Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

September 29, 2017

CERTIFIED MAIL

Ms. Emily E. Schwing
Northwest News Network
c/o KUOW Puget Sound Public Radio
4518 University Way NE. Suite 310
Seattle, Washington 98105

Dear Ms. Schwing:

FREEDOM OF INFORMATION ACT REQUEST (FOI 2017-01150)

This is in further response to the request for information that you sent the Department of Energy (DOE) under the Freedom of Information Act (FOIA). You requested:

1) "Any correspondence dated between January 1, 2014 and May 9, 2017 between DOE and authors of the CRESP Interim Progress Report, dated August 31, 2015 and including keywords "PUREX" and/or "tunnel." The authors of that report include: David S. Kosson, Charles W. Powers, Jennifer Salisbury, Craig H. Benson, Lisa S. Bliss, Kevin G. Brown, Joanna Burger, Bethany L. Burkhardt, James H. Clarke, Allen G. Croff, Lyndsey Fern Fyffe, Michael Gochfeld, Kathryn A. Higley, George M. Hornberger, Kimberly L. Jones, Steven L. Krahn, Eugene J. LeBoeuf, Henry J Mayer, Richard B. Stewart, and Hamp Turner."

2) "Any correspondence that includes keywords "PUREX" and/or "tunnel" dated between January 1, 2014 and May 9, 2017 between DOE and the following individuals associated with the Pacific Northwest National Laboratory: Wayne Johnson, Robert Bryce, Amoret Bunn, Mickie Chamness, Janelle Downs, Vicki Freedman, Elizabeth Golovich, Alicia Gorton, Kris Hand, Ellen Kennedy, Kyle Larson, George Last, Peter Lowry, Jennifer L. Mendez, Mary Peterson, Reid Peterson, Christine Ross, Mark Triplett, and Michael Truex."

3) "Any correspondence that includes keywords "PUREX" and/or "tunnel" dated between January 1, 2014 and May 9, 2017 between DOE and Jeannette Hyatt of the Savannah River National Laboratory."

4) "Any internal communications dated August 31, 2015 and May 09, 2017 including the following keywords: "CRESP," "PUREX," "tunnel," "degradation," "emergency," "accident," "vulnerable," "vulnerability," "collapse," "plan," "contingency," "risk," "mitigate," "mitigation," "management," "decommission," "demolish," "decontaminate," "debris," "remove," "removal," "bury," " burial"."

5) “Any internal reports, studies or memos specific to the PUREX tunnels dating back to the time of each individual tunnel's retirement.”

6) “Maintenance records, associated with PUREX tunnels from the start of operation in 1956 to May 9, 2017.”

7) “Documentation that outlines plans for decontamination, demolishing and debris removal associated specifically with the PUREX tunnels.”

On June 15, 2017, you communicated via email with me and confirmed your agreement to amend your request to the following:

1) “Any correspondence dated between January 1, 2014 and May 9, 2017 between DOE and authors of the CRESP Interim Progress Report, dated August 31, 2015 and including keywords “PUREX” and/or "tunnel." The authors of that report include: David S. Kosson, Charles W. Powers, Jennifer Salisbury, Craig H. Benson, Lisa S. Bliss, Kevin G. Brown, Joanna Burger, Bethany L. Burkhardt, James H. Clarke, Allen G. Croff, Lyndsey Fern Fyffe, Michael Gochfeld, Kathryn A. Higley, George M. Hornberger, Kimberly L. Jones, Steven L. Krahn, Eugene J. LeBoeuf, Henry J Mayer, Richard B. Stewart, and Hamp Turner.”

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3) “Any correspondence that includes keywords "PUREX" and/or "tunnel" dated between January 1, 2014 and May 9, 2017 between DOE and Jeannette Hyatt of the Savannah River National Laboratory.”

4) “Any internal communications dated August 31, 2015 and May 09, 2017 including the following keywords: "CRESP," "PUREX," "tunnel," "degradation," "emergency," "accident," "vulnerable," "vulnerability," "collapse," "plan," "contingency," "risk," "mitigate," "mitigation," "management," "decommission," "demolish," "decontaminate," "debris," "remove," "removal," "bury," "burial".

In a letter dated June 22, 2017, the DOE Headquarters (HQ) FOIA Office notified you that Items No. 1, 2 and 3 of your amended request fell under the jurisdiction of the DOE Oak Ridge Office (ORO) and the Savannah River Operations Office (SRO), and provided you with the contact information for each location. As a result, the HQ FOIA Office forwarded the request to the ORO and SRO to conduct a search of their files.

In a series of email messages, this office discussed the scope of Item No. 4 of your request, and on July 17, 2017, Ms. Anna King narrowed this item to any emails from or to Mr. Doug Shoop, Mr. Geoff Tyree, Mr. Erik Olds, and Mr. Mark Heeter, dated August 31, 2015, and May 09, 2017, that included the words "PUREX," "tunnel," "collapse," or "burial." In addition, on September 7, 2017, Ms. King modified the request to exclude the following categories of emails dated August 31, 2015: 1) draft Memorandum of Agreement regarding the 2015 land conveyance, 2) email regarding RL's response to the media inquiry regarding the River Corridor Inquiry, and 3) personal emails (non-Hanford related).

We have completed the search for responsive documents and the enclosed documents (599 pages) dated May 9, 2017, were located. After review of the responsive documents, DOE has determined that certain information should be withheld pursuant to Exemption 5 of the FOIA, 5 USC § 552(b)(5), and Exemption 6 of the FOIA, 5 USC § 552(b)(6).

Exemption 5 protects "inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency. This Exemption protects those documents normally privileged in the civil discovery process, such as pre-decisional, deliberative process material. The deliberative process protects advice, recommendations, and opinions that are pre-decisional and part of the decision-making process of the Government. This privilege protects not merely the documents, but also the integrity of the deliberative process itself, where the exposure of that process, or an element thereof, would result in harm. The material withheld as deliberative includes exchanges between government employees and government representatives regarding decisions not yet made. It is reasonably foreseeable that release of such information could chill open and frank discussions, limit government personnel's range of options to consider, and thus detract from the quality of Agency decisions.

In addition, we have also deleted information in draft documents, pursuant to Exemption 5. Draft documents, by their very nature, are pre-decisional because they are prepared prior to the undertaking of any action by the agency. Draft documents are deliberative because they are part of the deliberative process by which that agency action was considered and taken. They reflect only the tentative view of their authors, views that might be altered or rejected upon further deliberation, either by the authors or by their superiors. The withheld information in the draft documents does not represent final agency policy on the matters it discusses. For these reasons, the information is being withheld.

