The heap is “rested,” meaning that there is a temporary cessation of application of acidic solution to allow for oxidation of the ore before leaching begins again.
E. The ion-exchange system extracts the uranium from solution where it is later processed into a yellowcake.
F. The yellowcake is packed in 55-gallon drums to be transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

[5] Other technology includes drip systems, sometimes used at gold extraction heaps.

G. Finally, there is a final drain down of the heap solutions, as well as a possible rinsing of the heap, upon which it is closed in place.

Today we are proposing to regulate this type of uranium extraction under Subpart W. Our rationale (explained in greater detail in Section IV.D.4.) is that from the moment uranium extraction takes place in the heap, uranium byproduct material is left behind.

There may also be holding or evaporation ponds at this type of facility. In many cases these ponds hold liquids containing byproduct material and are regulated under Subpart W.

~~D~~E. What are the existing requirements under Subpart W?

Subpart W was promulgated on December 15, 1989 (54 FR 51654). At the time of promulgation the predominant form of uranium recovery was through the use of conventional mills. There are two separate standards required in Subpart W. The first standard is for "existing" impoundments, e.g., those in existence and licensed by the NRC or its Agreement States) on or prior to December 15, 1989. Those existing facilities must ensure that emissions from the existing tailings impoundments not exceed a radon (Rn-222) flux standard of 20 picocuries per meter squared per second

($pCi/m^2/sec$). As stated at the time of promulgation: "This rule will have the practical effect of requiring the mill owners to keep their piles wet or covered.[6]" Keeping the piles (impoundments) wet or covered with soil would reduce radon emissions to a level that would meet the standard. This is still considered an effective method to reduce radon emissions at all uranium tailings impoundments.

The method for monitoring for compliance with the radon flux standard was prescribed as Method 115, found at 40 CFR Part 61, Appendix B. The owners or operators of existing impoundments must report to EPA the results of the compliance testing for any calendar year by no later than March 31 of the following year. There is one existing operating mill with impoundments that pre-date December 15, 1989, and two mills that are currently in standby mode.

The second standard applies to "new" impoundments designed and/or constructed after December 15, 1989. The requirements are work practice standards that regulate the size and number of impoundments, or the amount of tailings that may remain uncovered at any time. After December 15, 1989, 40 CFR 61.252(b) states that no new tailings impoundment can be built unless it is designed, constructed

[6] See 54 FR 51689

and operated to meet one of the following two work practices:

1. Phased disposal in lined impoundments that are no more than 40 acres in area and meet the requirements of 40 CFR 192.32(a) as determined by the NRC. The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.
2. Continuous disposal of tailings that are dewatered and immediately disposed with no more than 10 acres uncovered at any time and operated in accordance with 40 CFR 192.32(a) as determined by the NRC.

The basis of the work practice standards are to (1) limit the size of the impoundment, which limits the radon source; or (2) utilize the continuous disposal system, which prohibits large accumulations of uncovered tailings, limiting the amount of radon released.

The work practice standards described above were promulgated after EPA considered a number of factors that influence the emissions of Rn-222 from tailings impoundments, including the climate and the size of the impoundment. For example, for a given concentration of Ra-226 in the tailings, and a given grain size of the

tailings, the moisture content of the tailings will control the radon emission rate; the higher the moisture content the lower the emission rate. In the arid and semi-arid areas of the country where most impoundments are located or proposed, the annual evaporation rate is quite high. As a result, the exposed tailings (absent controls like sprinkling) dry rapidly. In previous assessments, we explicitly took the fact of rapid drying into account by using a Rn-222 flux rate of 1 pCi/m^2/s per pCi/g Ra-226 to estimate the Rn-222 source term from the dry areas of the impoundments. (Note: The estimated source terms from the ponded (areas completely covered by liquid) and saturated areas of the impoundments are considered to be zero, reflecting the complete attenuation of the Rn-222).

Another fact we considered was the size of the impoundment, which has a direct linear relationship with the Rn-222 source term. Again, assuming the same Ra-226 concentration and grain sizes in the tailings, a 100-acre dry impoundment will emit 10 times the radon of a 10-acre dry impoundment. This linear relationship between size and Rn-222 source term is one of the main reasons that Subpart W imposed size restrictions on all future impoundments (40 acres per impoundment if phased disposal is chosen and 10 acres total uncovered if continuous disposal is chosen).

Subpart W also mandates that all tailings impoundments at uranium recovery facilities comply with the requirements at 40 CFR 192.32(a). EPA explained the reason for adding this requirement in the preamble as follows:

> "EPA recognizes that in the case of a tailings pile which is not synthetically or clay lined (the clay lining can be the result of natural conditions at the site) water placed on the tailings in an amount necessary to reduce radon levels, can result in ground water contamination. In addition, in certain situations the water can run off and contaminate surface water. EPA cannot allow a situation where the reduction of radon emissions comes at the expense of increased pollution of the ground or surface water. Therefore, all piles will be required to meet the requirements of 40 CFR 192.32(a) which protects water supplies from contamination. Under the current rules, existing piles are exempt from these provisions, this rule will end that exemption."

54 FR 51654, 51680 (December 15, 1989). Therefore, all impoundments are required to meet the requirements at 40 CFR 192.32(a).

Section 192.32(a) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any

time during the active life of the impoundment. Briefly, 40 CFR 264.221(c) requires that the liner system must include:

1. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into the liner during the active life of the unit.
2. A composite bottom liner consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life of the unit. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least three feet of compacted soil material with a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec.
3. A leachate collection and removal system between the liners, which acts as a leak detection system. This system must be capable of detecting, collecting and removing hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to the waste or liquids in the impoundment.

There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements.[7] Another area of importance is the requirement that the liner system must be compatible with the waste being placed in the impoundment. 40 CFR 264.221(a) states:

> "The liner must be designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil or ground water or surface water) during the active life of the facility, provided that the impoundment is closed in accordance with § 264.228(a)(1)(clean closure). For impoundments that will be closed in accordance with §264.228(a)(2)(closure in place), the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility."

Commented [ss1]: I don't remember this as part of our discussion with Gina – did she ask about this? Did she ask that we include this? Let's discuss this. I am concerned that we may be creating the possibility for potential differences in the liner requirements if we give ourselves the authority to grant the alternative (see below).

[7] For detailed information on the design and operating requirements, refer to 40 CFR Part 264 Subpart K - Surface Impoundments.

In order to meet this requirement the wastes placed on the liner must not degrade the physical characteristics of the liner such that the liner would fail. Compatibility tests are performed by the owner or operator to ensure that the physical properties of the waste are not incompatible with the physical properties of the liner(s). This is particularly important at conventional impoundments and heap leach piles, where the wastes will remain in place after closure, and also because of the usually acidic properties of the byproduct material that resides in the impoundment. In the event of incompatibilities between the liner system and the wastes 40 CFR 264.221(d) allows for the Regional Administrator to approve alternative design or operating practices to those specified if the owner or operator demonstrates to the Regional Administrator that such design and operating practices, together with location characteristics:(1) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal system specified in paragraph (c) of this section; and (2) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.

~~E. Legal Challenge and Response~~

Commented [ss2]: In the Part 192 regulations we specifically state that the “RA” in that context is NRC, not EPA. Are you suggesting EPA – under the CAA – should also be allowed to grant this alternative? Let’s discuss. I’m concerned about differences under subpart W and the NRC license.

Commented [ss3]: Where is this from? Please provide the citation.

~~OGC will determine if this section remains~~

~~On April 26, 2007, Colorado Citizens Against Toxic Waste and Rocky Mountain Clean Air Action filed a lawsuit against EPA (Docket Reference) for EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009(Docket reference).~~

Commented [ss4]: We can include this information in a footnote but it doesn't need its own section.

F. How Did We Gather Information for this Proposed Rule?

This section describes the information we used as the basis for making the determination to revise Subpart W. We collected this information using various methods. We performed literature searches, where appropriate, of the engineering methods used by existing uranium recovery facilities in the United States as well as the rest of the world. We used this information to determine whether the technology used to contain uranium byproduct material had advanced since the time of the original promulgation of Subpart W. We reviewed and compiled a list of existing and proposed uranium recovery facilities and the containment technologies being used, as well as those proposed to be used. We compared and contrasted those technologies with the engineering requirements of hazardous waste surface impoundments regulated under Subtitle C of the Resource

Conservation and Recovery Act (RCRA), which are used as the design basis for existing uranium byproduct material impoundments.

We collected information on existing uranium mills and in-situ leach facilities by issuing information collection requests authorized under section 114(a) of the CAA to uranium recovery facilities. These requests required uranium recovery companies to provide detailed information about the uranium mill and/or in-situ leaching facility, as well as the number, sizes and types of affected sources (tailings impoundments, evaporation ponds and collection ponds) that now or in the past held uranium byproduct material. We requested information on the history of operation since 1975, ownership changes, whether the operation was in standby mode and whether plans existed for new facilities or reactivated operations were expected.[8]

We also reviewed the regulatory history of Subpart W and the radon measurement methods used to determine compliance with the existing standards, and we performed a comparison between the 1989 risk assessment used for promulgation of Subpart W with current risk assessment approaches, focusing on the adequacy and the

[8] Section 114(a) letters and responses can be found at http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

appropriateness of the original assessments. We did this by using the information we collected to perform new risk assessments for existing facilities, as well as two idealized "generic" sites, one located in the eastern half of the United States and one located in the southwest United States. (These two model sites do not exist. They are idealized using representative features of mills in differing climate and geography). This information has been collected into one document[9] that has been placed in the docket (DOCKET REFERENCE) for this proposed rulemaking. Below is a synopsis of the information we collected and our analyses.

1. Pre-1989 Conventional Mill Impoundments

We have been able to identify three facilities, either operating or on standby,[10] that have been in operation since before the promulgation of Subpart W in 1989. These existing facilities must ensure that emissions from their impoundments not exceed a radon (Rn-222) flux standard of 20 pCi/m^2/sec. The method for monitoring for compliance with

[9] Technical and Regulatory Support to Develop a Rulemaking to Potentially Modify the NESHAP Subpart W Standard for Radon Emissions from Operating Uranium Mills (40 CFR 61.250)

[10] "Standby" is when a facility impoundment is licensed for the continued placement of tailings/byproduct material but is currently not receiving tailings/byproduct material. See Section V.A. for a discussion of this definition that we are proposing to add to Subpart W.

the radon flux standard was prescribed as Method 115, found at 40 CFR Part 61, Appendix B. These facilities must also meet the requirements in 40 CFR 61.252(c), which cross-references the requirements of 40 CFR 192.32(a).

The White Mesa Conventional Mill in Blanding, Utah, has one pre-1989 impoundment (known by the company as Cell 3) that is currently in operation and near capacity but is still authorized and continues to receive tailings. The company has placed as much tailings sands into it as possible at this time. The company is now pumping any residual free solution out of the cell and contouring the sands. It will then be determined whether any more solids need to be added to the cell to fill it to the specified final elevation. It is expected to close in the near future. (Reference) The mill also uses an impoundment constructed before 1989 as an evaporation pond (known as Cell 1). Since it most likely contains byproduct material it is also regulated by Subpart W.

The Sweetwater conventional mill is located 42 miles northwest of Rawlins, Wyoming. The mill operated for a short time in the 1980s and is currently in standby status. Annual radon values collected by the facility indicate that there is little measurable radon flux from the mill tailings that are currently in the lined impoundment. This monitoring program remains active at the facility. According to company records, of the 37 acres of tailings, approximately 28.3 acres of tailings are covered with soil; the remainder of the tailings are continuously covered with water. The dry tailings have an earthen cover that is maintained as needed. During each monitoring event one hundred radon flux measurements are taken on the exposed tailings, as required by Method 115 for compliance with Subpart W. The mean radon flux for the exposed tailings was 8.5 pCi/m^2/sec. The radon flux for the entire tailings impoundment was calculated to be 6.01 pCi/m^2/sec. The calculated radon flux from the entire tailings impoundment surface is thus approximately 30% of the 20.0 pCi/m^2/sec standard. (Reference)

The Shootaring Canyon project is a conventional mill located about 3 miles north of Ticaboo, Utah, in Garfield County. The approximately 1,900-acre site includes an ore pad, a small milling building, and a tailings impoundment system that is partially constructed. The mill operated for a very short period of time. Shootaring Canyon did pre-date the standard, but the mill was shut down prior to the promulgation of the standard. The impoundment is in a standby status and has an active license administered by the Utah Department of Environmental Quality, Division of Radiation Control. The future plans for this uranium recovery operation are unknown. Current activities at this remote site consist of intermittent environmental monitoring by consultants to the parent company. (Reference)

The Shootaring Canyon mill operated for approximately 30 days. Tailings were deposited in a portion of the upper impoundment. A lower impoundment was conceptually designed but has not been built. Milling operations in 1982 produced 25,000 cubic yards of tailings, deposited in a 2,508 m^2 (0.62 acres) area. The tailings are dry except for moisture associated with occasional precipitation events; consequently, there are no beaches[11]. The tailings have a soil cover that is maintained by the operating company. Radon sampling for the 2010 year took place in April. Again, one hundred radon flux measurements were collected. The average radon flux from this sampling event was 11.9 pCi/m^2-sec for the less than one acre surface area.

A fourth mill is Cotter Corporation in Cañon City, Colorado. The mill no longer exists, and the pre-1989 impoundments are in closure. A reclamation plan exists but

[11] The term “beaches” refers to portions of the tailings impoundment where the tailings are wet but not saturated or covered with liquids.

is under revision as part of license renewal. Since the impoundments are in closure, the impoundments would not be subject to Subpart W but instead would be subject to the long-term closure and decommissioning requirements in their license issued by the state of Colorado, an NRC agreement State.

2. 1989-Present Conventional Mill Impoundments

There currently is only one operating conventional mill with an impoundment that was constructed after December 15, 1989. The White Mesa conventional mill in Utah has two impoundments (Cell 4A and Cell 4B: Cell 4A is currently operating and Cell 4B is being used as an evaporation pond) designed and constructed after 1989. The facility uses the phased disposal work practice for their impoundments. There are several conventional mills in the planning and/or permitting stage and these impoundments will utilize one of the current work practice standards.

3. In-Situ Leach Facilities

After Subpart W was promulgated, the price of uranium began to fall, and the uranium mining and milling industry essentially collapsed, with very few operations remaining in business. However, several years ago, because of renewed interest in nuclear power, the price of uranium began to rise so that it became profitable once more for companies to consider uranium recovery. ISL has been the preferred choice of uranium extraction where suitable geologic conditions exist.

Currently there are five ISL facilities in operation: (1) the Alta Mesa project in Brooks County, Texas; (2) the Crow Butte Operation in Dawes County, Nebraska; (3) the Hobson/La Palangana Operation in South Texas; (4) the Willow Creek (formerly Christensen Ranch/Irigaray Ranch) in Wyoming; and (5) the Smith Ranch-Highland Operation in Converse County, Wyoming.[12] These facilities use or have used evaporation ponds to hold back liquids containing uranium byproduct material from reinjection to maintain a proper pressure gradient within the wellfield.[13] These ponds are subject to the Subpart W requirements and range in size from less than an acre up to 40 acres. Based on the information provided to us the majority of the ponds meet the requirements of 40 CFR 61.252(c).

There are approximately 12 facilities in various stages of licensing or on standby. It is anticipated that there could be approximately another 20-30 license applications over the next 5-10 years (REFERENCE).

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[12] Source: U.S. Energy Information Administration, http://www.eia.gov/uranium/production/quarterly/html/qupd_tbl4.html

[13] The Alta Mesa operation uses deep well injection rather than evaporation ponds.

4. Heap Leach Facilities

As stated earlier, there are currently no operating heap leach facilities in the United States. We are aware of two to three potential operations. The most advanced application is the Sheep Mountain facility in Wyoming. Titan Uranium has announced its intent to submit a license application to the NRC in mid 2012. One or two other as yet to be determined operations may be located in Lander County, Nevada and a site in New Mexico.

(5) Risk Analysis.

One of the tasks we performed while considering how to set a GACT standard in this proposal for existing impoundments was to update the risk analysis we performed for promulgating the risk standard in 1989, focusing on the adequacy and the appropriateness of the original assessment using updated risk assumptions, particularly as the risk related to the radon flux standard of 20 pCi/m^2/sec for the conventional impoundments in operation prior to December 15, 1989 (REFERENCE).

As part of this work, we evaluated various computer models that could be used to calculate the doses and risks due to the operation of conventional and ISL uranium recovery facilities, and selected CAP88 V 3.0 for use in this analysis. CAP88 V 3.0 was developed in 1988 from the AIRDOS, RADRISK, and DARTAB computer programs, which had been developed for the EPA at the Oak Ridge National Laboratory (ORNL).

CAP88 V 3.0, which stands for “Clean Air Act Assessment Package-1988 version 3.0,” is used to demonstrate compliance with the NESHAP requirements applicable to radionuclides. CAP88 V 3.0 calculates the doses and risk to a designated receptor as well as the surrounding population. Exposure pathways evaluated by CAP88 V 3.0 are: inhalation, air immersion, ingestion of vegetables, meat, and milk, and ground surface exposure. CAP88 V 3.0 uses a modified Gaussian plume equation to estimate the average dispersion of radionuclides released from up to six emitting sources. The sources may be either elevated stacks, such as a smokestack, or uniform area sources, such as the surface of a uranium byproduct material impoundment. Plume rise can be calculated assuming either a momentum or buoyant-driven plume.

At several sites analyzed in this evaluation only site-wide releases of radon were available to us. This assessment was limited by the level of detail provided by its sources. In instances where more specific data were available, site-wide radon releases were used as a bounding estimate. Assessments are done for a circular grid of distances and directions for a radius of up to 80 kilometers (50 miles) around the facility. The Gaussian plume model produces results that agree with experimental data as well as any model, is fairly easy to work with, and is consistent with the random nature of turbulence. A description of the mathematical models used by CAP88 V 3.0 is provided in the CAP88 V 3.0 Users Manual.[14]

The uranium recovery facilities that we analyzed included three existing conventional mills (Cotter, White Mesa and Sweetwater), five operating ISL operations (1) the Alta Mesa project in Brooks County, Texas; (2) the Crow Butte Operation in Dawes County, Nebraska; (3) the Hobson/La Palangana Operation in South Texas; (4) the Willow Creek (formerly Christensen Ranch/Irigaray Ranch) in Wyoming; and (5) the Smith Ranch-Highland Operation in Converse County, Wyoming), and two generic sites assumed to be the location of conventional mills (we chose conventional mills because we believe they have the greater potential for radon emissions). One generic site was modeled in the southwest United States (Western Generic) while the other was assumed to be located in the eastern United States (Eastern Generic). This was done to

[14] http://www.epa.gov/radiation/assessment/CAP88 V 3.0/index.html

accommodate the recognition that several uranium recovery facilities are expected to apply for construction licenses in the future, and to determine potential risks in geographic areas of the U.S. that customarily have not hosted uranium recovery facilities. For this proposal the facilities we were most interested in were the White Mesa mill and the Sweetwater mill. (The Shootaring Canyon mill was not analyzed, because the impoundment is very small and is soil covered, and the Cotter facility is now in closure). These conventional mills are either in operation or standby and are subject to the flux standard of 20 pCi/m^2/sec. The risk analyses performed for these two mills showed that the lifetime risks from radon emissions from the White Mesa impoundments were 1.1 x 10^{-4} while the lifetime risks from radon associated with the impoundments at the Sweetwater mill were 2.4 x 10^{-5}. In protecting public health, EPA strives to provide the maximum feasible protection by limiting lifetime cancer risk from radon exposure to approximately 1 in 10,000 (i.e., 10^{-4}). The analyses also estimated that the risk to the population (i.e., total cancer incidence) from all ten modeled uranium sites is between 0.0015 and 0.0026 fatal cancers per year, or approximately 1 case every 385 to 667 years to the 4 million persons living within 80 km of the uranium recovery facilities. The analyses are described in more detail in the background document generated for this proposal (DOCKET REFERENCE).

(6) Flux Requirement versus Work Practice Standards for Conventional Impoundments in operation before December 15, 1989.

In performing our analysis we considered the information we received from all the existing conventional impoundments. We also looked at the compliance history of the existing conventional impoundments. After this review we considered two specific questions: 1) Are any of the conventional impoundments using any novel methods to reduce radon emissions? 2) Is there now any reason to believe that any of the existing impoundments could not comply with the work practice standards for new impoundments, in which case would we need to continue to make the distinction between conventional impoundments constructed before or after December 15, 1989? We arrived at the following conclusions: First, we are not aware of any impoundment that uses any novel technologies to reduce radon emissions. Impoundment operators continue to use the standard method of reducing radon emissions by limiting the size of the impoundment and covering tailings with soil or keeping tailings wet. These are very effective methods for limiting the amount of radon released to the environment.

Second, we believe that only one existing operating impoundment designed and in operation before December 15, 1989, could not meet the work practice standards. This impoundment is Cell 3 at the White Mesa mill, which is expected to close in 2012. We were very clear in our 1989 rulemaking that all conventional mill impoundments must meet the requirements of 40 CFR 192.32(a), which in addition to requiring ground-water monitoring also required the use of liner systems to ensure there would be no leakage from the impoundment into the ground water. We did this by ending the exemption for existing piles from the 40 CFR 192.32(a) requirements (54 FR 51680). However, we did not require those existing impoundments to meet either the phased disposal or continuous disposal work practice standards, which limit the area and number of impoundments, thereby limiting the potential for radon emissions. This is because at the time of promulgation of the rule, conventional impoundments existed that were larger in area than the maximum work practice standard of 40 acres used for the phased disposal work practice, or 10 acres for the continuous disposal requirement. This area limitation was important in reducing the amount of exposed tailings that were available to emit radon. However, we recognized that by instituting a radon flux standard we would require owners and operators to limit radon emissions (usually by placing water or soil) on exposed portions of the impoundments. The presumption was that impoundments constructed before this date could be left in a dry and uncovered state, which would allow for unfettered release of radon. The flux standard was promulgated to have the practical effect of requiring owners and operators of these old impoundments to keep their tailings either wet or covered with soil, thereby reducing the amount of radon that could be emitted (54 FR 51680).

We believe that the existing impoundments at both the Shootaring Canyon and Sweetwater facilities can meet the work practice standards in the current Subpart W regulation. Impoundments at both these facilities are less than 40 acres in area and are synthetically lined as per the requirements in 40 CFR 192.32(a). We also have information that the new impoundments operating at the White Mesa mill will follow the phased work practice standard of limiting impoundments to no more than two, each 40 acres or less in area. In compliance with this requirement, the existing Cell 3 would need to close if it already wasn’t preparing to close. As a result, we find that at the time of promulgation of this proposed rule there would be no impoundment designed or constructed before December 15, 1989, that could not meet a work practice standard. Since these impoundments in existence prior to December 15, 1989, appear to meet the work practice standards and have shown they can be maintained on standby we are proposing to eliminate the distinction of whether the impoundment was constructed before or after December 15, 1989. We are also proposing that the impoundments must meet the requirements of one of the two work practice standards, and that the flux standard of 20 pCi/m^2/sec will no longer be required for the impoundments in existence prior to December 15, 1989. We ask for comment on this approach.

G. What revisions are we making to Subpart W?

Add a section here that answers this question: Why is it appropriate to revise subpart W [under 112(d)(5)]?

~~G~~H. How does this action relate to other EPA standards?

Under the CAA, EPA promulgated Subpart W, which includes standards and other requirements for controlling radon emissions from operating mill tailings at uranium recovery facilities. Under our authority in the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), we have also issued standards that are more broadly applicable to

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uranium and thorium byproduct materials at active and inactive uranium mills. NRC (or Agreement States) and DOE implement and enforce these standards at these mills as directed by UMTRCA. These standards, located in 40 CFR Part 192, address the radiological and non-radiological hazards of uranium and thorium byproduct materials in ground water and soil, in addition to air. For the non-radiological hazards, UMTRCA directed us to promulgate standards consistent with those used by EPA to regulate non-radiological hazardous materials under RCRA. Therefore, our Part 192 standards incorporate the ground-water protection requirements applied to hazardous waste management units under RCRA and specify the placement of uranium or thorium byproduct materials in impoundments constructed in accordance with RCRA requirements. Radon emissions from non-operational impoundments (i.e., those with final covers) are limited in 40 CFR Part 192 to the emissions levels of 20 pCi/m^2/sec. We are currently preparing a regulatory proposal to update provisions of 40 CFR Part 192, with emphasis on ground-water protection for ISL facilities. As explained in previous sections, Subpart W currently contains reference to some of the Part 192 standards.

III. Summary of the Proposed Requirements

A. What are the proposed standards?

Today we are proposing to revise Subpart W to include requirements for affected sources at three types of operating uranium recovery facilities: (1) conventional uranium mills; (2) ISL facilities; and (3) heap leach facilities. The affected sources at these uranium recovery facilities include conventional impoundments, non-conventional impoundments where tailings are contained in ponds and covered by liquids (examples of these affected sources are evaporation or holding ponds that exist at conventional mills, ISLs and heap leach facilities) and heap leach piles. The proposed GACT standards and rationale for these proposed determinations are discussed below and in Section IV. We request comment on all aspects of these proposed requirements.

B. What are the initial and subsequent requirements?

1. Conventional impoundments.

In the 1989 promulgation of Subpart W we created two work practice standards, phased disposal and continuous disposal. The work practice standards, which limit the area and number of impoundments at a uranium recovery facility, apply to single piles that are no larger than 40 acres (for phased disposal) or 10 uncovered acres (for continuous disposal). We took this approach because we recognized that the radon emissions from these impoundments could be greater if the piles were left dry and uncovered. These standards also included the requirements in 40 CFR 192.32(a), which include design and construction requirements for the impoundments as well as requirements for prevention and mitigation of ground-water contamination.

As discussed earlier, we no longer believe that a distinction needs to be made for conventional impoundments based on the date when they were designed and/or constructed. We believe that the existing impoundments at both the Shootaring Canyon and Sweetwater facilities can meet the work practice standards in the current Subpart W regulation. Impoundments at both these facilities are less than 40 acres in area and are synthetically lined as per the requirements in 40 CFR 192.32(a)(1). The existing cell 3 at the White Mesa mill will undergo closure in 2012 and will be replaced with impoundments that meet the phased disposal work practice standard. Therefore, there is no reason not to bring these older impoundments under the umbrella of the work practice standards required for impoundments designed or constructed after December 15, 1989. By incorporating these impoundments under the work practices, we no longer need the requirement of radon flux

testing, and we are proposing to eliminate this requirement.

The proposed elimination of the monitoring requirement in 40 CFR 61.253 applies only to those facilities currently subject to the radon flux standard in 40 CFR 61.252(a), which we understand applies to only the three impoundments in existence prior to the original promulgation of ~~the~~ Subpart W ~~requirements~~ on December 15, 1989. This action does not relieve the owner or operator of the uranium recovery facility of the monitoring and maintenance requirements of their operating license issued by the NRC or its Agreement States. These requirements are found at 10 CFR 40, Appendix A, Criterion 8 and 8A. ~~Criterion 8 specifically requires portions of the impoundments not covered by standing liquids to be wetted or chemically stabilized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement allows for radon emissions to be minimized by using the same techniques practiced by uranium recovery facilities which use one of the two existing work practice standards.~~

Commented [ss5]: This does not seem relevant to a discussion regarding monitoring. It seems we're trying to explain how if we eliminate the monitoring requirement in 40 CFR 61.253 that these same facilities will still have some monitoring requirements under their licenses – true? If so, let's point to the monitoring requirements, not general practices for minimizing emissions.

For the proposed rule we also evaluated the requirements of 40 CFR 192.32(a) as they pertain to the Subpart W standards. The requirements of 40 CFR 192.32(a) are included in the NRC's review during the licensing process.

We determined that the requirements at 40 CFR 192.32(a)(1), which reference the RCRA requirements at 40 CFR 264.221, are the only requirements necessary for EPA to incorporate for Subpart W as they are effective methods of containment of tailings and protecting ground water while also limiting radon emissions. This liner requirement, described earlier in this preamble, remains in use for the permitting of hazardous waste land disposal units under RCRA. The requirements at 40 CFR 192.32(a)(1) contain safeguards to allow for the placement of tailings and yet provides an early warning system in the event of a leak in the liner system. We are therefore proposing to retain the two work practice standards and the requirements of 40 CFR 192.32(a)(1) as GACT because these methods for limiting radon emissions while also protecting ground water have proven effective for these types of impoundments.

3. Non-conventional impoundments where tailings are contained in ponds and covered by liquids.

Today we are proposing a GACT standard specifically for non-conventional impoundments where uranium byproduct materials are contained in ponds and covered by liquids. Common names for these structures may include, but are not limited to, impoundments and evaporation or holding ponds.

These affected sources may be found at any of the three types of uranium recovery facilities.

These units meet the existing applicability criteria in 40 CFR 61.250 to classify them for regulation under Subpart W. The holding or evaporation ponds located at conventional mills, ISL facilities and potentially heap leach facilities contain uranium byproduct material, either in solid form or dissolved in solution, and therefore are regulated under Subpart W. As defined at 40 CFR 61.251(g), uranium byproduct material or tailings means the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content. Therefore, the ponds in the uranium recovery process that contain either solids or radionuclides dissolved in liquids are regulated under the Subpart W requirements. Today we are again stating that determination and proposing a GACT standard for these impoundments.

Evaporation or holding ponds, while sometimes smaller in area than conventional impoundments, perform a basic task. They hold uranium byproduct material until it can be disposed. Our survey of existing ponds shows that they contain liquids, and, as such, this general practice has been sufficient to limit the amount of radon emitted from the ponds, in many cases, to almost zero. Because of the low potential for radon emissions from these impoundments, we do not believe it is necessary to monitor them for radon emissions. We have found that as long as approximately one meter of liquid is maintained in the pond, the effective radon emissions from the pond are so low that it is difficult to determine whether there is any contribution above background radon values. EPA has stated in the *Final Rule for Radon-222 Emissions from Licensed Uranium Mill Tailings: Background Information Document* (August, 1986):

> "Recent technical assessments of radon emission rates from tailings indicate that radon emissions from tailings covered with less than one meter of water, or merely saturated with water, are about 2% of emissions from dry tailings. Tailings covered with more than one meter of water are estimated to have a zero emissions rate. The Agency believes this calculated difference between 0% and 2% is negligible. The Agency used an emission rate of zero for all tailings covered with water or saturated with water in estimating radon emissions."

Therefore, we are proposing as GACT that these impoundments meet the design and construction requirements of 40 CFR 192.32(a)(1), with no size/area restriction, and that during the active life of the pond at least one meter of liquid be maintained in the pond.

We are also proposing that no monitoring be required for this type of impoundment. We have received information and collected data that show there is no acceptable radon flux test method for a pond holding a large amount of liquid. (Method 115 does not work because a solid surface is needed to place the large area activated carbon canisters used in the Method). Further, even if there was an acceptable method, we recognize that radon emissions from the pond would be expected to be very low because the liquid acts as an effective barrier to radon emissions; given that radon-222 has a very short half-life (3.8 days), there simply is not enough time for the radon produced by the solids or from solution to migrate to the water/surface air interface before decaying.(REFERENCE) It therefore appears that monitoring at these ponds is not necessary for demonstrating compliance with the proposed standards. We do, however, ask for comment on two issues: (1) whether these impoundments need to be monitored, and why; and (2) if these impoundments do need monitoring, what methods would a facility use (for example, radon collection devices, or monument placement in the pond to measure liquid levels), at evaporation or holding ponds.

4. Heap Leach Piles.

The final category for which we are proposing GACT standards is heap leach piles. We are proposing to require heap leach piles meet the phased disposal work practice standard and the design and construction requirements at 40

CFR 192.32(a)(1) as GACT. As noted earlier in the preamble, there are currently no operating uranium heap leach facilities in the United States. We are aware that the currently proposed heap leach facility will use the design and operating requirements at 40 CFR 192.32(a)(1) for the design of the heap. Since this requirement, along with the work practice standards, is the basis for all the other impoundments in this standard, we are proposing to also use it for heap leach piles. The premise is that the operator of a heap would not want to lose any of the uranium-bearing solution; thus, it is cost effective to maintain a good liner system so that there will be no leakage and ground water will be protected. At the same time, however, we recognize that keeping the uranium byproduct material in the heap in a near-saturated state (in order to reduce radon emissions) is not a practical solution as it would be at a conventional tailings impoundment. In the definitions at 40 CFR 61.251(c) we have defined “dewatered” tailings as those where the water content of the tailings does not exceed 30% by weight. We are proposing today to require operating heaps to maintain moisture content of greater than 30% so that the byproduct material in the heap is not allowed to become dewatered which would allow more radon emissions. We are specifically asking for comment on the amount of liquid required in the heap, and whether the 30% figure is a realistic objective. We are also asking for comments on precisely where in the heap leach pile this requirement must be met. The heap leach pile may not be evenly saturated during the uranium extraction process. The sprayer/drip system commonly used on the top of heap leach piles usually results in a semi-saturated moisture condition at the top of the pile, since flow of the lixiviant is not uniformly spread across the top of the pile. As downward flow continues, the internal areas of the pile become saturated. We are requesting information on where specifically in the pile the 30% moisture content should apply.

C. What are the monitoring requirements?

As the rule currently exists, only mills with existing conventional impoundments in operation on or prior to December 15, 1989, are currently required to monitor to ensure compliance with the radon flux standard. The reason for this is because at the time of promulgation of the 1989 rule EPA stated that no flux monitoring would be required for new impoundments because the proposed work practice standards would be effective in reducing radon emissions from operating impoundments by limiting the amount of tailings exposed (54 FR 51681). Since we have now determined that existing older impoundments can meet one of the two work practice standards, we are proposing to eliminate the radon flux monitoring requirement.

In reviewing Subpart W we looked into whether we should extend radon monitoring to all impoundments constructed and operated after 1989 so that the monitoring requirement would apply to all impoundments containing uranium byproduct materials. We also reviewed how this requirement would apply to facilities where Method 115 is not applicable, such as at impoundments totally covered by liquids. We concluded that the original work practice standards (now proposed as GACT) continue to be an effective practice for the limiting of radon emissions from impoundments and from heap leach piles. We also concluded that by maintaining an effective water cover on non-conventional impoundments the radon emissions from those impoundments are so low as to be difficult to differentiate from background radon levels at uranium recovery facilities. Therefore, we are proposing today that it is not necessary to require radon monitoring to any affected sources regulated under Subpart W.

D. What are the notification, recordkeeping and reporting requirements?

New and existing affected sources are required to comply with the existing requirements of the General Provisions (40 CFR part 61, subpart A). The General Provisions include specific requirements for notifications, recordkeeping and reporting, including provisions for notification of construction and/or modification and startup as required by 40 CFR 61.07, 61.08 and 61.09.

Today we are also proposing that all affected sources will be required to maintain certain records pertaining to the design, construction and operation of the impoundments, both conventional and nonconventional, and heap leach piles. These records will be retained at the facility and include the approved design of the impoundments and/or heap leach pile, including but not limited to all tests performed that proves the liner is compatible with the material(s) being placed on the liner. For nonconventional impoundments this requirement also includes records showing compliance with the continuous 1 meter of liquid in the impoundment and for heap leach piles this requirement includes records showing that the 30% moisture content of the pile is continuously maintained. Apart from the design documents, the inspections and determinations made can be performed during the daily inspections of the tailings and waste retention systems required by the NRC (and Agreement

Commented [ss6]: It looks like sections 61.253, 61.254 and 61.255 really need an overhaul if we are eliminating the radon flux standard (and monitoring, reporting and recordkeeping that go along with it) and now proposing new recordkeeping (and reporting?) requirements for the new standards. We should make sure we are really capturing everything we need to revise.

Commented [ss7]: I think you'll need to consider whether this has PRA implications – you'll need to estimate the burden and do the calculations to make sure we comply with that statute. This may require a new ICR.

States) under the inspection requirements of 10 CFR 40, Appendix A, Criterion 8A.

E. When must I comply with these proposed standards?

All existing affected sources subject to this proposed rule would be required to comply with the rule requirements upon the date of publication of the final rule in the Federal Register. To our knowledge, there is no existing operating facility that would be required to modify its affected sources to meet the requirements of the final rule; however, we request any information regarding affected sources that would not meet these requirements. New sources would be required to comply with these rule requirements upon the date of publication of the final rule in the Federal Register or upon startup of the facility, whichever is later.

IV. Rationale for this Proposed Rule

A. How did we determine GACT?

As provided in CAA section 112(d)(5), we are proposing standards representing GACT for this area source category. In developing the proposed GACT standards, we evaluated the control technologies and management practices that reduce HAP emissions from the affected sources that are generally available and utilized by operating uranium recovery facilities.

As noted in Section II.F., for this proposal we solicited information on the available controls and management practices for this area source category using written facility surveys (surveys authorized by section 114(a) of the CAA), reviews of published literature, and reviews of existing facilities (REFERENCE). We also held discussions with trade association and industry representatives and other stakeholders at various public meetings[15]. Our determination of GACT is based on this information. We also considered costs and economic impacts in determining GACT (See Section VI.).

We identified two general management practices that reduce radon emissions from impoundments. First, limiting the area of exposed tailings in conventional impoundments limits the amount of radon that can be emitted. The work practice standards currently included in subpart W require owners and operators of impoundments to implement this management practice by either limiting the area of existing, operating impoundments or covering dewatered tailings to allow for no more than 10 acres of exposed tailings. Second, covering uranium byproduct materials with liquids is another general management

[15] See http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html for a list of presentations made at public meetings held by EPA and at various conferences open to the public.

practice that is an effective method for limiting radon emissions. While this management practice is not currently required under subpart W, facilities using this practice have generally shown its effectiveness in reducing emissions in both conventional impoundments and holding or evaporation ponds. Therefore we believe that a combination of these two management practices will be effective in limiting radon emissions. We also believe that since heap leach piles are in many ways similar to the design of conventional impoundments, the same combination of these practices will limit radon emissions in heap leach piles.

~~As provided in CAA section 112(d)(5), we are proposing standards representing GACT for this area source category. As noted in Section II.F., for this proposal we solicited information on the available controls and management practices for this area source category using written facility surveys (surveys authorized by section 114(a) of the CAA), reviews of published literature, and reviews of existing facilities (REFERENCE). We also held discussions with trade association and industry representatives and other stakeholders at various public meetings[16]. Our determination of GACT is based on this information. We also~~

~~[16] See http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html for a list of presentations made at public meetings held by EPA and at various conferences open to the public.~~

Commented [ss8]: Comment for ORIA: Rather than say "we believe" (which is not all that persuasive in a rulemaking package), we should explain these ideas in terms of what we've seen (i.e. from the data and information we have) and what we can conclude from that.

Commented [ss9]: Comments from Wendy: This is too cursory and conclusory of a discussion. We should clearly explain what the existing rule requires. We should then explain what we think is generally available that is NOT currently required. This wasn't clear to me. (Note from SS – I have made edits to the paragraph to address this comment).

The last sentence here is very conclusory. Why do we believe these things?

What evidence do we have that all of these approaches are generally available.

This GACT discussion is too thin. We need cost numbers and an explanation not only of why something is generally available, but why is it cost effective and thus reasonable GACT.

~~considered costs and economic impacts in determining GACT (See Section VI.).~~

~~We identified two general management practices that reduce radon emissions from impoundments. First, as discussed in the original rulemaking and required through the work practice standards, limiting the area of exposed tailings in conventional impoundments limits the amount of radon that can be emitted. Currently, owners and operators of impoundments are required to either limit the area of existing, operating impoundments or cover dewatered tailings to allow for no more than 10 acres of exposed tailings. Second, we recognize that liquids covering uranium byproduct materials are effective in limiting radon emissions. This has been shown in both conventional impoundments and holding or evaporation ponds. Therefore, from the information and data that we have collected, we conclude that a combination of these two management practices has been and will be effective in limiting radon emissions. We also conclude that since heap leach piles are in many ways similar to the design of conventional impoundments, the same combination of these practices will limit radon emissions.~~

~~B. The Legal Basis for Using GACT for Area Source Categories~~

~~Placeholder for explaining why we can set a GACT standard for this source category. OGC will insert it later.~~

~~Unlike MACT, which is specifically described in section 112(d)(2) and (3), the meaning of GACT, or of what is "generally available," is not defined in the Act. Section 112(d)(5) authorizes the Administrator to:~~

> ~~[P]romulgate standards or requirements applicable to [area] sources…which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants.~~

~~Section 112(d)(5) does not limit us to strict "standard setting" in order to provide for the use of GACT. We read section 112(d)(5) to authorize promulgation of at least two types of rules: rules that set emission levels based on specific controls or management practices (analogous to MACT standard setting) and rules that establish permitting or other regulatory processes that result in the identification and application of GACT standards. As long as the result of section 112(d)(5) rulemaking is that sources use enforceable generally~~

~~available control technologies or management practices, section 112(d)(5) appears to give us the flexibility of choosing between the numerical emissions limits and the promulgation of other requirements that result in sources applying GACT to achieve comparable results.~~

~~C~~B. Proposed GACT Standards for Operating Mill Tailings.

1. Conventional Impoundments.

In the 1989 promulgation of Subpart W we required these impoundments to comply with one of two work practice standards, phased disposal or continuous disposal. These work practice standards contain specific limits on the area and number of operating impoundments to limit radon emissions, because we recognized that greater radon emissions could occur if the piles were left dry and uncovered. We are proposing as the GACT standard that all conventional impoundments comply with one of the two work practice standards, phased disposal or continuous disposal, because these methods for limiting radon emissions by limiting the area of exposed tailings continue to be effective methods for reducing radon emissions from the impoundments (reference EPA 520-1-86-009, August 1986). We are not aware of any impoundments either in existence or planned that use any novel technologies to reduce radon emissions. Impoundment operators continue to use the standard management practice of reducing radon emissions by limiting the size of the impoundment and covering tailings with soil or keeping tailings wet. These practices form the bases of the work practice standards. These are very effective methods for limiting the amount of radon released to the environment. Therefore, we are proposing that GACT for these impoundments will be the same work practice standards and the same design and construction requirements in 40 CFR 192.32(a)(1) as were previously included in Subpart W.

2. Requirements at 40 CFR 192.32(a)

For our current effort we evaluated the management practices of facilities placing tailings in lined impoundments and using one of the two work practices. We determined that the design and construction of the bottom liner requirements at 40 CFR 192.32(a)(1), which reference the RCRA requirements at 40 CFR 264.221, continue to be an effective method of containment of tailings. (REFERENCE IMPOUNDMENT STUDY) The liner requirement, described earlier in this document, remains in use for the permitting of hazardous waste land disposal units under RCRA. Because of the requirement for nearly impermeable boundaries between the tailings and the subsurface, and the requirement for leak detection between the liners, we believe the requirements contain enough safeguards to allow for the placement of tailings and yet provide an early warning system in the event of a leak in the liner system.(REFERENCE IMPOUNDMENT STUDY) For this reason we are proposing to continue to require conventional impoundments, as well as non-conventional impoundments and heap leach piles, to comply with the liner requirements in 40 CFR 192.32, but we are proposing to replace the general reference of 40 CFR 192.32(a) with a more specific reference to 40 CFR 192.32(a)(1); this will narrow the requirements under this proposed rule to only the design and construction requirements for the liner of the impoundment.

3. Non-conventional Impoundments where Tailings are Contained in Ponds and Covered by Liquids

Today we are proposing a GACT standard specifically for use by any operating uranium recovery facility that is using non-conventional impoundments at its facility (i.e., those impoundments where tailings are contained in ponds and covered by liquids). Common names for these structures may include, but are not limited to, impoundments, evaporation ponds and holding ponds.

Industry has argued in preambles to responses to the CAA section 114(a) letters[17] that the 1989 standards did not, and were never meant to, include these types of evaporation or holding ponds under the Subpart W requirements. Industry asserts that the original Subpart W did not specifically reference evaporation or holding ponds but was regulating only conventional mill tailings impoundments. They argue that the ponds are temporary because they hold very little solid material but instead contain mostly liquids containing dissolved radionuclides (which emit very little radon), and at the end of the facility's life they are drained, and any solid materials, along with the liner system, are disposed in a properly licensed impoundment.

EPA has consistently maintained that these non-conventional impoundments meet the existing applicability criteria for regulation under Subpart W. As defined at 40 CFR 61.251(g), uranium byproduct material or tailings means the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content. The holding or evaporation ponds located at conventional mills, ISL facilities and potentially heap leach facilities contain uranium byproduct materials,

[17] http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

either in solid form or dissolved in solution, and therefore are regulated under Subpart W. Today we reiterate that position and are proposing a GACT standard more specifically tailored for these types of impoundments.

We are proposing that these non-conventional impoundments (the evaporation or holding ponds) must meet the design and construction requirements in 40 CFR 192.32 (a)(1) and must maintain a liquid level in the impoundment of no less than one meter at all times during the operation of the impoundment. Maintaining this liquid level will ensure that radon-222 emissions from the byproduct material in the pond are eliminated or minimized. We are also proposing that there is no maximum area requirement for the size of these ponds since the risk of radon emissions is small. Our basis for this determination is because radon emissions from the pond will be expected to be very low since the liquid in the ponds acts as an effective barrier to radon emissions; given that radon-222 has a very short half-life (3.8 days), there simply is not enough time for the radon produced by the solids or from solution to migrate to the water/surface air interface before decaying.

4. Heap Leach Piles

The final affected source for which we are proposing GACT standards is heap leach piles. As noted earlier in this document, there are currently no operating uranium heap leach facilities in the United States.

Our rationale for proposing to regulate this type of uranium extraction under Subpart W is that from the moment that uranium extraction takes place in the heap, uranium byproduct materials are left behind. During the process of uranium extraction on a heap, as the acid drips through the ore, uranium is solubilized and carried away to the collection system where it is further processed. At the point of uranium movement out of the heap, what remains is uranium byproduct materials as defined by 40 CFR 61.251(g). In other words, what remains in the heap is the waste produced by the extraction or concentration of uranium from ore processed primarily for its source material content. We believe Subpart W applies because uranium byproduct materials are being generated during and following the processing of the uranium ore in the heap.

As a result, we are proposing GACT standards for heap leach piles. We are proposing that these piles conform to the phased disposal work practice standard and that the moisture content of the byproduct material in the heap leach pile be greater than or equal to 30% moisture content. We are, however, requesting comment on what should be the areal extent of a heap leach pile. We believe that the phased disposal approach can be usefully applied here because it limits the amount of tailings that can be exposed at any one time, which limits the amount of radon that can be emitted. The phased disposal work practice standard is applicable for heap leach piles because in essence they act as a conventional impoundment. After the uranium has been removed the byproduct material that remains is contained in a structure that is lined per the requirements of 40 CFR 192.32(a)(1) while at the same time covered with soil to minimize radon emissions. This is what occurs at conventional impoundments using the phased disposal standard. Limiting the size of the operating heap leach pile to 40 acres or less has the same effect as it does on conventional impoundments; that is, it limits the area of exposed byproduct material available for emission of radon.

Therefore, we are proposing as GACT for the heap leach pile the phased disposal work practice standard already applicable to conventional impoundments. This would limit the exposed area of the heap to 40 acres and allow no more than two heaps to be active at any one time.

By requiring a moisture content of at least 30%(the moisture content in the existing regulation that delineates when byproduct material is "dewatered"), the heap leach pile is sufficiently saturated to reduce the amount of radon that can escape from the pile. However, we request further information on all the chemical mechanisms in place during the leaching operation, and whether the 30% moisture content is sufficient for minimizing radon emissions from the heap leach pile. We are also asking for comment on exactly where in the pile the 30% moisture content should be achieved. We are also soliciting comments on whether the leaching operation itself liberates more radon than the equivalent of a conventional impoundment. We assume that because low-grade ore is usually processed by heap leach, there would be less radon emitted from a heap than from a conventional impoundment of similar size. We request information on whether this is a correct assumption.

We are also aware that there could be a competing argument against regulating the heap leach pile. While not directly correlative, the process of heap leach could be defined as active "milling." The procedure being carried out on the heap is the extraction of uranium. In this view, the operation is focused on the production of uranium rather than on managing uranium byproduct materials. The heap meets the definition of tailings after the final draw down of the heap solutions occur and the heap is preparing to close. We are requesting comments on the relative merits of this interpretation.

Regardless, as with ISL facilities, collection and/or evaporation ponds (non-conventional impoundments) will exist at heap leach facilities that will also contain uranium byproduct materials, and these ponds will be regulated under Subpart W regardless of whether the heap leach pile is also subject to regulation.

V. Other Issues Generated by Our Review of Subpart W

During our review of Subpart W we also identified several issues that need clarification in order to be more fully understood. The issues that we have identified are:

- Clarification of the term “standby” and how it relates to the operational phase of an impoundment;
- Amending the definition of “operation” so that it is clear when the owner or operator is subject to the requirements of Subpart W;
- Determining whether Subpart W adequately addresses protection from extreme weather events;

- Revising 40 CFR 61.252(b) and (c) to accurately reflect that it is only 40 CFR 192.32(a)(1)that is applicable to Subpart W; and
- Removing the phrase "as determined by the Nuclear Regulatory Commission" in 40 CFR 61.252(b)(1) and (2).

A. Clarification of the Term "Standby"

There has been some confusion on whether the requirements of Subpart W apply to an impoundment that is in "standby" mode. This is the period of time that an impoundment may not be accepting tailings, but has not yet entered the "closure period." This period of time usually takes place when the price of uranium is such that it may not be cost effective for the uranium recovery facility to continue operations, and yet the facility has every intention to re-establish operations once the price of uranium rises to a point where it is cost effective to do so. Since the impoundment has not entered the closure period, it could continue to accept tailings at any time; therefore, Subpart W requirements continue to apply to the impoundment.

Today we are proposing to add a definition to 40 CFR 61.251 to define "standby" as:

Standby means the period of time that an impoundment may not be accepting uranium byproduct material but has not yet entered the closure period.

B. Amending the Definition of "Operation" for a Conventional Impoundment

As currently written, 40 CFR 61.251(e) defines the operational period of a tailings impoundment. It states that "operation" means that an impoundment is being used for the continuing placement of new tailings or is in standby status for such placement [which means that as long as the facility has generated byproduct material at some point and placed it in an impoundment, it is subject to the requirements of Subpart W]. An impoundment is in operation from the day that tailings are first placed in the impoundment until the day that final closure begins."

There has been some confusion over this definition. For example, a uranium mill announced that it was closing a pre-December 15, 1989, impoundment. Before initiating closure, however, it stated that it would keep the impoundment open to dispose of material generated by other closure activities at the site that contained byproduct material (liners, deconstruction material, etc) but not "new tailings." The company argued that since it was not disposing of new tailings the impoundment was no longer subject to Subpart W. We disagree with this interpretation. While it may be true that the company was no longer disposing of new tailings in the impoundment, it has not begun closure activities; therefore, the impoundment is still open to disposal of byproduct material that emits radon and continues to be subject to all applicable Subpart W requirements.

To prevent future confusion, we are proposing today to amend the following definition of "operation" in the Subpart W definitions at 40 CFR 61.251:

Operation. Operation means that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins.

C. Weather Events

In the past, uranium recovery facilities have been located in the western regions of the United States. In these areas, the annual precipitation falling on the impoundment, and any drainage area contributing surface runoff to the impoundment, has usually been less than the annual evaporation from the impoundment. Also, these facilities have been located away from regions of the country where extreme rainfall events (e.g., hurricanes or flooding) could jeopardize the structural integrity of the impoundment, although there is a potential for these facilities to be affected by flash floods, tornadoes, etc. Now, however, uranium exploration in the U.S. has the potential to move eastward, into more climatologically temperate regions of the country, with south central Virginia being considered for a conventional uranium mill. In determining whether additional measures would be needed for impoundments operating in areas where precipitation exceeds evaporation, a review of the existing requirements was necessary.

The proposed revisions to Subpart W will require owners and operators of impoundments or ponds to follow the requirements of 40 CFR 192.32(a)(1). That particular regulation references the RCRA surface impoundment design and operations requirements of 40 CFR 264.221. At 40 CFR 264.221(g) and (h) are requirements that can be used to ensure proper design and operation of tailings impoundments. Section 264.221(g) states that impoundments must be designed, constructed, maintained and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and rain action (e.g., a two foot freeboard requirement); rainfall; run-on; malfunctions of level controllers, alarms and other equipment; and human error. Section 264.221(h) states that impoundments must have dikes that are designed, constructed and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the unit.

Since uranium recovery facilities have been and will continue to be required to comply with the requirements of 40 CFR 192.32(a)(1), they are already required to be designed to prevent failure of impoundments during extreme weather events. As we stated in Section IV B.2., we believe the design requirements contain enough safeguards to allow for the placement of tailings and yet provide an early warning system in the event of a leak in the liner system. Therefore, we are proposing to include these requirements in the Subpart W requirements without modification.

D. <u>Applicability of 40 CFR 192.32(a) to Subpart W</u>

The requirements at 40 CFR 61.252(b) and (c) require compliance with 40 CFR 192.32(a), as determined by the Nuclear Regulatory Commission. However, we are now proposing to focus the Subpart W requirements on the impoundment design and construction requirements found specifically at 40 CFR 192.32(a)(1). The remainder of 40 CFR 192.32(a) goes beyond this limited scope by including requirements for ground-water detection monitoring systems and closure of operating impoundments. These other requirements, along with all of the Part 192 standards, are regulated by the NRC through its licensing requirements for uranium recovery facilities at 10 CFR part 40, Appendix A. However, when referenced in Subpart W, the requirements in 40 CFR 192.32(a)(1) are also implemented and enforced by EPA as the regulatory authority administering Subpart W under its CAA authority. Therefore today we are proposing to revise 40 CFR 61.252 (a),(b) and (c) to specifically define which portions of 40 CFR 192.32(a) are applicable to Subpart W. At the same time we are proposing to eliminate the phrase "…as determined by the Nuclear Regulatory Commission" from 40 CFR 61.252(b). This should eliminate confusion regarding what an applicant must submit to EPA under the CAA in its pre-construction and modification approval applications as required by 40 CFR 61.07 and better explain that EPA is the regulatory agency administering Subpart W under the CAA. This proposed change will have no effect on the licensing requirements of the NRC or its regulatory authority to implement the Part 192 standards through its licenses under UMTRCA.

VI. Summary of Environmental, Cost and Economic Impacts

As discussed earlier, uranium recovery activities are carried out at several different types of facilities. We are proposing to revise Subpart W ~~by introducing three categories related to~~based on how uranium recovery facilities manage byproduct materials during and after the processing of uranium ore at their particular facility. As discussed in Section [fill in], we are proposing GACT requirements for three types of affected sources at uranium recovery facilities: (1) conventional impoundments; (2) non-conventional impoundments; and (3) heap leach piles. This section presents the costs and benefits associated with the implementation of ~~the various components of~~ the proposed requirements for these three types of affected sources~~GACTs~~ found at the different types of uranium recovery facilities described in Section [fill in].

The first ~~category is the~~ set of requirements ~~standards~~ are for conventional mill tailings impoundments. The second ~~category consists of~~offset of requirements are for nonconventional impoundments where uranium byproduct material (i.e., tailings) is contained in ponds and covered by liquids. ~~Examples of this category are evaporation or holding ponds that exist at conventional mills and ISR and heap leach facilities. Requirements in this second category are that the nonconventional impoundments are provided with~~

Commented [ss10]: This is not true – we are not categorizing or subcategorizing, we are proposing requirements based on what kind of affected source is at the facility.

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~~a double liner and that liquid at a depth of 1 meter be maintained in the impoundment.~~ The third set of requirements are ~~category of revised Subpart W would require that~~for heap leach piles~~ be provided with a double liner and that the moisture content in the heap leach pile be maintained above 30% by weight~~. Additionally, the revised Subpart W would remove the requirement to monitor the radon flux at conventional facilities constructed on or prior to December 15, 1989.

Our analysis of~~ these~~ uranium recovery facilities led us to estimate that there ~~were~~ are approximately the following numbers of potentially affected area sources within each type of uranium recovery facility: (a) five conventional milling operations;~~,~~ (b) 50 ISL operations;~~,~~ and (c) one heap leach operation. The following paragraphs present our estimates of the impacts that this proposed rule would have on these facilities. For more information, please refer to the Economic Impact Analysis report that is included in the public docket for this proposed rule. (DOCKET REFERENCE)

A. What are the air quality impacts?

We project that a benefit of this proposed rule is that the proposed requirements will maintain or improve ~~that there will be no adverse~~ the air quality surrounding these facilities~~impacts~~. The control technologies being proposed today have been used at uranium recovery facilities for the past twenty or more years. These work practice standards minimize the amount of radon that is released to the air by keeping the impoundments wet or covered with soil and by limiting the area of exposed tailings. The requirements in this proposed rule should eliminate or reduce radon emissions at ~~ISL ponds~~all three types of affected sources to a level that is difficult to distinguish from the background levels naturally found in the environment.

B. What are the cost and economic impacts?

The baseline costs were estimated using recently published cost data for actual uranium recovery facilities. For the conventional mill, we used data from the proposed new mill at the Piñon Ridge project in Colorado~~ were used~~. For the ISL facility, we used data from two proposed new facilities~~ were used~~: (1) ~~the first was~~ the Centennial Uranium project in Colorado; and (2)~~the second was~~ the Dewey-Burdock project in South Dakota. The Centennial project is expected to have a 14- to 15-year production period, which is a long duration for an ISL facility, while the Dewey-Burdock project is expected to have a shorter production period of about 9 years, which is more representative of ISL facilities. Because two projects were analyzed, a sensitivity analysis of the ISL cost estimates was not performed. For the heap leach facility, we used data from the Sheep Mountain project in Wyoming ~~were used~~.

Existing Subpart W required ~~licensees~~ facilities to perform annual monitoring using Method 115 to demonstrate that the radon flux standard at conventional impoundments constructed before December 15, 1989 was below 20 pCi/m^2-sec. The proposed removal~~deletion~~ of this monitoring requirement would result in a cost saving to the three facilities for which this requirement still applies: (1) Sweetwater;~~,~~ (2) White Mesa;~~,~~ and (3) Shootaring Canyon. Method 115 requires 100 measurements as the minimum number of flux measurements considered necessary to determine a representative mean radon flux value. ~~Thus, f~~For the three sites that ~~were~~ are still required to perform Method 115 radon flux monitoring, the average annual cost to perform that monitoring is estimated to be about $9,730 for Shootaring and Sweetwater, and $19,460 for White Mesa. For all three sites the total annual average cost is estimated to be $38,920 per year, with a range from approximately $28,000 to $49,500 per year per site. For all three sites the total annual average cost savings would be $29,200, with a range from about $21,000 to $37,000.

Baseline costs for conventional impoundment liner construction will remain the same, since the proposed rule does not impose additional requirements. Additionally, all of the evaporation ponds at the four existing conventional mills and the five existing ISLs were built in conformance with Part 192.32(a)(1). Therefore the only economic impact is the cost of complying with the new requirement to maintain a minimum of ~~1~~ one meter of water in the non-conventional ~~ponds~~ impoundments during operation and standby.

As shown in earlier in the preamble, as long as approximately one meter of water is maintained in the non-conventional ~~ponds~~ impoundments the effective radon emissions from the ponds are so low that it is difficult to determine if there is any contribution above background radon values. In order to maintain ~~1~~ one meter, or any level of water within a pond, it is necessary to replace the water that is evaporated from the pond. If the evaporated water is not replaced by naturally occurring precipitation, then it would need to be replaced with makeup water supplied by the ~~pond's~~ nonconventional impoundment's operator. The replacement process is assumed to be required as part of the normal operation of the uranium recovery facility, which would occur regardless of

Commented [ss11]: But what are these costs? Let's show them and explain why they are reasonable.

the GACT. Thus, this cost estimate does not include process water replacement. In performing the cost impacts for this requirement, three potential sources of ~~pond~~ impoundment makeup water were considered: (1) municipal water suppliers; ~~,~~ (2) offsite non-drinking water suppliers; ~~,~~ and (3) onsite water. We have estimated that this requirement will cost owners and operators between $3,000~~.00~~ and $30,000~~.00~~ per year, depending on the area of the pond. The requirement to maintain a minimum of ~~1~~ one meter of liquid in the ponds is estimated to cost approximately $0.03 per pound of ~~$U_3O_8$~~ uranium produced.

By requiring a minimum of ~~1~~ one meter of water in all nonconventional impoundments that contain uranium byproduct material, the release of radon from these impoundments would be reduced. Nielson and Rogers (1986) present the following equation for calculating the radon attenuation:

$$A = e^{\left(-\left[\frac{\lambda}{D}\right]^{0.5} d\right)} \qquad 6\text{-}1$$

Where:

A = Radon attenuation factor (unitless)

λ = Radon-222 decay constant (sec^{-1})

= 2.1×10^{-6} sec^{-1}

D = Radon diffusion coefficient (cm^2/sec)

= 0.003 cm^2/sec in water

d = Depth of water (cm)

= 100 cm

Commented [ss12]: This is not correct – whatever the facility was doing as their normal operations does not matter. Now that we are requiring that they keep one meter of water on the impoundment at all times, we must factor in all costs associated with that requirement. Please include that additional cost in your calculations.

Commented [ss13]: Why? This sentence does not help a reader understand the wide range provided here, or how these numbers were derived. This needs more explanation.

Commented [ss14]: As in size? Or as in location in the country? Please clarify.

Commented [ss15]: Please use "plain language" instead of the scientific terminology in the preamble.

Solving the above equation shows that ~~1~~ one meter of water has a radon attenuation factor of about 0.07. To demonstrate the impact that a ~~1~~one-meter water cover would have, the doses and risks have been recalculated. In this recalculation, it was assumed that an additional ~~1~~ one meter of water covered all of the radon sources. Table 1 shows the results of this recalculation, in terms of the dose and risk reduction attributable to covering the source area with ~~1~~ one meter of water. Table 1 shows both the original radon release and the radon release after the source area has been covered with ~~1~~ one meter of water.

Commented [ss16]: What is this – in plain language?

Commented [ss17]: Why are we suddenly discussing risk in the middle of a discussion about costs? This is out of place. Not sure it should be here at all. Is this what OP/ORD wanted in the preamble? Let's discuss.

Table 1: Annual Dose and Risk Reduction from Maintaining ~~1~~ One Meter of Water in the Impoundments

Uranium Site	Radon Release (Ci/yr)		Annual Dose Reduction		LCF(a) Risk Reduction (yr^{-1})	
	Error! Reference source not found.~~-~~Original	1 Meter Water	Population person-rem	RMEI mrem	Population	RMEI
Sweetwater	2,075	147	0.5	1.1	2.7E-06	5.6E-07
White Mesa	1,750	124	4.8	11.1	3.2E-05	5.9E-06
Smith Ranch - Highland	36,500	2,590	3.4	1.4	2.1E-05	7.2E-07
Crow Butte	8,885	630	2.5	3.1	1.6E-05	1.6E-06
Christensen/Irigaray	1,600	114	3.5	1.8	2.2E-05	9.2E-07
Alta Mesa	740	52	20.1	10.7	1.2E-04	5.7E-06
Kingsville Dome	6,958	494	53.9	10.5	3.5E-04	5.7E-06

* LCF = latent cancer fatalities

Designing and constructing heap leach piles to meet the requirements at 40 CFR 192.32(a)(1) would minimize the potential for leakage of uranium enriched lixiviant into the ground water. Specifically, this would require that a double liner, with drainage collection capabilities, be provided under heap piles. Baseline costs for construction will be the same as for conventional impoundments.

Commented [ss18]: But what are the costs? Just saying they are the same is not as helpful. We need the numbers.

For heap leach piles, when the soil moisture content falls below about 30% by weight, the radon flux increases above what the flux would be if the soil was completely dewatered. If the moisture content is kept above 30% by weight, the radon flux will be below the dewatered flux level. This is also true for the heap leach pile. The unit costs for providing liquids to a heap leach pile are assumed to be the same as the unit costs developed for providing water to nonconventional impoundments.

Commented [ss19]: Why is this a reasonable assumption?

The only cost associated with maintaining the moisture level within the pile is the cost of the liquid. It is assumed that existing piping (used to supply lixiviant to the pile during leaching) would be used to supply water necessary for maintaining the moisture level. Also, it is assumed that the in-soil method for moisture monitoring would be used, and that the above costs are insignificant. Finally, it is assumed that moisture readings would be

Commented [ss20]: Why? How can we make such conclusory statements?

performed during the daily inspections of the heap pile with no additional work hours required.

The base heap leach facility includes a heap pile that will occupy up to 80 acres at a height of up to 50 ~~ft~~feet. With an assumed porosity of 0.39 and a moisture content of 30% by weight, the effective surface area of the liquid within the heap pile is 33.7 acres.

Table 2 presents the calculated cost for makeup water to maintain the moisture level in the heap pile, such that the moisture content is at 30% by weight, or greater. The unit costs for water and the net evaporation rates derived for evaporation ponds used for this estimate.

Table 2: Heap Pile Annual Makeup Water Cost

Cost Type	Water Cost ($/gal)	Net Evaporation (in/yr)	Makeup Water Cost ($/yr)	Makeup Water Rate (gpm/ft^2)
Mean	$0.00010	45.7	$4,331	2.3E-05
Median	$0.00010	41.3	$3,946	2.1E-05
Minimum	$0.000035	6.1	$196	3.0E-06
Maximum	$0.00015	96.5	$13,318	4.8E-05

To place this amount of makeup water in perspective, during leaching and rinsing of the pile, liquid is dripped onto the pile at a rate of 0.005 gallons per minute per square foot (gpm/ft^2) (Titan 2011). This rate is significantly higher than the makeup water rates necessary to maintain the moisture content at 30% by weight, shown in Table 2.

Commented [ss21]: Is this gallons? Please specify.

C. What are the non-air environmental impacts?

Water quality would be maintained by implementation of this proposed rule. This proposed rule does contain requirements (by reference) related to water discharges and spill containment. In fact, the liner requirements cross referenced at 40 CFR 192.32(a)(1) will significantly decrease the possibility of contaminated ground water leaking from impoundments. Section 192.32(a)(1) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life of the impoundment. There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements.

Including a double liner in the design of all onsite impoundments that would contain uranium byproduct material would reduce the potential for ground-water contamination. Although the amount of the potential reduction is not quantifiable, it is important to take this into consideration due to the significant use of ground water as a source of drinking water.

VII. Statutory and Executive Orders Review

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review.

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a "significant regulatory action." The Executive Order defines "significant regulatory action" as one that is likely to result in a rule that may "raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order."

Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been approved by the Office of Management and Budget (OMB) under the provisions of the

Paperwork Reduction Act, 44 U.S.C. 3501 et seq. and have been assigned OMB control number 1100.14.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) a small business whose company has less than 500 employees and is primarily engaged in leaching or beneficiation of uranium, radium or vanadium ores as defined by NAIC code 212291; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This proposed rule is estimated to impact approximately 50 uranium recovery facilities that are currently operating or plan to operate in the future.

To evaluate the significance of the economic impacts of the proposed revisions to Subpart W, separate analyses were performed for each of the three proposed GACTs.

The GACT for uranium recovery facilities that use conventional milling techniques proposes that only phased disposal units or continuous disposal units be used to manage the tailings. For either option, the disposal unit must be lined and equipped with a leak detection system, designed in accordance with Part 192.32(a)(1). If phased disposal is the option chosen, the rule limits the disposal unit to a maximum of 40 acres, with no more than two units open at any given time. If continuous disposal is chosen, no more than 10 acres may be open at any given time. Finally, the Agency is proposing to eliminate the distinction that was made in the 1989 rule between impoundments constructed pre-1989 and post-1989 since all of the remaining pre-1989 impoundments comply with the proposed GACT. The elimination of this distinction also eliminates the requirement that pre-1989 disposal units be monitored on an annual basis to demonstrate that the average Rn-222 flux does not exceed 20pCi/sec/sq. meter.

The conventional milling GACT applies to three existing mills and one proposed mill that is in the process of being licensed. The four conventional mills are: the White Mesa mill owned by Denison Mines; the Shootaring Canyon mill owned by Uranium One, Inc.; the Sweetwater mill owned by Kennecott Uranium Co.; and the proposed Pinon Ridge mill owned by Energy Fuels, Inc. Of the four companies that own conventional mills, two, Dennison Mines and Energy Fuels, are classified as small businesses using fewer than 500 employees as the classification criterion.

Denison Mines' White Mesa mill uses a phased disposal system that complies with the proposed GACT. When its existing open unit is full it will be contoured and covered and a new unit, constructed in accordance with the proposed GACT, will be opened to accept future tailings. Energy Fuels is proposing a phased disposal system to manage its tailings; this system also complies with the proposed GACT.

Based on the fact that both small entities are in compliance with the proposed GACT, we conclude that the rulemaking will not impose any new economic impacts on either facility. For Denison Mines, the proposed rule will actually result in a cost saving as it will no longer have to perform annual monitoring to determine the average radon flux from its impoundments.

The GACT for evaporation ponds at uranium recovery facilities requires that the evaporation ponds be constructed in accordance with design requirements in Part 192.32(a)(1) and that a minimum of 1 meter of liquid be maintained in the ponds during operation and standby. The key design requirements for the ponds are for a double-liner with a leak detection system between the two liners.

In addition to the four conventional mills identified above, the GACT for evaporation ponds applies to in-situ leach (ISL) facilities and heap leach facilities. Currently, there are five operating ISLs and no operating heap leach facilities. The operating ISLs are Crow Butte and Smith Ranch owned by Cameco Resources, Alta Mesa owned by Mestena Uranium, LLC, Willow Creek owned by Uranium One, Inc., and Hobson owned by Uranium Energy Corp. Again using the fewer than 500 employees criterion, Mestena Uranium, LLC and Uranium Energy Corp are both small businesses, while Cameco Resources and Uranium One, Inc. are both large businesses.

All of the evaporation ponds at the four conventional mills and the five ISLs were built in conformance with Part 192.32(a)(1). Therefore the only economic impact is the cost of complying with the new requirement to maintain a minimum of 1 meter of water in the ponds during operation and standby.

In addition to the five operating ISLs, a number of ISLs have been proposed for licensing. These are: Dewey-Burdock owned by Powertech Uranium Corp.; Nichols Ranch owned by Uranez Uranium Corp.; Moore Ranch owned by Uranium One, Inc.; Benavidas, Kingsville Dome, Los Finados, Rosito, and Vasques all owned by Uranium Resources One. All of these companies, except Uranium One, Inc., are small businesses.

According to the licensing documents submitted by the owners of the proposed ISLs, all will be constructed in conformance with Part 192.32(a)(1). Therefore the only economic impact is the cost of complying with the new requirement to maintain a minimum of 1 meter of water in the ponds during operation and standby.

The requirement to maintain a minimum of 1 meter of liquid in the ponds is estimated to cost up to $0.03 per pound of U_3O_8 produced. This cost is not a significant impact on any of these small entities.

Although there are no heap leach facilities currently licensed, Titan Uranium is expected to submit a licensing application for the Sheep Mountain Project. From the preliminary documentation that Titan has presented, the facility will have an Evaporation Pond, a Collection Pond, and a Raffinate Pond. All three ponds will be double lined with leak detection. However, as Titan Uranium is a large business, it does not affect the determination of impacts on small businesses.

The GACT for heap leach facilities applies the phased disposal option of the GACT for conventional mills to these facilities and adds the requirement that the heap leach pile be maintained at a minimum 30 percent moisture content by weight during operations.

As noted previously, there are no heap leach facilities currently in existence, and the only one that is known to be preparing to submit a license application is being proposed by Titan Uranium, which is a large business.

Of the 19 facilities identified above, 11 are owned by small businesses. No small organizations or small governmental entities have been identified that would be impacted by the proposed GACTs.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires us to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows us to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before we established any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, we must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

We have determined that the options considered in this proposed rule do not contain a Federal mandate that may result in expenditures of $100 million or more to State, local, and tribal governments in the aggregate, or to the private sector in any one year. Thus, this proposed rule is not subject to the requirements of sections 202 and 205 of the UMRA. Additionally, for the same reason as above for all governments, we believe the options considered in this proposed rule do not contain requirements that might significantly or uniquely affect small governments.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled “Federalism” (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Thus, the requirements of the Executive Order do not apply to this proposed rule.

In the spirit of Executive Order 13132 and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November

9, 2000). This action would not have substantial direct effects on tribal governments, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes. The action imposes requirements on owners and operators of specified area sources and not tribal governments. Thus, Executive Order 13175 does not apply to this action.

EPA specifically solicits additional comment on this proposed action from tribal officials.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the Order has the potential to influence the regulation. This action is not subject to EO 13045 because it is based solely on technology performance.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a “significant energy action” as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This proposed rule will not adversely affect in a material way, productivity, competition, or prices in the energy sector.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law No. 104-113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This proposed rulemaking does not involve test methods. Therefore, EPA is not considering the use of any voluntary consensus standards.

We request public comment on this aspect of the proposed rulemaking, and specifically, ask you to identify potentially applicable voluntary consensus standards and to explain why such standards could be used in this regulation.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it maintains the current level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. This proposed rule would reduce toxics emissions from sources and thus maintain the safe amount of such emissions to which all affected populations are exposed, is a proposed rule that establishes national standards for air quality, and will increase the level of environmental protection without creating "hotspots" that could disproportionately and adversely affect a minority or low-income population.

National Emission Standards for Radon Emissions From Operating Mill Tailings

List of Subjects in 40 CFR Part 61

Environmental protection, Air pollution control, Hazardous substances, Radon, Tailings, Byproduct, Uranium, Reporting and recordkeeping requirements.

____
Dated:

____
Lisa P. Jackson,
Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency proposes to amend title 40, Chapter I of the Code of Federal Regulations as follows:

PART 61—-[AMENDED]

1. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 7401 et seq.

Subpart W—[AMENDED]

2. Section 61.251 is revised by amending one definition and amended by adding new definitions in alphabetical order as follows:

§61.251 Definitions

*   *   *   *   *

(h) Conventional Impoundment. A conventional impoundment is a permanent structure located at any uranium recovery facility which contains mostly solid uranium byproduct material from the extraction of uranium from uranium ore. These impoundments are left in place at facility closure.

(i) Non-Conventional Impoundment. A non-conventional impoundment can be located at any uranium recovery facility and contains uranium byproduct material suspended in and/or covered by liquids. These structures are commonly known as holding ponds or evaporation ponds. They are removed at facility closure.

(j) Heap Leach Pile. A heap leach pile is a pile of uranium ore placed on an engineered structure and stacked so as to

allow uranium to be dissolved and removed by leaching liquids.

(k) Standby. Standby means the period of time that an impoundment may not be accepting uranium byproduct materials but has not yet entered the closure period.

(l) Operation. Operation means that an impoundment is being used for the continued placement of uranium byproduct materials or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct materials or tailings are first placed in the impoundment until the day that final closure begins.

(m) Uranium Recovery Facility. A uranium recovery facility means a facility licensed to manage uranium byproduct materials during and following the processing of uranium ores. Common names for these facilities are a conventional uranium mill, an in-situ leach (or recovery) facility and a heap leach facility or pile.

3. Revise §61.252 to read as follows:

§61.252 Standard.

(a) Conventional Impoundments.

(1) Conventional impoundments shall be designed, constructed and operated to meet one of the two following work practices:

(i) Phased disposal in lined tailings impoundments that are no more than 40 acres in area and shall comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.

(ii) Continuous disposal of tailings such that tailings are dewatered and immediately disposed with no more than 10 acres uncovered at any time and shall comply with the requirements of 40 CFR 192.32(a)(1).

(b) Non-Conventional Impoundments. Non-conventional impoundments shall meet the requirements of 40 CFR 192.32(a)(1). During operation and until final closure begins the liquid level in the impoundment shall not be less than one meter.

(c) Heap Leach Piles. Heap leach piles shall comply with the phased disposal work practice standard in 40 CFR 61.252(a)(1)(i). The heap leach piles shall also comply with the requirements of 40 CFR 192.32(a)(1). The moisture content of the heap leach pile shall be maintained at 30% or greater. The moisture content determination shall be performed using generally accepted geotechnical methods.

§61.253 [Removed]

§61.254 [Removed]

Revise Section 61.255 to read as follows:

§61.255 Recordkeeping Requirements

The owner or operator of the uranium recovery facility must maintain records that confirm the approved design and operating procedures for the conventional impoundment(s), nonconventional impoundment(s) and heap leach pile(s). Included in these records shall be the results of liner compatibility tests, measurements confirming that one meter of liquid has been maintained in nonconventional impoundments and records confirming that heap leach piles have constantly maintained at least 30% moisture content during the operating life of the heap leach pile. These records must be kept at the uranium recovery facility for at least five years and must be made available for inspection by the Administrator, or his authorized representative.

Commented [ss22]: We don't even want some kind of annual certification of compliance?

Commented [ss23]: If we don't somehow require that these records become publicly available, I think we'll get comments about that as it will limit the public's ability to bring citizens' suits under CAA section 304.

NPRM: NESHAP Amendments for Operating Uranium Mill Tailings (Supbart W, SAN 5281) *Tier 2 – Significant* **COMMENTS: Incorporating ICR requirements as suggested by OGC.** **TO DO:**	**EPA Review Process**	
	Preliminary Analytic Blueprint	1/22/2009
	Early Guidance	4/9/2009
	Detailed Analytic Blueprint	6/8/2009
	Option Selection	6/30/2011 4/17/12
	FAR	4/24/2012
	OP Review	14 days, 5/7/2012 – 5/21/2012 4/30/12 – 5/14/12
	Two Week Notice to OMB	5/21/2012 – ? 4/30/12
	OMB Review	
	Received by OMB	5/21/2012 5/14/12
	Interagency Review of Package	90 days, 5/21/2012 – 8/21/12 5/14/12 – 8/14/12
	Signature Date	**9/28/2012** 9/21/12
NPRM: Uranium Extraction Facilities (SAN 5319) *Tier 2 – Significant* **COMMENTS:** **TO DO:**	**EPA Review Process**	
	Preliminary Analytic Blueprint	9/18/2009
	Early Guidance	12/8/2009
	Detailed Analytic Blueprint	3/3/2010
	Option Selection	4/16/2012
	FAR	5/30/2012
	OP Review	14 days, 6/18/2012 – 7/2/2012
	Two Week Notice to OMB	6/18/2012
	OMB Review	
	Received by OMB	7/2/2012
	Interagency Review of Package	90 days, 7/2/2012 – 10/2/2012
	Signature Date	**10/31/2012**

Alzn
3/14

March 14, 2012

Red = Court Schedule
Blue = Time Sensitive

EPA-5005

Alan Perrin/DC/USEPA/US

03/14/2012 05:22 PM

To Raymond Lee

cc Daniel Schultheisz, Tom Peake, Reid Rosnick

bcc

Subject subpart W schedule

Ray, sorry you're not feeling well today -- probably the weather (just kidding!). Not sure you'll be getting at reg tracker since you are out (and it can probably wait for next week's update), but just in case, here are the date changes we've cleared (up through Mike F) in the attached. Basically the dates are about a week earlier than what was in the spreadsheet you sent to me. Any Qs, let me know. Thanks, Alan

[Untitled].pdf

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
office (202) 343-9775 | bb (202) 279-0376

EPA-4748

Susan Stahle/DC/USEPA/US	To	
03/20/2012 12:34 PM	cc	
	bcc	
	Subject	Subpart W - discuss my questions on the latest version

Meeting

Date	03/20/2012
Time	01:00:00 PM to 02:00:00 PM
Chair	Susan Stahle
Invitees	
Required	Reid Rosnick
Optional	
FYI	
Location	I will call you

I've done some more tinkering with the attached version, especially in Section IV. I've added all my questions throughout the document and would like to discuss those so they don't seem quite so overwhelming as they may appear when you first see them. I think it's close, just want to nail down some items. Shouldn't be too bad.

Draft Outline FR Proposal for Revision of Subpart W Rev11 (ss 032012).docx

ENVIRONMENTAL PROTECTION AGENCY 6560.50

40 CFR Part 61

[EPA-HQ-OAR-2008-0218; FRL_XXXX-X]

RIN 2060-AP21

Revisions to National Emission Standards for Radon Emissions from Operating Mill Tailings

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to revise certain portions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for radon emissions from operating uranium mill tailings. The proposed emissions standards for new and existing sources are based on what constitutes the generally available control technology (GACT) or management practices for this area source category. We are also proposing to add and refine definitions and clarify that the existing rule applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method.

DATES: Comments must be received on or before **[insert date]**, days after publication in the Federal Register.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2008-0218, by one of the following methods:

- www.regulations.gov: Follow the on-line instructions for submitting comments.
- Email: a-and-r-docket@epa.gov
- Fax: 202-566-9744
- Mail: Air and Radiation Docket, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave., NW, Washington, DC 20460.
- Hand Delivery: EPA West Building, Room 3334, 1301 Constitution Ave., NW Washington, DC 20004. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA-HQ-OAR-2008-0218. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other

information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through www.regulations.gov or e-mail. The www.regulations.gov website is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through www.regulations.gov your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at http://www.epa.gov/epahome/dockets.htm

Docket: All documents in the docket are listed in the www.regulations.gov index. Although listed in the index, some information is not publicly available, e.g., CBI or

other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in www.regulations.gov or in hard copy at the Office of Air and Radiation Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air and Radiation Docket is (202) 566-1792.

FOR FURTHER INFORMATION CONTACT: Reid J. Rosnick, Office of Radiation and Indoor Air, Radiation Protection Division, Mailcode 6608J, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW Washington, DC 20460; telephone number: 202-343-9290; fax number: 202-343-2304; email address: rosnick.reid@epa.gov.

SUPPLEMENTARY INFORMATION:

Outline. The information in this preamble is organized as follows:

I. General Information
- A. Does this action apply to me?
- B. What should I consider as I prepare my comments to EPA?
- C. Acronyms and abbreviations

D. Where can I get a copy of this document?
E. When would a public hearing occur?
II. Background Information for Proposed Area Source Standards
A. What is the statutory authority for the proposed standards?
B. What criteria did EPA use in developing the proposed GACT standards for these area sources?
C. What source category is affected by the proposed standards?
D. What are the production operations, emission sources, and available controls?
E. What are the existing requirements under Subpart W?
F. How did we gather information for this proposed rule?
G. What revisions are we making to Subpart W?
H. How does this action relate to other EPA standards?
III. Summary of the Proposed Requirements
A. What are the proposed standards?
B. What are the initial and subsequent requirements?
C. What are the monitoring requirements?
D. What are the notification, recordkeeping and reporting requirements?
E. When must I comply with these proposed standards?
IV. Rationale for this Proposed Rule
A. How did we determine GACT?
B. Proposed GACT standards for operating mill tailings
V. Other Issues Generated by Our Review of Subpart W
A. Clarification of the Term “standby”
B. Amending the definition of “operation” for conventional impoundments
C. Weather Events
D. Applicability of 40 CFR 192.32(a) to Subpart W
VI. Summary of Environmental, Cost and Economic Impacts
A. What are the air impacts?
B. What are the cost and economic impacts?
C. What are the non-air environmental impacts?
VII. Statutory and Executive Order Reviews
A. Executive Order 12866: Regulatory Planning and Review
B. Paperwork Reduction Act
C. Regulatory Flexibility Act
D. Unfunded Mandates Reform Act
E. Executive Order 13132: Federalism
F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks
H. Executive Order 13211: Actions Concerning Regulations
That Significantly Affect Energy Supply, Distribution or Use
I. National Technology Transfer Advancement Act
J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

I. General Information

A. Does this Action Apply to Me?

The regulated categories and entities potentially affected by the proposed standards include:

Category	NAICS code[1]	Examples of regulated Entities
Industry:		
Uranium Ores Mining and/or Beneficiating	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content
Leaching of Uranium, Radium or Vanadium Ores	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content

[1] North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this proposed action. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permit authority for the entity or your EPA regional representative as listed in 40 CFR 61.04 of subpart A (General Provisions).