Material determined to be exempt from mandatory disclosure may be released if disclosure is determined to be in the public interest. We have determined the public interest is best served by non-disclosure because disclosure of this information would impede the government's ability to effectively discuss options surrounding issues. In addition, as described above, as the withheld information consists of proposed recommendations and strategies deliberative in nature, the information is pre-decisional and exempt from disclosure.

We also deleted personal cell phone numbers, names of certain contractor employees, and any other personal information regarding other individuals, pursuant to Exemption 6 of the FOIA. Exemption 6 provides that an agency may protect from disclosure all personal information if its disclosure would constitute a clearly unwarranted invasion of privacy by subjecting third-party individuals to unwanted communications, harassment, intimidation, retaliation, or other substantial privacy invasions by interested parties. In invoking Exemption 6 we considered 1) whether a significant privacy interest would be invaded by disclosure of information, 2) whether release of the information would further the public interest by shedding light on the operations or activities of the government, and 3) whether disclosure would constitute a clearly unwarranted invasion of private or public interest. DOE has determined that the public interest in the identity and personal information of the third-party individuals whose information appears in the documents does not outweigh the individuals' privacy interests.

This satisfies the standard set forth by the Attorney General by Memorandum on March 19, 2009, that the agency is justified in not releasing material if it reasonably foresees that disclosure would harm an interest protected by one of the statutory exemptions or disclosure is prohibited by law. This also satisfies DOE's regulation at Title 10, Code of Federal Regulations (CFR), Section 1004.1, to make records available that it is authorized to withhold under 5 USC 552 when it determines that such disclosure is in the public interest. Accordingly, we will not make discretionary disclosure of this information.

Within the responsive documents, we located records that were generated by DOE HQ. For this reason, I have sent the request to the HQ FOIA Office, along with the responsive documents, for a release determination. Upon completion of the review of documents, HQ will provide a response directly to you. If you have any questions about the processing of the documents, please contact Mr. Alexander Morris, FOIA Officer, DOE Headquarters, Office of Public Information, MA-46/Forrestal Building 1000 Independence Avenue, SW, Washington, DC 20585, or at (202) 586-5955.

No documents responsive to your request were located for the date of August 31, 2015.

Lastly, during our search for records we located several new bulletins issued by the following external organizations and sent to Mr. Erik Olds:

Energy Communities Alliance (ECA)

- "Breaking News: Hanford Emergency Alert issued re potential radiation release" dated May 9, 2017.

Portfolio Media, Inc.

- Energy Law 360 "EPA, DOI Join Congress' Push to Overhaul Science Panels" dated May 9, 2017.

Washington Governor, Jay Inslee

- Governor Jay Inslee Press Updates "Inslee statement on today's Hanford Nuclear Reservation tunnel breach" dated May 9, 2017.

The documents were not generated by the Federal Government. The copyright for these publications belong to the above external organizations and this office does not have permission to reproduce them; however, you may wish to contact those offices directly at the following:

- ECA, 1625 Eye Street, N.W., Suite 800, Washington, DC 20006, (202) 828-2317.
- Portfolio Media, Inc. 111 West 19th Street, 5th Floor, New York, NY 10011, Email: customerservice@law360.com, (646) 783-7100.
- Governor Jay Inslee, Office of the Governor, PO Box 40002, Olympia, WA 98504-0002, (360) 902-4111.

You may contact the DOE Richland Operations Office FOIA Public Liaison, Richard Buel, at (509) 376-3375, or by mail at P.O. Box 550, Richland, Washington, 99352 for any further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, Maryland 20740-6001, email at ogis@nara.gov; telephone at 202-741-5770; toll free at 1-877-684-6448; or facsimile at 202-741-5769.

All releasable requested information in the documents has been segregated and is being provided to you. The undersigned individual is responsible for this determination. You have the right to appeal to the Office of Hearings and Appeals, as provided in 10 CFR 1004.8, for our determination. Should you choose to exercise this right, your appeal must be filed within 90 days after receipt of this letter. You may submit your appeal by email to OHA.filings@hq.doe.gov, including the phrase "Freedom of Information Appeal" in the subject line. Alternatively, any such appeal may be made in writing to the following address: Director, Office of Hearings and Appeals (HG-1), U.S. Department of Energy, L'Enfant Plaza Building, 1000 Independence Avenue SW, Washington, D.C. 20585-1615. Should you choose to appeal, please provide this office with a copy of your appeal email or letter.

For the purpose of assessment of fees, you have been categorized under the DOE regulation at 10 CFR 1004.9(b)(3), as a “news media” requester. Requesters in this category are charged fees for duplication only and are provided 100 pages at no cost.

Costs associated with your request are as follows:

Duplication – 599 pages (100 pages at no cost) @ $.05/page	$	24.95

Your check of $24.95 should be made payable to the U.S. Department of Energy and forwarded to my attention at the address provided on page 1.

This letter completes our response to your request. If you have any questions regarding your request, please contact me at our address above or on (509) 376-6288.

Sincerely,

-Original Signed By-

Dorothy Riehle
Freedom of Information Act Officer
Office of Communications
and External Affairs

OCE:DCR

Enclosures

Davisson, Tracy E

From: Olds, Theodore E (Erik)
Sent: Tuesday, May 9, 2017 9:07 AM
To: Crawford, Celinda H
Subject: FW: Heads up

FYI

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 8:37 AM
To: Nartker, Michael (CONTR) <Michael.Nartker@EM.doe.gov>; Holmes, Kristen L <Kristen.L.Holmes@rl.doe.gov>; Heeter, Mark A <Mark.Heeter@rl.doe.gov>
Cc: Olds, Theodore E (Erik) <Theodore_E_Erik_Olds@rl.doe.gov>; Brooks, Renee L <Renee_L_Brooks@rl.gov>; Buel, Richard D <richard.buel@rl.doe.gov>; Colborn, Jennifer M <Jennifer_M_Colborn@rl.gov>; Conrad, Patrick J <Patrick_J_Conrad@rl.gov>; Copeland, Jennifer L <Jennifer_L_Copeland@rl.gov>; Gribble, Dana C <Dana_C_Gribble@rl.gov>; Henderson, Destry J <Destry_J_Henderson@rl.gov>; Holmes, Kristen L <Kristen.L.Holmes@rl.doe.gov>; Johnson, Sonya E <Sonya_E_Johnson@rl.gov>; Millikin, Dee <Dee_Millikin@rl.gov>; Moss, Rae S <Rae_Moss@rl.gov>; Reyes, Tania <Tania_Reyes@rl.gov>
Subject: Heads up

I just spoke to our Emergency Preparedness manager in our Emergency Operations Shift Office. Wanted to give you a heads up that Hanford Fire is being dispatched to the PUREX facility area, after report of a possible collapse of part of the tunnel next to PUREX (b)(5) A precautionary take cover of the 200 East Area has been declared (PUREX is located in the 200 East Area), and the site is moving to an emergency status with a probably (b)(5) to be established. I'm heading to the Federal Building to check in and assist with public affairs as needed. I'll be in touch again.
Geoff

Geoff Tyree
Deputy Director, Public Affairs
Richland Operations Office
Department of Energy
Geoffrey.Tyree@rl.doe.gov
(509) 376-4171
www.hanford.gov
www.facebook.com/hanfordsite

Davisson, Tracy E

From: Trenchard, Glyn D
Sent: Tuesday, May 9, 2017 9:14 AM
To: Olds, Theodore E (Erik)
Subject: Fwd: Ballinger

Fyi

Sent from my iPhone

Begin forwarded message:

> **From:** <Glyn_D_Trenchard@orp.doe.gov>
> **Date:** May 9, 2017 at 9:10:19 AM PDT
> **To:** <Thomas_W_Fletcher@rl.doe.gov>
> **Subject: Ballinger**
>
> Romine gave ballinger a (b)(5) and she may be at EOC already
>
> Sent from my iPhone

Davisson, Tracy E

From: Teynor, Thomas K
Sent: Tuesday, May 9, 2017 9:17 AM
To: Olds, Theodore E (Erik)
Subject: Re: tunnel (b)(5)

I'm on it

Sent from my iPhone

On May 9, 2017, at 9:14 AM, Olds, Theodore E (Erik) <Theodore_E_Erik_Olds@rl.doe.gov> wrote:

(b)(5) that you have (b)(5) Doug and I need (b)(5) (b)(5) office later today.

Erik Olds
Chief of Staff
Richland Operations Office
509-372-8656
509-(b)(6) (cell)

From: Tyree, Geoffrey T [mailto:geoffrey.tyree@rl.doe.gov]
Sent: Tuesday, May 09, 2017 11:37 AM
To: Nartker, Michael <Michael.Nartker@EM.doe.gov>; Holmes, Kristen L <Kristen.L.Holmes@rl.doe.gov>; Heeter, Mark <Mark.Heeter@rl.doe.gov>
Cc: Olds, Theodore E (Erik) <Theodore_E_Erik_Olds@rl.doe.gov>; Brooks, Renee L <Renee_L_Brooks@rl.gov>; Buel, Richard D <richard.buel@rl.doe.gov>; Colborn, Jennifer M <Jennifer_M_Colborn@rl.gov>; Conrad, Patrick J <Patrick_J_Conrad@rl.gov>; Copeland, Jennifer L <Jennifer_L_Copeland@rl.gov>; Gribble, Dana C <Dana_C_Gribble@rl.gov>; Henderson, Destry J <Destry_J_Henderson@rl.gov>; Holmes, Kristen L <Kristen.L.Holmes@rl.doe.gov>; Johnson, Sonya E <sonya_e_johnson@rl.gov>; Millikin, Dee <dee_millikin@rl.gov>; Moss, Rae S <Rae_Moss@rl.gov>; Reyes, Tania <tania_reyes@rl.gov>
Subject: Heads up

I just spoke to our Emergency Preparedness manager in our Emergency Operations Shift Office. Wanted to give you a heads up that Hanford Fire is being dispatched to the PUREX facility area, after report of a possible collapse of part of the tunnel next to PUREX (b)(5) A precautionary take cover of the 200 East Area has been declared (PUREX is located in the 200 East Area), and the site is moving to an emergency status with a probably (b)(5) to be established. I'm heading to the Federal Building to check in and assist with public affairs as needed. I'll be in touch again.
Geoff

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Deputy Director, Public Affairs
Richland Operations Office
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www.facebook.com/hanfordsite

Davisson, Tracy E

From: Stanley, Rory (Energy) <Rory_Stanley@energy.senate.gov>
Sent: Tuesday, May 9, 2017 9:15 AM
To: Olds, Theodore E (Erik)
Subject: (b)(5)

Just got a news alert, wanted to check in with you when you get a moment

Davisson, Tracy E

From: Teynor, Thomas K
Sent: Tuesday, May 9, 2017 9:23 AM
To: Shoop, Doug S; Olds, Theodore E (Erik)
Subject: (b)(5)
Attachments: FW: (b)(5) FW:

FYI. Purex (b)(5)

R/Tom

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of the Freedom of Information and Privacy Act

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of the Freedom of Information and Privacy Act

Davisson, Tracy E

From: Farabee, Oliver A (AI)
Sent: Tuesday, May 9, 2017 9:24 AM
To: Franco, Joe R; Low, Corey; Olds, Theodore E (Erik)
Subject: FW: Purex Tunnel (b)(5)
Attachments: Purex (b)(5)

From: Reddick, Julie A
Sent: Tuesday, May 09, 2017 9:21 AM
To: Farabee, Oliver A (AI) <oliver.farabee@rl.doe.gov>
Subject: Purex Tunnel (b)(5)

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Davisson, Tracy E

From: Teynor, Thomas K
Sent: Tuesday, May 9, 2017 9:24 AM
To: Shoop, Doug S; Olds, Theodore E (Erik)
Subject: FW: Purex (b)(5)

Link to (b)(5)

R/ Tom Teynor
PFP Closure Project
Federal Project Director
Ph: 509-376-6363

From: Farabee, Oliver A (AI)
Sent: Tuesday, May 9, 2017 9:22 AM
To: Low, Corey <corey.low@rl.doe.gov>; Franco, Joe R <Joe.Franco@rl.doe.gov>; Olds, Theodore E (Erik) <Theodore_E_Erik_Olds@rl.doe.gov>; Teynor, Thomas K <thomas.teynor@rl.doe.gov>; Blackford, Ty <Ty_Blackford@rl.gov>
Subject: FW: Purex (b)(5)

From: Ensign, P G (Patty)
Sent: Tuesday, May 09, 2017 9:21 AM
To: Farabee, Oliver A (AI) <oliver.farabee@rl.doe.gov>
Subject: Purex (b)(5)

"Purex (b)(5) can be accessed via the following link:
(b)(5)

Davisson, Tracy E

From: Farabee, Oliver A (Al)
Sent: Tuesday, May 9, 2017 9:41 AM
To: Olds, Theodore E (Erik)
Subject: RE: PUREX (b)(5)

See pages

(b)(5)

Of the (b)(5)