B. What Should I Consider as I Prepare My Comments for EPA?

1. ***Submitting CBI.*** Do not submit this information to EPA through www.regulations.gov or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

2. ***Tips for Preparing Your Comments.*** When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, Federal Register date and page number).
- Follow directions - The agency may ask you to

respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.

- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

Make sure to submit your comments by the comment period deadline identified.

C. Acronyms and Abbreviations

We use many acronyms and abbreviations in this document. These include:

AEA – Atomic Energy Act
ALARA – As low as reasonably achievable
BID – Background information document

CAA – Clean Air Act
CAAA – Clean Air Act amendments of 1990
CCAT – Colorado Citizens Against Toxic Waste
CFR – Code of Federal Regulations
Ci – Curie, a unit of radioactivity equal to the amount of a radioactive isotope that decays at the rate of 3.7×10^{10} disintegrations per second.
DOE – U.S. Department of Energy
EIA – economic impact analysis
EO – Executive Order
EPA – U.S. Environmental Protection Agency
FR – Federal Register
GACT – Generally Available Control Technology
gpm - Gallons Per Minute
HAP – Hazardous Air Pollutant
ICRP – International Commission on Radiological Protection
ISL – In-situ leach uranium recovery, also known as in-situ recovery (ISR)
NAAQS – National Ambient Air Quality Standards
NCRP – National Council on Radiation Protection and Measurements
mrem – millirem, 1×10^{-3} rem
MACT – Maximum Achievable Control Technology
NESHAP – National Emission Standard for Hazardous Air Pollutants
NRC – U.S. Nuclear Regulatory Commission
OMB – Office of Management and Budget
pCi – picocurie, 1×10^{-12} curie
Ra-226 - Radium-226
Rn-222 – Radon-222
Radon flux - A term applied to the amount of radon crossing a unit area per unit time, as in picocuries per square centimeter per second ($pCi/m^2/sec$).
RCRA – Resource Conservation and Recovery Act
Subpart W – National Emission Standards for Radon Emissions from Operating Mill Tailings at 40 CFR 61.250-61.256
TEDE – Total Effective Dose Equivalent
UMTRCA – Uranium Mill Tailings Radiation Control Act of 1978
U.S.C. – United States Code

D. Where can I get a copy of this document?

In addition to being available in the docket, an electronic copy of this proposed action will also be available on the Worldwide Web (WWW) through the Technology Transfer Network (TTN). Following signature, a copy of this proposed action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: http://www.epa.gov/ttn/oarpg/. The TTN provides information and technology exchange in various areas of air pollution control.

E. When would a public hearing occur?

If anyone contacts EPA requesting to speak at a public hearing concerning these proposed rules by [INSERT DATE DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], we will hold a public hearing on [INSERT DATE DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]. If you are interested in attending the public hearing, contact Mr. Anthony Nesky at (202) 343-9597 to verify that a hearing will be held. If a public hearing is held, it will be held at…WILL BE ADDED LATER

II. Background Information for Proposed Area Source Standards

A. What is the statutory authority for the proposed standards?

Section 112(q)(1)[1] of the Clean Air Act (CAA) requires that National Emissions Standards for Hazardous Air Pollutants (NESHAP) "in effect before the date of enactment of the Clean Air Act Amendments of 1990 [Nov. 15, 1990]. . . shall be reviewed and, if appropriate, revised, to comply with the requirements of subsection (d) of . . . section [112] within 10 years after the date of enactment of the Clean Air Act Amendments of 1990." EPA promulgated 40 CFR Part 61, Subpart W, "National Emission Standards for Radon Emissions From Operating Mill Tailings," ("Subpart W") on December 15, 1989, but has not previously reviewed or revised Subpart W. EPA is conducting this review of Subpart W under CAA section 112(q)(1) to determine what revisions, if any, are appropriate.

Section 112(d) of the CAA requires EPA to establish emission standards for major and area source categories that are listed for regulation under CAA section 112(c). A major source is any stationary source that emits or has the potential to emit 10 tons per year (tpy) or more of any single hazardous air pollutant (HAP) or 25 tpy or more of any combination of HAP. An area source is a stationary

[1] On April 26, 2007, Colorado Citizens Against Toxic Waste and Rocky Mountain Clean Air Action filed a lawsuit against EPA (Docket Reference) for EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009 (Docket reference).

source that is not a major source. For the purpose of Subpart W, the HAP at issue is radon-222. Calculations of radon emissions from operating uranium recovery facilities have shown that facilities regulated under Subpart W are area sources. (REFERENCE)

Section 112(q)(1) does not dictate how EPA must conduct its review of those NESHAP issued prior to 1990. Rather, it provides that the Agency must review, and if appropriate, revise the standards to comply with the requirements of 112(d). Determining what revisions, if any, are appropriate for these NESHAP is best assessed through a case-by-case consideration of each NESHAP. As explained below, in this case, we have reviewed Subpart W and are revising the standards consistent with section 112(d)(5), which provides EPA authority to issue standards for area sources.

Under CAA section 112(d)(5), the Administrator may elect to promulgate standards or requirements for area sources “which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants.” Under section 112(d)(5), the Administrator has the discretion to use generally available control technology or management practices (GACT) in lieu of maximum achievable control technology (MACT) under section 112(d)(2) and (d)(3), which is required for major sources. Pursuant to section 112(d)(5), we are proposing revisions to Subpart W to reflect GACT.

B. What criteria did EPA use in developing the proposed GACT standards for these area sources?

Additional information on the definition of GACT is found in the Senate report on the legislation (Senate Report Number 101–228, December 20, 1989), which indicates GACT means:

> * * * methods, practices and techniques which are commercially available and appropriate for application by the sources in the category considering economic impacts and the technical capabilities of the firms to operate and maintain the emissions control systems.

Consistent with the legislative history, in addition to considering technical capabilities of the facilities and the availability of control measures, we may consider costs and economic impacts in determining GACT, which is particularly important when developing regulations for source categories that may have few establishments and many small businesses.

Determining what constitutes GACT involves considering the control technologies and management practices that are generally available to the area sources in the source category. We also consider the standards applicable to major sources[2] in the same industrial sector to determine if the control technologies and management practices are transferable and generally available to area sources. In appropriate circumstances, we may also consider technologies and practices at area and major sources in similar categories to determine whether such technologies and practices could be considered generally available for the area source category at issue. Finally, as noted above, in determining GACT for a particular area source category, we consider the costs and economic impacts of available control technologies and management practices on that category.

C. What source category is affected by the proposed standards?

As defined by EPA pursuant to the CAA, the source category for 40 CFR Part 61, Subpart W (hereafter "Subpart W") is "facilities licensed [by the U.S. Nuclear Regulatory Commission (NRC)] to manage uranium byproduct material during and following the processing of uranium ores, commonly referred to as uranium mills and their associated tailings." 40 CFR 61.250. Subpart W defines "uranium byproduct material or tailings" as "the waste produced by

[2] None of the sources in this source category are major sources.

the extraction or concentration of uranium from any ore processed primarily for its source material content.[3]" 40 CFR 61.251(g). For clarity, in this proposed rule we refer to this source category by the term "uranium recovery facilities" and we are proposing to add this phrase to the definitions section of the rule. Use of this term encompasses the existing universe of facilities that are currently regulated under Subpart W. Uranium recovery facilities process uranium ore to extract uranium. Any type of uranium recovery facility that manages uranium byproduct material or tailings is subject to regulation under Subpart W. This currently includes three types of uranium recovery facilities: (1) conventional uranium mills; (2) in-situ leach recovery facilities; and (3) heap leach facilities. Subpart W requirements specifically apply to the affected sources at the uranium recovery facilities that are used to manage or contain the uranium byproduct material or tailings. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for

[3] Pursuant to the Atomic Energy Act of 1954, as amended, the Nuclear Regulatory Commission defines "source material" as "(1) Uranium or thorium or any combination of uranium or thorium in any chemical or physical form; or (2) Ores that contain, by weight, one-twentieth of one percent (0.05 percent), or more, of uranium or thorium, or any combination of uranium or thorium." (10 CFR 20.1003)

determining whether Subpart W requirements apply to that structure; rather, applicability is based on the use of these structures to manage or contain uranium byproduct material.

D. What are the production operations, emission sources, and available controls?

As noted above, uranium recovery and processing currently occur by one of three methods: (1) conventional milling; (2) in-situ leach (ISL); and (3) heap leach. Below we present a brief explanation of the various uranium recovery methods and the usual structures that contain uranium byproduct materials.

(1) Conventional Mills.

Conventional milling is one of the two primary recovery methods that are currently used to extract uranium from mined ore. Conventional mills are typically located in areas of low population density. Only one conventional mill in the United States is currently operating; the others are in standby, in decommissioning (closure) or have already been decommissioned.

A conventional uranium mill is a chemical plant that extracts uranium using the following process:

(A) Trucks deliver uranium ore to the mill, where it is crushed before the uranium is extracted through a leaching process. In most cases, sulfuric acid is the leaching agent, but alkaline solutions can also be used to leach the uranium from the ore. The process generally extracts 90 to 95 percent of the uranium from the ore.

(B) The mill then concentrates the extracted uranium to produce a uranium oxide material which is called "yellowcake" because of its yellowish color.[4]

(C) Finally, the yellowcake is transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

(D) The waste generated from this process produces both solid and liquid wastes (i.e., uranium byproduct material, or “tailings”), which are transported from the extraction location to an on-site tailings impoundment or a pond for temporary storage.

Uranium byproduct material/tailings are typically created in slurry form during processing and are then

[4] The term “yellowcake” is still commonly used to refer to this material, although in addition to yellow the uranium oxide material can also be black or grey in color.

deposited in an impoundment or "mill tailings pile" which must be carefully monitored and controlled. This is because the mill tailings contain heavy metal ore constituents, including radium. The radium decays to produce radon, which may then be released to the environment. Because radon is a radioactive gas which may be inhaled into the respiratory tract, EPA has determined that exposure to radon and its daughter products contributes to an increased risk of lung cancer. Its presence is of particular concern in confined areas (such as mines or homes).[5]

The holding or evaporation ponds at this type of facility hold liquids containing byproduct material which are also regulated under Subpart W. These ponds are discussed in more detail in the next section.

(2) In-Situ Leach/Recovery

In-situ leach or recovery sites (ISL/ISR, in this document we will use ISL) represent the majority of the uranium recovery operations that currently exist. The research and development projects and associated pilot projects of the 1980s demonstrated ISL as a viable uranium recovery technique where site conditions (e.g., geology) are amenable to its use. The economics of this technology produce a better return on the investment dollar;

[5] http://www.epa.gov/radon/pdfs/citizensguide.pdf

therefore, the cost to produce uranium is more favorable to investors. Due to this, the trend in uranium production is moving toward the ISL process.

In-situ leaching is defined as the underground leaching or recovery of uranium from the host rock (typically sandstone) by chemicals, followed by recovery of uranium at the surface. Leaching, or more correctly the re-mobilization of uranium into solution, is accomplished through the underground injection of a lixiviant into the host rock (i.e., ore body) through wells that are connected to the ore formation. A lixiviant is a chemical solution used to extract (or leach) uranium from underground ore bodies.

The injection of a lixiviant essentially reverses the geochemical reactions that resulted in the formation of the uranium deposit. The lixiviant assures that the dissolved uranium, as well as other metals, remains in the solution while it is collected from the ore zone by recovery wells which pump the solution to the surface. At the surface, the uranium is recovered in an ion exchange column and further processed into yellowcake. The yellowcake is packaged and transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

Two types of lixiviant solutions can be used, loosely defined as “acid” or “alkaline” systems. In the U.S., the geology and geochemistry of the majority of the uranium ore bodies favors the use of alkaline lixiviants or bicarbonate-carbonate lixiviant and oxygen. Other factors in the choice of the lixiviant are the uranium recovery efficiencies, operating costs, and the ability to achieve satisfactory ground water restoration.

After processing, lixiviant is recharged and pumped back down into the formation for reuse in extracting more uranium. However, a small amount of this liquid is held back from reinjection to maintain a proper pressure gradient within the wellfield. This liquid is sent to an impoundment (often called an evaporation pond or holding pond) on site or injected into a deep well for disposal. These ponds, since they contain uranium byproduct material, are subject to the requirements of Subpart W. In addition, there is a risk of the lixiviant spreading beyond the zone of the uranium deposit (excursion), and this produces a risk of ground-water contamination. The operator of the ISL facility remediates this excursion by pumping large amounts of water in and out of the formation to contain the excursion, and this water (often containing byproduct

material) is often stored in the evaporation or holding ponds. Although the excursion operation itself is not regulated under Subpart W, the ponds that contain byproduct material are regulated since they are a potential source of radon emissions. After the ore body has been depleted, restoration of the formation is accomplished by flushing the host rock with water and sometimes additional chemicals. The restoration fluids are also considered byproduct material.

(3) Heap Leaching

In addition to conventional uranium milling and ISL, some facilities may use an extraction method known as heap leaching. In some instances uranium ore is of such low grade or the geology of the ore body is such that it is not cost-effective to remove the uranium via conventional milling or through ISL. In this case a heap leaching method may be utilized.

No such facilities currently operate to recover uranium in the U.S. However, there are plans for at least one facility to open in the U.S. within the next few years.

Heap leach/ion-exchange operations involve the following process:

A. Small pieces of ore are placed in a large pile, or "heap," on an impervious pad of plastic, clay, or asphalt, with perforated pipes under the heap.
B. An acidic solution is then sprayed[6] over the ore to dissolve the uranium it contains.
C. The uranium-rich solution drains into the perforated pipes, where it is collected and transferred to an ion-exchange system.
D. The heap is "rested," meaning that there is a temporary cessation of application of acidic solution to allow for oxidation of the ore before leaching begins again.
E. The ion-exchange system extracts the uranium from solution where it is later processed into a yellowcake.
F. The yellowcake is packed in 55-gallon drums to be transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

[6] Other technology includes drip systems, sometimes used at gold extraction heaps.

G. Finally, there is a final drain down of the heap solutions, as well as a possible rinsing of the heap, upon which it is closed in place.

Today we are proposing to regulate this type of uranium extraction under Subpart W. Our rationale (explained in greater detail in Section IV.D.4.) is that from the moment uranium extraction takes place in the heap, uranium byproduct material is left behind.

There may also be holding or evaporation ponds at this type of facility. In many cases these ponds hold liquids containing byproduct material and are regulated under Subpart W.

E. What are the existing requirements under Subpart W?

Subpart W was promulgated on December 15, 1989 (54 FR 51654). At the time of promulgation the predominant form of uranium recovery was through the use of conventional mills. There are two separate standards required in Subpart W. The first standard is for “existing” impoundments, e.g., those in existence and licensed by the NRC or its Agreement States) on or prior to December 15, 1989. Those existing facilities must ensure that emissions from the existing tailings impoundments not exceed a radon (Rn-222) flux standard of 20 picocuries per meter squared per second (pCi/m^2/sec). As stated at the time of promulgation: "This rule will have the practical effect of requiring the mill owners to keep their piles wet or covered.[7]" Keeping the piles (impoundments) wet or covered with soil would reduce radon emissions to a level that would meet the standard. This is still considered an effective method to reduce radon emissions at all uranium tailings impoundments.

The method for monitoring for compliance with the radon flux standard was prescribed as Method 115, found at 40 CFR Part 61, Appendix B. The owners or operators of existing impoundments must report to EPA the results of the compliance testing for any calendar year by no later than March 31 of the following year. There is one existing operating mill with impoundments that pre-date December 15, 1989, and two mills that are currently in standby mode.

The second standard applies to "new" impoundments designed and/or constructed after December 15, 1989. The requirements are work practice standards that regulate the size and number of impoundments, or the amount of tailings that may remain uncovered at any time. After December 15, 1989, 40 CFR 61.252(b) states that no new tailings impoundment can be built unless it is designed, constructed

[7] See 54 FR 51689

and operated to meet one of the following two work practices:

1. Phased disposal in lined impoundments that are no more than 40 acres in area and meet the requirements of 40 CFR 192.32(a) as determined by the NRC. The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.
2. Continuous disposal of tailings that are dewatered and immediately disposed with no more than 10 acres uncovered at any time and operated in accordance with 40 CFR 192.32(a) as determined by the NRC.

The basis of the work practice standards are to (1) limit the size of the impoundment, which limits the radon source; or (2) utilize the continuous disposal system, which prohibits large accumulations of uncovered tailings, limiting the amount of radon released.

The work practice standards described above were promulgated after EPA considered a number of factors that influence the emissions of Rn-222 from tailings impoundments, including the climate and the size of the impoundment. For example, for a given concentration of Ra-226 in the tailings, and a given grain size of the

tailings, the moisture content of the tailings will control the radon emission rate; the higher the moisture content the lower the emission rate. In the arid and semi-arid areas of the country where most impoundments are located or proposed, the annual evaporation rate is quite high. As a result, the exposed tailings (absent controls like sprinkling) dry rapidly. In previous assessments, we explicitly took the fact of rapid drying into account by using a Rn-222 flux rate of 1 pCi/m^2/s per pCi/g Ra-226 to estimate the Rn-222 source term from the dry areas of the impoundments. (Note: The estimated source terms from the ponded (areas completely covered by liquid) and saturated areas of the impoundments are considered to be zero, reflecting the complete attenuation of the Rn-222).

Another fact we considered was the size of the impoundment, which has a direct linear relationship with the Rn-222 source term. Again, assuming the same Ra-226 concentration and grain sizes in the tailings, a 100-acre dry impoundment will emit 10 times the radon of a 10-acre dry impoundment. This linear relationship between size and Rn-222 source term is one of the main reasons that Subpart W imposed size restrictions on all future impoundments (40 acres per impoundment if phased disposal is chosen and 10 acres total uncovered if continuous disposal is chosen).

Subpart W also mandates that all tailings impoundments at uranium recovery facilities comply with the requirements at 40 CFR 192.32(a). EPA explained the reason for adding this requirement in the preamble as follows:

> "EPA recognizes that in the case of a tailings pile which is not synthetically or clay lined (the clay lining can be the result of natural conditions at the site) water placed on the tailings in an amount necessary to reduce radon levels, can result in ground water contamination. In addition, in certain situations the water can run off and contaminate surface water. EPA cannot allow a situation where the reduction of radon emissions comes at the expense of increased pollution of the ground or surface water. Therefore, all piles will be required to meet the requirements of 40 CFR 192.32(a) which protects water supplies from contamination. Under the current rules, existing piles are exempt from these provisions, this rule will end that exemption."

54 FR 51654, 51680 (December 15, 1989). Therefore, all impoundments are required to meet the requirements at 40 CFR 192.32(a).

Section 192.32(a) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any

time during the active life of the impoundment. Briefly, 40 CFR 264.221(c) requires that the liner system must include:

1. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into the liner during the active life of the unit.
2. A composite bottom liner consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life of the unit. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least three feet of compacted soil material with a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec.
3. A leachate collection and removal system between the liners, which acts as a leak detection system. This system must be capable of detecting, collecting and removing hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to the waste or liquids in the impoundment.

There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements.[8]

F. How Did We Gather Information for this Proposed Rule?

This section describes the information we used as the basis for making the determination to revise Subpart W. We collected this information using various methods. We performed literature searches, where appropriate, of the engineering methods used by existing uranium recovery facilities in the United States as well as the rest of the world. We used this information to determine whether the technology used to contain uranium byproduct material had advanced since the time of the original promulgation of Subpart W. We reviewed and compiled a list of existing and proposed uranium recovery facilities and the containment technologies being used, as well as those proposed to be used. We compared and contrasted those technologies with the engineering requirements of hazardous waste surface impoundments regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA), which are used as the

[8] For detailed information on the design and operating requirements, refer to 40 CFR Part 264 Subpart K – Surface Impoundments.

design basis for existing uranium byproduct material impoundments.

We collected information on existing uranium mills and in-situ leach facilities by issuing information collection requests authorized under section 114(a) of the CAA to uranium recovery facilities. These requests required uranium recovery companies to provide detailed information about the uranium mill and/or in-situ leaching facility, as well as the number, sizes and types of affected sources (tailings impoundments, evaporation ponds and collection ponds) that now or in the past held uranium byproduct material. We requested information on the history of operation since 1975, ownership changes, whether the operation was in standby mode and whether plans existed for new facilities or reactivated operations were expected.[9]

We also reviewed the regulatory history of Subpart W and the radon measurement methods used to determine compliance with the existing standards, and we performed a comparison between the 1989 risk assessment used for promulgation of Subpart W with current risk assessment approaches, focusing on the adequacy and the appropriateness of the original assessments. We did this by

[9] Section 114(a) letters and responses can be found at http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

using the information we collected to perform new risk assessments for existing facilities, as well as two idealized “generic” sites, one located in the eastern half of the United States and one located in the southwest United States. (These two model sites do not exist. They are idealized using representative features of mills in differing climate and geography). This information has been collected into one document[10] that has been placed in the docket (DOCKET REFERENCE) for this proposed rulemaking. Below is a synopsis of the information we collected and our analyses.

1. Pre-1989 Conventional Mill Impoundments

We have been able to identify three facilities, either operating or on standby,[11] that have been in operation since before the promulgation of Subpart W in 1989. These existing facilities must ensure that emissions from their impoundments not exceed a radon (Rn-222) flux standard of 20 pCi/m^2/sec. The method for monitoring for compliance with the radon flux standard was prescribed as Method 115, found

[10] Technical and Regulatory Support to Develop a Rulemaking to Potentially Modify the NESHAP Subpart W Standard for Radon Emissions from Operating Uranium Mills (40 CFR 61.250)

[11] “Standby” is when a facility impoundment is licensed for the continued placement of tailings/byproduct material but is currently not receiving tailings/byproduct material. See Section V.A. for a discussion of this definition that we are proposing to add to Subpart W.

at 40 CFR Part 61, Appendix B. These facilities must also meet the requirements in 40 CFR 61.252(c), which cross-references the requirements of 40 CFR 192.32(a).

The White Mesa Conventional Mill in Blanding, Utah, has one pre-1989 impoundment (known by the company as Cell 3) that is currently in operation and near capacity but is still authorized and continues to receive tailings. The company has placed as much tailings sands into it as possible at this time. The company is now pumping any residual free solution out of the cell and contouring the sands. It will then be determined whether any more solids need to be added to the cell to fill it to the specified final elevation. It is expected to close in the near future. (Reference) The mill also uses an impoundment constructed before 1989 as an evaporation pond (known as Cell 1). Since it most likely contains byproduct material it is also regulated by Subpart W.

The Sweetwater conventional mill is located 42 miles northwest of Rawlins, Wyoming. The mill operated for a short time in the 1980s and is currently in standby status. Annual radon values collected by the facility indicate that there is little measurable radon flux from the mill tailings that are currently in the lined impoundment. This monitoring program remains active at the facility. According to company records, of the 37 acres of tailings, approximately 28.3 acres of tailings are covered with soil; the remainder of the tailings are continuously covered with water. The dry tailings have an earthen cover that is maintained as needed. During each monitoring event one hundred radon flux measurements are taken on the exposed tailings, as required by Method 115 for compliance with Subpart W. The mean radon flux for the exposed tailings was 8.5 pCi/m^2/sec. The radon flux for the entire tailings impoundment was calculated to be 6.01 pCi/m^2/sec. The calculated radon flux from the entire tailings impoundment surface is thus approximately 30% of the 20.0 pCi/m^2/sec standard. (Reference)

The Shootaring Canyon project is a conventional mill located about 3 miles north of Ticaboo, Utah, in Garfield County. The approximately 1,900-acre site includes an ore pad, a small milling building, and a tailings impoundment system that is partially constructed. The mill operated for a very short period of time. Shootaring Canyon did pre-date the standard, but the mill was shut down prior to the promulgation of the standard. The impoundment is in a standby status and has an active license administered by the Utah Department of Environmental Quality, Division of

Radiation Control. The future plans for this uranium recovery operation are unknown. Current activities at this remote site consist of intermittent environmental monitoring by consultants to the parent company. (Reference)

The Shootaring Canyon mill operated for approximately 30 days. Tailings were deposited in a portion of the upper impoundment. A lower impoundment was conceptually designed but has not been built. Milling operations in 1982 produced 25,000 cubic yards of tailings, deposited in a 2,508 m^2 (0.62 acres) area. The tailings are dry except for moisture associated with occasional precipitation events; consequently, there are no beaches[12]. The tailings have a soil cover that is maintained by the operating company. Radon sampling for the 2010 year took place in April. Again, one hundred radon flux measurements were collected. The average radon flux from this sampling event was 11.9 pCi/m^2-sec for the less than one acre surface area.

A fourth mill is Cotter Corporation in Cañon City, Colorado. The mill no longer exists, and the pre-1989 impoundments are in closure. A reclamation plan exists but is under revision as part of license renewal. Since the

[12] The term "beaches" refers to portions of the tailings impoundment where the tailings are wet but not saturated or covered with liquids.

impoundments are in closure, the impoundments would not be subject to Subpart W but instead would be subject to the long-term closure and decommissioning requirements in their license issued by the state of Colorado, an NRC agreement State.

2. 1989-Present Conventional Mill Impoundments

There currently is only one operating conventional mill with an impoundment that was constructed after December 15, 1989. The White Mesa conventional mill in Utah has two impoundments (Cell 4A and Cell 4B: Cell 4A is currently operating and Cell 4B is being used as an evaporation pond) designed and constructed after 1989. The facility uses the phased disposal work practice for their impoundments. There are several conventional mills in the planning and/or permitting stage and these impoundments will utilize one of the current work practice standards.

3. In-Situ Leach Facilities

After Subpart W was promulgated, the price of uranium began to fall, and the uranium mining and milling industry essentially collapsed, with very few operations remaining in business. However, several years ago, because of renewed interest in nuclear power, the price of uranium began to rise so that it became profitable once more for companies to consider uranium recovery. ISL has been the preferred choice of uranium extraction where suitable geologic conditions exist.

Currently there are five ISL facilities in operation: (1) the Alta Mesa project in Brooks County, Texas; (2) the Crow Butte Operation in Dawes County, Nebraska; (3) the Hobson/La Palangana Operation in South Texas; (4) the Willow Creek (formerly Christensen Ranch/Irigaray Ranch) in Wyoming; and (5) the Smith Ranch-Highland Operation in Converse County, Wyoming.[13] These facilities use or have used evaporation ponds to hold back liquids containing uranium byproduct material from reinjection to maintain a proper pressure gradient within the wellfield.[14] These ponds are subject to the Subpart W requirements and range in size from less than an acre up to 40 acres. Based on the information provided to us the majority of the ponds meet the requirements of 40 CFR 61.252(c).

There are approximately 12 facilities in various stages of licensing or on standby. It is anticipated that there could be approximately another 20-30 license applications over the next 5-10 years (REFERENCE).

4. Heap Leach Facilities

[13] Source: U.S. Energy Information Administration, http://www.eia.gov/uranium/production/quarterly/html/qupd_tbl4.html
[14] The Alta Mesa operation uses deep well injection rather than evaporation ponds.

As stated earlier, there are currently no operating heap leach facilities in the United States. We are aware of two to three potential operations. The most advanced application is the Sheep Mountain facility in Wyoming. Titan Uranium has announced its intent to submit a license application to the NRC in mid 2012. One or two other as yet to be determined operations may be located in Lander County, Nevada and a site in New Mexico.

(5) Risk Analysis.

One of the tasks we performed while considering how to set a GACT standard in this proposal for existing impoundments was to update the risk analysis we performed for promulgating the risk standard in 1989, focusing on the adequacy and the appropriateness of the original assessment using updated risk assumptions, particularly as the risk related to the radon flux standard of 20 pCi/m^2/sec for the conventional impoundments in operation prior to December 15, 1989 (REFERENCE).

As part of this work, we evaluated various computer models that could be used to calculate the doses and risks due to the operation of conventional and ISL uranium recovery facilities, and selected CAP88 V 3.0 for use in this analysis. CAP88 V 3.0 was developed in 1988 from the

AIRDOS, RADRISK, and DARTAB computer programs, which had been developed for the EPA at the Oak Ridge National Laboratory (ORNL).

CAP88 V 3.0, which stands for "Clean Air Act Assessment Package-1988 version 3.0," is used to demonstrate compliance with the NESHAP requirements applicable to radionuclides. CAP88 V 3.0 calculates the doses and risk to a designated receptor as well as the surrounding population. Exposure pathways evaluated by CAP88 V 3.0 are: inhalation, air immersion, ingestion of vegetables, meat, and milk, and ground surface exposure. CAP88 V 3.0 uses a modified Gaussian plume equation to estimate the average dispersion of radionuclides released from up to six emitting sources. The sources may be either elevated stacks, such as a smokestack, or uniform area sources, such as the surface of a uranium byproduct material impoundment. Plume rise can be calculated assuming either a momentum or buoyant-driven plume.

At several sites analyzed in this evaluation only site-wide releases of radon were available to us. This assessment was limited by the level of detail provided by its sources. In instances where more specific data were available, site-wide radon releases were used as a bounding estimate. Assessments are done for a circular grid of distances and directions for a radius of up to 80 kilometers (50 miles) around the facility. The Gaussian plume model produces results that agree with experimental data as well as any model, is fairly easy to work with, and is consistent with the random nature of turbulence. A description of the mathematical models used by CAP88 V 3.0 is provided in the CAP88 V 3.0 Users Manual.[15]

The uranium recovery facilities that we analyzed included three existing conventional mills (Cotter, White Mesa and Sweetwater), five operating ISL operations (1) the Alta Mesa project in Brooks County, Texas; (2) the Crow Butte Operation in Dawes County, Nebraska; (3) the Hobson/La Palangana Operation in South Texas; (4) the Willow Creek (formerly Christensen Ranch/Irigaray Ranch) in Wyoming; and (5) the Smith Ranch-Highland Operation in Converse County, Wyoming), and two generic sites assumed to be the location of conventional mills (we chose conventional mills because we believe they have the greater potential for radon emissions). One generic site was modeled in the southwest United States (Western Generic) while the other was assumed to be located in the eastern United States (Eastern Generic). This was done to accommodate the recognition that several uranium recovery

[15] http://www.epa.gov/radiation/assessment/CAP88 V 3.0/index.html

facilities are expected to apply for construction licenses in the future, and to determine potential risks in geographic areas of the U.S. that customarily have not hosted uranium recovery facilities. For this proposal the facilities we were most interested in were the White Mesa mill and the Sweetwater mill. (The Shootaring Canyon mill was not analyzed, because the impoundment is very small and is soil covered, and the Cotter facility is now in closure). These conventional mills are either in operation or standby and are subject to the flux standard of 20 $pCi/m^2/sec$. The risk analyses performed for these two mills showed that the lifetime risks from radon emissions from the White Mesa impoundments were 1.1×10^{-4} while the lifetime risks from radon associated with the impoundments at the Sweetwater mill were 2.4×10^{-5}. In protecting public health, EPA strives to provide the maximum feasible protection by limiting lifetime cancer risk from radon exposure to approximately 1 in 10,000 (i.e., 10^{-4}). The analyses also estimated that the risk to the population (i.e., total cancer incidence) from all ten modeled uranium sites is between 0.0015 and 0.0026 fatal cancers per year, or approximately 1 case every 385 to 667 years to the 4 million persons living within 80 km of the uranium recovery facilities. The analyses are described in more detail in the background document generated for this proposal (DOCKET REFERENCE).

(6) Flux Requirement versus Work Practice Standards for Conventional Impoundments in operation before December 15, 1989.

In performing our analysis we considered the information we received from all the existing conventional impoundments. We also looked at the compliance history of the existing conventional impoundments. After this review we considered two specific questions: 1) Are any of the conventional impoundments using any novel methods to reduce radon emissions? 2) Is there now any reason to believe that any of the existing impoundments could not comply with the work practice standards for new impoundments, in which case would we need to continue to make the distinction between conventional impoundments constructed before or after December 15, 1989. We arrived at the following conclusions: First, we are not aware of any impoundment that uses any novel technologies to reduce radon emissions. Impoundment operators continue to use the standard method of reducing radon emissions by limiting the size of the impoundment and covering tailings with soil or keeping tailings wet. These are very effective methods for limiting the amount of radon released to the environment.

Second, we believe that only one existing operating impoundment designed and in operation before December 15, 1989, could not meet the work practice standards. This impoundment is Cell 3 at the White Mesa mill, which is expected to close in 2012. We were very clear in our 1989 rulemaking that all conventional mill impoundments must meet the requirements of 40 CFR 192.32(a), which in addition to requiring ground-water monitoring also required the use of liner systems to ensure there would be no leakage from the impoundment into the ground water. We did this by ending the exemption for existing piles from the 40 CFR 192.32(a) requirements (54 FR 51680). However, we did not require those existing impoundments to meet either the phased disposal or continuous disposal work practice standards, which limit the area and number of impoundments, thereby limiting the potential for radon emissions. This is because at the time of promulgation of the rule, conventional impoundments existed that were larger in area than the maximum work practice standard of 40 acres used for the phased disposal work practice, or 10 acres for the continuous disposal requirement. This area limitation was important in reducing the amount of exposed tailings that were available to emit radon. However, we recognized that by instituting a radon flux standard we would require owners and operators to limit radon emissions (usually by placing water or soil) on exposed portions of the impoundments. The presumption was that impoundments constructed before this date could be left in a dry and uncovered state, which would allow for unfettered release of radon. The flux standard was promulgated to have the practical effect of requiring owners and operators of these old impoundments to keep their tailings either wet or covered with soil, thereby reducing the amount of radon that could be emitted (54 FR 51680).

We believe that the existing impoundments at both the Shootaring Canyon and Sweetwater facilities can meet the work practice standards in the current Subpart W regulation. Impoundments at both these facilities are less than 40 acres in area and are synthetically lined as per the requirements in 40 CFR 192.32(a). We also have information that the new impoundments operating at the White Mesa mill will follow the phased work practice standard of limiting impoundments to no more than two, each 40 acres or less in area. In compliance with this requirement, the existing Cell 3 would need to close if it already wasn't preparing to close. As a result, we find that at the time of promulgation of this proposed rule there would be no impoundment designed or constructed before December 15, 1989, that could not meet a work practice standard. Since these impoundments in existence prior to December 15, 1989, appear to meet the work practice standards and have shown they can be maintained on standby we are proposing to eliminate the distinction of whether the impoundment was constructed before or after December 15, 1989. We are also proposing that the impoundments must meet the requirements of one of the two work practice standards, and that the flux standard of 20 pCi/m^2/sec will no longer be required for the impoundments in existence prior to December 15, 1989. We ask for comment on this approach.

G. What revisions are we making to Subpart W?

Add a section here that answers this question: Why is it appropriate to revise subpart W [under 112(d)(5)]?

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H. How does this action relate to other EPA standards?

Under the CAA, EPA promulgated Subpart W, which includes standards and other requirements for controlling radon emissions from operating mill tailings at uranium recovery facilities. Under our authority in the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), we have also issued standards that are more broadly applicable to uranium and thorium byproduct materials at active and inactive uranium mills. NRC (or Agreement States) and DOE implement and enforce these standards at these mills as directed by UMTRCA. These standards, located in 40 CFR Part 192, address the radiological and non-radiological hazards of uranium and thorium byproduct materials in ground water and soil, in addition to air. For the non-radiological hazards, UMTRCA directed us to promulgate standards consistent with those used by EPA to regulate non-radiological hazardous materials under RCRA. Therefore, our Part 192 standards incorporate the ground-water protection requirements applied to hazardous waste management units under RCRA and specify the placement of uranium or thorium byproduct materials in impoundments constructed in accordance with RCRA requirements. Radon emissions from non-operational impoundments (i.e., those with final covers) are limited in 40 CFR Part 192 to the emissions levels of 20 $pCi/m^2/sec$. We are currently preparing a regulatory proposal to update provisions of 40 CFR Part 192, with emphasis on ground-water protection for ISL facilities. As explained in previous sections, Subpart W currently contains reference to some of the Part 192 standards.

III. Summary of the Proposed Requirements

A. What are the proposed standards?

Today we are proposing to revise Subpart W to include requirements for affected sources at three types of operating uranium recovery facilities: (1) conventional uranium mills; (2) ISL facilities; and (3) heap leach facilities. The affected sources at these uranium recovery facilities include conventional impoundments, non-conventional impoundments where tailings are contained in ponds and covered by liquids (examples of these affected sources are evaporation or holding ponds that exist at conventional mills, ISLs and heap leach facilities) and heap leach piles. The proposed GACT standards and rationale for these proposed determinations are discussed below and in Section IV. We request comment on all aspects of these proposed requirements.

B. What are the initial and subsequent requirements?

1. Conventional impoundments.

In the 1989 promulgation of Subpart W we created two work practice standards, phased disposal and continuous disposal. The work practice standards, which limit the area and number of impoundments at a uranium recovery facility, apply to single piles that are no larger than 40 acres (for phased disposal) or 10 uncovered acres (for continuous disposal). We took this approach because we recognized that the radon emissions from these impoundments could be greater if the piles were left dry and uncovered. These standards also included the requirements in 40 CFR 192.32(a), which include design and construction requirements for the impoundments as well as requirements for prevention and mitigation of ground-water contamination.

As discussed earlier, we no longer believe that a distinction needs to be made for conventional impoundments based on the date when they were designed and/or constructed. We believe that the existing impoundments at both the Shootaring Canyon and Sweetwater facilities can meet the work practice standards in the current Subpart W regulation. Impoundments at both these facilities are less than 40 acres in area and are synthetically lined as per the requirements in 40 CFR 192.32(a)(1). The existing cell 3 at the White Mesa mill will undergo closure in 2012 and will be replaced with impoundments that meet the phased disposal work practice standard. Therefore, there is no reason not to bring these older impoundments under the umbrella of the work practice standards required for impoundments designed or constructed after December 15, 1989. By incorporating these impoundments under the work practices, we no longer need the requirement of radon flux

testing, and we are proposing to eliminate this requirement.

The proposed elimination of the monitoring requirement in 40 CFR 61.253 applies only to those facilities currently subject to the radon flux standard in 40 CFR 61.252(a), which we understand applies to only the three impoundments in existence prior to the original promulgation of Subpart W on December 15, 1989. While we are proposing to eliminate the radon monitoring standard for these three impoundments under Subpart W, this action does not relieve the owner or operator of the uranium recovery facility of the monitoring and maintenance requirements of their operating license issued by the NRC or its Agreement States. These requirements are found at 10 CFR Part 40, Appendix A, Criterion 8 and 8A. Additionally, NRC, through its Regulatory Guide 4.14, may also incorporate radionuclide air monitoring at operating facility boundaries.

Further, when the impoundments formally close they are subject to the radon monitoring requirements of 40 CFR 192.32(a)(3), also under the NRC licensing requirements.

From a cost standpoint, by not requiring radon monitoring we expect that for all three sites the total annual average cost savings would be $29,200, with a range from about $21,000 to $37,000. More details on economic costs can be found in Section IV.B of this preamble.

For the proposed rule we also evaluated the requirements of 40 CFR 192.32(a) as they pertain to the Subpart W standards. The requirements of 40 CFR 192.32(a) are included in the NRC's review during the licensing process. We determined that the requirements at 40 CFR 192.32(a)(1), which reference the RCRA requirements for design and operation of surface impoundments at 40 CFR 264.221, are the only requirements necessary for EPA to incorporate for Subpart W as they are effective methods of containment of tailings and protecting ground water while also limiting radon emissions. This liner requirement, described earlier in this preamble, remains in use for the permitting of hazardous waste land disposal units under RCRA. The requirements at 40 CFR 192.32(a)(1) contain safeguards to allow for the placement of tailings and yet provides an early warning system in the event of a leak in the liner system. We are therefore proposing to retain the two work practice standards and the requirements of 40 CFR 192.32(a)(1) as GACT because these methods for limiting radon emissions while also protecting ground water have proven effective for these types of impoundments.

3. Non-conventional impoundments where tailings are contained in ponds and covered by liquids.

Today we are proposing a GACT standard specifically for non-conventional impoundments where uranium byproduct materials are contained in ponds and covered by liquids. Common names for these structures may include, but are not limited to, impoundments and evaporation or holding ponds. These affected sources may be found at any of the three types of uranium recovery facilities.

These units meet the existing applicability criteria in 40 CFR 61.250 to classify them for regulation under Subpart W. The holding or evaporation ponds located at conventional mills, ISL facilities and potentially heap leach facilities contain uranium byproduct material, either in solid form or dissolved in solution, and therefore are regulated under Subpart W. As defined at 40 CFR 61.251(g), uranium byproduct material or tailings means the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content. Therefore, the ponds in the uranium recovery process that contain either solids or radionuclides dissolved in liquids are regulated under the Subpart W requirements. Today we are again stating that determination and proposing a GACT standard for these impoundments.

Evaporation or holding ponds, while sometimes smaller in area than conventional impoundments, perform a basic task. They hold uranium byproduct material until it can be disposed. Our survey of existing ponds shows that they contain liquids, and, as such, this general practice has been sufficient to limit the amount of radon emitted from the ponds, in many cases, to almost zero. Because of the low potential for radon emissions from these impoundments, we do not believe it is necessary to monitor them for radon emissions. We have found that as long as approximately one meter of liquid is maintained in the pond, the effective radon emissions from the pond are so low that it is difficult to determine whether there is any contribution above background radon values. EPA has stated in the *Final Rule for Radon-222 Emissions from Licensed Uranium Mill Tailings: Background Information Document* (August, 1986):

> "Recent technical assessments of radon emission rates from tailings indicate that radon emissions from tailings covered with less than one meter of water, or merely saturated with water, are about 2% of emissions from dry tailings. Tailings covered with more than one meter of water are estimated to have a zero emissions rate. The Agency believes this calculated difference between 0% and 2% is negligible. The Agency used an emission rate of zero for all tailings covered with water or saturated with water in estimating radon emissions."