From: Olds, Theodore E (Erik)
Sent: Tuesday, May 09, 2017 9:34 AM
To: Farabee, Oliver A (Al) <oliver.farabee@rl.doe.gov>
Subject: Re: PUREX (b)(5)

Thank you Al, but (b)(5)

Sent from my iPad

On May 9, 2017, at 9:26 AM, Farabee, Oliver A (Al) <oliver.farabee@rl.doe.gov> wrote:

From: Derosa, David C
Sent: Tuesday, May 09, 2017 9:25 AM
To: Farabee, Oliver A (Al) <oliver.farabee@rl.doe.gov>; Ensign, P G (Patty) <patty.ensign@rl.doe.gov>
Subject: PUREX (b)(5)

Al – (b)(5)

David DeRosa, PMI-RMP, PMP, CM
TRU Program Manager
Corporate Allocation Services, Inc.
Contractor to U.S. Department of Energy, Richland Operations
509-376-7900 – Office
509-(b)(6) Cell

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Davisson, Tracy E

From: David Reeploeg <dreeploeg@tridec.org>
Sent: Tuesday, May 9, 2017 9:32 AM
To: Olds, Theodore E (Erik)
Subject: PUREX

Hi Erik,

I'm sure you're scrambling, but I've already received two calls from Congressional offices about the PUREX situation. If you could get me any information ASAP it would be helpful.

Thanks,
David
(509) (b)(6) cell

Davisson, Tracy E

From: Olds, Theodore E (Erik)
Sent: Tuesday, May 09, 2017 9:55 AM
To: Betsy Connell; Trummell, Candice S

The Department of Energy Richland Operations Office activated the Hanford Emergency Operations Center at 8:26 am after an alert was declared at the 200 East Area. There are concerns about subsidence in the soil covering railroad tunnels near a former chemical processing facility. The tunnels contain contaminated materials. As a precaution, workers in potentially affected areas of the site have gone indoors. Access to the 200 East Area of the Hanford Site is restricted. Emergency personnel are on site assessing the extent of the situation. At this time, it appears (b)(5) There is no confirmation or indication of (b)(5) at this time. There is no indication of (b)(5) (b)(5)

Sent from my iPad

Davisson, Tracy E

From: ^Hanford EOC
Sent: Tuesday, May 9, 2017 10:49 AM
To: Olds, Theodore E (Erik)
Subject: EOC Event Summary 10:45 AM

Event Summary 5/9/2017 10:37 AM

HANFORD SITE EMERGENCY

The U.S. Department of Energy (DOE) Richland Operations Office activated the Hanford Emergency Operations Center at 8:26 a.m., after an alert was declared. Officials are responding to reports of a cave-in of a 20 foot section of a tunnel that is hundreds of feet long that is used to store contaminated materials. The tunnel is located next to the Plutonium Uranium Extraction Facility, also known as PUREX, which is located in the center of the Hanford Site in an area known as the 200 East Area. There is no indication of a release of contamination at this point, Crews are continuing to survey the area for contamination. All personnel in the vicinity of the PUREX facility have been accounted for and there are no reports of injuries.

Actions taken to protect site employees include:

- As a precaution, workers in the vicinity of the PUREX facility as well as the Hanford Site north of the Wye Barricade (southern entrance to the site) have been told to shelter in-place
- Access to the 200 East Area of the Hanford Site, which is located in the center of the Hanford Site, has been restricted to protect employees

The public can request information regarding the event by calling (509) 376-8116. The media may call (509) 376-3322.

No action is currently required for residents of Benton and Franklin Counties.

Davisson, Tracy E

From: Olds, Theodore E (Erik)
Sent: Tuesday, May 9, 2017 10:51 AM
To: Davenport, Shari T; Michael Nartker
Subject: Updated information

HANFORD SITE EMERGENCY

The U.S. Department of Energy (DOE) Richland Operations Office activated the Hanford Emergency Operations Center at 8:26 a.m., after an alert was declared. Officials are responding to reports of a cave-in of a 20 foot section of a tunnel that is hundreds of feet long that is used to store contaminated materials. The tunnel is located next to the Plutonium Uranium Extraction Facility, also known as PUREX, which is located in the center of the Hanford Site in an area known as the 200 East Area. There is no indication of a release of contamination at this point, Crews are continuing to survey the area for contamination. All personnel in the vicinity of the PUREX facility have been accounted for and there are no reports of injuries.

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- Access to the 200 East Area of the Hanford Site, which is located in the center of the Hanford Site, has been restricted to protect employees

Sent from my iPad

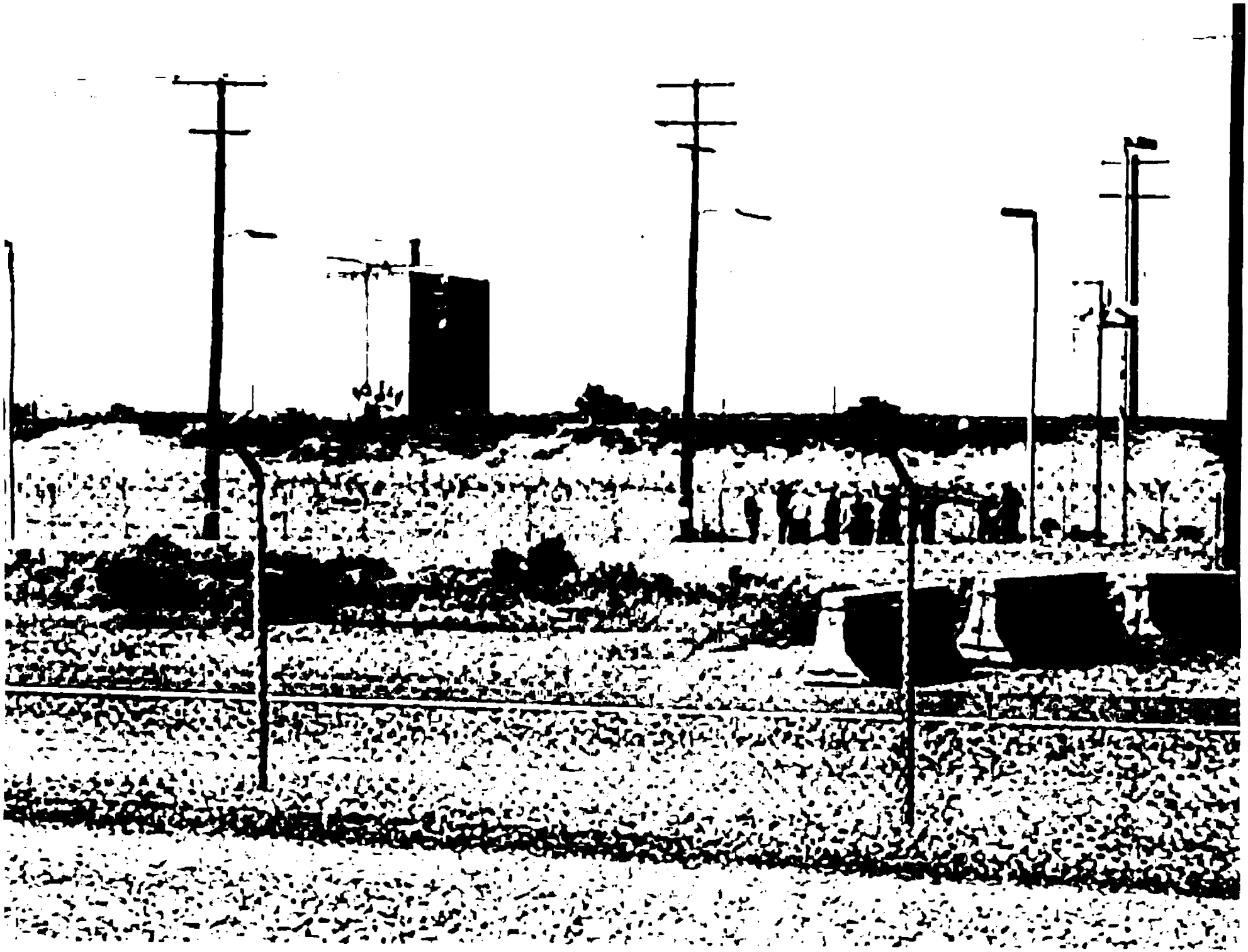
Davisson, Tracy E

From: Trenchard, Glyn D
Sent: Tuesday, May 9, 2017 11:00 AM
To: Gamache, Lori M; Fletcher, Thomas W; Olds, Theodore E (Erik); Hastings, Robert G (Rob)
Subject: FW: 200 East Take Cover
Attachments: 20170509_104201 Tunnel.jpg

From TF FRs -

The photo was just taken from MO 493 looking East toward the tunnel.
A team of about 15 individuals is working their way toward the area reported to be the breach, at the left of the concrete structure on the opposite side of the tunnel.

WRPS Radcon reports WRPS HPTs taking a fenceline survey at the request of CH. They are accompanied by IHTs and have turnback values, hence minimal PPE. They are now at the South end of the tunnel exterior, having walked it's length.



Davisson, Tracy E

From: Conrad, Jill A
Sent: Tuesday, May 9, 2017 2:15 PM
To: Olds, Theodore E (Erik)
Subject: FW: Hanford Site Accident

(b)(5)

From: Richland School District #400 [mailto:info@rsd.edu]
Sent: Tuesday, May 09, 2017 11:46 AM
To: Conrad, Jill A <jill.conrad@rl.doe.gov>
Subject: Hanford Site Accident

Good morning,

There was an incident this morning on the Hanford 200 East Site involving a tunnel collapse. Richland Police have contacted the District and said there is no danger of any atmospheric contamination drifting over RSD campuses. Our RSD campuses will not be affected in any way by this incident. More information is located at: http://www.hanford.gov/c.cfm/coc/?page=290

Thank you.

Richland School District 400 would like to continue connecting with you via email. If you prefer to be removed from our list, please contact Richland School District 400 directly. To stop receiving all email messages distributed through our SchoolMessenger service, follow this link and confirm: Unsubscribe

SchoolMessenger is a notification service used by the nation's leading school systems to connect with parents, students and staff through voice, SMS text, email, and social media.

Davisson, Tracy E

From: Morgan Ashley <morgan.ashley@nbcrightnow.com>
Sent: Tuesday, May 9, 2017 8:38 AM
To: Heeter, Mark A
Subject: Question

Hey Mark!!

Long time no talk :] I have a question for you. We're hearing some news about a possible tunnel collapse at PUREX. Do you know who I need to get into contact with at DOE?

Your help is much appreciated!

Morgan Ashley
Wake Up Northwest Anchor
morgan.ashley@nbcrightnow.com
Office: 509.737.6741
Cell: 509 (b)(6)
Facebook: www.facebook.com/MorganAshleyTV
Twitter: @KNDUMorganAsh

NBC Right Now KNDO 23 KNDU 25
Download our News App: Apple | Android | Kindle

Davisson, Tracy E

From: Microsoft Outlook on behalf of 509(b)(6)
Sent: Tuesday, May 9, 2017 8:47 AM
To: Heeter, Mark A
Subject: Voice Mail (26 seconds)
Attachments: 509(b)(6)(26 seconds) Voice Mail.wav

MARK hi this is Shannon KTTV hey just heard a around 8:15 AM that they put up roller that there but I will collapse out near the peer X plant.

Yeah 00 you guys described it as a major releases contamination.

I just wanna get more information we can on it and I don't know if it didn't sound like it was a drill so you can reach me at (b)(6)

Preview provided by Microsoft Speech Technology Learn More...

You received a voice mail from 509(b)(6)

Caller-Id: 509(b)(6)

Davisson, Tracy E

From: Microsoft Outlook on behalf of 509 (b)(6)
Sent: Tuesday, May 9, 2017 9:05 AM
To: Heeter, Mark A
Subject: Voice Mail (17 seconds)
Attachments: 509 (b)(6) (17 seconds) Voice Mail.wav

MARK better Shannon KTTV call (b)(6) just wanted to check in on this.

Time collapse and radiation release if you can.

You can reach me (b)(6)

Preview provided by Microsoft Speech Technology. Learn More...

You received a voice mail from 509 (b)(6)

Caller-Id: 509 (b)(6)

Davisson, Tracy E

From: Microsoft Outlook on behalf of 206 (b)(6)
Sent: Tuesday, May 9, 2017 9:05 AM
To: Heeter, Mark A
Subject: Voice Mail (27 seconds)
Attachments: 206 (b)(6) (27 seconds) Voice Mail.wav

Hi .

Mr. HEETER my name is Tom James I'm a reporter at Reuters here in CLI calling to inquire about report 15 there's been tunnel collapse at Hanford at the finishing a plant.

My number is (360) 710-0045 that's (360) 710-0045 this is a developing are breaking increase so if you could get back to me as soon as possible I'd appreciate it thanks.

Preview provided by Microsoft Speech Technology. Learn More

You received a voice mail from 206 (b)(6)

Caller-Id: 206 (b)(6)

Davisson, Tracy E

From:	Microsoft Outlook on behalf of 2067709642
Sent:	Tuesday, May 9, 2017 9:10 AM
To:	Heeter, Mark A
Subject:	Voice Mail (19 seconds)
Attachments:	2067709642 (19 seconds) Voice Mail.wav

Hey MARK dance printer fox news channel here calling coz we just thought tweak that there was some sort of a dot com collapse audit Hanford and workers are being word to.