Therefore, we are proposing as GACT that these impoundments meet the design and construction requirements of 40 CFR 192.32(a)(1), with no size/area restriction, and that during the active life of the pond at least one meter of liquid be maintained in the pond.

We are also proposing that no monitoring be required for this type of impoundment. We have received information and collected data that show there is no acceptable radon flux test method for a pond holding a large amount of liquid. (Method 115 does not work because a solid surface is needed to place the large area activated carbon canisters used in the Method). Further, even if there was an acceptable method, we recognize that radon emissions from the pond would be expected to be very low because the liquid acts as an effective barrier to radon emissions; given that radon-222 has a very short half-life (3.8 days), there simply is not enough time for the radon produced by the solids or from solution to migrate to the water/surface air interface before decaying.(REFERENCE) It therefore appears that monitoring at these ponds is not necessary for demonstrating compliance with the proposed standards. We do, however, ask for comment on two issues: (1) whether these impoundments need to be monitored, and why; and (2) if these impoundments do need monitoring, what methods would a facility use (for example, radon collection devices, or monument placement in the pond to measure liquid levels), at evaporation or holding ponds.

4. Heap Leach Piles.

The final category for which we are proposing GACT standards is heap leach piles. We are proposing to require heap leach piles meet the phased disposal work practice standard and the design and construction requirements at 40 CFR 192.32(a)(1) as GACT. As noted earlier in the preamble, there are currently no operating uranium heap leach facilities in the United States. We are aware that the currently proposed heap leach facility will use the design and operating requirements at 40 CFR 192.32(a)(1) for the design of the heap. Since this requirement, along with the work practice standards, is the basis for all the other impoundments in this standard, we are proposing to also use it for heap leach piles. The premise is that the operator of a heap would not want to lose any of the uranium-bearing solution; thus, it is cost effective to maintain a good liner system so that there will be no leakage and ground water will be protected. At the same time, however, we recognize that keeping the uranium byproduct material in the heap in a near-saturated state (in order to reduce radon emissions) is not a practical solution as it would be at a conventional tailings impoundment. In the definitions at 40 CFR 61.251(c) we have defined “dewatered” tailings as those where the water content of the tailings does not exceed 30% by weight. We are proposing today to require operating heaps to maintain moisture content of greater than 30% so that the byproduct material in the heap is not allowed to become dewatered which would allow more radon emissions. We are specifically asking for comment on the amount of liquid required in the heap, and whether the 30% figure is a realistic objective. We are also asking for comments on precisely where in the heap leach pile this requirement must be met. The heap leach pile may not be evenly saturated during the uranium extraction process. The sprayer/drip system commonly used on the top of heap leach piles usually results in a semi-saturated moisture condition at the top of the pile, since flow of the lixiviant is not uniformly spread across the top of the pile. As downward flow continues, the internal areas of the pile become saturated. We are requesting information on where specifically in the pile the 30% moisture content should apply.

C. What are the monitoring requirements?

As the rule currently exists, only mills with existing conventional impoundments in operation on or prior to

December 15, 1989, are currently required to monitor to ensure compliance with the radon flux standard. The reason for this is because at the time of promulgation of the 1989 rule EPA stated that no flux monitoring would be required for new impoundments because the proposed work practice standards would be effective in reducing radon emissions from operating impoundments by limiting the amount of tailings exposed (54 FR 51681). Since we have now determined that existing older impoundments can meet one of the two work practice standards, we are proposing to eliminate the radon flux monitoring requirement.

In reviewing Subpart W we looked into whether we should extend radon monitoring to all impoundments constructed and operated after 1989 so that the monitoring requirement would apply to all impoundments containing uranium byproduct materials. We also reviewed how this requirement would apply to facilities where Method 115 is not applicable, such as at impoundments totally covered by liquids. We concluded that the original work practice standards (now proposed as GACT) continue to be an effective practice for the limiting of radon emissions from impoundments and from heap leach piles. We also concluded that by maintaining an effective water cover on non-conventional impoundments the radon emissions from those impoundments are so low as to be difficult to differentiate from background radon levels at uranium recovery facilities. Therefore, we are proposing today that it is not necessary to require radon monitoring to any affected sources regulated under Subpart W.

D. What are the notification, recordkeeping and reporting requirements?

New and existing affected sources are required to comply with the existing requirements of the General Provisions (40 CFR part 61, subpart A). The General Provisions include specific requirements for notifications, recordkeeping and reporting, including provisions for notification of construction and/or modification and startup as required by 40 CFR 61.07, 61.08 and 61.09.

Today we are also proposing that all affected sources will be required to maintain certain records pertaining to the design, construction and operation of the impoundments, both conventional and nonconventional, and heap leach piles. We are proposing that t~~T~~hese records will be retained at the facility and contain information ~~regarding~~ demonstrating that the impoundments and/or heap leach pile meet the requirements in section 192.32(a)(1), ~~the approved design of the impoundments and/or heap leach pile,~~ including but not limited to, all tests performed that prove the liner is compatible with the material(s) being placed on the liner. For nonconventional impoundments we are proposing that this requirement would also include~~s~~ records showing compliance with the continuous one meter of liquid in the impoundment; for heap leach piles, we are proposing that this requirement would include~~s~~ records showing that the 30% moisture content of the pile is continuously maintained. ~~Apart from~~ Documents showing that the impoundments and/or heap leach pile meet the requirements in section 192.32(a)(1)~~the design documents, which~~ are already required as part of~~for~~ the pre-construction application ~~required~~submitted under ~~Subpart A of~~ 40 CFR ~~part~~ 61.07, so these records should already be available. Records showing compliance with the one meter liquid cover requirement for nonconventional impoundments and~~ the~~ records showing compliance with the 30% moisture level required in heap leach piles can be created and stored during the daily inspections of the tailings and waste retention systems required by the NRC (and Agreement States) under the inspection requirements of 10 CFR 40, Appendix A, Criterion 8A.

Because we are proposing new record-keeping requirements for uranium recovery facilities, we are required by the Paperwork Reduction Act (PRA) to prepare an estimate of the burden of such record-keeping on the regulated entity, in both cost and hours necessary to comply with the requirements. We must also submit an Information Collection Request (ICR) containing this burden estimate and other supporting documentation to the Office of Management and Budget (OMB) at the time this proposal is published in the Federal Register. See Section VII.B for more discussion of the PRA and ICR.

We believe the record-keeping requirements proposed today will not create a significant burden for operators of uranium recovery facilities. As described earlier, we are proposing to require retention of three types of records: (1) records demonstrating that the ~~containing~~ impoundments and/or heap leach pile meet the requirements in section 192.32(a)(1) (e.g. the design and liner testing information);~~,~~ (2) records showing that one meter of water is maintained to cover~~ing~~ the byproduct material stored in nonconventional impoundments;~~,~~ and (3) records showing that heap~~s~~ leach piles maintain a moisture content of at least 30%.

Documents demonstrating that the impoundments and/or heap leach pile comply with section 192.32(a)(1) requirements ~~Impoundment design and liner testing information is~~are necessary for the facility to obtain regulatory approval from NRC and EPA to construct and operate the impoundments and/or heap leach piles (this ~~, as would~~includes any revisions during the period of operations). Therefore, these records will exist independent of s~~S~~ubpart W requirements and will not need to be continually updated as a result of this record-keeping requirement in subpart W; however, we are proposing to include this record-keeping requirement in subpart W to require that the records be maintained at the facility during its operational lifetime (~~whereas~~ in some cases ~~now~~ the records might be stored at a location away from the facility, such as corporate offices). This might necessitate creating copies of the original records and providing a location for storing them at the facility.

Keeping a record to provide c~~C~~onfirmation that water to a depth of one meter is maintained above the byproduct material stored in nonconventional impoundments should also be relatively straightforward. This would involve placement of a measuring device or devices in or at the edge of the impoundment to allow observation of the water level relative to the level of byproduct material in the impoundment. Such devices need not be highly technical and might consist of, for example, measuring sticks with easily-observable markings placed at various locations, or

Commented [ss1]: In Section VII and in the reg text the requirement is to keep the records for 5 years. Which is it? Please be consistent.

marking the sides of the impoundment to illustrate different water depths. As noted earlier, NRC and Agreement State licenses require operators to inspect the facility on a daily basis. Limited effort should be necessary to record observations of water depth and record the information in inspection log books that are already kept on site and available to inspectors.

Similarly, daily inspections would provide a mechanism for recording moisture content of heap leach piles. However, because no heap leach facilities are currently operating, there is more uncertainty about exactly how the operator will determine that the heap has maintained a 30% moisture content. As discussed in more detail in Section E.4 of this preamble, soil moisture probes are readily available and~~that~~ could be used for this purpose. Such probes could be either left in the heap, placed at locations that provide a representative estimate for the heap as a whole, or facility personnel could use handheld probes to collect readings. The facility might also employ mass-balance estimates to provide a further check on the data collected.

We estimate the burden in hours and cost for uranium recovery facilities to comply with the proposed recordkeeping requirements are as follows: ~~for~~(1)

Commented [ss2]: Do you mean Section IV.E.4?

Commented [ss3]: Not sure we've called it a "heap" anywhere else have we? Let's call it a "heap leach pile" so we don't confuse readers with a change in terminology. Please make this change throughout.

maintaining records related to ~~impoundment liners~~the section 192.32(a)(1) requirements~~,~~: approximately 20 hours and approximately $1,360 as a one-time cost; (2) ~~for~~ verifying the water level in nonconventional impoundments:~~,~~ approximately 288 hours and $12,958 annually; and (3)~~for~~ verifying the moisture content of heap leach piles~~,~~: approximately 2,068 hours and $86,548 annually. Burden levels for heap leach piles are most uncertain because they depend on the chosen method of measurement (e.g., purchasing and maintaining multiple probes or a smaller number of handheld units) as well as the personnel training involved (e.g., a person using a handheld unit will likely need more training than someone who is simply recording readings from already-placed probes). We invite comment on our estimates of burden, as well as suggestions of methods that could readily and efficiently be used to collect the required information. More discussion of the ICR and opportunities for comment may be found in Section VII.B.

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E. When must I comply with these proposed standards?

All existing affected sources subject to this proposed rule would be required to comply with the rule requirements upon the date of publication of the final rule in the Federal Register. To our knowledge, there is no existing operating facility that would be required to modify its affected sources to meet the requirements of the final rule; however, we request any information regarding affected sources that would not meet these requirements. New sources would be required to comply with these rule requirements upon the date of publication of the final rule in the Federal Register or upon startup of the facility, whichever is later.

IV. Rationale for this Proposed Rule

A. How did we determine GACT?

As provided in CAA section 112(d)(5), we are proposing standards representing GACT for this area source category. In developing the proposed GACT standards, we evaluated the control technologies and management practices that reduce HAP emissions from the affected sources that are generally available and utilized by operating uranium recovery facilities.

As noted in Section II.F., for this proposal we solicited information on the available controls and management practices for this area source category using written facility surveys (surveys authorized by section 114(a) of the CAA), reviews of published literature, and reviews of existing facilities (REFERENCE). We also held discussions with trade association and industry representatives and other stakeholders at various public meetings[16]. Our determination of GACT is based on this information. We also considered costs and economic impacts in determining GACT (See Section VI.).

We identified two general management practices ~~that are being used by all existing uranium recovery facilities~~ that reduce radon emissions from conventional and nonconventional impoundments. These general management practices are currently being used by all existing uranium recovery facilities. First, limiting the area of exposed tailings in conventional impoundments limits the amount of radon that can be emitted. The work practice standards currently included in subpart W require owners and operators of impoundments to implement this management practice by either limiting the area of existing, operating impoundments or covering dewatered tailings to allow for no more than 10 acres of exposed tailings. This is an existing requirement of Subpart W and of the NRC licensing requirements; hence, owners and operators of uranium recovery facilities are already incurring the costs associated with limiting the area of impoundments to 40 acres or less, or by dewatering to allow no more than 10

Commented [ss5]: Is this really true? But what if a facility does not have an evaporation pond – are they still using liquids to reduce emissions? I'm wondering if we need to rework this sentence to make sure it is accurate.

[16] See http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html for a list of presentations made at public meetings held by EPA and at various conferences open to the public.

acres uncovered. Since all affected sources use these methods, we have determined that it is a generally available control technology.

Second, c~~C~~overing uranium byproduct materials with liquids is a general management practice that is an effective method for limiting radon emissions. This general management practice is often used at nonconventional impoundments, which, as stated earlier, are also known as evaporation or holding ponds. These~~y~~ nonconventional impoundments also contain byproduct material, and as such we have regulated them under Subpart W. They are also regulated under the NRC operating license. While they hold mostly liquids, they are still designed and constructed in the manner of conventional impoundments, meaning they meet the requirements of section 192.32(a)(1). ~~Covering uranium byproduct materials with liquids is a general management practice that is an effective method for limiting radon emissions.~~ While this management practice of covering uranium byproduct materials in impoundments with liquids is not currently required under subpart W, facilities currently using this practice have generally shown its effectiveness in reducing emissions in both conventional impoundments and nonconventional impoundments (i.e. holding or evaporation ponds). ~~Since the impoundments~~

Commented [ss6]: Is this true? Don't you really mean all conventional impoundments built after 1989? Please edit to be accurate.

~~already exist and use the same, generally available impoundment technology as conventional impoundments, W~~We are therefore proposing to require the use of liquids in nonconventional impoundments as a way to limit radon emissions.

Commented [ss7]: This begs the question of why we are only requiring liquids for nonconventional impoundments. If it's been shown to be equally effective in conventional impoundments, why not also require it there?

Heap leach piles at operating uranium recovery facilities currently do not exist in the United States. There is one such facility currently being designed. This facility would use the double liner systems required for both conventional and nonconventional impoundments. Designing and constructing heap leach piles to meet the requirements at 40 CFR 192.32(a)(1) would minimize the potential for leakage of uranium enriched lixiviant into the ground water.

Therefore after review of the available information and from the evidence we have examined we have determined that a combination of the management practices listed above will be effective in limiting radon emissions, and will do so in a cost effective manner. We discuss our reasons supporting this conclusion in more detail in Section IV.B.3.

B. Proposed GACT Standards for Operating Mill Tailings.

1~~2~~. Requirements at 40 CFR 192.32(a)(1)

As an initial matter, ~~For our current effort we evaluated the management practices of facilities placing tailings in lined impoundments and using one of the two work practices. W~~we determined that the ~~design and construction of the bottom liner~~ requirements at 40 CFR 192.32(a)(1), which reference the RCRA requirements for the design and construction of liners at 40 CFR 264.221, continue to be an effective method of containment of tailings for all types of impoundments and for heap leach piles. (REFERENCE IMPOUNDMENT STUDY) The ~~liner~~ liner requirements, described earlier in this document, remain~~s~~ in use for the permitting of hazardous waste land disposal units under RCRA. Because of the requirement for nearly impermeable boundaries between the tailings and the subsurface, and the requirement for leak detection between the liners, we have determined that the requirements contain enough safeguards to allow for the placement of tailings and yet provide an early warning system in the event of a leak in the liner system.(REFERENCE IMPOUNDMENT STUDY) For this reason we are proposing ~~to continue~~ to require as GACT that conventional impoundments, ~~as well as~~ non-conventional impoundments and heap leach piles~~, to~~ all comply with the liner requirements in 40 CFR 192.32(a)(1).~~,~~ Previously Subpart W contained this requirement but contained a more ~~we are proposing to replace the~~ general reference ~~of~~ to 40 CFR 192.32(a); we are proposing to replace that general reference with a more specific reference to 40 CFR 192.32(a)(1)~~; this will~~ to narrow the requirements under this proposed rule to only the design and construction requirements for the liner of the impoundment contained in 40 CFR 192.32(a)(1).

The cost of the liner requirements…

~~1.~~ 2. Conventional Impoundments.

In the 1989 promulgation of Subpart W we required new conventional ~~these~~ impoundments to comply with one of two work practice standards, phased disposal or continuous disposal. These work practice standards contain specific limits on the area and number of operating impoundments to limit radon emissions~~,~~ because we recognized that greater radon emissions could occur if the piles were left dry and uncovered. We are proposing as the GACT standard that all conventional impoundments – both existing impoundments and new impoundments – comply with one of the two work practice standards, phased disposal or continuous disposal,~~;~~ because these methods for limiting radon emissions by limiting the area of exposed tailings continue to be effective methods for reducing radon emissions from the impoundments (reference EPA 520-1-86-009, August 1986). We are not aware

Commented [ss8]: We need to add the cost information for these requirements right here.

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Commented [ss9]: We need some explanation regarding why we are extending this requirement to existing impoundments.

of any conventional impoundments either in existence or planned that use any ~~novel~~ other technologies or management practices to reduce radon emissions. ~~Impoundment~~ ~~o~~Operators continue to use the ~~standard~~ general management practices for ~~of~~ reducing radon emissions from their conventional impoundments by limiting the size of the impoundment and either covering the tailings with soil or keeping the tailings wet. These management practices form the bases of the work practice standards and~~.~~ continue to be~~These are~~ very effective methods for limiting the amount of radon released to the environment.

These work practice standards are a cost-effective method for reducing radon emissions from conventional impoundments. The ~~mean~~average cost associated with construction of these conventional impoundments is $13,800,000. We estimate that this cost is approximately 3% of the total uranium yellowcake production costs, estimated at $372,000,000.(REFERENCE) Therefore, we are proposing that GACT for these impoundments will be the same work practice standards ~~and the same design and construction requirements in 40 CFR 192.32(a)(1)~~ as were previously included in Subpart W.

~~2. Requirements at 40 CFR 192.32(a)(1)~~

Commented [ss10]: Please use "plain language" in the preamble and use the word "average" instead of the more technical term "mean." I did not make this change everywhere – please search the doc and make the change.

Commented [ss11]: Is this for one impoundment? And is this the cost for complying with the work practice standards or for complying with the section 192.32(a)(1) requirements?
Also – does this cost change if a facility chooses phased disposal or continuous disposal? If so, what is the difference?
Also – what other costs, besides construction of the impoundment, does a facility incur for complying with the work practice standard? Are there any annual operating type costs we're not capturing here?

Commented [ss12]: Is this for the entire industry or for production at one facility? Do we have any idea how this relates to their revenue or profit?

~~For our current effort we evaluated the management practices of facilities placing tailings in lined impoundments and using one of the two work practices. We determined that the design and construction of the bottom liner requirements at 40 CFR 192.32(a)(1), which reference the RCRA requirements at 40 CFR 264.221, continue to be an effective method of containment of tailings. (REFERENCE IMPOUNDMENT STUDY) The liner requirement, described earlier in this document, remains in use for the permitting of hazardous waste land disposal units under RCRA. Because of the requirement for nearly impermeable boundaries between the tailings and the subsurface, and the requirement for leak detection between the liners, we have determined that the requirements contain enough safeguards to allow for the placement of tailings and yet provide an early warning system in the event of a leak in the liner system.(REFERENCE IMPOUNDMENT STUDY) For this reason we are proposing to continue to require conventional impoundments, as well as non conventional impoundments and heap leach piles, to comply with the liner requirements in 40 CFR 192.32, but we are proposing to replace the general reference of 40 CFR 192.32(a) with a more specific reference to 40 CFR 192.32(a)(1); this will narrow the requirements under this proposed rule to only the design~~

~~and construction requirements for the liner of the impoundment.~~

3. Non-conventional Impoundments where Tailings are Contained in Ponds and Covered by Liquids

Today we are proposing a GACT standard specifically for use by any operating uranium recovery facility that is using non-conventional impoundments at its facility (i.e., those impoundments where tailings are contained in ponds and covered by liquids). Common names for these structures may include, but are not limited to, impoundments, evaporation ponds and holding ponds.

Industry has argued in preambles to responses to the CAA section 114(a) letters[17] that ~~the 1989 standards~~Wubpart W ~~did~~ does not, and ~~were~~ never meant to, include these types of evaporation or holding ponds under the Subpart W requirements. Industry asserts that the original Subpart W did not specifically reference evaporation or holding ponds but was regulating only conventional mill tailings impoundments. They argue that the ponds are temporary because they hold very little solid material but instead contain mostly liquids containing dissolved radionuclides (which emit very little radon), and at the end of the

[17] http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

facility's life they are drained, and any solid materials, along with the liner system, are disposed in a properly licensed impoundment.

EPA has consistently maintained that these non-conventional impoundments meet the existing applicability criteria for regulation under Subpart W. As defined at 40 CFR 61.251(g), uranium byproduct material or tailings means the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content. The holding or evaporation ponds located at conventional mills, ISL facilities and potentially heap leach facilities contain uranium byproduct materials, either in solid form or dissolved in solution, and therefore are regulated under Subpart W. Today we reiterate that position and are proposing a GACT standard more specifically tailored for these types of impoundments.

We are proposing that these non-conventional impoundments (the evaporation or holding ponds) must ~~meet the design and construction requirements in 40 CFR 192.32 (a)(1) and must~~ maintain a liquid level in the impoundment of no less than one meter at all times during the operation of the impoundment. Maintaining this liquid level will ensure that radon-222 emissions from the uranium byproduct material in the pond are eliminated or minimized. We are also proposing that there is no maximum area requirement for the size of these ponds since the risk of radon emissions is small. Our basis for this determination is because radon emissions from the pond will be expected to be very low since the liquid in the ponds acts as an effective barrier to radon emissions; given that radon-222 has a very short half-life (3.8 days), there simply is not enough time for the radon produced by the solids or from the solution to migrate to the water/surface air interface before decaying.

By requiring a minimum of one meter of water in all nonconventional impoundments that contain uranium byproduct material, the release of radon from these impoundments would be reduced. Nielson and Rogers (1986) present the following equation for calculating the radon attenuation:

$$A = e^{\left(-\left[\frac{\lambda}{D}\right]^{0.5} d\right)} \qquad \text{6-1}$$

Where:

A	=	Radon attenuation factor (unitless)
λ	=	Radon-222 decay constant (sec^{-1})
	=	2.1×10^{-6} sec^{-1}
D	=	Radon diffusion coefficient (cm^2/sec)
	=	0.003 cm^2/sec in water
d	=	Depth of water (cm)
	=	100 cm

The above equation indicates that the attenuation of radon emanation by water (i.e., the amount by which a water cover will decrease the amount of radon emitted from the impoundment) depends on how quickly radon-222 decays, how quickly radon-222 can move through water (the diffusion coefficient), and the thickness of the layer of water. Solving the above equation shows that one meter of water has a radon attenuation factor of about 0.07. That is, emissions can be expected to be reduced by about 93% compared to no water cover. To demonstrate the impact that a one-meter water cover would have in practice, the amount of radon emitted by these impoundments has been recalculated (REFERENCE). In this recalculation, it was assumed that an additional one meter of water covered all of the radon sources.

The benefit incurred by this requirement is that significantly less radon will be released to the atmosphere. The amount varies from facility to facility based on the size of the nonconventional impoundment, but across existing facilities radon can be expected to be reduced by approximately 24,600 curies, a decline of approximately 93%.

Commented [ss13]: Is this paragraph what follows above? If not, what does? I'm trying to find something to follow the last sentence in the paragraph above; otherwise, it just hangs there.

We have estimated that for an average 80 acre nonconventional impoundment (what appears ~~we consider~~ to be the largest ~~a maximum~~ size of a nonconventional impoundment generally in use, based on surveys of impoundment size), the ~~mean~~average cost of construction of a ~~double lined~~nonconventional impoundment is $23.7 million. This cost is approximately 6% of the total cost to produce uranium yellowcake at an ISL facility, assuming baseline costs of $372 million. Including a double liner in the design of all on-site nonconventional impoundments that would contain uranium byproduct material would reduce the potential for ground water contamination. Although the amount of the potential reduction is not quantifiable, we have determined that the costs of a double liner are reasonable because of the significance of ground water as a source of drinking water.

The only other additional cost associated with this technology is the proposed one meter of liquid that would be required to limit the amount of radon emissions to the air. We estimate that this requirement will cost owners or operators of 80 acre nonconventional impoundments between $1,042 and $9,687 per year. This value varies according to the location of the impoundment, which will determine evaporation rates, which determines how much replacement

Commented [ss14]: If the requirements under 192.32(a)(1) require a double liner, I think we should just generally refer to the "requirements" under 192.32(a)(1) rather than calling this a "double-lined" impoundment. Using a new phrase like that makes it sound like a new requirement.

Commented [ss15]: Is this the cost to comply with the 192.32(a)(1) requirements? If so, we should make that more clear. Also, we should probably include this information in Section IV.B.1. rather than here where we can just focus on the cost of the one meter of liquid requirement.

Commented [ss16]: What do you mean by baseline costs?

Commented [ss17]: I don't think we can really make this kind of unsupported "determination." Isn't there anything you can add here? Anything at least qualitative in nature? We must have more information about potential ground water contamination.
Also – are double liners already required by section 192.32(a)(1)? If so, we should make that point, and explain that we are not requiring anything more than what the facility would already have to do to obtain a license from NRC.

water will be required to maintain the minimum amount of one meter. If the evaporated water is not replaced by naturally occurring precipitation, then it would need to be replaced with make-up water supplied by the nonconventional impoundment's operator. However, the cost to maintain the one meter of liquid in a nonconventional impoundment is less than 1% of the total costs to produce uranium, assuming baseline costs of $372 million.

Commented [ss18]: What is included in what you consider "total costs?" We should use more standardized terminology so it is obvious what kind of costs we are talking about.

The most obvious source of water is what is known as the "process water" from the extraction of uranium from the subsurface. Indeed, management of this process water is the reason for constructing the impoundment in the first place, as the process water contains uranium byproduct material that must also be managed by the facility. It is possible that an operator ~~can~~could maintain one meter of water in the impoundment solely through the use of process water. ~~However, t~~If so, this would not ~~entail~~create any additional costs for the facility~~,~~ as the cost of the process water can be attributed to its use in the uranium extraction process. However, f~~F~~or purposes of estimating the economic impacts associated with our proposal, ~~therefore,~~ our cost estimate does not include process water as a source of water potentially added to the impoundment to replace water that has evaporated. Instead, ~~By not~~

~~including as a source of replacement, this process water, which is part of the process of uranium extraction,~~ we estimated the costs of using water from other sources. ~~Using t~~This method results in the most conservative cost estimate for compliance with the one meter requirement.

Commented [ss19]: I finally get it! ☺ Thanks, this now makes sense to me.

~~In performing the cost impacts for this requirement, three potential sources of impoundment makeup water were considered: (1) municipal water suppliers; (2) offsite non-drinking water suppliers; and (3) onsite water.~~

~~By requiring a minimum of one meter of water in all nonconventional impoundments that contain uranium byproduct material, the release of radon from these impoundments would be reduced. Nielson and Rogers (1986) present the following equation for calculating the radon attenuation:~~

$$A = e^{\left(-\left[\frac{\lambda}{D}\right]^{0.5} d\right)} \qquad \text{6-1}$$

~~Where:~~	~~A~~	~~=~~	~~Radon attenuation factor (unitless)~~
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		~~=~~	~~2.1×10^{-6} sec^{-1}~~
	~~D~~	~~=~~	~~Radon diffusion coefficient (cm^2/sec)~~
		~~=~~	~~0.003 cm^2/sec in water~~
	~~d~~	~~=~~	~~Depth of water (cm)~~
		~~=~~	~~100 cm~~

~~The above equation indicates that the attenuation of radon emanation by water (i.e., the amount by which a water~~

~~cover will decrease the amount of radon emitted from the impoundment) depends on how quickly radon-222 decays, how quickly radon-222 can move through water (the diffusion coefficient), and how thick the layer of water is. Solving the above equation shows that one meter of water has a radon attenuation factor of about 0.07. That is, emissions can be expected to be reduced by about 93% compared to no water cover. To demonstrate the impact that a one-meter water cover would have in practice, the amount of radon emitted by these impoundments has been recalculated (REFERENCE). In this recalculation, it was assumed that an additional one meter of water covered all of the radon sources.~~

In performing the cost impacts for this requirement, t~~T~~hree potential sources of impoundment make-up water were considered: (1) municipal water suppliers;~~,~~ (2) offsite non-drinking-water suppliers;~~,~~ and (3) on-site water. (REFERENCE) Depending on the source of water chosen, we estimate that this requirement will cost owners or operators of nonconventional impoundments between $1,042.00 and $9,687.00 per year. This value also varies according to the size and location of the nonconventional impoundment, up to 80 acres. The requirement to maintain a minimum of

Commented [ss20]: Can you provide more of this detail, i.e. how the costs differ for the three sources you mention above? Can you also provide the detail on how the costs differ depending on the size and location of the impoundment? This is the kind of detail that OMB likes to see. Again, they love tables, so if you can put this into a table, that is a simple way to present the information to them.

one meter of liquid in the ponds is estimated to cost approximately $0.03 per pound of uranium produced.

~~The benefit incurred by this requirement is that significantly less radon will be released to the atmosphere. The amount varies from facility to facility based on the size of the nonconventional impoundment, but across existing facilities radon can be expected to be reduced by approximately 24,600 curies, a decline of approximately 93%.~~

4. Heap Leach Piles

The final affected source for which we are proposing GACT standards is heap leach piles. ~~As noted earlier in this document,~~ While there are currently no operating uranium heap leach facilities in the United States, ~~.~~ we are

~~Our rationale for~~ proposing to regulate any future facilities using this type of uranium extraction under Subpart W since~~is that from~~ the moment that uranium extraction takes place in the heap, uranium byproduct materials are left behind. During the process of uranium extraction on a heap, as the acid drips through the ore, uranium is solubilized and carried away to the collection system where it is further processed. At the point of uranium movement out of the heap, what remains is uranium byproduct materials as defined by 40 CFR 61.251(g). In

Commented [ss21]: How is this calculated?

Commented [ss22]: I suggest adding a conclusion about how cost-effective this requirement is and therefore why it is appropriate to propose this requirement as GACT for these impoundments.

other words, what remains in the heap is the waste produced by the extraction or concentration of uranium from ore processed primarily for its source material content. ~~We believe~~ Thus, Subpart W applies because uranium byproduct materials are being generated during and following the processing of the uranium ore in the heap.

As a result, we are proposing GACT standards for heap leach piles. We are proposing that these piles conform to the phased disposal work practice standard and that the moisture content of the uranium byproduct material in the heap leach pile be greater than or equal to 30% moisture content. ~~We are, however, requesting comment on what should be the areal extent of a heap leach pile.~~ We believe that the phased disposal approach can be usefully applied here because it limits the amount of tailings that can be exposed at any one time, which limits the amount of radon that can be emitted. The phased disposal work practice standard is applicable for heap leach piles because in essence they act as a conventional impoundment. After the uranium has been removed the uranium byproduct material that remains is contained in a structure that is lined ~~per~~ according to the requirements of 40 CFR 192.32(a)(1) while at the same time covered with soil to minimize radon emissions. This is what occurs at conventional impoundments

Commented [ss23]: Is this just during operation, i.e. while the leaching is taking place, or at all times? I think we need to clarify exactly when this requirement must be met.

using the phased disposal standard. Limiting the size of the operating heap leach pile to 40 acres or less has the same effect as it does on conventional impoundments; that is, it limits the area of exposed uranium byproduct material and therefore limits the ~~available for emission of~~ radon emissions from the heap leach pile. While we believe that the 40 acre limitation is appropriate for heap leach piles, we are requesting comment on what should be the areal extent of a heap leach pile.

~~Even though no heap leach piles currently exist, t~~The ~~proposed~~ liner systems we are proposing that heap leach piles must use are the same as those ~~equivalent to the systems~~ used for conventional and nonconventional impoundments. We ~~have been able to~~ estimate that the ~~mean~~average costs associated with the construction of a 40 acre heap leach pile ~~impoundments~~ that meets the phased disposal work practice standard~~requirements~~ we are proposing is approximately $15.3 million.~~,~~ ~~and~~ When compared~~ it~~ to the costs associated with the total production of uranium produced by the facility (estimated over the lifetime of the facility at $356 million),~~. The meanaverage cost of constructing such an impoundment is approximately $15.3 million~~. ~~T~~the costs for using this type

Commented [ss24]: Is there a more "plain language" way to say this?

Commented [ss25]: Is this just the cost to comply with 192.32(a)(1)? Or does it include additional costs to comply with the phased disposal work practice standard? If it includes both, can we break it out and show the costs for each type of requirement?

Commented [ss26]: Not sure I understand this figure, or how it is calculated.

Commented [ss27]: Is this just the cost to comply with 192.32(a)(1)? Or does it include additional costs to comply with the phased disposal work practice standard? If it includes both, can we break it out and show the costs for each type of requirement?

of liner system is about 4% of the total cost of heap leach uranium production.

Therefore, we are proposing as GACT for the heap leach pile the phased disposal work practice standard already applicable to conventional impoundments. This would limit the exposed area of the heap to 40 acres and allow no more than two heaps to be active at any one time.

We are also proposing as GACT that the heap leach pile constantly maintain a moisture content of at least 30%. By requiring a moisture content of at least 30% ~~(the moisture content in the existing regulation that delineates when byproduct material is "dewatered")~~, we think that the heap leach pile will be~~is~~ sufficiently saturated to reduce the amount of radon that can escape from the heap leach pile. However, we request further information on all the chemical mechanisms in place during the leaching operation, and whether the 30% moisture content is sufficient for minimizing radon emissions from the heap leach pile.

Because there is no "process water" component to a heap leach operation, as there is for an ISL, water for the heap leach pile must be supplied from an outside source. Even if an ISL and heap leach operation were to be located at the same site, we consider it unlikely that an operator would

Commented [ss28]: Per facility? Please clarify. And how are we calculating this?

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Commented [ss29]: Same question here – how "constant" is this requirement? Just during the leaching process or at all times?

Commented [ss30]: Is this relevant/important here? It's somewhat confusing and not sure how it helps make any particular point. Can you explain why this is needed?

Commented [ss31]: Do we have any reasons that we can add here for why we think 30% is enough?

use ISL process water as the basis for an acidic heap leach solution. It is possible, in fact likely, that the solution used in the heap will be recycled (i.e., applied to the heap more than once), which could reduce the amount of outside water needed to some degree, although as we discuss~~ed~~ later in this section, it would not seem that recycling solution would affect the overall moisture content. In calculating the high-end costs of heap leaching, we have not included this possibility in our estimates of economic impacts.

The unit costs for providing liquids to a heap leach pile are assumed to be the same as the unit costs developed for providing water to nonconventional impoundments. ~~There are limited ways to deliver liquids to a remote location, and they have been discussed in relation to nonconventional impoundments, and in~~ As was the case for nonconventional impoundments, ~~this case~~ we examined three potential sources of ~~impoundment~~ make-up water: (1) municipal water suppliers; (2) off-site non-drinking water suppliers; and (3) on-site water (ground water and surface water).

The only cost associated with maintaining the moisture level within the pile is the cost of the liquid. ~~It is~~We assume~~d~~ that existing piping ~~(~~used to supply lixiviant to

Commented [ss32]: We don't really discuss them above, we just list them.

the pile during leaching~~)~~ would be used to supply water necessary for maintaining the moisture level. Also, ~~it is~~we assume~~d~~ that the facility will use the in-soil method for moisture monitoring~~ would be used~~.~~, and t~~The process and costs are ~~shown~~described below.

Soil moisture sensors have been used for laboratory and outdoor testing purposes and for agricultural applications for over 50 years. They are mostly used to measure moisture in gardens and lawns to determine when it is appropriate to turn on irrigation systems. Soil moisture sensors can either be placed in the soil or held by hand.

For example, one system would bury soil moisture sensors to the desired depth in the heap. Then, a portable soil moisture meter would be connected by cable to each buried sensor one at a time, i.e., a single meter can read any number of sensors. The portable soil moisture meter costs about $350, and each in-soil sensor about $35 or $45, depending on the length of the cable (either 5 or 10 ft).

Alternatively, with a handheld soil moisture meter, two rods (up to 8 inches long) that are attached to the meter are driven into the soil at the desired location, and a reading is taken. A handheld meter of this type costs about $1,065, and replacement rods about $58 for a pair. Our estimates for costs of monitoring the heap include 100

Commented [ss33]: What is the total estimated cost for using this system?

sensors located within the heap, with a meter on each sensor. We chose 100 sampling stations because heaps are generally the same size as conventional impoundments, and Method 115 prescribed a minimum of 100 sampling stations for measuring radon. The total estimated c~~C~~osts ~~are estimated~~for using this system are~~ at~~ approximately $86,500 per year.

Finally, it is assumed that moisture readings would be performed during the daily inspections of the heap leach pile, which would require ~~with~~ approximately 2,000 additional work hours per year ~~required~~per facility.

The base heap leach facility includes a heap leach pile that will occupy up to 80 acres at a height of up to 50 feet. With an assumed porosity of 0.39 and a moisture content of 30% by weight, the effective surface area of the liquid within the heap pile is 33.7 acres.

Table 1 presents the calculated cost for make-up water to maintain the moisture level in the heap leach pile, such that the moisture content is at 30% by weight, or greater. The unit costs for water and the net evaporation rates are identical to those derived for evaporation ponds used for this estimate.

Commented [ss34]: Is this per facility? If so, please clarify.

Commented [ss35]: Is this accurate? If so, what kind of additional cost does this include? Is this already factored in above?

Table 1: Heap Pile Annual Makeup Water Cost

Cost Type	Water Cost ($/gal)	Net Evaporation (in/yr)	Makeup Water Cost ($/yr)	Makeup Water Rate (gpm/ft²)
Mean	$0.00010	45.7	$4,331	2.3E-05
Median	$0.00010	41.3	$3,946	2.1E-05
Minimum	$0.000035	6.1	$196	3.0E-06
Maximum	$0.00015	96.5	$13,318	4.8E-05

To place this amount of make-up water in perspective, during leaching and rinsing of the heap leach pile, liquid is dripped onto the pile at a rate of 0.005 gallons per minute per square foot (gpm/ft^2) (Titan 2011). This rate is significantly higher than the make-up water rates necessary to maintain the moisture content at 30% by weight, shown in Table 1. We conclude from this analysis that the leaching solution applied in a typical operation should be sufficient to maintain the moisture content of the heap leach pile to the required levels, and only in unusual circumstances would additional liquids need to be applied.

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Commented [ss36]: This depends on when this requirement applies – does it just apply during the leaching process or at all times? If at all times, it may be necessary to add water to the pile to keep it wet, right?

We are ~~also~~ asking for comment on exactly where in the pile the 30% moisture content should be achieved. We are also soliciting comments on whether the leaching operation itself liberates more radon than the equivalent of a conventional impoundment. We assume that because low-grade ore is usually processed by heap leach, there would be less radon emitted from a heap leach pile than from a conventional impoundment of similar size. We request information on whether this is a correct assumption.

We are also aware that there could be a competing argument against regulating the heap leach pile. While not directly correlative, the process of heap leach could be defined as active “milling.” The procedure being carried out on the heap is the extraction of uranium. In this view, the operation is focused on the production of uranium rather than on managing uranium byproduct materials. The heap meets the definition of tailings after the final draw down of the heap solutions occur and the heap is preparing to close. We are requesting comments on the relative merits of this interpretation.

Regardless, as with ISL facilities, collection and/or evaporation ponds (non-conventional impoundments) will exist at heap leach facilities that will also contain uranium byproduct materials, and these ponds will be regulated under Subpart W regardless of whether the heap leach pile is also subject to regulation.

V. Other Issues Generated by Our Review of Subpart W

During our review of Subpart W we also identified several issues that need clarification in order to be more fully understood. The issues that we have identified are:

- Clarification of the term "standby" and how it relates to the operational phase of an impoundment;
- Amending the definition of "operation" so that it is clear when the owner or operator is subject to the requirements of Subpart W;
- Determining whether Subpart W adequately addresses protection from extreme weather events;
- Revising 40 CFR 61.252(b) and (c) to accurately reflect that it is only 40 CFR 192.32(a)(1)that is applicable to Subpart W; and
- Removing the phrase "as determined by the Nuclear Regulatory Commission" in 40 CFR 61.252(b)(1) and (2).

A. Clarification of the Term "Standby"

There has been some confusion on whether the requirements of Subpart W apply to an impoundment that is in "standby" mode. This is the period of time that an impoundment may not be accepting tailings, but has not yet entered the "closure period." This period of time usually takes place when the price of uranium is such that it may not be cost effective for the uranium recovery facility to continue operations, and yet the facility has every intention to re-establish operations once the price of uranium rises to a point where it is cost effective to do so. Since the impoundment has not entered the closure period, it could continue to accept tailings at any time; therefore, Subpart W requirements continue to apply to the impoundment.

Today we are proposing to add a definition to 40 CFR 61.251 to define "standby" as:

> Standby means the period of time that an impoundment may not be accepting uranium byproduct material but has not yet entered the closure period.

B. Amending the Definition of "Operation" for a Conventional Impoundment

As currently written, 40 CFR 61.251(e) defines the operational period of a tailings impoundment. It states that "operation" means that an impoundment is being used for the continuing placement of new tailings or is in standby status for such placement [which means that as long as the facility has generated byproduct material at some point and placed it in an impoundment, it is subject to the requirements of Subpart W]. An impoundment is in operation from the day that tailings are first placed in the impoundment until the day that final closure begins."

There has been some confusion over this definition. For example, a uranium mill announced that it was closing a pre-December 15, 1989, impoundment. Before initiating closure, however, it stated that it would keep the impoundment open to dispose of material generated by other closure activities at the site that contained byproduct material (liners, deconstruction material, etc) but not "new tailings." The company argued that since it was not disposing of new tailings the impoundment was no longer subject to Subpart W. We disagree with this interpretation. While it may be true that the company was no longer disposing of new tailings in the impoundment, it has not begun closure activities; therefore, the impoundment is still open to disposal of byproduct material that emits radon and continues to be subject to all applicable Subpart W requirements.