To stay in place (206) 770-9642 thanks.

Preview provided by Microsoft Speech Technology. Learn More...

You received a voice mail from 2067709642

Caller-Id: 2067709642

Davisson, Tracy E

From: Arlia, Rosanna (NBCUniversal) <Rosanna.Arlia@nbcuni.com>
Sent: Tuesday, May 9, 2017 9:12 AM
To: Heeter, Mark A; 'geoff.tyree@rl.doe.gov'; 'yvonne.levardi@orp.doe.gov'
Cc: Arlia, Rosanna (NBCUniversal); Torres, Liza (NBCUniversal)
Subject: NBC News Information Request

Hello—

We are seeing reports on twitter that there is some sort of emergency at Hanford due to a tunnel collapse and that workers have been asked to take cover.

Can you confirm that there is an emergency situation and elaborate on details of the situation?

Please add our newsdesk to your distribution list for any updates: burbankdeskeditors@nbcuni.com

Thank You
Rosanna Arlia
NBC News, Los Angeles Bureau
818-684-3459

Davisson, Tracy E

From: Malone, Patrick <pmalone@publicintegrity.org>
Sent: Tuesday, May 9, 2017 12:34 PM
To: Heeter, Mark A; Tyree, Geoffrey T
Subject: Urgently seeking document

Hi Mark and Geoffrey,

I hope you're both doing well on what I can only imagine is a day of terrible surprise, and a very busy one at that.
I'm trying to obtain a document referenced in one of the Hanford monthly evaluation reports: "CP 040 309 1623 - Data Quality Objectives for Assessing the Structural Integrity for the PUREX Tunnels 1 and 2, submitted on September 13, 2016"
Can you provide that or let me know where it's readily available? It's for our reporting on today's tunnel collapse.
Thanks.

Patrick Malone
Reporter
Center for Public Integrity
910 17th St. NW – 7th Floor
Washington, D.C. 20006
Desk: 202-481-1243
Mobile: 719-(b)(6)

The Center for Public Integrity

Davisson, Tracy E

From: Heeter, Mark A
Sent: Tuesday, May 9, 2017 1:23 PM
To: Ryan, Don
Cc: Tyree, Geoffrey T
Subject: Re: Photo permission

Don,
DOE owns the photo and grants AP permission to use it.
Thanks

Sent from my iPhone

On May 9, 2017, at 12:57 PM, Ryan, Don <dryan@ap.org> wrote:

Mark:

The Associated Press would like to use the photo shown on this DOE website of the damaged tunnel at Hanford. To do so, we need confirmation that the DOE owns copyright to the photo and grants AP to publish the photo. Our permission statement is below. If the DOE owns copyright, can you reply to this email stating such and that the DOE agrees to the statement giving AP permission to publish.

Photo Handout Permission Form:

Dear DOE,

On _May 9, 2017,, you provided photo(s) to AP for distribution by AP to its subscribers and customers for world-wide editorial publication.

In response to this email, please identify both the photographer and copyright owner of the photo(s) furnished to AP.

If you or your organization is the copyright holder, please confirm that you have furnished the photo(s) to AP for world-wide editorial publication by AP and its subscribers and customers in all media now known or hereafter created.

If you or your organization is not the copyright owner, please confirm that you have written authorization from the copyright owner or the owner's authorized agent to furnish the photo(s) to AP for world-wide editorial publication by AP and its subscribers and customers in all media now known or hereafter created.

Please also confirm that the photo content is an accurate rendering of what it depicts and that it has not been modified or augmented except for standard cropping and toning.

Please let me know if you need anything else from us—thanks for your help.

Regards,

Don Ryan
AP Photos
Portland, OR
503-(b)(6)

http://www.hanford.gov/c.cfm/coc/?page=290
<Hanford lorez.png>

Davisson, Tracy E

From: Heeter, Mark A
Sent: Tuesday, May 9, 2017 1:44 PM
To: Lisa.Lewnes@thomsonreuters.com
Cc: Tyree, Geoffrey T; Levardi, Yvonne M; TVDNE@thomson.com
Subject: Re: Reuters Inquiry - Hanford Livestream

Lisa,
We're evaluating exactly how we will do that, as we progress toward recovery actions.
Thanks for keeping an eye on Hanford.gov

Sent from my iPhone

On May 9, 2017, at 1:36 PM, "Lisa.Lewnes@thomsonreuters.com" <Lisa.Lewnes@thomsonreuters.com> wrote:

> Thank you, Mark. Do you expect to provide another update this afternoon/evening?
>
> Lisa Lewnes
> Reuters Video News
> Live Producer
>
> Thomson Reuters
>
> Phone: (1) 202-354-5829
> Mobile: (1) 202-(b)(6)
> lisa.lewnes@thomsonreuters.com
>
> **From:** Heeter, Mark A [mailto:Mark.Heeter@rl.doe.gov]
> **Sent:** Tuesday, May 09, 2017 4:27 PM
> **To:** Lewnes, Lisa (Reuters)
> **Cc:** Tyree, Geoffrey T; Levardi, Yvonne M
> **Subject:** Re: Reuters Inquiry - Hanford Livestream
>
> Hello.
> I confirm.
>
> Thank you
> Mark Heeter
>
> Sent from my iPhone
>
> On May 9, 2017, at 12:29 PM, "Lisa.Lewnes@thomsonreuters.com" <Lisa.Lewnes@thomsonreuters.com> wrote:
>
>> Hello,
>>
>> I'm writing from Reuters Television to request your permission to use the Department of Energy Hanford Site Facebook livestream for our live and edited news coverage of your emergency updates on the tunnel collapse.
>>
>> If we have your permission, would you please reply "I confirm" to the release below, which basically states that you have not promised exclusive coverage to any news

organization, and that we have your permission to distribute the content to our subscribers. This is a requirement by our legal department for any content we receive from a third party, including government agencies.

> You represent and warrant that you own the Facebook livestream of the Department of Energy/Hanford Site (the Content), or that you are the authorized licensee of the copyright owner, and that you have not promised or provided the Content to any other persons or entities for their exclusive use.
>
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We will be sure to list Department of Energy/Hanford Site as the source of the video. (Or, if you prefer different wording, please let me know.)

If you have any other live streams we should be aware of for our news coverage, please let me know.

I hope you and your staff remain safe as you respond to this emergency situation.

Best,
Lisa

Lisa Lewnes
Reuters Video News
Live Producer

Thomson Reuters

Phone: (1) 202-354-5829
Mobile: (1) 202-(b)(6)
lisa.lewnes@thomsonreuters.com

Davisson, Tracy E

From: Heeter, Mark A
Sent: Tuesday, May 9, 2017 2:20 PM
To: cgrygiel@ap.org
Cc: Henderson, Destry J
Subject: Re: Associated Press photo permission for media image

Chris,
DOE owns the photo, and you may use it.
Thanks for checking
Mark

Sent from my iPhone

On May 9, 2017, at 2:13 PM, Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov> wrote:

> **From:** Grygiel, Chris [mailto:CGrygiel@ap.org]
> **Sent:** Tuesday, May 9, 2017 1:04 PM
> **To:** Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
> **Subject:** Associated Press photo permission for media image
>
> Hello Geoff
>
> Can you confirm that DOE owns the copyright to the photo you put on the website showing the tunnel collapse? We'd like to move it on the AP wire. Thanks
>
> http://www.hanford.gov/c.cfm/coc/?page=290
>
> Dear Geoff Tyree
> On May 9, 2017 you provided photo(s) to AP for distribution by AP to its subscribers and customers for world-wide editorial publication.
> In response to this email, please identify both the photographer and copyright owner of the photo(s) furnished to AP.
> If you or your organization is the copyright holder, please confirm that you have furnished the photo(s) to AP for world-wide editorial publication by AP and its subscribers and customers in all media now known or hereafter created.
> If you or your organization is not the copyright owner, please confirm that you have written authorization from the copyright owner or the owner's authorized agent to furnish the photo(s) to AP for world-wide editorial publication by AP and its subscribers and customers in all media now known or hereafter created.
> Please also confirm that the photo content is an accurate rendering of what it depicts and that it has not been modified or augmented except for standard cropping and toning.
> Sincerely,
>
> **Chris Grygiel**

Northwest News Editor
206-682-1812
1000 Denny Way, #501
Seattle, WA 98109
<image001.jpg><image002.jpg>

Davisson, Tracy E

From: Geranios, Nick K. <ngeranios@ap.org>
Sent: Tuesday, May 9, 2017 2:37 PM
To: Heeter, Mark A
Subject: RE: 1 more ap question

Hi Mark
We have been reporting all day that the rail cars were filled with nuclear waste and then driven into the tunnels for storage. This has been called into question
We need to know if we are correct or incorrect in our reporting, so we can fix it if needed.
Please call me at 509-624-1258. It is urgent that we have clarity on this issue

Nick Geranios
AP Spokane

From: Heeter, Mark A [mailto:Mark.Heeter@rl.doe.gov]
Sent: Tuesday, May 09, 2017 2:34 PM
To: Geranios, Nick K.
Cc: Henderson, Destry J
Subject: Fwd: 1 more ap question

Nick,
The rail cars contain material and equipment that were generated or used but no longer needed in the PUREX plant.

Sent from my iPhone

Begin forwarded message:

> **From:** Geranios, Nick K. [mailto:ngeranios@ap.org]
> **Sent:** Tuesday, May 9, 2017 2:05 PM
> **To:** Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
> **Subject:** 1 more ap question
>
> Geoff
> Members are questioning whether the rail cars were full of nuclear waste, as we are reporting?
> So were they filled with wastes, or were the rail cars just themselves contaminated with radioactive materials?
>
> Thanks
> Nick Geranios
> AP Spokane
>
> Nicholas K. Geranios
> The Associated Press
> Spokane Correspondent
> Cell: 509(b)(6)

Office: 509.624.1258
Email: ngeranios@ap.org

<image001.jpg>

Davisson, Tracy E

From: (b)(6) @msn.com>
Sent: Tuesday, May 9, 2017 3:11 PM
To: Heeter, Mark A
Subject: PUREX TUNNEL ISSUES

Perhaps indicate for folks whether it is Tunnel 1 or Tunnel 2.. much different characteristics for each..

Thanks,
(b)(6)
Pasco, Wa.

Sent from my LG G Pad 7.0 LTE, an AT&T 4G LTE tablet

Davisson, Tracy E

From: Holloway, Jerry N
Sent: Tuesday, May 9, 2017 4:32 PM
To: Heeter, Mark A; Henderson, Destry J; Gray, Dee
Subject: FW: PRUEX storage tunnel waste analysis plan attached....
Attachments: PUREX storage tunnel waste analysis plan.pdf

More info

-----Original Message-----
From: Lawson, John R [John_R_Lawson@rl.gov]
Received: Tuesday, 09 May 2017, 9:08AM
To: Bengtson, Peter J [Peter_J_Bengtson@rl.gov]; Holloway, Jerry N [Jerry_N_Holloway@rl.gov]; Britton, John C [John_C_Britton@rl.gov]; McKenna, Mark [Mark_Mckenna@rl.gov]
Subject: PRUEX storage tunnel waste analysis plan attached....

COMPLETE

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 632514

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [ ] Direct Revision [X] Change ECN [ ] Temporary [ ] Standby [ ] Supersedure [ ] Cancel/Void [ ]	Chris Haas, PUREX Technical Support Team, S6-21, 373-7823	[] Yes [X] No	July 2, 1996
	5. Project Title/No./Work Order No. PUREX Storage Tunnels Waste Analysis Plan	6. Bldg./Sys./Fac. No. 218-E-14/15, PUREX Facility	7. Approval Designator N/A
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-EN-WAP-007, Rev. 2	9. Related ECN No(s). N/A	10. Related PO No. N/A

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out blk. 11b) [X] No (NA blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

Change document WHC-SD-EN-WAP-007, Rev. 2 to Rev. 3 (attached).

13a. Justification (mark one)

Criteria Change	[]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[X]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

13b. Justification Details

Direct revision ECN, changes Rev. 2 to Rev. 3.

14. Distribution (include name, MSIN, and no. of copies)

See distribution sheet attached.