To prevent future confusion, we are proposing today to amend the following definition of "operation" in the Subpart W definitions at 40 CFR 61.251:

Operation. Operation means that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins.

C. Weather Events

In the past, uranium recovery facilities have been located in the western regions of the United States. In these areas, the annual precipitation falling on the impoundment, and any drainage area contributing surface runoff to the impoundment, has usually been less than the annual evaporation from the impoundment. Also, these facilities have been located away from regions of the country where extreme rainfall events (e.g., hurricanes or flooding) could jeopardize the structural integrity of the impoundment, although there is a potential for these facilities to be affected by flash floods, tornadoes, etc. Now, however, uranium exploration in the U.S. has the potential to move eastward, into more climatologically temperate regions of the country, with south central Virginia being considered for a conventional uranium mill. In determining whether additional measures would be needed for impoundments operating in areas where precipitation exceeds evaporation, a review of the existing requirements was necessary.

The proposed revisions to Subpart W will require owners and operators of impoundments or ponds to follow the requirements of 40 CFR 192.32(a)(1). That particular regulation references the RCRA surface impoundment design and operations requirements of 40 CFR 264.221. At 40 CFR

264.221(g) and (h) are requirements that can be used to ensure proper design and operation of tailings impoundments. Section 264.221(g) states that impoundments must be designed, constructed, maintained and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and rain action (e.g., a two foot freeboard requirement); rainfall; run-on; malfunctions of level controllers, alarms and other equipment; and human error. Section 264.221(h) states that impoundments must have dikes that are designed, constructed and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the unit.

Since uranium recovery facilities have been and will continue to be required to comply with the requirements of 40 CFR 192.32(a)(1), they are already required to be designed to prevent failure of impoundments during extreme weather events. As we stated in Section IV B.2., we believe the design requirements contain enough safeguards to allow for the placement of tailings and yet provide an early warning system in the event of a leak in the liner system.

Therefore, we are proposing to include these requirements in the Subpart W requirements without modification.

D. Applicability of 40 CFR 192.32(a) to Subpart W

The requirements at 40 CFR 61.252(b) and (c) require compliance with 40 CFR 192.32(a), as determined by the Nuclear Regulatory Commission. However, we are now proposing to focus the Subpart W requirements on the impoundment design and construction requirements found specifically at 40 CFR 192.32(a)(1). The remainder of 40 CFR 192.32(a) goes beyond this limited scope by including requirements for ground-water detection monitoring systems and closure of operating impoundments. These other requirements, along with all of the Part 192 standards, are regulated by the NRC through its licensing requirements for uranium recovery facilities at 10 CFR part 40, Appendix A. However, when referenced in Subpart W, the requirements in 40 CFR 192.32(a)(1) are also implemented and enforced by EPA as the regulatory authority administering Subpart W under its CAA authority. Therefore today we are proposing to revise 40 CFR 61.252 (a),(b) and (c) to specifically define which portions of 40 CFR 192.32(a) are applicable to Subpart W. At the same time we are proposing to eliminate the phrase "…as determined by the Nuclear Regulatory

Commission" from 40 CFR 61.252(b). This should eliminate confusion regarding what an applicant must submit to EPA under the CAA in its pre-construction and modification approval applications as required by 40 CFR 61.07 and better explain that EPA is the regulatory agency administering Subpart W under the CAA. This proposed change will have no effect on the licensing requirements of the NRC or its regulatory authority to implement the Part 192 standards through its licenses under UMTRCA.

VI. Summary of Environmental, Cost and Economic Impacts

As discussed earlier, uranium recovery activities are carried out at several different types of facilities. We are proposing to revise Subpart W based on how uranium recovery facilities manage uranium byproduct materials during and after the processing of uranium ore at their particular facility. As discussed in Sections III and IV, we are proposing GACT requirements for three types of affected sources at uranium recovery facilities: (1) conventional impoundments; (2) nonconventional impoundments; and (3) heap leach piles.

Our analysis of uranium recovery facilities led us to estimate that there are approximately the following numbers of potentially affected area sources within each type of uranium recovery facility: (a) five conventional milling operations; (b) 50 ISL operations; and (c) one heap leach operation. The following paragraphs present our estimates of the impacts that this proposed rule would have on these facilities. For more information, please refer to the Economic Impact Analysis report that is included in the public docket for this proposed rule. (DOCKET REFERENCE)

A. What are the air quality impacts?

We project that a benefit of this proposed rule is that the proposed requirements will maintain or improve the air quality surrounding these facilities. The control technologies being proposed today have been used at uranium recovery facilities for the past twenty or more years. These work practice standards minimize the amount of radon that is released to the air by keeping the impoundments wet or covered with soil and by limiting the area of exposed tailings. The requirements in this proposed rule should eliminate or reduce radon emissions at all three types of affected sources to a level that is difficult to distinguish from the background levels naturally found in the environment.

B. What are the cost impacts?

The baseline costs were estimated using recently published cost data for actual uranium recovery facilities.

For the conventional mill, we used data from the recently licensed new mill at the Piñon Ridge project in Colorado. For the ISL facility, we used data from two proposed new facilities: (1) the Centennial Uranium project in Colorado; and (2) the Dewey-Burdock project in South Dakota. The Centennial project is expected to have a 14- to 15-year production period, which is a long duration for an ISL facility, while the Dewey-Burdock project is expected to have a shorter production period of about 9 years, which is more representative of ISL facilities. For the heap leach facility, we used data from the Sheep Mountain project in Wyoming.

Existing Subpart W required facilities to perform annual monitoring using Method 115 to demonstrate that the radon flux standard at conventional impoundments constructed before December 15, 1989 was below 20 pCi/m^2-sec. The proposed removal of this monitoring requirement would result in a cost saving to the three facilities for which this requirement still applies: (1) Sweetwater; (2) White Mesa; and (3) Shootaring Canyon. Method 115 requires 100 measurements as the minimum number of flux measurements considered necessary to determine a representative mean radon flux value. For the three sites that are still required to perform Method 115 radon flux monitoring, the average annual cost to perform that monitoring is estimated to be about $9,730 for Shootaring and Sweetwater, and $19,460 for White Mesa. For all three sites the total annual average cost is estimated to be $38,920 per year, with a range from approximately $28,000 to $49,500 per year per site. For all three sites the total annual average cost savings would be $29,200, with a range from about $21,000 to $37,000.

Baseline costs for conventional impoundment liner construction will remain the same, since the proposed rule does not impose additional requirements. The average cost to construct one of these impoundments is $13.8 million. We estimate that this cost is approximately 3% of the total uranium yellowcake production costs, estimated at $372 million. ~~Additionally,~~

~~a~~All of the evaporation ponds at the four existing conventional mills and the five existing ISLs were built in conformance with Part 192.32(a)(1). We have estimated that for an average 80 acre nonconventional impoundment the ~~mean~~average cost of construction of an ~~double lined~~ impoundment is $23.7 million. This cost is approximately 6% of the total cost to produce uranium yellowcake at an ISL facility, assuming baseline costs of $372 million.

~~Including a double liner in the design of all~~

Commented [ss37]: What do you mean by this phrase?

Commented [ss38]: Is this the total cost for a conventional mill? The total cost for the entire industry? Please clarify. And what type of costs are included here? Not sure "production costs" is the right term of art here.

Commented [ss39]: Here you call it "baseline costs" instead of "production costs." What do these terms mean?

~~onsite~~Requiring nonconventional impoundments to comply with the liner requirements in 40 CFR 192.32(a)(1) ~~that~~ will ~~would~~ contain the uranium byproduct material ~~would~~and reduce the potential for ground water contamination. The other economic impact for nonconventional impoundments is the cost of complying with the new requirement to maintain a minimum of one meter of water in the nonconventional impoundments during operation and standby.

As shown in Section IV.B.3. of this preamble, as long as approximately one meter of water is maintained in the non-conventional impoundments the effective radon emissions from the ponds are so low that it is difficult to determine if there is any contribution above background radon values. In order to maintain one meter ~~, or any level~~ of ~~water~~ liquid within a pond, it is necessary to replace the water that is evaporated from the pond. Depending on the source of water chosen[18], we estimate that this requirement will cost owners or operators of nonconventional impoundments between $1,042 and $9,687 per year. This value also varies according to the size of the nonconventional impoundment, up to 80 acres, and the location of the impoundment. Evaporation rates vary by geographic location. However, the

[18] Municipal sources were the most expensive, with average unit costs of $0.0033 per gallon. Offsite non-drinking water sources were the cheapest, at $0.000069 per gallon on average. For more detail, please see Section 6.3.3 of the Background Information Document.

cost to maintain the one meter of liquid in a nonconventional impoundment is estimated to be less than 1% of the total costs to produce uranium, estimated at $23.7 million. The requirement to maintain a minimum of one meter of liquid in the ponds is estimated to cost approximately $0.03 per pound of uranium produced.

Designing and constructing heap leach piles to meet the requirements at 40 CFR 192.32(a)(1) would minimize the potential for leakage of uranium enriched lixiviant into the ground water. Specifically, this would require that a double liner, with drainage collection capabilities, be provided under heap leach piles. Baseline costs for construction will be essentially the same as for conventional impoundments. Since the liner systems are equivalent to the systems used for conventional and nonconventional impoundments, we have been able to estimate the average costs associated with the construction of heap leach pile impoundments that meet the phased disposal requirements we are proposing, and compare it to the costs associated with the total production of uranium produced by the facility. The average cost of constructing such an impoundment is approximately $15.3 million. The costs for using this type of liner system is about 4% of the estimated total cost of heap leach uranium production costs estimated at $356 million.

For heap leach piles, when the soil moisture content in the heap falls below about 30% by weight, the radon flux out of the heap increases because radon moves through the air faster (with less opportunity to decay) than water. We concluded from our analysis that the leaching solution applied in a typical operation should be sufficient to maintain the moisture content of the heap to the required levels, and only in unusual circumstances would additional liquids need to be applied. However, in a circumstance that would require the additional application of liquid to maintain the 30% moisture limit, such as excessive evaporation, we estimate that requiring the owner/operator of a heap leach pile to maintain 30% moisture content in the pile will average approximately $4,000 per year. We also estimate that it will cost approximately $86,500 per year with labor of approximately 2,000 hours to perform the tests required to verify that the moisture content is being maintained. These costs are less than one percent of the total costs of heap leach uranium production, estimated at $356 million.

C. What are the non-air environmental impacts?

Commented [ss40]: Same questions here – want to better understand this number. Here you go back to saying "production costs."

Commented [ss41]: I don't think we included this information in Section IV. We should.

Commented [ss42]: See comments on these numbers in Section IV. Let's make the same changes here.

Water quality would be maintained by implementation of this proposed rule. This proposed rule does contain requirements (by reference) related to water discharges and spill containment. In fact, the liner requirements cross referenced at 40 CFR 192.32(a)(1) will significantly decrease the possibility of contaminated ground water leaking from impoundments. Section 192.32(a)(1) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life of the impoundment. There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements.

Including a double liner in the design of all onsite impoundments that would contain uranium byproduct material would reduce the potential for ground-water contamination. Although the amount of the potential reduction is not quantifiable, it is important to take this into consideration due to the significant use of ground water as a source of drinking water.

VII. Statutory and Executive Orders Review

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review.

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a "significant regulatory action." The Executive Order defines "significant regulatory action" as one that is likely to result in a rule that may "raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order."

Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. The Information

Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2464.01.

The information to be collected for the proposed rulemaking today is based on the requirements of the Clean Air Act~~ (42 USC 1857)~~. Section 114 authorizes the Administrator of EPA to require any person who owns or operates any emission source or who is subject to any requirements of the Act to:

- Establish and maintain records
- Make reports, install, use, and maintain monitoring equipment or method
- Sample emissions in accordance with EPA-prescribed locations, intervals and methods
- Provide information as may be requested

(b) Practical Utility/Users

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EPA's regional offices use the information collected to ensure that public health continues to be protected from the hazards of radionuclides by compliance with health based standards and/ or Generally Available Control Technology (GACT).

The proposed rule would require the owner or operator of a uranium recovery facility to maintain records that confirm that ~~the approved design and operating procedures for~~ the conventional impoundment(s), nonconventional impoundment(s) and heap leach pile(s) meet the requirements in section 192.32(a)(1). Included in these records are the results of liner compatibility tests, measurements confirming that one meter of liquid has been maintained in nonconventional impoundments and records confirming that heap leach piles have constantly maintained at least 30% moisture content during the operating life of the heap leach pile. This documentation should be sufficient to allow an independent auditor (such as an EPA inspector) to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the mill or facility for at least five years and, upon request, be made available for inspection by the Administrator, or his/her authorized representative. The proposed rule would not require the owners or operators of operating impoundments and heap leach piles to report the results of the compliance inspections or calculations required in Section 61.255. The recordkeeping requirements require only the specific information needed to determine compliance. We have taken this step to minimize the reporting requirements for small business facilities.

Commented [ss44]: In the earlier discussion we said the facility had to keep the records throughout the life of the operations of the facility. Which is it? Please make them consistent.

The annual proposed monitoring and recordkeeping burden to affected sources for this collection (averaged over the first three years after the effective date of the proposed rule) is estimated to be 10,400 hours with a total annual cost of $400,000. This estimate includes a total capital and start-up cost component annualized over the facility's expected useful life, a total operation and maintenance component, and a purchase of services component. We estimate that this total burden will be spread over 21 facilities that will be required to keep records. Of this total burden, however, 4,150 hours (and $93,000) will be incurred by the one heap leach uranium recovery facility, due to the requirements for purchasing, installing and monitoring the soil moisture sensors, as well as training staff on how to operate the equipment.

Burden is defined at 5 CFR 1320.3(b).An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR Part 9.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, EPA has established a public docket for this rule, which includes this ICR, under Docket ID number EPA-HQ-OAR-2008-0218. Submit any comments related to the ICR to EPA and OMB. See

ADDRESSES section at the beginning of this notice for where to submit comments to EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW, Washington, DC 20503, Attention: Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after **[Insert date of publication in the Federal Register.]**, a comment to OMB is best assured of having its full effect if OMB receives it by **[Insert date 30 days after publication in the Federal Register.]**. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) a small business whose company has less than 500 employees and is primarily engaged in leaching or beneficiation of uranium, radium or vanadium ores as defined by NAIC code 212291; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This proposed rule is estimated to impact approximately 50 uranium recovery facilities that are currently operating or plan to operate in the future.

To evaluate the significance of the economic impacts of the proposed revisions to Subpart W, separate analyses were performed for each of the three proposed GACTs.

The GACT for uranium recovery facilities that use conventional milling techniques proposes that only phased disposal units or continuous disposal units be used to manage the tailings. For either option, the disposal unit must be lined and equipped with a leak detection system, designed in accordance with Part 192.32(a)(1). If phased disposal is the option chosen, the rule limits the disposal unit to a maximum of 40 acres, with no more than two units open at any given time. If continuous disposal is chosen, no more than 10 acres may be open at any given time. Finally, the Agency is proposing to eliminate the distinction that was made in the 1989 rule between impoundments constructed pre-1989 and post-1989 since all of the remaining pre-1989 impoundments comply with the proposed GACT. The elimination of this distinction also eliminates the requirement that pre-1989 disposal units be monitored on an annual basis to demonstrate that the average Rn-222 flux does not exceed 20pCi/sec/sq. meter.

The conventional milling GACT applies to three existing mills and one proposed mill that is in the process of being licensed. The four conventional mills are: the White Mesa mill owned by Denison Mines; the Shootaring Canyon mill owned by Uranium One, Inc.; the Sweetwater mill owned by Kennecott Uranium Co.; and the proposed Pinon Ridge mill owned by Energy Fuels, Inc. Of the four companies that own conventional mills, two, Dennison Mines and Energy Fuels, are classified as small businesses using fewer than 500 employees as the classification criterion.

Denison Mines' White Mesa mill uses a phased disposal system that complies with the proposed GACT. When its existing open unit is full it will be contoured and covered and a new unit, constructed in accordance with the proposed GACT, will be opened to accept future tailings. Energy Fuels is proposing a phased disposal system to manage its tailings; this system also complies with the proposed GACT.

Based on the fact that both small entities are in compliance with the proposed GACT, we conclude that the rulemaking will not impose any new economic impacts on either facility. For Denison Mines, the proposed rule will actually result in a cost saving as it will no longer have to perform annual monitoring to determine the average radon flux from its impoundments.

The GACT for evaporation ponds at uranium recovery facilities requires that the evaporation ponds be constructed in accordance with design requirements in Part 192.32(a)(1) and that a minimum of 1 meter of liquid be maintained in the ponds during operation and standby. The key design requirements for the ponds are for a double-liner with a leak detection system between the two liners.

In addition to the four conventional mills identified above, the GACT for evaporation ponds applies to in-situ leach (ISL) facilities and heap leach facilities. Currently, there are five operating ISLs and no operating heap leach facilities. The operating ISLs are Crow Butte and Smith Ranch owned by Cameco Resources, Alta Mesa owned by Mestena Uranium, LLC, Willow Creek owned by Uranium One, Inc., and Hobson owned by Uranium Energy Corp. Again using the fewer than 500 employees criterion, Mestena Uranium, LLC and Uranium Energy Corp are both small businesses, while Cameco Resources and Uranium One, Inc. are both large businesses.

All of the evaporation ponds at the four conventional mills and the five ISLs were built in conformance with Part 192.32(a)(1). Therefore the only economic impact is the cost of complying with the new requirement to maintain a minimum of 1 meter of water in the ponds during operation and standby.

In addition to the five operating ISLs, a number of ISLs have been proposed for licensing. These are: Dewey-Burdock owned by Powertech Uranium Corp.; Nichols Ranch owned by Uranez Uranium Corp.; Moore Ranch owned by Uranium One, Inc.; Benavidas, Kingsville Dome, Los Finados, Rosito, and Vasques all owned by Uranium Resources One. All of these companies, except Uranium One, Inc., are small businesses.

According to the licensing documents submitted by the owners of the proposed ISLs, all will be constructed in conformance with Part 192.32(a)(1). Therefore the only economic impact is the cost of complying with the new requirement to maintain a minimum of 1 meter of water in the ponds during operation and standby.

The requirement to maintain a minimum of 1 meter of liquid in the ponds is estimated to cost up to $0.03 per pound of U_3O_8 produced. This cost is not a significant impact on any of these small entities.

Although there are no heap leach facilities currently licensed, Titan Uranium is expected to submit a licensing application for the Sheep Mountain Project. From the preliminary documentation that Titan has presented, the facility will have an Evaporation Pond, a Collection Pond, and a Raffinate Pond. All three ponds will be double lined with leak detection. However, as Titan Uranium is a large business, it does not affect the determination of impacts on small businesses.

The GACT for heap leach facilities applies the phased disposal option of the GACT for conventional mills to these facilities and adds the requirement that the heap leach pile be maintained at a minimum 30 percent moisture content by weight during operations.

As noted previously, there are no heap leach facilities currently in existence, and the only one that is known to be preparing to submit a license application is being proposed by Titan Uranium, which is a large business.

Of the 19 facilities identified above, 11 are owned by small businesses. No small organizations or small governmental entities have been identified that would be impacted by the proposed GACTs.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires us to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows us to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before we established any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, we must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

We have determined that the options considered in this proposed rule do not contain a Federal mandate that may result in expenditures of $100 million or more to State, local, and tribal governments in the aggregate, or to the private sector in any one year. Thus, this proposed rule is not subject to the requirements of sections 202 and 205 of the UMRA. Additionally, for the same reason as above for all governments, we believe the options considered in this proposed rule do not contain requirements that might significantly or uniquely affect small governments.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Thus, the requirements of the Executive Order do not apply to this proposed rule.

In the spirit of Executive Order 13132 and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This action would not have substantial direct effects on tribal governments, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes. The action imposes requirements on owners and operators of specified area sources and not tribal governments. Thus, Executive Order 13175 does not apply to this action.

EPA specifically solicits additional comment on this proposed action from tribal officials.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the Order has the potential to influence the regulation. This action is not subject to EO 13045 because it is based solely on technology performance.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a "significant energy action" as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This proposed rule will not adversely affect in a material way, productivity, competition, or prices in the energy sector.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law No. 104-113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This proposed rulemaking does not involve test methods. Therefore, EPA is not considering the use of any voluntary consensus standards.

We request public comment on this aspect of the proposed rulemaking, and specifically, ask you to identify potentially applicable voluntary consensus standards and to explain why such standards could be used in this regulation.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it maintains the current level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. This proposed rule would reduce toxics emissions from sources and thus maintain the safe amount of such emissions to which all affected populations are exposed, is a proposed rule that establishes national standards for air quality, and will increase the level of environmental protection without creating “hotspots” that could disproportionately and adversely affect a minority or low-income population.

National Emission Standards for Radon Emissions From Operating Mill Tailings

List of Subjects in 40 CFR Part 61

Environmental protection, Air pollution control, Hazardous substances, Radon, Tailings, Byproduct, Uranium, Reporting and recordkeeping requirements.

____
Dated:

____
Lisa P. Jackson,
Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency proposes to amend title 40, Chapter I of the Code of Federal Regulations as follows:

PART 61—-[AMENDED]

1. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 7401 et seq.

Subpart W—[AMENDED]

2. Section 61.251 is revised by amending one definition and amended by adding new definitions in alphabetical order as follows:

§61.251 Definitions

* * * * *

(h) Conventional Impoundment. A conventional impoundment is a permanent structure located at any uranium recovery facility which contains mostly solid uranium byproduct material from the extraction of uranium from uranium ore. These impoundments are left in place at facility closure.

(i) Non-Conventional Impoundment. A non-conventional impoundment can be located at any uranium recovery facility and contains uranium byproduct material suspended in and/or covered by liquids. These structures are commonly known as holding ponds or evaporation ponds. They are removed at facility closure.

(j) Heap Leach Pile. A heap leach pile is a pile of uranium ore placed on an engineered structure and stacked so as to

allow uranium to be dissolved and removed by leaching liquids.

(k) Standby. Standby means the period of time that an impoundment may not be accepting uranium byproduct materials but has not yet entered the closure period.

(l) Operation. Operation means that an impoundment is being used for the continued placement of uranium byproduct materials or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct materials or tailings are first placed in the impoundment until the day that final closure begins.

(m) Uranium Recovery Facility. A uranium recovery facility means a facility licensed to manage uranium byproduct materials during and following the processing of uranium ores. Common names for these facilities are a conventional uranium mill, an in-situ leach (or recovery) facility and a heap leach facility or pile.

3. Revise §61.252 to read as follows:

§61.252 Standard.

(a) Conventional Impoundments.

(1) Conventional impoundments shall be designed, constructed and operated to meet one of the two following work practices:

(i) Phased disposal in lined tailings impoundments that are no more than 40 acres in area and shall comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.

(ii) Continuous disposal of tailings such that tailings are dewatered and immediately disposed with no more than 10 acres uncovered at any time and shall comply with the requirements of 40 CFR 192.32(a)(1).

(b) Non-Conventional Impoundments. Non-conventional impoundments shall meet the requirements of 40 CFR 192.32(a)(1). During operation and until final closure begins the liquid level in the impoundment shall not be less than one meter.

(c) Heap Leach Piles. Heap leach piles shall comply with the phased disposal work practice standard in 40 CFR 61.252(a)(1)(i). The heap leach piles shall also comply with the requirements of 40 CFR 192.32(a)(1). The moisture content of the heap leach pile shall be maintained at 30% or greater. The moisture content determination shall be performed using generally accepted geotechnical methods.

§61.253 [Removed]

§61.254 [Removed]

Revise Section 61.255 to read as follows:

§61.255 Recordkeeping Requirements

(a) The owner or operator of ~~the~~ any uranium recovery facility must maintain records that confirm ~~the approved design and operating procedures for~~ that the conventional impoundment(s), nonconventional impoundment(s) and heap leach pile(s) at the facility meet the requirements in 40 CFR 192.32(a)(1). ~~Included in t~~These records shall include, but not be limited to, ~~be~~ the results of liner compatibility tests.~~,~~

(b) The owner or operator of any uranium recovery facility with nonconventional impoundments must maintain records that include measurements confirming that one meter of liquid has been constantly maintained in the nonconventional impoundments at the facility.

(c) The owner or operator of any heap leach facility shall maintain ~~and~~ records confirming that the heap leach piles have constantly maintained at least 30% moisture content during the operating life of the heap leach pile.

(d) The~~se~~ records required in paragraphs (a), (b) and (c) above must be kept at the uranium recovery facility for at least five years and must be made available for inspection by the Administrator, or his authorized representative.

Commented [ss45]: What does this mean?

EPA-178

Raymond Lee/DC/USEPA/US	To	Reid Rosnick
03/28/2012 11:42 AM	cc	
	bcc	
	Subject	Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Reid,

See, I told you Tom and Wanda are quick! :)

The last step is to just send out a official meeting notice through Lotus to all of the participating workgroup members with the FAR meeting logistics as well as the call-in number. You also should attach all of you current package materials (including one doc that lists all of the workgroup members) for them to look at.

Again, let me know if you need anything else or have questions.

Thanks,

Ray

-----Forwarded by Raymond Lee/DC/USEPA/US on 03/28/2012 11:40AM -----

To: Raymond Lee/DC/USEPA/US@EPA
From: Tom Eagles/DC/USEPA/US
Date: 03/28/2012 11:37AM
Cc: Wanda Farrar/DC/USEPA/US@EPA
Subject: Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

OK, here you go.
(See attached file: FAR Memo -- Uranium Mill Tailings.pdf)

Inactive hide details for Raymond Lee---03/28/2012 11:26:03 AM---Hi Tom, I just got the automated message that Wanda is out - Raymond Lee---03/28/2012 11:26:03 AM---Hi Tom, I just got the automated message that Wanda is out - I guess you'll have to sign it for us?

From: Raymond Lee/DC/USEPA/US
To: Tom Eagles/DC/USEPA/US@EPA
Date: 03/28/2012 11:26 AM
Subject: Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Tom,

I just got the automated message that Wanda is out - I guess you'll have to sign it for us?

Thanks!

Ray

-----Raymond Lee/DC/USEPA/US wrote: -----
To: Wanda Farrar/DC/USEPA/US@EPA
From: Raymond Lee/DC/USEPA/US
Date: 03/28/2012 11:24AM
Cc: Tom Eagles/DC/USEPA/US@EPA
Subject: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Wanda,

We have another FAR memo ready for signature! If you could look this over, sign it and get it back to us as soon as you can, that would be great! Today is the last day we have to get the materials out to the workgroup per the FAR procedures, and we **just** heard back from Nicole at OP confirming the date (otherwise we would've sent this to you sooner).

Thanks and let me know if you need anything else.

Ray

-----Forwarded by Raymond Lee/DC/USEPA/US on 03/28/2012 11:22AM -----
To: Raymond Lee/DC/USEPA/US@EPA
From: Reid Rosnick/DC/USEPA/US
Date: 03/28/2012 11:20AM
Cc: Tom Peake/DC/USEPA/US@EPA
Subject: Re: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Ray,

OK, I changed the date on the memo to the 19th, got the same room, and attached is the announcement memo ready for signature. Please let me know if there's anything else. Thanks!

Reid

(See attached file: farannouncementmemoSubpart W.docx)

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

Raymond Lee---03/28/2012 11:14:56 AM---Hi Reid, Well, this stinks. Here's the reply from Nicole. If you want to go ahead and pick a time

From: Raymond Lee/DC/USEPA/US
To: Reid Rosnick/DC/USEPA/US@EPA
Date: 03/28/2012 11:14 AM
Subject: Fw: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Reid,

Well, this stinks. Here's the reply from Nicole. If you want to go ahead and pick a time and then insert that into the FAR memo (along with the new 4/19 date), and then forward it on to Wanda and Tom Eagles we should be good to go. Once she signs the memo and gets it back to us, you can send out the official meeting invite along with the materials.

I'm working from home today, so call me at 703-725-8367 if you need anything.

Thanks,

Ray

-----Forwarded by Raymond Lee/DC/USEPA/US on 03/28/2012 11:13AM -----
To: Raymond Lee/DC/USEPA/US@EPA
From: Nicole Owens/DC/USEPA/US
Date: 03/28/2012 10:54AM
Cc: Mariana Cubeddu/DC/USEPA/US@EPA
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Mariana is out.

That time doesn't work for us. Also, neither the day you distribute the material nor the day of the FAR count as full working days. By my count you need to hold the FAR on the 19th, if you distribute the material today. I can do 11:00am or 1:00pm.

Nicole

Raymond Lee---03/28/2012 08:49:44 AM---Hi Nicole, Just following up on this FAR meeting request. Both the workgroup chair and I have ping

From: Raymond Lee/DC/USEPA/US
To: owens.nicole@epa.gov
Date: 03/28/2012 08:49 AM
Subject: Re: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Nicole,

Just following up on this FAR meeting request. Both the workgroup chair and I have pinged

Mariana again but with no response, and we're really trying to get this scheduled so that the date doesn't slip again. Today is the last day we have to send out the FAR materials if we want to meet the 4/17 date.

Does that work on your calendar? Please see the note below for more details.

Thanks,

Ray

-----Raymond Lee/DC/USEPA/US wrote: -----
To: Mariana Cubeddu/DC/USEPA/US@EPA
From: Raymond Lee/DC/USEPA/US
Date: 03/26/2012 01:26PM
Cc: Nicole Owens/DC/USEPA/US@EPA, Reid Rosnick/DC/USEPA/US@EPA
Subject: FAR Meeting for NESHAP Subpart W (SAN 5281)

Hi Mariana/Nicole,

I am putting the finishing touches on another FAR meeting for an ORIA action. This is for the NESHAP Subpart W proposed rule, which will revise national emissions standards for uranium mill tailings.

After discussion amongst the workgroup members, **April 17th (Tuesday) at 1:00 PM** seems to be the best fit. We already have a conference room and call-in number reserved for that date/time, but obviously we want to make sure that you or Nicole are available to chair the meeting then.

Please let me know if those logistics work for either of you and then we'll get all the FAR materials sent out as soon as possible.

Thanks!

Ray

Ray Lee | Center for Radiation Information and Outreach (CRIO) | US EPA | Phone 202.343.9463 | Fax 202.343.2305 | lee.raymond@epa.

[attachment "farannouncementmemoSubpart W.docx" removed by Raymond Lee/DC/USEPA/US] - FAR Memo -- Uranium Mill Tailings.pdf

MAR 2 8 2012

MEMORANDUM

SUBJECT: **Final Agency Review Meeting** for Revisions to National Emissions Standards for Operating Mill Tailings (Tier 2; SAN 5281)

FROM: for Wanda Farrar OW Eagles
OAR Steering Committee Representative

TO: Participating Steering Committee Representatives
Participating Regional Regulatory Contacts
EPA Workgroup Members

The Final Agency Review (FAR) meeting for the Revisions to National Emissions Standards for Operating Mill Tailings is scheduled for Thursday, April 19, 2012 at 1 p.m. EDT. The meeting room is located at 1310 L St., NW, Washington, DC. The call-in number is 866-299-3188, conference code 2023439563. I have confirmed with the workgroup chair that the workgroup has been polled and agrees that this action is ready for FAR. The draft action memo, workgroup list, draft communication materials, fact sheet, supporting analyses and proposed rule are attached. Since the last workgroup meeting we were requested by Gina McCarthy to add some record keeping requirements to the proposal. We added the requirement that the owner/operator of a uranium recovery facility keep the following records on site:

1. The approved design and construction plans that were approved by EPA.
2. All records showing compliance with the one meter of liquid in evaporation ponds.
3. All records showing compliance for the 30% moisture requirement at heap leach piles.

As a result of this amendment we also had to generate an Information Collection Request (ICR) for the record keeping requirement. We also have been adding some language to enhance up the discussion on economics. This is a Tier 2 action.

EPA is proposing to revise certain portions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for radon emissions from operating uranium mill tailings. The proposed emissions standards for new and existing sources are based on EPA's proposed determination as to what constitutes the generally available control technology (GACT) or management practices for this area source category. We are also proposing to add and refine definitions and clarify that the existing rule applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method.

Final Agency Review is the last point for internal cross-Agency review of this action. It provides a forum for confirming that (1) the workgroup has successfully completed its job and resolved or elevated all issues, (2) the rulemaking package is complete and ready for OMB review (if necessary), and (3) all Agency and external requirements have been met. **Each lead workgroup member is expected to represent the position of his or her Assistant/Associate/Regional Administrator (AA or RA) at FAR**, and may take one of the following three positions:

1). If an office has minor, *non-substantive comments,* they may **concur without comment**.

2). If an office has *substantive comments*, they may **concur with comment**. While the lead program should try to resolve the issue(s) raised by the comments, it may choose to go forward to OMB for review, or to the Administrator for signature, without resolving the issues. The lead office is responsible for working with all of the offices that provided substantive comments to determine how to address the comments. If the offices cannot agree on a way to address the comments, the lead office must include the comments in the action memorandum with an explanation of why it cannot satisfactorily address the comments.

3). If an office feels that *a major issue remains unresolved* (e.g., the action lacks legal authority or conflicts with other EPA rules or policies), it may **non-concur**. Non-concurrence indicates that the AA or RA objects to the action being forwarded to OMB, or to the Administrator for signature.

Please address your FAR comments to Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, and send the original memorandum directly to her. Please also forward a copy of your comments to me (farrar.wanda@epa.gov); Reid Rosnick, Workgroup Chair (rosnick.reid@epa.gov or fax: 202-343-2304); and Lena Ferris, OP (ferris.lena@epa.gov or fax: 202-564-0965).

OPEI's Regulatory Management Division (RMD) will chair the FAR meeting and distribute a memorandum following the meeting that documents all positions provided and any further action agreed upon at the meeting. If a participating Office or Region is not represented at the FAR meeting and has not previously contacted the Workgroup Chair and me in writing with his or her AA's or RA's position prior to the meeting, "concurrence without comment" will be assumed.

Thank you for your assistance in reviewing this action. If you have any questions about the FAR process, please call me (202-564-1953). If you have questions about the substance of the notice or need more information on the supporting analyses, please contact Reid Rosnick, the Workgroup Chair, at rosnick.reid@epa.gov or 202-343-9563.

Attachments:

cc: Kristina Friedman
Nicole Owens
Lena Ferris

EPA-5007

Alan Perrin/DC/USEPA/US
03/28/2012 06:17 PM

To Perrin.alan
cc
bcc
Subject subpart W materials to self

Final Agency Review, Subpart W Proposed Rule

Thu 04/19/2012 1:00 PM - 2:00 PM

Attendance is for Alan Perrin

Chair: **Reid Rosnick/DC/USEPA/US**

Location: Call-in number - 866-299-3188 Conference Code 2023439563 Rooms: 1310L Room 502/DC-1310L-OAR@EPA

Required:	Angelique Diaz/R8/USEPA/US@EPA, Barry Elman/DC/USEPA/US@EPA, CharlesA Hooper/R7/USEPA/US@EPA, Charlie Garlow/DC/USEPA/US@EPA, Davis Zhen/R10/USEPA/US@EPA, George Brozowski/R6/USEPA/US@EPA, Marilyn Ginsberg/DC/USEPA/US@EPA, Nicole Owens/DC/USEPA/US@EPA, Robert Dye/R7/USEPA/US@EPA, Stephen Hoffman/DC/USEPA/US@EPA, Stuart Walker/DC/USEPA/US@EPA, Susan Stahle/DC/USEPA/US@EPA, Tim Benner/DC/USEPA/US@EPA, Tom Peake/DC/USEPA/US@EPA, Wanda Farrar/DC/USEPA/US@EPA
Optional:	Alan Perrin/DC/USEPA/US@EPA, Andrea Cherepy/DC/USEPA/US@EPA, Daniel Schultheisz/DC/USEPA/US@EPA, Mariana Cubeddu/DC/USEPA/US@EPA, Philip Egidi/DC/USEPA/US@EPA, Raymond Lee/DC/USEPA/US@EPA, Tom Eagles/DC/USEPA/US@EPA

Description

Draft Outline FR Proposal for Revision of Subpart W Rev15.docx

Workgroup Members and Contact Information.docx Draft Action MEMO Subpart W.docx

FAR Memo -- Subpart W.pdf All, Attached for the FAR meeting are the announcement memo, the draft action memo, a list of workgroup members and the draft preamble and rule language. Please let me know if you have any questions or comments. Thanks.

Personal Notes

Alan Perrin, Deputy Director
Radiation Protection Division, USEPA
office (202) 343-9775 | bb (202) 279-0376

ENVIRONMENTAL PROTECTION AGENCY **6560.50**

40 CFR Part 61

[EPA-HQ-OAR-2008-0218; FRL_XXXX-X]

RIN 2060-AP21

Revisions to National Emission Standards for Radon Emissions from Operating Mill Tailings

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to revise certain portions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for radon emissions from operating uranium mill tailings. The proposed emissions standards for new and existing sources are based on what constitutes the generally available control technology (GACT) or management practices for this area source category. We are also proposing to add and refine definitions and clarify that the existing rule applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method.

DATES: Comments must be received on or before **[insert date]**, days after publication in the Federal Register.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2008-0218, by one of the following methods:

- www.regulations.gov: Follow the on-line instructions for submitting comments.
- Email: a-and-r-docket@epa.gov
- Fax: 202-566-9744
- Mail: Air and Radiation Docket, Environmental Protection Agency, Mailcode: 2822T, 1200 Pennsylvania Ave., NW, Washington, DC 20460.
- Hand Delivery: EPA West Building, Room 3334, 1301 Constitution Ave., NW Washington, DC 20004. Such deliveries are only accepted during the Docket’s normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA-HQ-OAR-2008-0218. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other

information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through www.regulations.gov or e-mail. The www.regulations.gov website is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through www.regulations.gov your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at http://www.epa.gov/epahome/dockets.htm

Docket: All documents in the docket are listed in the www.regulations.gov index. Although listed in the index, some information is not publicly available, e.g., CBI or

other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in www.regulations.gov or in hard copy at the Office of Air and Radiation Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air and Radiation Docket is (202) 566-1792.

FOR FURTHER INFORMATION CONTACT: Reid J. Rosnick, Office of Radiation and Indoor Air, Radiation Protection Division, Mailcode 6608J, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW Washington, DC 20460; telephone number: 202-343-9290; fax number: 202-343-2304; email address: rosnick.reid@epa.gov.

SUPPLEMENTARY INFORMATION:

Outline. The information in this preamble is organized as follows:

I. General Information
- A. Does this action apply to me?
- B. What should I consider as I prepare my comments to EPA?
- C. Acronyms and abbreviations

D. Where can I get a copy of this document?
E. When would a public hearing occur?
II. Background Information for Proposed Area Source Standards
A. What is the statutory authority for the proposed standards?
B. What criteria did EPA use in developing the proposed GACT standards for these area sources?
C. What source category is affected by the proposed standards?
D. What are the production operations, emission sources, and available controls?
E. What are the existing requirements under Subpart W?
F. How did we gather information for this proposed rule?
G. What revisions are we making to Subpart W?
H. How does this action relate to other EPA standards?
III. Summary of the Proposed Requirements
A. What are the proposed standards?
B. What are the initial and subsequent requirements?
C. What are the monitoring requirements?
D. What are the notification, recordkeeping and reporting requirements?
E. When must I comply with these proposed standards?
IV. Rationale for this Proposed Rule
A. How did we determine GACT?
B. Proposed GACT standards for operating mill tailings
V. Other Issues Generated by Our Review of Subpart W
A. Clarification of the Term "standby"
B. Amending the definition of "operation" for conventional impoundments
C. Weather Events
D. Applicability of 40 CFR 192.32(a) to Subpart W
VI. Summary of Environmental, Cost and Economic Impacts
A. What are the air impacts?
B. What are the cost and economic impacts?
C. What are the non-air environmental impacts?
VII. Statutory and Executive Order Reviews
A. Executive Order 12866: Regulatory Planning and Review
B. Paperwork Reduction Act
C. Regulatory Flexibility Act
D. Unfunded Mandates Reform Act
E. Executive Order 13132: Federalism
F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks
H. Executive Order 13211: Actions Concerning Regulations
That Significantly Affect Energy Supply, Distribution or Use
I. National Technology Transfer Advancement Act
J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

I. General Information

A. Does this Action Apply to Me?

The regulated categories and entities potentially affected by the proposed standards include:

Category	NAICS code[1]	Examples of regulated Entities
Industry:		
Uranium Ores Mining and/or Beneficiating	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content
Leaching of Uranium, Radium or Vanadium Ores	212291	Area source facilities that extract or concentrate uranium from any ore processed primarily for its source material content

[1] North American Industry Classification System.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this proposed action. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permit authority for the entity or your EPA regional representative as listed in 40 CFR 61.04 of subpart A (General Provisions).

B. What Should I Consider as I Prepare My Comments for EPA?

1. ***Submitting CBI.*** Do not submit this information to EPA through www.regulations.gov or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

2. ***Tips for Preparing Your Comments.*** When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, Federal Register date and page number).
- Follow directions - The agency may ask you to

respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.

- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

Make sure to submit your comments by the comment period deadline identified.

C. Acronyms and Abbreviations

We use many acronyms and abbreviations in this document. These include:

AEA – Atomic Energy Act
ALARA – As low as reasonably achievable
BID – Background information document

CAA – Clean Air Act
CAAA – Clean Air Act amendments of 1990
CCAT – Colorado Citizens Against Toxic Waste
CFR – Code of Federal Regulations
Ci – Curie, a unit of radioactivity equal to the amount of a radioactive isotope that decays at the rate of 3.7×10^{10} disintegrations per second.
DOE – U.S. Department of Energy
EIA – economic impact analysis
EO – Executive Order
EPA – U.S. Environmental Protection Agency
FR – Federal Register
GACT – Generally Available Control Technology
gpm - Gallons Per Minute
HAP – Hazardous Air Pollutant
ICRP – International Commission on Radiological Protection
ISL – In-situ leach uranium recovery, also known as in-situ recovery (ISR)
NAAQS – National Ambient Air Quality Standards
NCRP – National Council on Radiation Protection and Measurements
mrem – millirem, 1×10^{-3} rem
MACT – Maximum Achievable Control Technology
NESHAP – National Emission Standard for Hazardous Air Pollutants
NRC – U.S. Nuclear Regulatory Commission
OMB – Office of Management and Budget
pCi – picocurie, 1×10^{-12} curie
Ra-226 - Radium-226
Rn-222 – Radon-222
Radon flux - A term applied to the amount of radon crossing a unit area per unit time, as in picocuries per square centimeter per second ($pCi/m^2/sec$).
RCRA – Resource Conservation and Recovery Act
Subpart W – National Emission Standards for Radon Emissions from Operating Mill Tailings at 40 CFR 61.250-61.256
TEDE – Total Effective Dose Equivalent
UMTRCA – Uranium Mill Tailings Radiation Control Act of 1978
U.S.C. – United States Code

D. Where can I get a copy of this document?

In addition to being available in the docket, an electronic copy of this proposed action will also be available on the Worldwide Web (WWW) through the Technology Transfer Network (TTN). Following signature, a copy of this proposed action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: http://www.epa.gov/ttn/oarpg/. The TTN provides information and technology exchange in various areas of air pollution control.

E. When would a public hearing occur?

If anyone contacts EPA requesting to speak at a public hearing concerning these proposed rules by [INSERT DATE DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER], we will hold a public hearing on [INSERT DATE DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]. If you are interested in attending the public hearing, contact Mr. Anthony Nesky at (202) 343-9597 to verify that a hearing will be held. If a public hearing is held, it will be held at…WILL BE ADDED LATER

II. Background Information for Proposed Area Source Standards

A. What is the statutory authority for the proposed standards?

Section 112(q)(1)[1] of the Clean Air Act (CAA) requires that National Emissions Standards for Hazardous Air Pollutants (NESHAP) "in effect before the date of enactment of the Clean Air Act Amendments of 1990 [Nov. 15, 1990]. . . shall be reviewed and, if appropriate, revised, to comply with the requirements of subsection (d) of . . . section [112] within 10 years after the date of enactment of the Clean Air Act Amendments of 1990." EPA promulgated 40 CFR Part 61, Subpart W, "National Emission Standards for Radon Emissions From Operating Mill Tailings," ("Subpart W") on December 15, 1989, but has not previously reviewed or revised Subpart W. EPA is conducting this review of Subpart W under CAA section 112(q)(1) to determine what revisions, if any, are appropriate.

Section 112(d) of the CAA requires EPA to establish emission standards for major and area source categories that are listed for regulation under CAA section 112(c). A major source is any stationary source that emits or has the potential to emit 10 tons per year (tpy) or more of any single hazardous air pollutant (HAP) or 25 tpy or more of any combination of HAP. An area source is a stationary

[1] On April 26, 2007, Colorado Citizens Against Toxic Waste and Rocky Mountain Clean Air Action filed a lawsuit against EPA (Docket Reference) for EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009 (Docket reference).

source that is not a major source. For the purpose of Subpart W, the HAP at issue is radon-222. Calculations of radon emissions from operating uranium recovery facilities have shown that facilities regulated under Subpart W are area sources. (REFERENCE)

Section 112(q)(1) does not dictate how EPA must conduct its review of those NESHAP issued prior to 1990. Rather, it provides that the Agency must review, and if appropriate, revise the standards to comply with the requirements of 112(d). Determining what revisions, if any, are appropriate for these NESHAP is best assessed through a case-by-case consideration of each NESHAP. As explained below, in this case, we have reviewed Subpart W and are revising the standards consistent with section 112(d)(5), which provides EPA authority to issue standards for area sources.

Under CAA section 112(d)(5), the Administrator may elect to promulgate standards or requirements for area sources "which provide for the use of generally available control technologies or management practices by such sources to reduce emissions of hazardous air pollutants." Under section 112(d)(5), the Administrator has the discretion to use generally available control technology or management practices (GACT) in lieu of maximum achievable control technology (MACT) under section 112(d)(2) and (d)(3), which is required for major sources. Pursuant to section 112(d)(5), we are proposing revisions to Subpart W to reflect GACT.

B. What criteria did EPA use in developing the proposed GACT standards for these area sources?

Additional information on the definition of GACT is found in the Senate report on the legislation (Senate Report Number 101-228, December 20, 1989), which indicates GACT means:

> * * * methods, practices and techniques which are commercially available and appropriate for application by the sources in the category considering economic impacts and the technical capabilities of the firms to operate and maintain the emissions control systems.

Consistent with the legislative history, in addition to considering technical capabilities of the facilities and the availability of control measures, we may consider costs and economic impacts in determining GACT, which is particularly important when developing regulations for source categories that may have few establishments and many small businesses.

Determining what constitutes GACT involves considering the control technologies and management practices that are generally available to the area sources in the source category. We also consider the standards applicable to major sources[2] in the same industrial sector to determine if the control technologies and management practices are transferable and generally available to area sources. In appropriate circumstances, we may also consider technologies and practices at area and major sources in similar categories to determine whether such technologies and practices could be considered generally available for the area source category at issue. Finally, as noted above, in determining GACT for a particular area source category, we consider the costs and economic impacts of available control technologies and management practices on that category.

C. What source category is affected by the proposed standards?

As defined by EPA pursuant to the CAA, the source category for 40 CFR Part 61, Subpart W (hereafter "Subpart W") is "facilities licensed [by the U.S. Nuclear Regulatory Commission (NRC)] to manage uranium byproduct material during and following the processing of uranium ores, commonly referred to as uranium mills and their associated tailings." 40 CFR 61.250. Subpart W defines "uranium byproduct material or tailings" as "the waste produced by

[2] None of the sources in this source category are major sources.

the extraction or concentration of uranium from any ore processed primarily for its source material content.[3]” 40 CFR 61.251(g). For clarity, in this proposed rule we refer to this source category by the term “uranium recovery facilities” and we are proposing to add this phrase to the definitions section of the rule. Use of this term encompasses the existing universe of facilities that are currently regulated under Subpart W. Uranium recovery facilities process uranium ore to extract uranium. Any type of uranium recovery facility that manages uranium byproduct material or tailings is subject to regulation under Subpart W. This currently includes three types of uranium recovery facilities: (1) conventional uranium mills; (2) in-situ leach recovery facilities; and (3) heap leach facilities. Subpart W requirements specifically apply to the affected sources at the uranium recovery facilities that are used to manage or contain the uranium byproduct material or tailings. Common names for these structures may include, but are not limited to, impoundments, tailings impoundments, evaporation or holding ponds, and heap leach piles. However, the name itself is not important for

[3] Pursuant to the Atomic Energy Act of 1954, as amended, the Nuclear Regulatory Commission defines “source material” as “(1) Uranium or thorium or any combination of uranium or thorium in any chemical or physical form; or (2) Ores that contain, by weight, one-twentieth of one percent (0.05 percent), or more, of uranium or thorium, or any combination of uranium or thorium.” (10 CFR 20.1003)

determining whether Subpart W requirements apply to that structure; rather, applicability is based on the use of these structures to manage or contain uranium byproduct material.

D. What are the production operations, emission sources, and available controls?

As noted above, uranium recovery and processing currently occur by one of three methods: (1) conventional milling; (2) in-situ leach (ISL); and (3) heap leach. Below we present a brief explanation of the various uranium recovery methods and the usual structures that contain uranium byproduct materials.

(1) Conventional Mills.

Conventional milling is one of the two primary recovery methods that are currently used to extract uranium from mined ore. Conventional mills are typically located in areas of low population density. Only one conventional mill in the United States is currently operating; the others are in standby, in decommissioning (closure) or have already been decommissioned.

A conventional uranium mill is a chemical plant that extracts uranium using the following process:

(A) Trucks deliver uranium ore to the mill, where it is crushed before the uranium is extracted through a leaching process. In most cases, sulfuric acid is the leaching agent, but alkaline solutions can also be used to leach the uranium from the ore. The process generally extracts 90 to 95 percent of the uranium from the ore.

(B) The mill then concentrates the extracted uranium to produce a uranium oxide material which is called "yellowcake" because of its yellowish color.[4]

(C) Finally, the yellowcake is transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

(D) The waste generated from this process produces both solid and liquid wastes (i.e., uranium byproduct material, or “tailings”), which are transported from the extraction location to an on-site tailings impoundment or a pond for temporary storage.

Uranium byproduct material/tailings are typically created in slurry form during processing and are then

[4] The term “yellowcake” is still commonly used to refer to this material, although in addition to yellow the uranium oxide material can also be black or grey in color.

deposited in an impoundment or "mill tailings pile" which must be carefully monitored and controlled. This is because the mill tailings contain heavy metal ore constituents, including radium. The radium decays to produce radon, which may then be released to the environment. Because radon is a radioactive gas which may be inhaled into the respiratory tract, EPA has determined that exposure to radon and its daughter products contributes to an increased risk of lung cancer. Its presence is of particular concern in confined areas (such as mines or homes).[5]

The holding or evaporation ponds at this type of facility hold liquids containing byproduct material which are also regulated under Subpart W. These ponds are discussed in more detail in the next section.

(2) In-Situ Leach/Recovery

In-situ leach or recovery sites (ISL/ISR, in this document we will use ISL) represent the majority of the uranium recovery operations that currently exist. The research and development projects and associated pilot projects of the 1980s demonstrated ISL as a viable uranium recovery technique where site conditions (e.g., geology) are amenable to its use. The economics of this technology produce a better return on the investment dollar;

[5] http://www.epa.gov/radon/pdfs/citizensguide.pdf

therefore, the cost to produce uranium is more favorable to investors. Due to this, the trend in uranium production is moving toward the ISL process.

In-situ leaching is defined as the underground leaching or recovery of uranium from the host rock (typically sandstone) by chemicals, followed by recovery of uranium at the surface. Leaching, or more correctly the re-mobilization of uranium into solution, is accomplished through the underground injection of a lixiviant into the host rock (i.e., ore body) through wells that are connected to the ore formation. A lixiviant is a chemical solution used to extract (or leach) uranium from underground ore bodies.

The injection of a lixiviant essentially reverses the geochemical reactions that resulted in the formation of the uranium deposit. The lixiviant assures that the dissolved uranium, as well as other metals, remains in the solution while it is collected from the ore zone by recovery wells which pump the solution to the surface. At the surface, the uranium is recovered in an ion exchange column and further processed into yellowcake. The yellowcake is packaged and transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

Two types of lixiviant solutions can be used, loosely defined as “acid” or “alkaline” systems. In the U.S., the geology and geochemistry of the majority of the uranium ore bodies favors the use of alkaline lixiviants or bicarbonate-carbonate lixiviant and oxygen. Other factors in the choice of the lixiviant are the uranium recovery efficiencies, operating costs, and the ability to achieve satisfactory ground water restoration.

After processing, lixiviant is recharged and pumped back down into the formation for reuse in extracting more uranium. However, a small amount of this liquid is held back from reinjection to maintain a proper pressure gradient within the wellfield. This liquid is sent to an impoundment (often called an evaporation pond or holding pond) on site or injected into a deep well for disposal. These ponds, since they contain uranium byproduct material, are subject to the requirements of Subpart W. In addition, there is a risk of the lixiviant spreading beyond the zone of the uranium deposit (excursion), and this produces a risk of ground-water contamination. The operator of the ISL facility remediates this excursion by pumping large amounts of water in and out of the formation to contain the excursion, and this water (often containing byproduct

material) is often stored in the evaporation or holding ponds. Although the excursion operation itself is not regulated under Subpart W, the ponds that contain byproduct material are regulated since they are a potential source of radon emissions. After the ore body has been depleted, restoration of the formation is accomplished by flushing the host rock with water and sometimes additional chemicals. The restoration fluids are also considered byproduct material.

(3) Heap Leaching

In addition to conventional uranium milling and ISL, some facilities may use an extraction method known as heap leaching. In some instances uranium ore is of such low grade or the geology of the ore body is such that it is not cost-effective to remove the uranium via conventional milling or through ISL. In this case a heap leaching method may be utilized.

No such facilities currently operate to recover uranium in the U.S. However, there are plans for at least one facility to open in the U.S. within the next few years.

Heap leach/ion-exchange operations involve the following process:

A. Small pieces of ore are placed in a large pile, or "heap," on an impervious pad of plastic, clay, or asphalt, with perforated pipes under the heap.

B. An acidic solution is then sprayed[6] over the ore to dissolve the uranium it contains.

C. The uranium-rich solution drains into the perforated pipes, where it is collected and transferred to an ion-exchange system.

D. The heap is "rested," meaning that there is a temporary cessation of application of acidic solution to allow for oxidation of the ore before leaching begins again.

E. The ion-exchange system extracts the uranium from solution where it is later processed into a yellowcake.

F. The yellowcake is packed in 55-gallon drums to be transported to a uranium conversion facility where it is processed through the stages of the nuclear fuel cycle to produce fuel for use in nuclear power reactors.

[6] Other technology includes drip systems, sometimes used at gold extraction heaps.

G. Finally, there is a final drain down of the heap solutions, as well as a possible rinsing of the heap, upon which it is closed in place.

Today we are proposing to regulate this type of uranium extraction under Subpart W. Our rationale (explained in greater detail in Section IV.D.4.) is that from the moment uranium extraction takes place in the heap, uranium byproduct material is left behind.

There may also be holding or evaporation ponds at this type of facility. In many cases these ponds hold liquids containing byproduct material and are regulated under Subpart W.

E. What are the existing requirements under Subpart W?

Subpart W was promulgated on December 15, 1989 (54 FR 51654). At the time of promulgation the predominant form of uranium recovery was through the use of conventional mills. There are two separate standards required in Subpart W. The first standard is for “existing” impoundments, e.g., those in existence and licensed by the NRC or it’s Agreement States) on or prior to December 15, 1989. Those existing facilities must ensure that emissions from the existing tailings impoundments not exceed a radon (Rn-222) flux standard of 20 picocuries per meter squared per second (pCi/m^2/sec). As stated at the time of promulgation: "This rule will have the practical effect of requiring the mill owners to keep their piles wet or covered.[7]" Keeping the piles (impoundments) wet or covered with soil would reduce radon emissions to a level that would meet the standard. This is still considered an effective method to reduce radon emissions at all uranium tailings impoundments.

The method for monitoring for compliance with the radon flux standard was prescribed as Method 115, found at 40 CFR Part 61, Appendix B. The owners or operators of existing impoundments must report to EPA the results of the compliance testing for any calendar year by no later than March 31 of the following year. There is one existing operating mill with impoundments that pre-date December 15, 1989, and two mills that are currently in standby mode.

The second standard applies to "new" impoundments designed and/or constructed after December 15, 1989. The requirements are work practice standards that regulate the size and number of impoundments, or the amount of tailings that may remain uncovered at any time. After December 15, 1989, 40 CFR 61.252(b) states that no new tailings impoundment can be built unless it is designed, constructed

[7] See 54 FR 51689

and operated to meet one of the following two work practices:

1. Phased disposal in lined impoundments that are no more than 40 acres in area and meet the requirements of 40 CFR 192.32(a) as determined by the NRC. The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.
2. Continuous disposal of tailings that are dewatered and immediately disposed with no more than 10 acres uncovered at any time and operated in accordance with 40 CFR 192.32(a) as determined by the NRC.

The basis of the work practice standards are to (1) limit the size of the impoundment, which limits the radon source; or (2) utilize the continuous disposal system, which prohibits large accumulations of uncovered tailings, limiting the amount of radon released.

The work practice standards described above were promulgated after EPA considered a number of factors that influence the emissions of Rn-222 from tailings impoundments, including the climate and the size of the impoundment. For example, for a given concentration of Ra-226 in the tailings, and a given grain size of the

tailings, the moisture content of the tailings will control the radon emission rate; the higher the moisture content the lower the emission rate. In the arid and semi-arid areas of the country where most impoundments are located or proposed, the annual evaporation rate is quite high. As a result, the exposed tailings (absent controls like sprinkling) dry rapidly. In previous assessments, we explicitly took the fact of rapid drying into account by using a Rn-222 flux rate of 1 pCi/m^2/s per pCi/g Ra-226 to estimate the Rn-222 source term from the dry areas of the impoundments. (Note: The estimated source terms from the ponded (areas completely covered by liquid) and saturated areas of the impoundments are considered to be zero, reflecting the complete attenuation of the Rn-222).

Another fact we considered was the size of the impoundment, which has a direct linear relationship with the Rn-222 source term. Again, assuming the same Ra-226 concentration and grain sizes in the tailings, a 100-acre dry impoundment will emit 10 times the radon of a 10-acre dry impoundment. This linear relationship between size and Rn-222 source term is one of the main reasons that Subpart W imposed size restrictions on all future impoundments (40 acres per impoundment if phased disposal is chosen and 10 acres total uncovered if continuous disposal is chosen).

Subpart W also mandates that all tailings impoundments at uranium recovery facilities comply with the requirements at 40 CFR 192.32(a). EPA explained the reason for adding this requirement in the preamble as follows:

> "EPA recognizes that in the case of a tailings pile which is not synthetically or clay lined (the clay lining can be the result of natural conditions at the site) water placed on the tailings in an amount necessary to reduce radon levels, can result in ground water contamination. In addition, in certain situations the water can run off and contaminate surface water. EPA cannot allow a situation where the reduction of radon emissions comes at the expense of increased pollution of the ground or surface water. Therefore, all piles will be required to meet the requirements of 40 CFR 192.32(a) which protects water supplies from contamination. Under the current rules, existing piles are exempt from these provisions, this rule will end that exemption."

54 FR 51654, 51680 (December 15, 1989). Therefore, all impoundments are required to meet the requirements at 40 CFR 192.32(a).

Section 192.32(a) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any

time during the active life of the impoundment. Briefly, 40 CFR 264.221(c) requires that the liner system must include:

1. A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into the liner during the active life of the unit.
2. A composite bottom liner consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life of the unit. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least three feet of compacted soil material with a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec.
3. A leachate collection and removal system between the liners, which acts as a leak detection system. This system must be capable of detecting, collecting and removing hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to the waste or liquids in the impoundment.

There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements.[8]

F. How Did We Gather Information for this Proposed Rule?

This section describes the information we used as the basis for making the determination to revise Subpart W. We collected this information using various methods. We performed literature searches, where appropriate, of the engineering methods used by existing uranium recovery facilities in the United States as well as the rest of the world. We used this information to determine whether the technology used to contain uranium byproduct material had advanced since the time of the original promulgation of Subpart W. We reviewed and compiled a list of existing and proposed uranium recovery facilities and the containment technologies being used, as well as those proposed to be used. We compared and contrasted those technologies with the engineering requirements of hazardous waste surface impoundments regulated under Subtitle C of the Resource Conservation and Recovery Act (RCRA), which are used as the

[8] For detailed information on the design and operating requirements, refer to 40 CFR Part 264 Subpart K – Surface Impoundments.

design basis for existing uranium byproduct material impoundments.

We collected information on existing uranium mills and in-situ leach facilities by issuing information collection requests authorized under section 114(a) of the CAA to uranium recovery facilities. These requests required uranium recovery companies to provide detailed information about the uranium mill and/or in-situ leaching facility, as well as the number, sizes and types of affected sources (tailings impoundments, evaporation ponds and collection ponds) that now or in the past held uranium byproduct material. We requested information on the history of operation since 1975, ownership changes, whether the operation was in standby mode and whether plans existed for new facilities or reactivated operations were expected.[9]

We also reviewed the regulatory history of Subpart W and the radon measurement methods used to determine compliance with the existing standards, and we performed a comparison between the 1989 risk assessment used for promulgation of Subpart W with current risk assessment approaches, focusing on the adequacy and the appropriateness of the original assessments. We did this by

[9] Section 114(a) letters and responses can be found at http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

using the information we collected to perform new risk assessments for existing facilities, as well as two idealized "generic" sites, one located in the eastern half of the United States and one located in the southwest United States. (These two model sites do not exist. They are idealized using representative features of mills in differing climate and geography). This information has been collected into one document[10] that has been placed in the docket (DOCKET REFERENCE) for this proposed rulemaking. Below is a synopsis of the information we collected and our analyses.

1. Pre-1989 Conventional Mill Impoundments

We have been able to identify three facilities, either operating or on standby,[11] that have been in operation since before the promulgation of Subpart W in 1989. These existing facilities must ensure that emissions from their impoundments not exceed a radon (Rn-222) flux standard of 20 pCi/m^2/sec. The method for monitoring for compliance with the radon flux standard was prescribed as Method 115, found

[10] Technical and Regulatory Support to Develop a Rulemaking to Potentially Modify the NESHAP Subpart W Standard for Radon Emissions from Operating Uranium Mills (40 CFR 61.250)

[11] "Standby" is when a facility impoundment is licensed for the continued placement of tailings/byproduct material but is currently not receiving tailings/byproduct material. See Section V.A. for a discussion of this definition that we are proposing to add to Subpart W.

at 40 CFR Part 61, Appendix B. These facilities must also meet the requirements in 40 CFR 61.252(c), which cross-references the requirements of 40 CFR 192.32(a).

The White Mesa Conventional Mill in Blanding, Utah, has one pre-1989 impoundment (known by the company as Cell 3) that is currently in operation and near capacity but is still authorized and continues to receive tailings. The company has placed as much tailings sands into it as possible at this time. The company is now pumping any residual free solution out of the cell and contouring the sands. It will then be determined whether any more solids need to be added to the cell to fill it to the specified final elevation. It is expected to close in the near future. (Reference) The mill also uses an impoundment constructed before 1989 as an evaporation pond (known as Cell 1). Since it most likely contains byproduct material it is also regulated by Subpart W.

The Sweetwater conventional mill is located 42 miles northwest of Rawlins, Wyoming. The mill operated for a short time in the 1980s and is currently in standby status. Annual radon values collected by the facility indicate that there is little measurable radon flux from the mill tailings that are currently in the lined impoundment. This monitoring program remains active at the facility. According to company records, of the 37 acres of tailings, approximately 28.3 acres of tailings are covered with soil; the remainder of the tailings are continuously covered with water. The dry tailings have an earthen cover that is maintained as needed. During each monitoring event one hundred radon flux measurements are taken on the exposed tailings, as required by Method 115 for compliance with Subpart W. The mean radon flux for the exposed tailings was 8.5 pCi/m^2/sec. The radon flux for the entire tailings impoundment was calculated to be 6.01 pCi/m^2/sec. The calculated radon flux from the entire tailings impoundment surface is thus approximately 30% of the 20.0 pCi/m^2/sec standard. (Reference)

The Shootaring Canyon project is a conventional mill located about 3 miles north of Ticaboo, Utah, in Garfield County. The approximately 1,900-acre site includes an ore pad, a small milling building, and a tailings impoundment system that is partially constructed. The mill operated for a very short period of time. Shootaring Canyon did pre-date the standard, but the mill was shut down prior to the promulgation of the standard. The impoundment is in a standby status and has an active license administered by the Utah Department of Environmental Quality, Division of

Radiation Control. The future plans for this uranium recovery operation are unknown. Current activities at this remote site consist of intermittent environmental monitoring by consultants to the parent company. (Reference)

The Shootaring Canyon mill operated for approximately 30 days. Tailings were deposited in a portion of the upper impoundment. A lower impoundment was conceptually designed but has not been built. Milling operations in 1982 produced 25,000 cubic yards of tailings, deposited in a 2,508 m^2 (0.62 acres) area. The tailings are dry except for moisture associated with occasional precipitation events; consequently, there are no beaches[12]. The tailings have a soil cover that is maintained by the operating company. Radon sampling for the 2010 year took place in April. Again, one hundred radon flux measurements were collected. The average radon flux from this sampling event was 11.9 pCi/m^2-sec for the less than one acre surface area.

A fourth mill is Cotter Corporation in Cañon City, Colorado. The mill no longer exists, and the pre-1989 impoundments are in closure. A reclamation plan exists but is under revision as part of license renewal. Since the

[12] The term “beaches” refers to portions of the tailings impoundment where the tailings are wet but not saturated or covered with liquids.

impoundments are in closure, the impoundments would not be subject to Subpart W but instead would be subject to the long-term closure and decommissioning requirements in their license issued by the state of Colorado, an NRC agreement State.

2. 1989-Present Conventional Mill Impoundments

There currently is only one operating conventional mill with an impoundment that was constructed after December 15, 1989. The White Mesa conventional mill in Utah has two impoundments (Cell 4A and Cell 4B: Cell 4A is currently operating and Cell 4B is being used as an evaporation pond) designed and constructed after 1989. The facility uses the phased disposal work practice for their impoundments. There are several conventional mills in the planning and/or permitting stage and these impoundments will utilize one of the current work practice standards.

3. In-Situ Leach Facilities

After Subpart W was promulgated, the price of uranium began to fall, and the uranium mining and milling industry essentially collapsed, with very few operations remaining in business. However, several years ago, because of renewed interest in nuclear power, the price of uranium began to rise so that it became profitable once more for companies to consider uranium recovery. ISL has been the preferred choice of uranium extraction where suitable geologic conditions exist.

Currently there are five ISL facilities in operation: (1) the Alta Mesa project in Brooks County, Texas; (2) the Crow Butte Operation in Dawes County, Nebraska; (3) the Hobson/La Palangana Operation in South Texas; (4) the Willow Creek (formerly Christensen Ranch/Irigaray Ranch) in Wyoming; and (5) the Smith Ranch-Highland Operation in Converse County, Wyoming.[13] These facilities use or have used evaporation ponds to hold back liquids containing uranium byproduct material from reinjection to maintain a proper pressure gradient within the wellfield.[14] These ponds are subject to the Subpart W requirements and range in size from less than an acre up to 40 acres. Based on the information provided to us the majority of the ponds meet the requirements of 40 CFR 61.252(c).

There are approximately 12 facilities in various stages of licensing or on standby. It is anticipated that there could be approximately another 20-30 license applications over the next 5-10 years (REFERENCE).

4. Heap Leach Facilities

[13] Source: U.S. Energy Information Administration, http://www.eia.gov/uranium/production/quarterly/html/qupd_tbl4.html

[14] The Alta Mesa operation uses deep well injection rather than evaporation ponds.

As stated earlier, there are currently no operating heap leach facilities in the United States. We are aware of two to three potential operations. The most advanced application is the Sheep Mountain facility in Wyoming. Titan Uranium has announced its intent to submit a license application to the NRC in mid 2012. One or two other as yet to be determined operations may be located in Lander County, Nevada and a site in New Mexico.

(5) Risk Analysis.

One of the tasks we performed while considering how to set a GACT standard in this proposal for existing impoundments was to update the risk analysis we performed for promulgating the risk standard in 1989, focusing on the adequacy and the appropriateness of the original assessment using updated risk assumptions, particularly as the risk related to the radon flux standard of 20 pCi/m^2/sec for the conventional impoundments in operation prior to December 15, 1989 (REFERENCE).

As part of this work, we evaluated various computer models that could be used to calculate the doses and risks due to the operation of conventional and ISL uranium recovery facilities, and selected CAP88 V 3.0 for use in this analysis. CAP88 V 3.0 was developed in 1988 from the

AIRDOS, RADRISK, and DARTAB computer programs, which had been developed for the EPA at the Oak Ridge National Laboratory (ORNL).

CAP88 V 3.0, which stands for “Clean Air Act Assessment Package-1988 version 3.0,” is used to demonstrate compliance with the NESHAP requirements applicable to radionuclides. CAP88 V 3.0 calculates the doses and risk to a designated receptor as well as the surrounding population. Exposure pathways evaluated by CAP88 V 3.0 are: inhalation, air immersion, ingestion of vegetables, meat, and milk, and ground surface exposure. CAP88 V 3.0 uses a modified Gaussian plume equation to estimate the average dispersion of radionuclides released from up to six emitting sources. The sources may be either elevated stacks, such as a smokestack, or uniform area sources, such as the surface of a uranium byproduct material impoundment. Plume rise can be calculated assuming either a momentum or buoyant-driven plume.

At several sites analyzed in this evaluation only site-wide releases of radon were available to us. This assessment was limited by the level of detail provided by its sources. In instances where more specific data were available, site-wide radon releases were used as a bounding estimate. Assessments are done for a circular grid of distances and directions for a radius of up to 80 kilometers (50 miles) around the facility. The Gaussian plume model produces results that agree with experimental data as well as any model, is fairly easy to work with, and is consistent with the random nature of turbulence. A description of the mathematical models used by CAP88 V 3.0 is provided in the CAP88 V 3.0 Users Manual.[15]

The uranium recovery facilities that we analyzed included three existing conventional mills (Cotter, White Mesa and Sweetwater), five operating ISL operations (1) the Alta Mesa project in Brooks County, Texas; (2) the Crow Butte Operation in Dawes County, Nebraska; (3) the Hobson/La Palangana Operation in South Texas; (4) the Willow Creek (formerly Christensen Ranch/Irigaray Ranch) in Wyoming; and (5) the Smith Ranch-Highland Operation in Converse County, Wyoming), and two generic sites assumed to be the location of conventional mills (we chose conventional mills because we believe they have the greater potential for radon emissions). One generic site was modeled in the southwest United States (Western Generic) while the other was assumed to be located in the eastern United States (Eastern Generic). This was done to accommodate the recognition that several uranium recovery

[15] http://www.epa.gov/radiation/assessment/CAP88 V 3.0/index.html

facilities are expected to apply for construction licenses in the future, and to determine potential risks in geographic areas of the U.S. that customarily have not hosted uranium recovery facilities. For this proposal the facilities we were most interested in were the White Mesa mill and the Sweetwater mill. (The Shootaring Canyon mill was not analyzed, because the impoundment is very small and is soil covered, and the Cotter facility is now in closure). These conventional mills are either in operation or standby and are subject to the flux standard of 20 $pCi/m^2/sec$. The risk analyses performed for these two mills showed that the lifetime risks from radon emissions from the White Mesa impoundments were 1.1×10^{-4} while the lifetime risks from radon associated with the impoundments at the Sweetwater mill were 2.4×10^{-5}. In protecting public health, EPA strives to provide the maximum feasible protection by limiting lifetime cancer risk from radon exposure to approximately 1 in 10,000 (i.e., 10^{-4}). The analyses also estimated that the risk to the population (i.e., total cancer incidence) from all ten modeled uranium sites is between 0.0015 and 0.0026 fatal cancers per year, or approximately 1 case every 385 to 667 years to the 4 million persons living within 80 km of the uranium recovery facilities. The analyses are described in more detail in the background document generated for this proposal (DOCKET REFERENCE).

(6) Flux Requirement versus Work Practice Standards for Conventional Impoundments in operation before December 15, 1989.

In performing our analysis we considered the information we received from all the existing conventional impoundments. We also looked at the compliance history of the existing conventional impoundments. After this review we considered two specific questions: 1) Are any of the conventional impoundments using any novel methods to reduce radon emissions? 2) Is there now any reason to believe that any of the existing impoundments could not comply with the work practice standards for new impoundments, in which case would we need to continue to make the distinction between conventional impoundments constructed before or after December 15, 1989. We arrived at the following conclusions: First, we are not aware of any impoundment that uses any novel technologies to reduce radon emissions. Impoundment operators continue to use the standard method of reducing radon emissions by limiting the size of the impoundment and covering tailings with soil or keeping tailings wet. These are very effective methods for limiting the amount of radon released to the environment.

Second, we believe that only one existing operating impoundment designed and in operation before December 15, 1989, could not meet the work practice standards. This impoundment is Cell 3 at the White Mesa mill, which is expected to close in 2012. We were very clear in our 1989 rulemaking that all conventional mill impoundments must meet the requirements of 40 CFR 192.32(a), which in addition to requiring ground-water monitoring also required the use of liner systems to ensure there would be no leakage from the impoundment into the ground water. We did this by ending the exemption for existing piles from the 40 CFR 192.32(a) requirements (54 FR 51680). However, we did not require those existing impoundments to meet either the phased disposal or continuous disposal work practice standards, which limit the area and number of impoundments, thereby limiting the potential for radon emissions. This is because at the time of promulgation of the rule, conventional impoundments existed that were larger in area than the maximum work practice standard of 40 acres used for the phased disposal work practice, or 10 acres for the continuous disposal requirement. This area limitation was important in reducing the amount of exposed tailings that were available to emit radon. However, we recognized that by instituting a radon flux standard we would require owners and operators to limit radon emissions (usually by placing water or soil) on exposed portions of the impoundments. The presumption was that impoundments constructed before this date could be left in a dry and uncovered state, which would allow for unfettered release of radon. The flux standard was promulgated to have the practical effect of requiring owners and operators of these old impoundments to keep their tailings either wet or covered with soil, thereby reducing the amount of radon that could be emitted (54 FR 51680).

We believe that the existing impoundments at both the Shootaring Canyon and Sweetwater facilities can meet the work practice standards in the current Subpart W regulation. Impoundments at both these facilities are less than 40 acres in area and are synthetically lined as per the requirements in 40 CFR 192.32(a). We also have information that the new impoundments operating at the White Mesa mill will follow the phased work practice standard of limiting impoundments to no more than two, each 40 acres or less in area. In compliance with this requirement, the existing Cell 3 would need to close if it already wasn’t preparing to close. As a result, we find that at the time of promulgation of this proposed rule there would be no impoundment designed or constructed before December 15, 1989, that could not meet a work practice standard. Since these impoundments in existence prior to December 15, 1989, appear to meet the work practice standards and have shown they can be maintained on standby we are proposing to eliminate the distinction of whether the impoundment was constructed before or after December 15, 1989. We are also proposing that the impoundments must meet the requirements of one of the two work practice standards, and that the flux standard of 20 pCi/m^2/sec will no longer be required for the impoundments in existence prior to December 15, 1989. We ask for comment on this approach.

G. What revisions are we making to Subpart W?

Add a section here that answers this question: Why is it appropriate to revise subpart W [under 112(d)(5)]?

H. How does this action relate to other EPA standards?

Under the CAA, EPA promulgated Subpart W, which includes standards and other requirements for controlling radon emissions from operating mill tailings at uranium recovery facilities. Under our authority in the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), we have also issued standards that are more broadly applicable to uranium and thorium byproduct materials at active and inactive uranium mills. NRC (or Agreement States) and DOE implement and enforce these standards at these mills as directed by UMTRCA. These standards, located in 40 CFR Part 192, address the radiological and non-radiological hazards of uranium and thorium byproduct materials in ground water and soil, in addition to air. For the non-radiological hazards, UMTRCA directed us to promulgate standards consistent with those used by EPA to regulate non-radiological hazardous materials under RCRA. Therefore, our Part 192 standards incorporate the ground-water protection requirements applied to hazardous waste management units under RCRA and specify the placement of uranium or thorium byproduct materials in impoundments constructed in accordance with RCRA requirements. Radon emissions from non-operational impoundments (i.e., those with final covers) are limited in 40 CFR Part 192 to the emissions levels of 20 pCi/m^2/sec. We are currently preparing a regulatory proposal to update provisions of 40 CFR Part 192, with emphasis on ground-water protection for ISL facilities. As explained in previous sections, Subpart W currently contains reference to some of the Part 192 standards.

III. Summary of the Proposed Requirements

A. What are the proposed standards?

Today we are proposing to revise Subpart W to include requirements for affected sources at three types of operating uranium recovery facilities: (1) conventional uranium mills; (2) ISL facilities; and (3) heap leach facilities. The affected sources at these uranium recovery facilities include conventional impoundments, non-conventional impoundments where tailings are contained in ponds and covered by liquids (examples of these affected sources are evaporation or holding ponds that exist at conventional mills, ISLs and heap leach facilities) and heap leach piles. The proposed GACT standards and rationale for these proposed determinations are discussed below and in Section IV. We request comment on all aspects of these proposed requirements.

B. What are the initial and subsequent requirements?

1. Conventional impoundments.

In the 1989 promulgation of Subpart W we created two work practice standards, phased disposal and continuous disposal. The work practice standards, which limit the area and number of impoundments at a uranium recovery facility, apply to single piles that are no larger than 40 acres (for phased disposal) or 10 uncovered acres (for continuous disposal). We took this approach because we recognized that the radon emissions from these impoundments could be greater if the piles were left dry and uncovered. These standards also included the requirements in 40 CFR 192.32(a), which include design and construction requirements for the impoundments as well as requirements for prevention and mitigation of ground-water contamination.

As discussed earlier, we no longer believe that a distinction needs to be made for conventional impoundments based on the date when they were designed and/or constructed. We believe that the existing impoundments at both the Shootaring Canyon and Sweetwater facilities can meet the work practice standards in the current Subpart W regulation. Impoundments at both these facilities are less than 40 acres in area and are synthetically lined as per the requirements in 40 CFR 192.32(a)(1). The existing cell 3 at the White Mesa mill will undergo closure in 2012 and will be replaced with impoundments that meet the phased disposal work practice standard. Therefore, there is no reason not to bring these older impoundments under the umbrella of the work practice standards required for impoundments designed or constructed after December 15, 1989. By incorporating these impoundments under the work practices, we no longer need the requirement of radon flux

testing, and we are proposing to eliminate this requirement.

The proposed elimination of the monitoring requirement in 40 CFR 61.253 applies only to those facilities currently subject to the radon flux standard in 40 CFR 61.252(a), which we understand applies to only the three impoundments in existence prior to the original promulgation of Subpart W on December 15, 1989. While we are proposing to eliminate the radon monitoring standard for these three impoundments under Subpart W, this action does not relieve the owner or operator of the uranium recovery facility of the monitoring and maintenance requirements of their operating license issued by the NRC or its Agreement States. These requirements are found at 10 CFR Part 40, Appendix A, Criterion 8 and 8A. Additionally, NRC, through its Regulatory Guide 4.14, may also incorporate radionuclide air monitoring at operating facility boundaries.

Further, when the impoundments formally close they are subject to the radon monitoring requirements of 40 CFR 192.32(a)(3), also under the NRC licensing requirements.

From a cost standpoint, by not requiring radon monitoring we expect that for all three sites the total annual average cost savings would be $29,200, with a range from about $21,000 to $37,000. More details on economic costs can be found in Section IV.B of this preamble.

For the proposed rule we also evaluated the requirements of 40 CFR 192.32(a) as they pertain to the Subpart W standards. The requirements of 40 CFR 192.32(a) are included in the NRC's review during the licensing process. We determined that the requirements at 40 CFR 192.32(a)(1), which reference the RCRA requirements for design and operation of surface impoundments at 40 CFR 264.221, are the only requirements necessary for EPA to incorporate for Subpart W as they are effective methods of containment of tailings and protecting ground water while also limiting radon emissions. This liner requirement, described earlier in this preamble, remains in use for the permitting of hazardous waste land disposal units under RCRA. The requirements at 40 CFR 192.32(a)(1) contain safeguards to allow for the placement of tailings and yet provides an early warning system in the event of a leak in the liner system. We are therefore proposing to retain the two work practice standards and the requirements of 40 CFR 192.32(a)(1) as GACT because these methods for limiting radon emissions while also protecting ground water have proven effective for these types of impoundments.

3. Non-conventional impoundments where tailings are contained in ponds and covered by liquids.

Today we are proposing a GACT standard specifically for non-conventional impoundments where uranium byproduct materials are contained in ponds and covered by liquids. Common names for these structures may include, but are not limited to, impoundments and evaporation or holding ponds. These affected sources may be found at any of the three types of uranium recovery facilities.

These units meet the existing applicability criteria in 40 CFR 61.250 to classify them for regulation under Subpart W. The holding or evaporation ponds located at conventional mills, ISL facilities and potentially heap leach facilities contain uranium byproduct material, either in solid form or dissolved in solution, and therefore are regulated under Subpart W. As defined at 40 CFR 61.251(g), uranium byproduct material or tailings means the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content. Therefore, the ponds in the uranium recovery process that contain either solids or radionuclides dissolved in liquids are regulated under the Subpart W requirements. Today we are again stating that determination and proposing a GACT standard for these impoundments.

Evaporation or holding ponds, while sometimes smaller in area than conventional impoundments, perform a basic task. They hold uranium byproduct material until it can be disposed. Our survey of existing ponds shows that they contain liquids, and, as such, this general practice has been sufficient to limit the amount of radon emitted from the ponds, in many cases, to almost zero. Because of the low potential for radon emissions from these impoundments, we do not believe it is necessary to monitor them for radon emissions. We have found that as long as approximately one meter of liquid is maintained in the pond, the effective radon emissions from the pond are so low that it is difficult to determine whether there is any contribution above background radon values. EPA has stated in the ***Final Rule for Radon-222 Emissions from Licensed Uranium Mill Tailings: Background Information Document*** (August, 1986):

> "Recent technical assessments of radon emission rates from tailings indicate that radon emissions from tailings covered with less than one meter of water, or merely saturated with water, are about 2% of emissions from dry tailings. Tailings covered with more than one meter of water are estimated to have a zero emissions rate. The Agency believes this calculated difference between 0% and 2% is negligible. The Agency used an emission rate of zero for all tailings covered with water or saturated with water in estimating radon emissions."

Therefore, we are proposing as GACT that these impoundments meet the design and construction requirements of 40 CFR 192.32(a)(1), with no size/area restriction, and that during the active life of the pond at least one meter of liquid be maintained in the pond.

We are also proposing that no monitoring be required for this type of impoundment. We have received information and collected data that show there is no acceptable radon flux test method for a pond holding a large amount of liquid. (Method 115 does not work because a solid surface is needed to place the large area activated carbon canisters used in the Method). Further, even if there was an acceptable method, we recognize that radon emissions from the pond would be expected to be very low because the liquid acts as an effective barrier to radon emissions; given that radon-222 has a very short half-life (3.8 days), there simply is not enough time for the radon produced by the solids or from solution to migrate to the water/surface air interface before decaying.(REFERENCE) It therefore appears that monitoring at these ponds is not necessary for demonstrating compliance with the proposed standards. We do, however, ask for comment on two issues: (1) whether these impoundments need to be monitored, and why; and (2) if these impoundments do need monitoring, what methods would a facility use (for example, radon collection devices, or monument placement in the pond to measure liquid levels), at evaporation or holding ponds.

4. Heap Leach Piles.

The final category for which we are proposing GACT standards is heap leach piles. We are proposing to require heap leach piles meet the phased disposal work practice standard and the design and construction requirements at 40 CFR 192.32(a)(1) as GACT. As noted earlier in the preamble, there are currently no operating uranium heap leach facilities in the United States. We are aware that the currently proposed heap leach facility will use the design and operating requirements at 40 CFR 192.32(a)(1) for the design of the heap. Since this requirement, along with the work practice standards, is the basis for all the other impoundments in this standard, we are proposing to also use it for heap leach piles. The premise is that the operator of a heap would not want to lose any of the uranium-bearing solution; thus, it is cost effective to maintain a good liner system so that there will be no leakage and ground water will be protected. At the same time, however, we recognize that keeping the uranium byproduct material in the heap in a near-saturated state (in order to reduce radon emissions) is not a practical solution as it would be at a conventional tailings impoundment. In the definitions at 40 CFR 61.251(c) we have defined “dewatered” tailings as those where the water content of the tailings does not exceed 30% by weight. We are proposing today to require operating heaps to maintain moisture content of greater than 30% so that the byproduct material in the heap is not allowed to become dewatered which would allow more radon emissions. We are specifically asking for comment on the amount of liquid required in the heap, and whether the 30% figure is a realistic objective. We are also asking for comments on precisely where in the heap leach pile this requirement must be met. The heap leach pile may not be evenly saturated during the uranium extraction process. The sprayer/drip system commonly used on the top of heap leach piles usually results in a semi-saturated moisture condition at the top of the pile, since flow of the lixiviant is not uniformly spread across the top of the pile. As downward flow continues, the internal areas of the pile become saturated. We are requesting information on where specifically in the pile the 30% moisture content should apply.

C. What are the monitoring requirements?

As the rule currently exists, only mills with existing conventional impoundments in operation on or prior to

December 15, 1989, are currently required to monitor to ensure compliance with the radon flux standard. The reason for this is because at the time of promulgation of the 1989 rule EPA stated that no flux monitoring would be required for new impoundments because the proposed work practice standards would be effective in reducing radon emissions from operating impoundments by limiting the amount of tailings exposed (54 FR 51681). Since we have now determined that existing older impoundments can meet one of the two work practice standards, we are proposing to eliminate the radon flux monitoring requirement.

In reviewing Subpart W we looked into whether we should extend radon monitoring to all impoundments constructed and operated after 1989 so that the monitoring requirement would apply to all impoundments containing uranium byproduct materials. We also reviewed how this requirement would apply to facilities where Method 115 is not applicable, such as at impoundments totally covered by liquids. We concluded that the original work practice standards (now proposed as GACT) continue to be an effective practice for the limiting of radon emissions from impoundments and from heap leach piles. We also concluded that by maintaining an effective water cover on non-conventional impoundments the radon emissions from those impoundments are so low as to be difficult to differentiate from background radon levels at uranium recovery facilities. Therefore, we are proposing today that it is not necessary to require radon monitoring to any affected sources regulated under Subpart W.

D. What are the notification, recordkeeping and reporting requirements?

New and existing affected sources are required to comply with the existing requirements of the General Provisions (40 CFR part 61, subpart A). The General Provisions include specific requirements for notifications, recordkeeping and reporting, including provisions for notification of construction and/or modification and startup as required by 40 CFR 61.07, 61.08 and 61.09.

Today we are also proposing that all affected sources will be required to maintain certain records pertaining to the design, construction and operation of the impoundments, both conventional and nonconventional, and heap leach piles. We are proposing that these records will be retained at the facility and contain information demonstrating that the impoundments and/or heap leach pile meet the requirements in section 192.32(a)(1), including but not limited to, all tests performed that prove the liner is compatible with the material(s) being placed on the liner.

For nonconventional impoundments we are proposing that this requirement would also include records showing compliance with the continuous one meter of liquid in the impoundment; for heap leach piles, we are proposing that this requirement would include records showing that the 30% moisture content of the pile is continuously maintained. Documents showing that the impoundments and/or heap leach pile meet the requirements in section 192.32(a)(1) are already required as part of the pre-construction application submitted under 40 CFR 61.07, so these records should already be available. Records showing compliance with the one meter liquid cover requirement for nonconventional impoundments and records showing compliance with the 30% moisture level required in heap leach piles can be created and stored during the daily inspections of the tailings and waste retention systems required by the NRC (and Agreement States) under the inspection requirements of 10 CFR 40, Appendix A, Criterion 8A.

Because we are proposing new record-keeping requirements for uranium recovery facilities, we are required by the Paperwork Reduction Act (PRA) to prepare an estimate of the burden of such record-keeping on the regulated entity, in both cost and hours necessary to comply with the requirements. We must also submit an

Information Collection Request (ICR) containing this burden estimate and other supporting documentation to the Office of Management and Budget (OMB) at the time this proposal is published in the Federal Register. See Section VII.B for more discussion of the PRA and ICR.

We believe the record-keeping requirements proposed today will not create a significant burden for operators of uranium recovery facilities. As described earlier, we are proposing to require retention of three types of records: (1) records demonstrating that the impoundments and/or heap leach pile meet the requirements in section 192.32(a)(1) (e.g. the design and liner testing information); (2) records showing that one meter of water is maintained to cover the byproduct material stored in nonconventional impoundments; and (3) records showing that heap leach piles maintain a moisture content of at least 30%.

Documents demonstrating that the impoundments and/or heap leach pile comply with section 192.32(a)(1) requirements are necessary for the facility to obtain regulatory approval from NRC and EPA to construct and operate the impoundments and/or heap leach piles (this includes any revisions during the period of operations). Therefore, these records will exist independent of subpart W requirements and will not need to be continually updated as a result of this record-keeping requirement in subpart W; however, we are proposing to include this record-keeping requirement in subpart W to require that the records be maintained at the facility during its operational lifetime (in some cases the records might be stored at a location away from the facility, such as corporate offices). This might necessitate creating copies of the original records and providing a location for storing them at the facility.

Keeping a record to provide confirmation that water to a depth of one meter is maintained above the byproduct material stored in nonconventional impoundments should also be relatively straightforward. This would involve placement of a measuring device or devices in or at the edge of the impoundment to allow observation of the water level relative to the level of byproduct material in the impoundment. Such devices need not be highly technical and might consist of, for example, measuring sticks with easily-observable markings placed at various locations, or marking the sides of the impoundment to illustrate different water depths. As noted earlier, NRC and Agreement State licenses require operators to inspect the facility on a daily basis. Limited effort should be necessary to record observations of water depth and record the information in inspection log books that are already kept on site and available to inspectors.

Similarly, daily inspections would provide a mechanism for recording moisture content of heap leach piles. However, because no heap leach facilities are currently operating, there is more uncertainty about exactly how the operator will determine that the heap has maintained a 30% moisture content. As discussed in more detail in Section IV.E.4 of this preamble, soil moisture probes are readily available and could be used for this purpose. Such probes could be either left in the heap leach pile, placed at locations that provide a representative estimate for the heap as a whole, or facility personnel could use handheld probes to collect readings. The facility might also employ mass-balance estimates to provide a further check on the data collected.

We estimate the burden in hours and cost for uranium recovery facilities to comply with the proposed recordkeeping requirements are as follows:

Table 1: Burden Hours and Costs for
Proposed Recordkeeping Requirements
(Annual Figures)

Activity	Hours	Costs
Maintaining Records for the section 192.32(a)(1) requirements	20*	$1,360*
Verifying the one meter liquid requirement for nonconventional impoundments	288	$12,958
Verifying the 30% moisture content at heap leach piles using multiple soil probes	2,068	$86,548

*These figures represent a one-time cost to the facility.

Burden levels for heap leach piles are most uncertain because they depend on the chosen method of measurement (e.g., purchasing and maintaining multiple probes or a smaller number of handheld units) as well as the personnel training involved (e.g., a person using a handheld unit will likely need more training than someone who is simply recording readings from already-placed probes). We invite comment on our estimates of burden, as well as suggestions of methods that could readily and efficiently be used to collect the required information. More discussion of the ICR and opportunities for comment may be found in Section VII.B.

E. When must I comply with these proposed standards?

All existing affected sources subject to this proposed rule would be required to comply with the rule requirements upon the date of publication of the final rule in the Federal Register. To our knowledge, there is no existing operating facility that would be required to modify its affected sources to meet the requirements of the final rule; however, we request any information regarding affected sources that would not meet these requirements. New sources would be required to comply with these rule requirements upon the date of publication of the final rule in the Federal Register or upon startup of the facility, whichever is later.

IV. Rationale for this Proposed Rule

A. How did we determine GACT?

As provided in CAA section 112(d)(5), we are proposing standards representing GACT for this area source category. In developing the proposed GACT standards, we evaluated the control technologies and management practices that reduce HAP emissions from the affected sources that are generally available and utilized by operating uranium recovery facilities.

As noted in Section II.F., for this proposal we solicited information on the available controls and management practices for this area source category using written facility surveys (surveys authorized by section 114(a) of the CAA), reviews of published literature, and reviews of existing facilities (REFERENCE). We also held discussions with trade association and industry representatives and other stakeholders at various public meetings[16]. Our determination of GACT is based on this information. We also considered costs and economic impacts in determining GACT (See Section VI.).

We identified two general management practices that reduce radon emissions from impoundments. These general management practices are currently being used by all existing uranium recovery facilities. First, limiting the area of exposed tailings in conventional impoundments limits the amount of radon that can be emitted. The work practice standards currently included in subpart W require owners and operators of impoundments to implement this management practice by either limiting the area of existing, operating impoundments or covering dewatered tailings to allow for no more than 10 acres of exposed tailings. This is an existing requirement of Subpart W and of the NRC licensing requirements; hence, owners and

[16] See http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html for a list of presentations made at public meetings held by EPA and at various conferences open to the public.

operators of uranium recovery facilities are already incurring the costs associated with limiting the area of impoundments to 40 acres or less, or by dewatering to allow no more than 10 acres uncovered.

Second, covering uranium byproduct materials with liquids is a general management practice that is an effective method for limiting radon emissions. This general management practice is often used at nonconventional impoundments, which, as stated earlier, are also known as evaporation or holding ponds. These nonconventional impoundments also contain byproduct material, and as such we have regulated them under Subpart W. They are also regulated under the NRC operating license. While they hold mostly liquids, they are still designed and constructed in the manner of conventional impoundments, meaning they meet the requirements of section 192.32(a)(1). While this management practice of covering uranium byproduct materials in impoundments with liquids is not currently required under subpart W, facilities currently using this practice have generally shown its effectiveness in reducing emissions in both conventional impoundments (that used phased disposal) and nonconventional impoundments (i.e. holding or evaporation ponds). We are therefore proposing to require the use of liquids in nonconventional impoundments as a way to limit radon emissions.

Therefore after review of the available information and from the evidence we have examined we have determined that a combination of the management practices listed above will be effective in limiting radon emissions, and will do so in a cost effective manner. We also believe that since heap leach piles are in many ways similar to the design of conventional impoundments, the same combination of these practices will limit radon emissions in heap leach piles. We discuss our reasons supporting these conclusions in more detail in Section IV.B.

B. Proposed GACT Standards for Operating Mill Tailings.

1. Requirements at 40 CFR 192.32(a)(1)

As an initial matter, we determined that the requirements at 40 CFR 192.32(a)(1), which reference the RCRA requirements for the design and construction of liners at 40 CFR 264.221, continue to be an effective method of containment of tailings for all types of impoundments and for heap leach piles. (REFERENCE IMPOUNDMENT STUDY) The liner requirements, described earlier in this document, remain in use for the permitting of hazardous waste land disposal units under RCRA. Because of the requirement for nearly impermeable boundaries between the tailings and the subsurface, and the requirement for leak detection between the liners, we have determined that the requirements contain enough safeguards to allow for the placement of tailings and yet provide an early warning system in the event of a leak in the liner system.(REFERENCE IMPOUNDMENT STUDY) For this reason we are proposing to require as GACT that conventional impoundments, non-conventional impoundments and heap leach piles all comply with the liner requirements in 40 CFR 192.32(a)(1). Previously, Subpart W contained this requirement but contained a more general reference to 40 CFR 192.32(a); we are proposing to replace that general reference with a more specific reference to 40 CFR 192.32(a)(1) to narrow the requirements under this proposed rule to only the design and construction requirements for the liner of the impoundment contained in 40 CFR 192.32(a)(1).

The estimated cost of the liner requirements for each type of uranium recovery facility are found in the table below (REFERENCE):

Table 2: Estimated Liner Costs ~~for Liners~~

Type of Uranium Recovery Facility	Cost ($Millions)
Conventional Impoundment	13.8
Nonconventional Impoundment	23.7
Heap Leach	15.3

In making these cost estimates, we have assumed the following: (1) a conventional impoundment is no larger than 40 acres in size, which is the maximum size allowed for the phased disposal option; (2) the nonconventional impoundment is no larger than 80 acres in size (the largest size we have seen); and (3) the heap leach pile is no larger than 40 acres in size (again, the maximum size allowed when using the phased disposal work practice standard).

We do not have precise data for the costs associated with conventional impoundments using the continuous disposal work practice standard because currently none exist, but a reasonable maximum approximation would be the costs for the 80 acre nonconventional impoundment, since it is the largest we have seen. We believe that no additional costs would be incurred for building a conventional impoundment that will use the continuous disposal option above what we estimated for building a nonconventional impoundment but we ask for comment on whether this assumption is reasonable. We also ask for data on the cost of building a conventional impoundment using continuous disposal, and how those costs would differ from the estimates provided above, or whether the costs we have listed for building a conventional impoundment using phased disposal are a reasonable approximation of the costs for building a conventional impoundment using continuous disposal.

These liner systems are already required by 40 CFR 192.32(a)(1), which, as explained above, are requirements promulgated by EPA under UMTRCA that are incorporated into NRC regulations and implemented and enforced by NRC through their licensing requirements. Therefore, we are not placing any additional liner requirements on facilities nor requiring them to incur any additional costs to build their conventional or nonconventional impoundments or heap leach piles above and beyond what an owner or operator of these impoundments must already incur to obtain an NRC license.

The liner systems we are proposing that heap leach piles must use are the same as those used for conventional and nonconventional impoundments. We estimate that the average costs associated with the construction of a 40 acre liner that complies with 40 CFR 192.32(a)(1)is approximately $15.3 million. When compared to the baseline economic costs associated with the facility (estimated at $356 million)(REFERENCE), the costs for using this type of liner system per facility is about 4% of the total baseline economic costs of a heap leach pile facility (REFERENCE).

For our purposes, baseline economic costs are defined as a reference point that reflects the world without the proposed regulation. It is the starting point for conducting an economic analysis of potential benefits and costs of a proposed regulation. The defined baseline influences first the level of emissions expected without regulatory intervention and also influences the expectation about the levels of emissions reduction that can be achieved from a base case scenario. Baselines have no standard definition besides that they simply indicate a base case scenario for economic activity and (in this case) radon emissions from which emissions reduction departures can be drawn. In some instances, these have been described as trend cases where economic development and emissions are expected to continue on the present path or trend projected purely as time dependant extensions of presently observed patterns. Trend cases have also been termed "do nothing" scenarios. This category of cases represents what have been termed business as usual scenarios[17].

2. Conventional Impoundments.

In the 1989 promulgation of Subpart W we required new conventional impoundments to comply with one of two work

[17] EPA has guidance on performing economic impact analyses, Guidelines for Preparing Economic Analyses, EPA240-R-00-003, September 2000.

practice standards, phased disposal or continuous disposal. These work practice standards contain specific limits on the area and number of operating impoundments to limit radon emissions because we recognized that greater radon emissions could occur if the piles were left dry and uncovered. We are proposing as the GACT standard that all conventional impoundments – both existing impoundments and new impoundments - comply with one of the two work practice standards, phased disposal or continuous disposal, because these methods for limiting radon emissions by limiting the area of exposed tailings continue to be effective methods for reducing radon emissions from the impoundments (reference EPA 520-1-86-009, August 1986). We are proposing that existing impoundments also comply with one of the two work practice standards because as discussed earlier, we no longer believe that a distinction needs to be made for conventional impoundments based on the date when they were designed and/or constructed.

We are also not aware of any conventional impoundments either in existence or planned that use any other technologies or management practices to reduce radon emissions. Operators continue to use the general management practices for reducing radon emissions from their conventional impoundments by limiting the size of the impoundment and either covering the tailings with soil or keeping the tailings wet. These management practices form the bases of the work practice standards and continue to be very effective methods for limiting the amount of radon released to the environment.

These work practice standards are a cost-effective method for reducing radon emissions from conventional impoundments. As stated above, the average cost associated with construction of a single conventional impoundment using phased disposal[18] is $13.8 million. We also estimate that for a conventional impoundment, annual operating and maintenance costs are approximately $200,000.(REFERENCE) We estimate that this cost is approximately 3% of the total baseline economic costs for development of a new conventional mill, estimated at $372 million. (REFERENCE) Therefore, we are proposing that GACT for these impoundments will be the same work practice standards as were previously included in Subpart W.

<u>3. Non-conventional Impoundments where Tailings are Contained in Ponds and Covered by Liquids</u>

[18] As stated earlier, since we do not have data for the costs for continuous disposal, we are asking for comment on whether the costs for phased disposal are a reasonable approximation of the costs for continuous disposal. For example, should the costs associated with dewatering tailings prior to disposal be added to cost estimates for continuous disposal? We request comment and data on all aspects of the costs that a facility would incur operating its conventional impoundments using the continuous disposal work practice standard.

Today we are proposing a GACT standard specifically for use by any operating uranium recovery facility that is using non-conventional impoundments at its facility (i.e., those impoundments where tailings are contained in ponds and covered by liquids). Common names for these structures may include, but are not limited to, impoundments, evaporation ponds and holding ponds.

Industry has argued in preambles to responses to the CAA section 114(a) letters[19] that Subpart W does not, and was never meant to, include these types of evaporation or holding ponds under the Subpart W requirements. Industry asserts that the original Subpart W did not specifically reference evaporation or holding ponds but was regulating only conventional mill tailings impoundments. They argue that the ponds are temporary because they hold very little solid material but instead contain mostly liquids containing dissolved radionuclides (which emit very little radon), and at the end of the facility's life they are drained, and any solid materials, along with the liner system, are disposed in a properly licensed impoundment.

EPA has consistently maintained that these non-conventional impoundments meet the existing applicability

[19] http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html

criteria for regulation under Subpart W. As defined at 40 CFR 61.251(g), uranium byproduct material or tailings means the waste produced by the extraction or concentration of uranium from any ore processed primarily for its source material content. The holding or evaporation ponds located at conventional mills, ISL facilities and potentially heap leach facilities contain uranium byproduct materials, either in solid form or dissolved in solution, and therefore are regulated under Subpart W. Today we reiterate that position and are proposing a GACT standard more specifically tailored for these types of impoundments.

We are proposing that these non-conventional impoundments (the evaporation or holding ponds) must maintain a liquid level in the impoundment of no less than one meter at all times during the operation of the impoundment. Maintaining this liquid level will ensure that radon-222 emissions from the uranium byproduct material in the pond are eliminated or minimized. We are also proposing that there is no maximum area requirement for the size of these ponds since the risk of radon emissions is small. Our basis for this determination is because radon emissions from the pond will be expected to be very low since the liquid in the ponds acts as an effective barrier to radon emissions; given that radon-222 has a very short half-life

(3.8 days), there simply is not enough time for the radon produced by the solids or from the solution to migrate to the water/surface air interface before decaying.

By requiring a minimum of one meter of water in all nonconventional impoundments that contain uranium byproduct material, the release of radon from these impoundments would be reduced. Nielson and Rogers (1986) present the following equation for calculating the radon attenuation:

$$A = e^{\left(-\left[\frac{\lambda}{D}\right]^{0.5} d\right)}$$

Where:

A	=	Radon attenuation factor (unit less)
λ	=	Radon-222 decay constant (sec^{-1})
	=	2.1×10^{-6} sec^{-1}
D	=	Radon diffusion coefficient (cm^2/sec)
	=	0.003 cm^2/sec in water
d	=	Depth of water (cm)
	=	100 cm

The above equation indicates that the attenuation of radon emanation by water (i.e., the amount by which a water cover will decrease the amount of radon emitted from the impoundment) depends on how quickly radon-222 decays, how quickly radon-222 can move through water (the diffusion coefficient), and the thickness of the layer of water. Solving the above equation shows that one meter of water has a radon attenuation factor of about 0.07. That is, emissions can be expected to be reduced by about 93% compared to no water cover.

The benefit incurred by this requirement is that significantly less radon will be released to the atmosphere. The amount varies from facility to facility based on the size of the nonconventional impoundment, but across existing facilities radon can be expected to be reduced by approximately 24,600 curies, a decline of approximately 93%.

The estimated cost associated with complying with the proposed one meter of liquid that would be required to limit the amount of radon emissions to the air vary according to the size of the impoundment and the geographic area in which it is located. We estimate that this requirement will cost owners or operators of 80 acre nonconventional impoundments between $1,042 and $9,687 per year. This value varies according to the location of the impoundment, which will determine evaporation rates, which determines how much replacement water will be required to maintain the minimum amount of one meter. If the evaporated water is not replaced by naturally occurring precipitation, then it would need to be replaced with make-up water supplied by the nonconventional impoundment’s operator

The most obvious source of water is what is known as “process water” from the extraction of uranium from the subsurface. Indeed, management of this process water is the reason for constructing the impoundment in the first place, as the process water contains uranium byproduct material that must also be managed by the facility. It is possible that an operator could maintain one meter of water in the impoundment solely through the use of process water. If so, this would not create any additional costs for the facility as the cost of the process water can be attributed to its use in the uranium extraction process. However, for purposes of estimating the economic impacts associated with our proposal, our cost estimate does not include process water as a source of water potentially added to the impoundment to replace water that has evaporated. Instead, we estimated the costs of using water from other sources. This method results in the most conservative cost estimate for compliance with the one meter requirement.

In performing the cost impacts for this requirement, three potential sources of impoundment make-up water were considered: (1) municipal water suppliers; (2) offsite non-drinking-water suppliers; and (3) on-site water. (REFERENCE) Depending on the source of water chosen, we estimate that this requirement will cost owners or operators of nonconventional impoundments between $1,042.00 and $9,687.00 per year.[20]

This value also varies according to the size and location of the nonconventional impoundment, up to 80 acres. The requirement to maintain a minimum of one meter of liquid in the ponds is estimated to cost approximately $0.03 per pound of uranium produced. The annual cost of makeup water was divided by the base facility yellowcake annual production rate to calculate the makeup water cost per pound of yellowcake produced (REFERENCE). We conclude that the costs associated with this proposed requirement are an effective way to significantly reduce radon emissions from nonconventional impoundments, and is therefore appropriate to propose as a GACT standard for nonconventional impoundments.

4. Heap Leach Piles

The final affected source for which we are proposing GACT standards is heap leach piles. While there are currently no operating uranium heap leach facilities in the United States, we are proposing to regulate any future facilities using this type of uranium extraction under

[20] Municipal sources were the most expensive, with average unit costs of $0.0033 per gallon. Offsite non-drinking water sources were the cheapest, at $0.000069 per gallon on average. Various references were used for the comparisons. For more detail, please see Section 6.3.3 of the Background Information Document.

Subpart W since the moment that uranium extraction takes place in the heap, uranium byproduct materials are left behind. During the process of uranium extraction on a heap, as the acid drips through the ore, uranium is solubilized and carried away to the collection system where it is further processed. At the point of uranium movement out of the heap, what remains is uranium byproduct materials as defined by 40 CFR 61.251(g). In other words, what remains in the heap is the waste produced by the extraction or concentration of uranium from ore processed primarily for its source material content. Thus, Subpart W applies because uranium byproduct materials are being generated during and following the processing of the uranium ore in the heap.

As a result, we are proposing GACT standards for heap leach piles. We are proposing that these piles conform to the phased disposal work practice standard and that the moisture content of the uranium byproduct material in the heap leach pile be greater than or equal to 30% moisture content. We believe that the phased disposal approach can be usefully applied here because it limits the amount of tailings that can be exposed at any one time, which limits the amount of radon that can be emitted. The phased disposal work practice standard is applicable for heap leach piles because in essence they act as a conventional impoundment. After the uranium has been removed the uranium byproduct material that remains is contained in a structure that is lined according to the requirements of 40 CFR 192.32(a)(1) while at the same time covered with soil to minimize radon emissions. This is what occurs at conventional impoundments using the phased disposal standard. Limiting the size of the operating heap leach pile to 40 acres or less has the same effect as it does on conventional impoundments; that is, it limits the area of exposed uranium byproduct material and therefore limits the radon emissions from the heap leach pile. While we believe that the 40 acre limitation is appropriate for heap leach piles, we are requesting comment on what should be the size (area) of a heap leach pile.

We are also proposing as GACT that the heap leach pile constantly maintain a moisture content of at least 30% by weight. By requiring a moisture content of at least 30%, the byproduct material in the heap leach pile will not become dewatered, and we think that the heap leach pile will be sufficiently saturated with liquid to reduce the amount of radon that can escape from the heap leach pile. However, we request further information on all the chemical mechanisms in place during the leaching operation, and whether the 30% moisture content is sufficient for minimizing radon emissions from the heap leach pile. We also request comment on the amount of time the 30% moisture requirement should be maintained by a facility. We are proposing the term "operational life" of the facility. We are aware of several operations that take place during the uranium extraction process at a heap leach pile. After an initial period of several months of allowing lixiviant to leach uranium from the pile, the heap leach pile is allowed to "rest," which enables the geochemistry in the pile to equilibrate. At that point the heap leach pile may be subjected to another round of extraction by lixiviant, or it may be rinsed to flush out any remaining uranium that is in solution in the heap leach pile. After the rinsing, the pile is allowed to drain and a radon barrier can be emplaced. We are proposing that the operational life of the heap leach pile be from the time that lixiviant is first placed on the heap leach pile until the time of the final rinse. We believe this incorporates a majority of the time that the heap leach pile is uncovered and when the ability for radon to be emitted to be the greatest. We ask for comment on this approach.

Because there is no "process water" component to a heap leach operation, as there is for an ISL, water for the heap leach pile must be supplied from an outside source. Even if an ISL and heap leach operation were to be located at the same site, we consider it unlikely that an operator would use ISL process water as the basis for an acidic heap leach solution. It is possible, in fact likely, that the solution used in the heap will be recycled (i.e., applied to the heap more than once), which could reduce the amount of outside water needed to some degree, although as we discuss later in this section, it would not seem that recycling solution would affect the overall moisture content. In calculating the high-end costs of heap leaching, we have not included this possibility in our estimates of economic impacts.

The unit costs for providing liquids to a heap leach pile are assumed to be the same as the unit costs developed for providing water to nonconventional impoundments. In performing the cost impacts for this requirement, three potential sources of impoundment make-up water were considered: (1) municipal water suppliers; (2) offsite non-drinking-water suppliers; and (3) on-site water. The only cost associated with maintaining the moisture level within the pile is the cost of the liquid. We assume that existing piping used to supply lixiviant to the pile during leaching would be used to supply water necessary for maintaining the moisture level. Also, we assume that the facility will use the in-soil method for moisture monitoring. The process and costs are described below.

Soil moisture sensors have been used for laboratory and outdoor testing purposes and for agricultural applications for over 50 years. They are mostly used to measure moisture in gardens and lawns to determine when it is appropriate to turn on irrigation systems. Soil moisture sensors can either be placed in the soil or held by hand.

For example, one system would bury soil moisture sensors to the desired depth in the heap. Then, a portable soil moisture meter would be connected by cable to each buried sensor one at a time, i.e., a single meter can read any number of sensors. The portable soil moisture meter costs about $350, and each in-soil sensor about $35 or $45, depending on the length of the cable (either 5 or 10 ft). The total estimated costs for using this system are approximately $86,500 per year per facility. Finally, it is assumed that moisture readings would be performed during the daily inspections of the heap leach pile, which would require approximately 2,000 additional work hours per year per facility. These costs are factored into the cost estimate quoted above.

Alternatively, with a handheld soil moisture meter, two rods (up to 8 inches long) that are attached to the meter are driven into the soil at the desired location, and a reading is taken. A handheld meter of this type costs about $1,065, and replacement rods about $58 for a pair. Our estimates for costs of monitoring the heap include 100 sensors located within the heap, with a meter on each sensor. We chose 100 sampling stations because heaps are generally the same size as conventional impoundments, and Method 115 prescribed a minimum of 100 sampling stations for measuring radon. We did not estimate costs for this method, as we concluded that the length of time required to walk around a heap leach pile and obtain these measurements required more time than is found in an average work day, and would expose workers to the acidic lixiviant.

The base heap leach facility includes a heap leach pile that will occupy up to 80 acres at a height of up to 50 feet. With an assumed porosity of 0.39 and a moisture content of 30% by weight, the effective surface area of the liquid within the heap pile is 33.7 acres.

Table 3 presents the calculated cost for make-up water to maintain the moisture level in the heap leach pile, such that the moisture content is at 30% by weight, or greater. The unit costs for water and the net evaporation rates are identical to those derived for evaporation ponds used for this estimate.

Table 3: Heap Leach Pile Annual Makeup Water Cost

Cost Type	Water Cost ($/gal)	Net Evaporation (in/yr)	Makeup Water Cost ($/yr)	Makeup Water Rate (gpm/ft^2)
Mean	$0.00010	45.7	$4,331	2.3E-05
Median	$0.00010	41.3	$3,946	2.1E-05
Minimum	$0.000035	6.1	$196	3.0E-06
Maximum	$0.00015	96.5	$13,318	4.8E-05

To place this amount of make-up water in perspective, during leaching and rinsing of the heap leach pile, liquid is dripped onto the pile at a rate of 0.005 gallons per minute per square foot (gpm/ft^2) (Titan 2011). This rate is significantly higher than the make-up water rates necessary to maintain the moisture content at 30% by weight, shown in Table 1. We conclude from this analysis that the leaching solution applied in a typical operation should be sufficient to maintain the moisture content of the heap leach pile to the required levels, and only in unusual circumstances (such as during the final rinse and draindown of the heap leach pile) would additional liquids need to be applied. However, in a circumstance that would require the additional application of liquid to maintain the 30% moisture limit, such as excessive evaporation, we estimate that requiring the owner/operator of a heap leach pile to maintain 30% moisture content in the pile will average approximately $4,000 per year.

We are asking for comment on exactly where in the pile the 30% moisture content should be achieved. We are also soliciting comments on whether the leaching operation itself liberates more radon than the equivalent of a conventional impoundment. We assume that because low-grade ore is usually processed by heap leach, there would be less radon emitted from a heap leach pile than from a conventional impoundment of similar size. We request information on whether this is a correct assumption.

We are also aware that there could be a competing argument against regulating the heap leach pile. While not directly correlative, the process of heap leach could be defined as active "milling." The procedure being carried out on the heap is the extraction of uranium. In this view, the operation is focused on the production of uranium rather than on managing uranium byproduct materials. The heap meets the definition of tailings after the final draw down of the heap solutions occur and the heap is preparing to close. We are requesting comments on the relative merits of this interpretation.

Regardless, as with ISL facilities, collection and/or evaporation ponds (nonconventional impoundments) will exist at heap leach facilities that will also contain uranium byproduct materials, and these ponds will be regulated under Subpart W regardless of whether the heap leach pile is also subject to regulation.

V. Other Issues Generated by Our Review of Subpart W

During our review of Subpart W we also identified several issues that need clarification in order to be more fully understood. The issues that we have identified are:

- Clarification of the term “standby” and how it relates to the operational phase of an impoundment;
- Amending the definition of “operation” so that it is clear when the owner or operator is subject to the requirements of Subpart W;
- Determining whether Subpart W adequately addresses protection from extreme weather events;
- Revising 40 CFR 61.252(b) and (c) to accurately reflect that it is only 40 CFR 192.32(a)(1)that is applicable to Subpart W; and
- Removing the phrase “as determined by the Nuclear Regulatory Commission” in 40 CFR 61.252(b)(1) and (2).

A. Clarification of the Term "Standby"

There has been some confusion on whether the requirements of Subpart W apply to an impoundment that is in "standby" mode. This is the period of time that an impoundment may not be accepting tailings, but has not yet entered the "closure period." This period of time usually takes place when the price of uranium is such that it may not be cost effective for the uranium recovery facility to continue operations, and yet the facility has every intention to re-establish operations once the price of uranium rises to a point where it is cost effective to do so. Since the impoundment has not entered the closure period, it could continue to accept tailings at any time; therefore, Subpart W requirements continue to apply to the impoundment.

Today we are proposing to add a definition to 40 CFR 61.251 to define "standby" as:

> Standby means the period of time that an impoundment may not be accepting uranium byproduct material but has not yet entered the closure period.

B. Amending the Definition of "Operation" for a Conventional Impoundment

As currently written, 40 CFR 61.251(e) defines the operational period of a tailings impoundment. It states that “operation” means that an impoundment is being used for the continuing placement of new tailings or is in standby status for such placement [which means that as long as the facility has generated byproduct material at some point and placed it in an impoundment, it is subject to the requirements of Subpart W]. An impoundment is in operation from the day that tailings are first placed in the impoundment until the day that final closure begins.”

There has been some confusion over this definition. For example, a uranium mill announced that it was closing a pre-December 15, 1989, impoundment. Before initiating closure, however, it stated that it would keep the impoundment open to dispose of material generated by other closure activities at the site that contained byproduct material (liners, deconstruction material, etc) but not “new tailings.” The company argued that since it was not disposing of new tailings the impoundment was no longer subject to Subpart W. We disagree with this interpretation. While it may be true that the company was no longer disposing of new tailings in the impoundment, it has not begun closure activities; therefore, the impoundment is still open to disposal of byproduct material that emits radon and continues to be subject to all applicable Subpart W requirements.

To prevent future confusion, we are proposing today to amend the following definition of “operation” in the Subpart W definitions at 40 CFR 61.251:

Operation. Operation means that an impoundment is being used for the continued placement of uranium byproduct material or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct material or tailings are first placed in the impoundment until the day that final closure begins.

C. Weather Events

In the past, uranium recovery facilities have been located in the western regions of the United States. In these areas, the annual precipitation falling on the impoundment, and any drainage area contributing surface runoff to the impoundment, has usually been less than the annual evaporation from the impoundment. Also, these facilities have been located away from regions of the country where extreme rainfall events (e.g., hurricanes or flooding) could jeopardize the structural integrity of the impoundment, although there is a potential for these facilities to be affected by flash floods, tornadoes, etc. Now, however, uranium exploration in the U.S. has the potential to move eastward, into more climatologically temperate regions of the country, with south central Virginia being considered for a conventional uranium mill. In determining whether additional measures would be needed for impoundments operating in areas where precipitation exceeds evaporation, a review of the existing requirements was necessary.

The proposed revisions to Subpart W will require owners and operators of impoundments or ponds to follow the requirements of 40 CFR 192.32(a)(1). That particular regulation references the RCRA surface impoundment design and operations requirements of 40 CFR 264.221. At 40 CFR 264.221(g) and (h) are requirements that can be used to ensure proper design and operation of tailings impoundments. Section 264.221(g) states that impoundments must be designed, constructed, maintained and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and rain action (e.g., a two foot freeboard requirement); rainfall; run-on; malfunctions of level controllers, alarms and other equipment; and human error. Section 264.221(h) states that impoundments must have dikes that are designed, constructed and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the unit.

Since uranium recovery facilities have been and will continue to be required to comply with the requirements of 40 CFR 192.32(a)(1), they are already required to be designed to prevent failure of impoundments during extreme weather events. As we stated in Section IV B.2., we believe the design requirements contain enough safeguards to allow for the placement of tailings and yet provide an early warning system in the event of a leak in the liner system. Therefore, we are proposing to include these requirements in the Subpart W requirements without modification.

D. Applicability of 40 CFR 192.32(a) to Subpart W

The requirements at 40 CFR 61.252(b) and (c) require compliance with 40 CFR 192.32(a), as determined by the Nuclear Regulatory Commission. However, we are now proposing to focus the Subpart W requirements on the impoundment design and construction requirements found specifically at 40 CFR 192.32(a)(1). The remainder of 40 CFR 192.32(a) goes beyond this limited scope by including requirements for ground-water detection monitoring systems and closure of operating impoundments. These other requirements, along with all of the Part 192 standards, are regulated by the NRC through its licensing requirements for uranium recovery facilities at 10 CFR part 40, Appendix A.

However, when referenced in Subpart W, the requirements in 40 CFR 192.32(a)(1) are also implemented and enforced by EPA as the regulatory authority administering Subpart W under its CAA authority. Therefore today we are proposing to revise 40 CFR 61.252 (a),(b) and (c) to specifically define which portions of 40 CFR 192.32(a) are applicable to Subpart W. At the same time we are proposing to eliminate the phrase "…as determined by the Nuclear Regulatory Commission" from 40 CFR 61.252(b). This should eliminate confusion regarding what an applicant must submit to EPA under the CAA in its pre-construction and modification approval applications as required by 40 CFR 61.07 and better explain that EPA is the regulatory agency administering Subpart W under the CAA. This proposed change will have no effect on the licensing requirements of the NRC or its regulatory authority to implement the Part 192 standards through its licenses under UMTRCA.

VI. Summary of Environmental, Cost and Economic Impacts

As discussed earlier, uranium recovery activities are carried out at several different types of facilities. We are proposing to revise Subpart W based on how uranium recovery facilities manage uranium byproduct materials during and after the processing of uranium ore at their particular facility. As discussed in Sections III and IV, we are proposing GACT requirements for three types of affected sources at uranium recovery facilities: (1) conventional impoundments; (2) nonconventional impoundments; and (3) heap leach piles.

Our analysis of uranium recovery facilities led us to estimate that there are approximately the following numbers of potentially affected area sources within each type of uranium recovery facility: (a) five conventional milling operations; (b) 50 ISL operations; and (c) one heap leach operation. The following paragraphs present our estimates of the impacts that this proposed rule would have on these facilities. For more information, please refer to the Economic Impact Analysis report that is included in the public docket for this proposed rule. (DOCKET REFERENCE)

<u>A. What are the air quality impacts?</u>

We project that a benefit of this proposed rule is that the proposed requirements will maintain or improve the air quality surrounding these facilities. The control technologies being proposed today have been used at uranium recovery facilities for the past twenty or more years. These work practice standards minimize the amount of radon that is released to the air by keeping the impoundments wet or covered with soil and by limiting the area of exposed tailings. The requirements in this proposed rule should eliminate or reduce radon emissions at all three types of affected sources to a level that is difficult to distinguish from the background levels naturally found in the environment.

B. What are the cost impacts?

The baseline costs were estimated using recently published cost data for actual uranium recovery facilities. For the conventional mill, we used data from the recently licensed new mill at the Piñon Ridge project in Colorado. For the ISL facility, we used data from two proposed new facilities: (1) the Centennial Uranium project in Colorado; and (2) the Dewey-Burdock project in South Dakota. The Centennial project is expected to have a 14- to 15-year production period, which is a long duration for an ISL facility, while the Dewey-Burdock project is expected to have a shorter production period of about 9 years, which is more representative of ISL facilities. For the heap leach facility, we used data from the Sheep Mountain project in Wyoming.

Existing Subpart W required facilities to perform annual monitoring using Method 115 to demonstrate that the radon flux standard at conventional impoundments constructed before December 15, 1989 was below 20 pCi/m^2-

sec. The proposed removal of this monitoring requirement would result in a cost saving to the three facilities for which this requirement still applies: (1) Sweetwater; (2) White Mesa; and (3) Shootaring Canyon. Method 115 requires 100 measurements as the minimum number of flux measurements considered necessary to determine a representative mean radon flux value. For the three sites that are still required to perform Method 115 radon flux monitoring, the average annual cost to perform that monitoring is estimated to be about $9,730 for Shootaring and Sweetwater, and $19,460 for White Mesa. For all three sites the total annual average cost is estimated to be $38,920 per year, with a range from approximately $28,000 to $49,500 per year per site. For all three sites the total annual average cost savings would be $29,200, with a range from about $21,000 to $37,000.

Baseline costs (explained in Section IV.B) for conventional impoundment liner construction will remain the same, since the proposed rule does not impose additional requirements. The average cost to construct one of these impoundments is $13.8 million. We estimate that this cost is approximately 3% of the total baseline economic costs to construct a conventional mill, estimated at $372 million.

All of the evaporation ponds at the four existing conventional mills and the five existing ISLs were built in conformance with Part 192.32(a)(1). We have estimated that for an average 80 acre nonconventional impoundment the average cost of construction of an impoundment is $23.7 million. This cost is approximately 6% of the total cost to produce uranium yellowcake at an ISL facility, assuming production costs of $372 million. Requiring nonconventional impoundments to comply with the liner requirements in 40 CFR 192.32(a)(1) will contain the uranium byproduct material and reduce the potential for ground water contamination. The other economic impact for nonconventional impoundments is the cost of complying with the new requirement to maintain a minimum of one meter of water in the nonconventional impoundments during operation and standby. As shown in Section IV.B.3. of this preamble, as long as approximately one meter of water is maintained in the nonconventional impoundments the effective radon emissions from the ponds are so low that it is difficult to determine if there is any contribution above background radon values. In order to maintain one meter of liquid within a pond, it is necessary to replace the water that is evaporated from the pond. Depending on the source of water chosen[21], we estimate that this requirement will cost owners or operators of nonconventional impoundments between $1,042 and $9,687 per year. This value also varies according to the size of the nonconventional impoundment, up to 80 acres, and the location of the impoundment. Evaporation rates vary by geographic location. However, the cost to maintain the one meter of liquid in a nonconventional impoundment is estimated to be less than 1% of the total costs to produce uranium, estimated at $23.7 million. The requirement to maintain a minimum of one meter of liquid in the ponds is estimated to cost approximately $0.03 per pound of uranium produced.

Designing and constructing heap leach piles to meet the requirements at 40 CFR 192.32(a)(1) would minimize the potential for leakage of uranium enriched lixiviant into the ground water. Specifically, this would require that a double liner, with drainage collection capabilities, be provided under heap leach piles. Baseline costs for construction will be essentially the same as for conventional impoundments. Since the liner systems are equivalent to the systems used for conventional and nonconventional impoundments, we have been able to estimate

[21] Municipal sources were the most expensive, with average unit costs of $0.0033 per gallon. Offsite non-drinking water sources were the cheapest, at $0.000069 per gallon on average. For more detail, please see Section 6.3.3 of the Background Information Document.

the average costs associated with the construction of heap leach pile impoundments that meet the phased disposal requirements we are proposing, and compare it to the costs associated with the total production of uranium produced by the facility. The average cost of constructing such an impoundment is approximately $15.3 million. The costs for using this type of liner system is about 4% of the estimated total baseline costs of a heap leach facility estimated at $356 million.

For heap leach piles, when the soil moisture content in the heap leach pile falls below about 30% by weight, the radon flux out of the heap leach pile increases because radon moves through the air faster (with less opportunity to decay) than water. We concluded from our analysis that the leaching solution applied in a typical operation should be sufficient to maintain the moisture content of the heap leach pile to the required levels, and only in unusual circumstances would additional liquids need to be applied. However, in a circumstance that would require the additional application of liquid to maintain the 30% moisture limit, such as excessive evaporation, we estimate that requiring the owner/operator of a heap leach pile to maintain 30% moisture content in the pile will average approximately $4,000 per year. We also estimate that it will cost approximately $86,500 per year (which includes labor of approximately 2,000 hours) to perform the tests required to verify that the moisture content is being maintained. These costs are less than one percent of the total baseline economic costs of a heap leach facility, estimated at $356 million.

C. What are the non-air environmental impacts?

Water quality would be maintained by implementation of this proposed rule. This proposed rule does contain requirements (by reference) related to water discharges and spill containment. In fact, the liner requirements cross referenced at 40 CFR 192.32(a)(1) will significantly decrease the possibility of contaminated ground water leaking from impoundments. Section 192.32(a)(1) includes a cross-reference to the surface impoundment design and construction requirements of hazardous waste surface impoundments regulated under the Resource Conservation and Recovery Act (RCRA), found at 40 CFR 264.221. Those requirements state that the impoundment shall be designed, constructed and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life of the impoundment. There are other requirements for the design and operation of the impoundment, and these include construction specifications, slope requirements, sump and liquid removal requirements.

Including a double liner in the design of all onsite impoundments that would contain uranium byproduct material would reduce the potential for ground-water contamination. Although the amount of the potential reduction is not quantifiable, it is important to take this into consideration due to the significant use of ground water as a source of drinking water.

VII. Statutory and Executive Orders Review

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review.

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a "significant regulatory action." The Executive Order defines "significant regulatory action" as one that is likely to result in a rule that may "raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order."

Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2464.01.

The information to be collected for the proposed rulemaking today is based on the requirements of the Clean Air Act. Section 114 authorizes the Administrator of EPA to require any person who owns or operates any emission source or who is subject to any requirements of the Act to:

- Establish and maintain records
- Make reports, install, use, and maintain monitoring equipment or method
- Sample emissions in accordance with EPA-prescribed locations, intervals and methods
- Provide information as may be requested

EPA's regional offices use the information collected to ensure that public health continues to be protected from the hazards of radionuclides by compliance with health based standards and/ or Generally Available Control Technology (GACT).

The proposed rule would require the owner or operator of a uranium recovery facility to maintain records that confirm that the conventional impoundment(s), nonconventional impoundment(s) and heap leach pile(s) meet the requirements in section 192.32(a)(1). Included in these records are the results of liner compatibility tests, measurements confirming that one meter of liquid has been maintained in nonconventional impoundments and records confirming that heap leach piles have constantly maintained at least 30% moisture content during the operating life of the heap leach pile. This documentation should be sufficient to allow an independent auditor (such as an EPA inspector) to verify the accuracy of the determination made concerning the facility's compliance with the standard. These records must be kept at the mill or facility for the operational life of the facility and, upon request, be made available for inspection by the Administrator, or his/her authorized representative. The proposed rule would not require the owners or operators of operating impoundments and heap leach piles to report the results of the compliance inspections or calculations required in Section 61.255. The recordkeeping requirements require only the specific information needed to determine compliance. We have taken this step to minimize the reporting requirements for small business facilities.

The annual proposed monitoring and recordkeeping burden to affected sources for this collection (averaged over the first three years after the effective date of the proposed rule) is estimated to be 10,400 hours with a total annual cost of $400,000. This estimate includes a total capital and start-up cost component annualized over the facility’s expected useful life, a total operation and maintenance component, and a purchase of services component. We estimate that this total burden will be spread over 21 facilities that will be required to keep records. Of this total burden, however, 4,150 hours (and $93,000) will be incurred by the one heap leach uranium recovery facility, due to the requirements for purchasing, installing and monitoring the soil moisture sensors, as well as training staff on how to operate the equipment.

Burden is defined at 5 CFR 1320.3(b).An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR Part 9.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, EPA has established a public docket for this rule, which includes this ICR, under Docket ID number EPA-HQ-OAR-2008-0218. Submit any comments related to the ICR to EPA and OMB. See ADDRESSES section at the beginning of this notice for where to submit comments to EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW, Washington, DC 20503, Attention: Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after **[Insert date of publication in the Federal Register.]**, a comment to OMB is best assured of having its full effect if OMB receives it by **[Insert date 30 days after publication in the Federal Register.]**. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure

Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) a small business whose company has less than 500 employees and is primarily engaged in leaching or beneficiation of uranium, radium or vanadium ores as defined by NAIC code 212291; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of this proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This proposed rule is estimated to impact approximately 50 uranium recovery facilities that are currently operating or plan to operate in the future.

To evaluate the significance of the economic impacts of the proposed revisions to Subpart W, separate analyses were performed for each of the three proposed GACTs.

The GACT for uranium recovery facilities that use conventional milling techniques proposes that only phased disposal units or continuous disposal units be used to manage the tailings. For either option, the disposal unit must be lined and equipped with a leak detection system, designed in accordance with Part 192.32(a)(1). If phased disposal is the option chosen, the rule limits the disposal unit to a maximum of 40 acres, with no more than two units open at any given time. If continuous disposal is chosen, no more than 10 acres may be open at any given time. Finally, the Agency is proposing to eliminate the distinction that was made in the 1989 rule between impoundments constructed pre-1989 and post-1989 since all of the remaining pre-1989 impoundments comply with the proposed GACT. The elimination of this distinction also eliminates the requirement that pre-1989 disposal units be monitored on an annual basis to demonstrate that the average Rn-222 flux does not exceed 20pCi/sec/sq. meter.

The conventional milling GACT applies to three existing mills and one proposed mill that is in the process of being licensed. The four conventional mills are: the

White Mesa mill owned by Denison Mines; the Shootaring Canyon mill owned by Uranium One, Inc.; the Sweetwater mill owned by Kennecott Uranium Co.; and the proposed Pinon Ridge mill owned by Energy Fuels, Inc. Of the four companies that own conventional mills, two, Dennison Mines and Energy Fuels, are classified as small businesses using fewer than 500 employees as the classification criterion.

Denison Mines' White Mesa mill uses a phased disposal system that complies with the proposed GACT. When its existing open unit is full it will be contoured and covered and a new unit, constructed in accordance with the proposed GACT, will be opened to accept future tailings. Energy Fuels is proposing a phased disposal system to manage its tailings; this system also complies with the proposed GACT.

Based on the fact that both small entities are in compliance with the proposed GACT, we conclude that the rulemaking will not impose any new economic impacts on either facility. For Denison Mines, the proposed rule will actually result in a cost saving as it will no longer have to perform annual monitoring to determine the average radon flux from its impoundments.

The GACT for evaporation ponds at uranium recovery facilities requires that the evaporation ponds be constructed in accordance with design requirements in Part

192.32(a)(1) and that a minimum of 1 meter of liquid be maintained in the ponds during operation and standby. The key design requirements for the ponds are for a double-liner with a leak detection system between the two liners.

In addition to the four conventional mills identified above, the GACT for evaporation ponds applies to in-situ leach (ISL) facilities and heap leach facilities. Currently, there are five operating ISLs and no operating heap leach facilities. The operating ISLs are Crow Butte and Smith Ranch owned by Cameco Resources, Alta Mesa owned by Mestena Uranium, LLC, Willow Creek owned by Uranium One, Inc., and Hobson owned by Uranium Energy Corp. Again using the fewer than 500 employees criterion, Mestena Uranium, LLC and Uranium Energy Corp are both small businesses, while Cameco Resources and Uranium One, Inc. are both large businesses.

All of the evaporation ponds at the four conventional mills and the five ISLs were built in conformance with Part 192.32(a)(1). Therefore the only economic impact is the cost of complying with the new requirement to maintain a minimum of 1 meter of water in the ponds during operation and standby.

In addition to the five operating ISLs, a number of ISLs have been proposed for licensing. These are: Dewey-

Burdock owned by Powertech Uranium Corp.; Nichols Ranch owned by Uranez Uranium Corp.; Moore Ranch owned by Uranium One, Inc.; Benavidas, Kingsville Dome, Los Finados, Rosito, and Vasques all owned by Uranium Resources One. All of these companies, except Uranium One, Inc., are small businesses.

According to the licensing documents submitted by the owners of the proposed ISLs, all will be constructed in conformance with Part 192.32(a)(1). Therefore the only economic impact is the cost of complying with the new requirement to maintain a minimum of 1 meter of water in the ponds during operation and standby.

The requirement to maintain a minimum of 1 meter of liquid in the ponds is estimated to cost up to $0.03 per pound of U_3O_8 produced. This cost is not a significant impact on any of these small entities.

Although there are no heap leach facilities currently licensed, Titan Uranium is expected to submit a licensing application for the Sheep Mountain Project. From the preliminary documentation that Titan has presented, the facility will have an Evaporation Pond, a Collection Pond, and a Raffinate Pond. All three ponds will be double lined with leak detection. However, as Titan Uranium is a large business, it does not affect the determination of impacts on small businesses.

The GACT for heap leach facilities applies the phased disposal option of the GACT for conventional mills to these facilities and adds the requirement that the heap leach pile be maintained at a minimum 30 percent moisture content by weight during operations.

As noted previously, there are no heap leach facilities currently in existence, and the only one that is known to be preparing to submit a license application is being proposed by Titan Uranium, which is a large business.

Of the 19 facilities identified above, 11 are owned by small businesses. No small organizations or small governmental entities have been identified that would be impacted by the proposed GACTs.

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with “Federal mandates” that may result in expenditures to

State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires us to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows us to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before we established any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, we must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

We have determined that the options considered in this proposed rule do not contain a Federal mandate that may result in expenditures of $100 million or more to State, local, and tribal governments in the aggregate, or to the private sector in any one year. Thus, this proposed rule is not subject to the requirements of sections 202 and 205 of the UMRA. Additionally, for the same reason as above for all governments, we believe the options considered in this proposed rule do not contain requirements that might significantly or uniquely affect small governments.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Thus, the requirements of the Executive Order do not apply to this proposed rule.

In the spirit of Executive Order 13132 and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This action would not have substantial direct effects on tribal governments, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes. The action imposes requirements on owners and operators of specified area sources and not tribal governments. Thus, Executive Order 13175 does not apply to this action.

EPA specifically solicits additional comment on this proposed action from tribal officials.

G. Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks

EPA interprets EO 13045 (62 FR 19885, April 23, 1997) as applying to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the Order has the potential to influence the regulation. This action is not subject to EO 13045 because it is based solely on technology performance.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a “significant energy action” as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This proposed rule will not adversely affect in a material way, productivity, competition, or prices in the energy sector.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (“NTTAA”), Public Law No. 104-113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This proposed rulemaking does not involve test methods. Therefore, EPA is not considering the use of any voluntary consensus standards.

We request public comment on this aspect of the proposed rulemaking, and specifically, ask you to identify potentially applicable voluntary consensus standards and to explain why such standards could be used in this regulation.

J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it maintains the current level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. This proposed rule would reduce toxics emissions from sources and thus maintain the safe amount of such emissions to which all affected populations are exposed, is a proposed rule that establishes national standards for air quality, and will increase the level of environmental protection without creating “hotspots” that could disproportionately and adversely affect a minority or low-income population.

National Emission Standards for Radon Emissions From Operating Mill Tailings

List of Subjects in 40 CFR Part 61

Environmental protection, Air pollution control, Hazardous substances, Radon, Tailings, Byproduct, Uranium, Reporting and recordkeeping requirements.

____
Dated:

____
Lisa P. Jackson,
Administrator.

For the reasons stated in the preamble, the Environmental Protection Agency proposes to amend title 40, Chapter I of the Code of Federal Regulations as follows:

PART 61—-[AMENDED]

1. The authority citation for part 61 continues to read as follows:

Authority: 42 U.S.C. 7401 et seq.

Subpart W—[AMENDED]

2. Section 61.251 is revised by amending one definition and amended by adding new definitions in alphabetical order as follows:

§61.251 Definitions

* * * * *

(h) <u>Conventional Impoundment.</u> A conventional impoundment is a permanent structure located at any uranium recovery facility which contains mostly solid uranium byproduct material from the extraction of uranium from uranium ore. These impoundments are left in place at facility closure.

(i) <u>Non-Conventional Impoundment.</u> A non-conventional impoundment can be located at any uranium recovery facility and contains uranium byproduct material suspended in and/or covered by liquids. These structures are commonly known as holding ponds or evaporation ponds. They are removed at facility closure.

(j) <u>Heap Leach Pile.</u> A heap leach pile is a pile of uranium ore placed on an engineered structure and stacked so as to

allow uranium to be dissolved and removed by leaching liquids.

(k) Standby. Standby means the period of time that an impoundment may not be accepting uranium byproduct materials but has not yet entered the closure period.

(l) Operation. Operation means that an impoundment is being used for the continued placement of uranium byproduct materials or tailings or is in standby status for such placement. An impoundment is in operation from the day that uranium byproduct materials or tailings are first placed in the impoundment until the day that final closure begins.

(m) Uranium Recovery Facility. A uranium recovery facility means a facility licensed to manage uranium byproduct materials during and following the processing of uranium ores. Common names for these facilities are a conventional uranium mill, an in-situ leach (or recovery) facility and a heap leach facility or pile.

(n) Heap Leach Pile Operational Life. The operational life of a heap leach pile means the time that lixiviant is first placed on the heap leach pile until the time of the final rinse.

3. Revise §61.252 to read as follows:

§61.252 Standard.

(a) Conventional Impoundments.

(1) Conventional impoundments shall be designed, constructed and operated to meet one of the two following work practices:

(i) Phased disposal in lined tailings impoundments that are no more than 40 acres in area and shall comply with the requirements of 40 CFR 192.32(a)(1). The owner or operator shall have no more than two impoundments, including existing impoundments, in operation at any one time.

(ii) Continuous disposal of tailings such that tailings are dewatered and immediately disposed with no more than 10 acres uncovered at any time and shall comply with the requirements of 40 CFR 192.32(a)(1).

(b) Non-Conventional Impoundments. Non-conventional impoundments shall meet the requirements of 40 CFR 192.32(a)(1). During operation and until final closure begins the liquid level in the impoundment shall not be less than one meter.

(c) Heap Leach Piles. Heap leach piles shall comply with the phased disposal work practice standard in 40 CFR 61.252(a)(1)(i). The heap leach piles shall also comply with the requirements of 40 CFR 192.32(a)(1). The moisture content of the heap leach pile shall be maintained at 30% or greater. The moisture content determination shall be performed using generally accepted geotechnical methods. The moisture content requirement shall apply during the heap leach pile operational life.

§61.253 [Removed]

§61.254 [Removed]

Revise Section 61.255 to read as follows:

§61.255 Recordkeeping Requirements

(a) The owner or operator of any uranium recovery facility must maintain records that confirm that the conventional impoundment(s), nonconventional impoundment(s) and heap leach pile(s) at the facility meet the requirements in 40 CFR 192.32(a)(1). These records shall include, but not be limited to, the results of liner compatibility tests.

(b) The owner or operator of any uranium recovery facility with nonconventional impoundments must maintain records that include measurements confirming that one meter of liquid has been constantly maintained in the nonconventional impoundments at the facility.

(c) The owner or operator of any heap leach facility shall maintain records confirming that the heap leach piles have constantly maintained at least 30% moisture content by weight during the heap leach pile operational life.

(d) The records required in paragraphs (a), (b) and (c) above must be kept at the uranium recovery facility for the operational life of the facility and must be made available for inspection by the Administrator, or his authorized representative.

MEMORANDUM

SUBJECT: Proposed Rule: Revisions to National Emissions Standards for Operating Mill Tailings (Tier 2; SAN 5281; RIN 2060-AP21) **– ACTION MEMORANDUM**

FROM: Gina McCarthy
Assistant Administrator

THRU: Office of Policy (1806A)
Office of Executive Secretariat (1105A)

TO: Lisa P. Jackson
EPA Administrator (1101A)

PURPOSE

Attached for your signature is a proposed rule revising the National Emissions Standards for Hazardous Air Pollutants (NESHAP) for radon emissions from operating uranium mill tailings. The proposal requires Generally Available Control Technologies (GACT) to be applied to the structures that contain uranium byproduct material from the processing of uranium ore. Section 112(q) of the Clean Air Act Amendments of 1990 (CAA) required EPA to review and revise requirements that were in existence prior to the enactment of the Act. The original NESHAP was promulgated in 1989. The timing is such that as more uranium recovery facilities are in the planning stages (due to increased interest in alternative energy sources), the new rule will provide enhanced environmental protection standards for these types of facilities.

DEADLINE

No deadlines apply to this action, but it does satisfy a requirement of a settlement agreement between EPA and two environmental groups over EPA's alleged failure to review and revise this standard within 10 years of enactment of the CAA.

OVERVIEW

Authority: Section 112(d) of the Clean Air Act Amendments of 1990.

Background: This proposal follows the direction in the Clean Air Act Amendments of 1990 in creating generally available control technology or management practices (GACT) for the area source category. We are clarifying the rule to confirm that it applies to all uranium recovery facilities that manage uranium byproduct material or tailings. This includes conventional mills, in-situ leach facilities and heap leach piles. The GACT is a set of standards designed so that radon emissions from these facilities will be minimized.

Actions Proposed: This action amends existing 40 CFR 61.250, Subpart W, Radon Emission Standards from Operating Uranium Mill Tailings. We are proposing GACT standards for conventional uranium mill impoundments, non-conventional impoundments that contain uranium byproduct material (i.e., evaporation or holding ponds) and heap leach piles, and eliminating the radon monitoring requirement for three existing facilities. The standards limit the size and number of impoundments that can exist at any time. The standards also prescribe requirements for design and construction of the impoundments (e.g., double liners, leak detection systems). The goal is to minimize radon emissions from these operating units, and to minimize the chances for ground-water contamination. We are also proposing to add and refine definitions in making determinations of where the regulation applies. Only the state of Utah is authorized to manage Subpart W, EPA retains authority elsewhere. We are proposing to require record keeping of documents showing compliance with the regulations. An ICR and supporting statement has been produced.

Other actions underway that affect this sector: Under our authority in the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), we have also issued standards that are more broadly applicable to uranium and thorium byproduct materials at active and inactive uranium mills. We are currently preparing a regulatory proposal to update provisions of 40 CFR Part 192, with emphasis on ground-water protection for ISL facilities. Subpart W currently contains reference to some of the Part 192 standards.

Legal History: On April 26, 2007, Colorado Citizens Against Toxic Waste and Rocky Mountain Clean Air Action filed a lawsuit against EPA for EPA's alleged failure to review and, if appropriate, revise NESHAP Subpart W under CAA section 112(q)(1). A settlement agreement was entered into between the parties in November 2009. EPA agreed to revise the rule as expeditiously as possible.

ANTICIPATED PUBLIC AND STAKEHOLDER RESPONSE

We anticipate significant interest from environmental groups who wanted us to establish a numerical, rather than technology-based standard. We also anticipate interest from industry, who will challenge our determinations on the applicability of Subpart W to evaporation ponds and heap leach piles.

We anticipate mixed external reactions to this proposed rulemaking from a variety of stakeholder groups. Reactions from state, local and tribal governments and related organizations will likely be mixed, but likely supportive. We expect industry groups will challenge our determinations on the applicability of Subpart W to evaporation ponds and heap leach piles. Environmental groups will likely express frustration that the timeline we used did not result in a new form of the standard. They will also be frustrated that we are proposing a technology-based standard.

INTERNAL DEVELOPMENT AND REVIEW PROCESS

This is a Tier 2 action. The workgroup was formed in early 2009, and contains members from OAR, OGC, OP, ORD, OECA, OSWER, OW, and Regions 6, 7, 8 and 10. The workgroup has been substantially engaged from development of the Analytical Blueprint through Early Guidance and Options selection, and has played a critical role in development of preamble language and proposed rule language. There are no outstanding issues from the development process.

OMB TRANSACTION

This action went to OMB for review because it raises novel legal and policy issues.

[Identify the determination by the Office of Management and Budget (OMB) (e.g., significant, non-significant, waived) and whether the action went to OMB for review under Executive Order (EO) 12866. If the action went to OMB for review, highlight significant issues resulting from EO 12866 review, including any significant issues raised by other agencies participating in the review. Explain any substantive changes made to the action as a result of recommendations from OMB or the other agencies.]
[Note that you will not be able to complete this section until after OMB completes its review of the action; therefore, this section generally will not be complete when you circulate the draft Action Memorandum with the FAR package and the EO 12866 review package to OMB. Do your best to provide what detail you can when circulating the draft memo, however (e.g., it is likely that you can list the OMB determination in this section, even at the draft stage.)]

IMPACTS

We project that a benefit of this proposed rule is that there will be no adverse air (radon) impacts. The control technologies being proposed today have been used at uranium recovery facilities for the past twenty or more years. These work practice standards minimize the amount of radon that is released to the air by keeping the impoundments wet or covered with soil and by limiting the area of exposed tailings. The requirements in this proposed rule should eliminate or reduce radon emissions at evaporation ponds to a level that is difficult to distinguish from the background levels naturally found in the environment.

Existing Subpart W required licensees to perform annual monitoring using Method 115 to demonstrate that the radon flux at conventional impoundments constructed before December 15, 1989 was below 20 pCi/m^2-sec. The deletion of this monitoring requirement (and regulation through a GACT standard) would result in cost savings of $21,000 to $37,000 per year to the three facilities for which this requirement still applies.

Baseline costs for conventional impoundment liner construction will remain the same, since the proposed rule does not impose additional requirements. The average cost to construct one of these impoundments is $13.8 million. We estimate that this cost is approximately 3% of the total uranium yellowcake production costs, estimated at $372 million. Non-conventional impoundment liner costs are projected to increase by approximately $1.5 million, and heap leach piles liners will increase costs by $1.7 million. The annual proposed monitoring and recordkeeping burden to affected sources for this collection (averaged over the first three years after the effective date of the proposed rule) is estimated to be 10,400 hours with a total annual cost of $400,000.

Including a requirement for liquids in impoundments would reduce radon emissions by 93%. Requiring a double liner in the design of all onsite impoundments that would contain uranium byproduct material and also reduce the potential for ground-water contamination. Although the amount of the potential reduction is difficult to quantify, it is important to take this into consideration due to the significant use of ground water as a source of drinking water.

STAKEHOLDER INVOLVEMENT

Stakeholders have been involved since the initial Notice of Intent to Sue. In addition to environmental groups, we have engaged industry, the general public, State agencies and Tribal groups. We developed a public website (http://www.epa.gov/radiation/neshaps/subpartw/rulemaking-activity.html) and placed all information pertinent to the rulemaking there. We hold quarterly conference calls to address issues. We have held or participated in nine public meetings (two on Tribal lands) to gather stakeholder input. We established an email address specifically for stakeholder questions. Stakeholders largest concern is that the rule will provide certainty that there will be no issues with uranium mill tailings as there has been in the past (i.e., legacy sites). Industry is concerned that the tailings are not "over regulated."

PEER REVIEW

There were no influential or highly influential products supporting this action as defined by the agency's *Peer Review Handbook.*

RECOMMENDATION

I recommend that you sign the attached rulemaking.

Attachments
(1) Proposed rule for signature
(2) Economic Impact Analysis
(3) FAR Memo

Workgroup Members and Contact Information

Workgroup Member	Office
Reid Rosnick (Chair)	OAR/ORIA, 202-343-9563
Tom Peake (Alternate)	OAR/ORIA, 202-343-9445
Susan Stahle	OGC, 202-564-1272
Barry Elman	OP, 202-566-2958
Tim Benner	ORD, 202-564-6769
Charlie Garlow	OECA, 202-564-1088
Stuart Walker	OSWER, 703-308-7294
Stephen Hoffmann	OSWER, 703-308-8413
Marilyn Ginsburg	OW, 202-564-3881
George Brozowski	Region 6, 214-665-8541
Bob Dye	Region 7, 913-551-7605
Charles Hooper	Region 7, 913-551-7271
Angelique Diaz	Region 8, 303-312-6344
Davis Zhen	Region 10, 206-553-7660

MAR 28 2012

MEMORANDUM

SUBJECT: **Final Agency Review Meeting** for Revisions to National Emissions Standards for Operating Mill Tailings (Tier 2; SAN 5281)

FROM: for Wanda Farrar OW Eagles
OAR Steering Committee Representative

TO: Participating Steering Committee Representatives
Participating Regional Regulatory Contacts
EPA Workgroup Members

The Final Agency Review (FAR) meeting for the Revisions to National Emissions Standards for Operating Mill Tailings is scheduled for Thursday, April 19, 2012 at 1 p.m. EDT. The meeting room is located at 1310 L St., NW, Washington, DC. The call-in number is 866-299-3188, conference code 2023439563. I have confirmed with the workgroup chair that the workgroup has been polled and agrees that this action is ready for FAR. The draft action memo, workgroup list, draft communication materials, fact sheet, supporting analyses and proposed rule are attached. Since the last workgroup meeting we were requested by Gina McCarthy to add some record keeping requirements to the proposal. We added the requirement that the owner/operator of a uranium recovery facility keep the following records on site:

1. The approved design and construction plans that were approved by EPA.
2. All records showing compliance with the one meter of liquid in evaporation ponds.
3. All records showing compliance for the 30% moisture requirement at heap leach piles.

As a result of this amendment we also had to generate an Information Collection Request (ICR) for the record keeping requirement. We also have been adding some language to enhance up the discussion on economics. This is a Tier 2 action.

EPA is proposing to revise certain portions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for radon emissions from operating uranium mill tailings. The proposed emissions standards for new and existing sources are based on EPA's proposed determination as to what constitutes the generally available control technology (GACT) or management practices for this area source category. We are also proposing to add and refine definitions and clarify that the existing rule applies to uranium recovery facilities that extract uranium through the in-situ leach method and the heap leach method.

Final Agency Review is the last point for internal cross-Agency review of this action. It provides a forum for confirming that (1) the workgroup has successfully completed its job and resolved or elevated all issues, (2) the rulemaking package is complete and ready for OMB review (if necessary), and (3) all Agency and external requirements have been met. **Each lead workgroup member is expected to represent the position of his or her Assistant/Associate/Regional Administrator (AA or RA) at FAR**, and may take one of the following three positions:

1). If an office has minor, *non-substantive comments,* they may **concur without comment**.

2). If an office has *substantive comments*, they may **concur with comment**. While the lead program should try to resolve the issue(s) raised by the comments, it may choose to go forward to OMB for review, or to the Administrator for signature, without resolving the issues. The lead office is responsible for working with all of the offices that provided substantive comments to determine how to address the comments. If the offices cannot agree on a way to address the comments, the lead office must include the comments in the action memorandum with an explanation of why it cannot satisfactorily address the comments.

3). If an office feels that *a major issue remains unresolved* (e.g., the action lacks legal authority or conflicts with other EPA rules or policies), it may **non-concur**. Non-concurrence indicates that the AA or RA objects to the action being forwarded to OMB, or to the Administrator for signature.

Please address your FAR comments to Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, and send the original memorandum directly to her. Please also forward a copy of your comments to me (farrar.wanda@epa.gov); Reid Rosnick, Workgroup Chair (rosnick.reid@epa.gov or fax: 202-343-2304); and Lena Ferris, OP (ferris.lena@epa.gov or fax: 202-564-0965).

OPEI's Regulatory Management Division (RMD) will chair the FAR meeting and distribute a memorandum following the meeting that documents all positions provided and any further action agreed upon at the meeting. If a participating Office or Region is not represented at the FAR meeting and has not previously contacted the Workgroup Chair and me in writing with his or her AA's or RA's position prior to the meeting, "concurrence without comment" will be assumed.

Thank you for your assistance in reviewing this action. If you have any questions about the FAR process, please call me (202-564-1953). If you have questions about the substance of the notice or need more information on the supporting analyses, please contact Reid Rosnick, the Workgroup Chair, at rosnick.reid@epa.gov or 202-343-9563.

Attachments:

cc: Kristina Friedman
Nicole Owens
Lena Ferris

EPA-427

Reid Rosnick/DC/USEPA/US
03/28/2012 07:22 PM

To Barry Elman
cc
bcc
Subject Quick question on Subpart W FAR

Hi Barry,

Yes, we entered into a settlement agreement (not a consent decree) with 2 environmental groups in Colorado. The agreement stated that, among other things, we would create a website, put all the documents available on the web site, hold 3 public meetings and a webinar, have quarterly stakeholder conference calls, and post the date on the website when we anticipated that we would propose the rule. We did NOT agree to dates when the rule would be proposed or go final. I have attached the settlement agreement for your information. I'm at home right now, but if you have any questions, please call me tomorrow morning. Hope this helps.

Reid

Reid J. Rosnick
Radiation Protection Division (6608J)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460
202.343.9563
rosnick.reid@epa.gov

-----Barry Elman/DC/USEPA/US wrote: -----
To: Reid Rosnick/DC/USEPA/US@EPA
From: Barry Elman/DC/USEPA/US
Date: 03/28/2012 05:20PM
Subject: Quick question on Subpart W FAR

Hi Reid,

I have in my notes that EPA has entered into a consent decree with two Colorado environmental groups that prescribes when the proposed and final standard will be issued. Is that correct? And if so, what are the deadlines that we are subject to under the consent decree? If you could let me know this evening or first thing in the morning, I'd appreciate it.

Thanks,

Barry - settlementagreement.pdf

SETTLEMENT AGREEMENT

WHEREAS, the parties to this Settlement Agreement are the Plaintiffs in Colorado Citizens Against Toxic Waste and Rocky Mountain Clean Air Action v. Jackson, Civ. Action No. 08-cv-1787 (D. Colo.), and Defendant, Lisa P. Jackson, in her official capacity as Administrator of the United States Environmental Protection Agency (hereinafter "EPA") (collectively, the "Parties");

WHEREAS, on August 21, 2008, Plaintiffs filed their complaint in the above-referenced case pursuant to section 304(a)(2) of the Clean Air Act ("CAA"), 42 U.S.C. § 7604(a)(2), alleging that EPA failed to perform a non-discretionary duty pursuant to CAA section 112(q)(1), 42 U.S.C. § 7412(q)(1), to review and, if appropriate, revise, 40 C.F.R. Part 61, Subpart W, National Emission Standards for Radon Emissions From Operating Mill Tailings, to comply with the requirements of CAA section 112(d), 42 U.S.C. § 7412(d);

WHEREAS, on October 24, 2008, pursuant to Fed. R. Civ. P. 12(b)(1) and (6), EPA filed a motion to dismiss the Complaint on the basis that the Court lacks subject matter jurisdiction over the claims in the Complaint because they are time-barred by the six-year statute of limitations applicable in this case: 28 U.S.C. § 2401(a);

WHEREAS, on November 11, 2008, Plaintiffs filed a motion (1) to stay the briefing on EPA's motion to dismiss and (2) to allow Plaintiffs to conduct discovery regarding subject matter jurisdiction;

WHEREAS, on January 20, 2009, after full briefing on Plaintiffs' request for discovery, the Court issued an Order denying Plaintiffs' request except in one limited instance;

WHEREAS, on February 6, 2009, the Court issued an Order granting the Parties' joint request to Stay Proceedings and Set a Settlement Conference;

WHEREAS, Magistrate Judge Michael E. Hegarty presided over Settlement Conferences held on March 2, 2009, and June 4, 2009;

WHEREAS, the Parties wish to effectuate a settlement of Colorado Citizens Against Toxic Waste et al. v. Jackson, Civ. Action No. 08-cv-01787 (D. Colo.), without expensive and protracted litigation;

WHEREAS, the Parties have agreed to a settlement without admission of any issue of fact or law;

WHEREAS, the Parties consider this Settlement Agreement to be an adequate and equitable resolution of the claims in the above-referenced case;

WHEREAS, EPA has commenced review of 40 C.F.R. Part 61, Subpart W, National Emission Standards for Radon Emissions From Operating Mill Tailings ("Subpart W"); and

WHEREAS, the Parties agree this Settlement Agreement will provide expanded public participation opportunities during the review of Subpart W which will assist EPA in receiving and considering input during the substantive review of Subpart W.

NOW THEREFORE, the Parties agree as follows:

1. Within 10 business days from the date both Parties sign this Agreement, the Parties shall file a joint motion with the Court notifying it of this Agreement and requesting that this case be stayed pending completion of the process under section 113(g) of the Clean Air Act as set forth in Paragraph 12. This Agreement shall not become final and effective until EPA notifies Plaintiffs in writing, pursuant to Paragraph 12, that it consents to the Agreement following the public notice and comment process required by Clean Air Act section113(g) as set forth in Paragraph 12.

2. Plaintiffs shall file a motion to administratively close this case under D.C.Colo.LCivR 41.2 within 10 business days of the date this Agreement becomes final pursuant to Paragraph 12. In the event that this motion is not granted, this Agreement is voidable at the election of either party. Plaintiffs shall file a motion for voluntary dismissal of the Complaint, with prejudice, pursuant to Fed. R Civ. P. 41(a), within 10 business days after publication in the Federal Register of EPA's promulgation of either: (1) EPA's issuance of a final determination not to revise Subpart W; or (2) EPA's promulgation of a final revision of Subpart W.

3. EPA agrees to take the following steps :

a. Within 30 days of finalization of this Agreement pursuant to Paragraph 12, EPA will create a website dedicated to Subpart W which provides internet access to background information already compiled by EPA. During the ongoing Subpart W review, the website is intended to be used to provide public access to all non-privileged records, especially technical documents, which will be posted as soon as practicable after the date such agency records are created or obtained by EPA;

b. Within 30 days of the finalization of this Agreement pursuant to Paragraph 12, EPA shall establish and post on the website, and thereafter maintain, a current estimate of a tentative timeframe for completing its review of Subpart W;

c. Within 30 days of finalization of this Agreement pursuant to Paragraph 12, EPA shall post an announcement on the Subpart W website indicating that EPA invites and encourages the public to provide comments on its review of Subpart W;

d. In addition to any other meetings it deems appropriate, prior to publication of a proposed rule regarding Subpart W, EPA shall provide at least four presentations, comprised of three in-person regional presentations and one internet seminar, regarding EPA's review of Subpart W, unless all parties agree otherwise, as follows:

i. A meeting on June 30, 2009 in Cañon City, Colorado;

ii. A meeting at a date to be determined, but on or before June 30, 2010, to be held in Blanding, Utah, or a similar location near the Denison Mill at White Mesa, Utah;

iii. A meeting in conjunction with the Western Mining Action Network's semi-annual conference, which will take place October 1-4, 2009, in Rapid City, South Dakota;

iv. Final locations (e.g. facilities) and other details of the meetings referenced in the above three paragraphs will be negotiated between the parties as soon as practicable to enable the above-referenced meetings to be held;

v. The fourth presentation will be a nationwide internet seminar held on a date to be determined, but on or before June 30, 2010. Information regarding the date and time of this presentation, as well as how to participate, will be provided to Plaintiffs at least 20 days before the seminar and will be posted on the Subpart W website.

e. EPA shall conduct quarterly call-in conference calls to brief the public on the status of its review of Subpart W, and to answer relevant questions the public may have regarding that review. The calls shall commence within 30 days after this Agreement becomes final, as indicated in Paragraph 12, and end when the Administrator takes final action regarding review of Subpart W. Except for the initial call, such calls will take place on the first Tuesday of the first month of the quarter at 11:00 a.m. Eastern Time, 9:00 a.m. Mountain Time. EPA shall provide the call-in number to the Plaintiffs at least five business days prior to the call via email.

4. The United States agrees to pay to Plaintiffs the sum of $27,427.50 which the parties agree constitutes a reasonable resolution of Plaintiffs' claim for statutory costs and attorneys' fees. All other fees and costs shall be borne by the parties. Payment shall be accomplished by electronic transfer to EMLC's Colorado Lawyer Trust Account Foundation ("COLTAF") account within a reasonable time after this Agreement becomes final. Within two business days after this Agreement becomes final, Plaintiffs agree to provide the necessary account and routing information and the United States agrees that such information shall be held confidential and used only for purposes of accomplishing this transfer of funds.

5. Plaintiffs agree that performance of the obligations described in Paragraphs 3 and 4 shall constitute full and complete settlement of all claims that Plaintiffs have or could have asserted under any provision of law in connection with this case, including claims for attorneys' fees or other litigation costs as a result of this case.

6. In the event EPA fails to fulfill the obligations described in Paragraph 3 of this Settlement Agreement, Plaintiffs' sole and exclusive remedy shall be the right to move the Court to reopen Case No. 08-cv-01787 (D. Colo.). No such motion shall be properly filed unless the Plaintiffs have first provided EPA with a written notice outlining the nature of the failure to perform, and requested and conducted informal negotiations with EPA to resolve the dispute, at least 30 business days before the motion is filed. EPA shall provide a written response within 20 days of Plaintiffs providing such written notice.

7. Except as expressly provided in this Settlement Agreement, none of the Parties waives or relinquishes any legal rights, claims, or defenses it may have, including, without limitation, Plaintiffs' right to challenge any final determination made by EPA regarding Subpart W.

8. Nothing in the terms of this Settlement Agreement shall be construed to limit or modify the Plaintiffs' abilities to take separate actions to ensure that existing and proposed facilities are in compliance with Subpart W.

9. Nothing in the terms of this Settlement Agreement shall be construed to limit or modify the discretion accorded EPA under the Clean Air Act or by general principles of administrative law.

10. Nothing in this Settlement Agreement shall be construed to confer upon the district court jurisdiction to review any issues that are within the exclusive jurisdiction of the

United States Courts of Appeals, or waive any remedies or defenses the Parties may have, pursuant to section 307(b)(1) of the Clean Air Act, 42 U.S.C. §§ 7607(b)(1), or otherwise.

11. The commitments by EPA in this Settlement Agreement are subject to the availability of appropriated funds. No provision of this Settlement Agreement shall be interpreted as or constitute a commitment or requirement that EPA obligate, expend, or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable appropriations law or regulation, or otherwise take any action in contravention of those laws or regulations.

12. The Parties agree and acknowledge that final approval of this Settlement Agreement is subject to the requirements of section 113(g) of the Clean Air Act, 42 U.S.C. § 7413(g). That section requires that the Administrator provide notice of any proposed settlement agreement in the Federal Register and provide a period of at least thirty (30) days following publication to allow persons who are not parties or intervenors in the litigation to comment in writing. Therefore, within 10 business days from the date this Agreement is executed by the Parties, EPA shall submit this Agreement to the Federal Register for publication. The Administrator or the Attorney General, as appropriate, must consider any comments in deciding whether to consent to the Settlement Agreement and may withdraw or withhold her or his consent to the Settlement Agreement if the comments disclose facts or considerations which indicate that such consent is inappropriate, improper, inadequate or inconsistent with the requirements of the Act. This Agreement shall become final on the date that EPA provides written notice of such finality to Plaintiffs. EPA shall provide such written notice within 60 days

after the notice of the Agreement is published in the Federal Register. Plaintiffs' sole remedy should the Administrator withhold her or his consent to the Settlement Agreement shall be the right to ask the Court to lift the stay of Civ. Action No. 08-cv-1787 (D. Colo.) and establish a schedule for further proceedings.

13. The undersigned representatives of each Party certify that they are fully authorized by the Parties they represent to bind the respective Parties to the terms of this Settlement Agreement. This Settlement Agreement will be deemed to be executed when it has been signed by the representatives of the Parties set forth below, subject to final approvals pursuant to Paragraph 12.

FOR PLAINTIFFS

TRAVIS E. STILLS
Energy Minerals Law Center
1911 Main Avenue, Suite 238
Durango, CO 81301
Tel: (970) 375-9231
Fax: (970) 382-0316
E-mail: emlc@frontier.net

DATED: August 11, 2009

FOR DEFENDANT

Laurel A. Bedig

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DATED: August 21, 2009

Of Counsel for Defendant:

SUSAN STAHLE
U.S. Environmental Protection Agency
Office of General Counsel
ARN: MC-2344A
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

EPA-5443

Tony Nesky/DC/USEPA/US

01/24/2012 11:09 AM

To Reid Rosnick

cc

bcc

Subject Re: Subpart W Communications Plan

I'm teleworking today, so let's chat about the fact sheets tomorrow or Thursday. Or if you prefer, you can call me at 703-329-6272.

Tony Nesky
Center for Radiation Information and Outreach
Tel: 202-343-9597
nesky.tony@epa.gov