RELEASE STAMP

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DATE:

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ID: 21

7-10-96

A-7900-013-2 (11/94) GEF095

A-7900-013-1

ENGINEERING CHANGE NOTICE	Page 2 of 2	1. ECN (use no. from pg. 1) 632514

15. Design Verification Required	16. Cost Impact		17. Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
[] Yes	Additional [] $ N/A	Additional [] $ N/A	Improvement [] N/A
[X] No	Savings [] $	Savings [] $	Delay [] N/A

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	N/A	Seismic/Stress Analysis	[]	Test Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

20. Approvals

Signature		Date	Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT-ENGINEER	
Cog. Eng. C. R. Haas	Chris R. Haas	7-1-96	PE	
Cog. Mgr. D. R. Harlow	D R Harlow	7/1/96	QA	
QA			Safety	
Safety			Design	
Environ.			Environ.	
Other			Other	
			DEPARTMENT OF ENERGY	
			Signature or a Control Number that tracks the Approval Signature	
			ADDITIONAL	

A-7900-013-3 (11/94) GEF096

PUREX Storage Tunnels Waste Analysis Plan

Chris E. Haas
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: ECN-632514 UC: 2000
Org Code: 17130 Charge Code: KP51G
B&R Code: EW7003000 Total Pages: 27

Key Words: PUREX, Storage Tunnels, Waste Analysis Plan

Abstract: Washington Administrative Code 173-303-300 requires that a facility develop and follow a written waste analysis plan which describes the procedures that will be followed to ensure that its dangerous waste is managed properly. This document covers the activities at the PUREX Storage Tunnels used to characterize and designate waste that is generated within the PUREX Plant, as well as waste received from other on-site sources.

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JUL 10 1996
DATE:
STA: 21
HANFORD RELEASE
ID: 21

Y. L. Birkland 7/9/96
Release Approval Date Release Stamp

Approved for Public Release

RECORD OF REVISION	(1) Document Number WHC-SD-EN-WAP-007	Page 1

(2) Title
PUREX Storage Tunnels Waste Analysis Plan, WHC-SD-EN-WAP-007, Rev. 3

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release (5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) EDT - 613548, 11-2-95		
1	Incorporated changes per ECN# 624205		
2	Incorporated changes per ECN# 629082		
3 RS	Incorporated changes per ECN# 632514	7-1-96	7/1/96

A-7320-005 (08/91) WEF168

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TABLE

1. PUREX Storage Tunnels Inventory T-1

GLOSSARY

ALARA	as low as reasonably achievable
ECOLOGY	Washington State Department of Ecology
EHW	extremely hazardous waste
EPA	U.S. Environmental Protection Agency
pH	negative logarithm of the hydrogen-ion concentration
PUREX	plutonium-uranium extraction
QA/QC	quality assurance and quality control
TSD	treatment, storage, and/or disposal
WAC	Washington Administrative Code
WAP	waste analysis plan

METRIC CONVERSION CHART

The following conversion chart is provided to the reader as a tool to aid in conversion.

Into metric units			Out of metric units		
If you know	Multiply by	To get	If you know	Multiply by	To get
Length			Length		
inches	25.40	millimeters	millimeters	0.0393	inches
inches	2.54	centimeters	centimeters	0.393	inches
feet	0.3048	meters	meters	3.2808	feet
yards	0.914	meters	meters	1.09	yards
miles	1.609	kilometers	kilometers	0.62	miles
Area			Area		
square inches	6.4516	square centimeters	square centimeters	0.155	square inches
square feet	0.092	square meters	square meters	10.7639	square feet
square yards	0.836	square meters	square meters	1.20	square yards
square miles	2.59	square kilometers	square kilometers	0.39	square miles
acres	0.404	hectares	hectares	2.471	acres
Mass (weight)			Mass (weight)		
ounces	28.35	grams	grams	0.0352	ounces
pounds	0.453	kilograms	kilograms	2.2046	pounds
short ton	0.907	metric ton	metric ton	1.10	short ton
Volume			Volume		
fluid ounces	29.57	milliliters	milliliters	0.03	fluid ounces
quarts	0.95	liters	liters	1.057	quarts
gallons	3.79	liters	liters	0.26	gallons
cubic feet	0.03	cubic meters	cubic meters	35.3147	cubic feet
cubic yards	0.76456	cubic meters	cubic meters	1.308	cubic yards
Temperature			Temperature		
Fahrenheit	subtract 32 then multiply by 5/9ths	Celsius	Celsius	multiply by 9/5ths, then add 32	Fahrenheit

Source: *Engineering Unit Conversions*, M. R. Lindeburg, PE., Second Ed., 1990, Professional Publications, Inc., Belmont, California.

1.0 FACILITY DESCRIPTION

This waste analysis plan (WAP) has been prepared for the PUREX Storage Tunnels, located on the Hanford Facility, Richland, Washington. This WAP applies to all mixed waste (containing both radioactive and dangerous components) regulated by Washington Administrative Code (WAC) 173-303 that is transferred to and/or contained in the PUREX Storage Tunnels.

The PUREX Storage Tunnels are permitted as a miscellaneous unit under WAC 173-303-680. The bulk of the waste stored in the PUREX Storage Tunnels is not placed in a typical container; rather, this waste is placed on a portable device (railcar) that is used as a storage platform. In general, the mixed waste stored in the PUREX Storage Tunnels is encased or contained within carbon or stainless steel plate, pipe, or vessels. Therefore, the mixed waste normally is not exposed to the tunnel environment.

The PUREX Facility, located in the 200 East Area, consists of two separate treatment, storage, and/or disposal (TSD) units, the PUREX Plant (202-A Building) and the PUREX Storage Tunnels. Access to the PUREX Storage Tunnels is by means of the railroad tunnel.

The PUREX Storage Tunnels branch off from the railroad tunnel and extend southward from the east end of the PUREX Plant. The tunnels are used for storage of radioactive and mixed waste from the PUREX Plant and from other onsite sources. Each storage tunnel is isolated from the railroad tunnel by a water-fillable shielding door. There are no electrical utilities, water lines, drains, fire detection or suppression systems, radiation monitoring, or communication systems provided inside the PUREX Storage Tunnels.

Material selected for storage is loaded on railcars modified to serve as both transport and storage platforms. Normally, a remote-controlled, battery-powered locomotive is used to position the railcar in the storage tunnel. In the past and possibly in the future, other remote movers, e.g., standard locomotive with a string of railcar spacers, power winch, etc., have or could be used to position a railcar into the tunnel or to withdraw a car from the tunnel. The railcar storage positions are numbered sequentially, commencing with Position 1 that abuts the railstop bumper at the south end of each tunnel. Position 2 is the location of the railcar that abuts the railcar in Position 1 and so forth. The railcars and material remain in the storage tunnel until final disposition is determined. Each railcar is retrievable; however, because the railcars are stored on a single, dead-end railroad track, the railcars can be removed only in reverse order (i.e., last in, first out).

Construction of Tunnel Number 1 was completed in 1956 and consists of three areas: the water-fillable door, the storage area, and the vent shaft. The water-fillable door is located at the north end of Tunnel Number 1 and separates the storage tunnel from the railroad tunnel. The door is 7.5 meters high, 6.6 meters wide, and 2.1 meters thick, and is constructed of 1.3-centimeter steel plate. The door is hollow so that the door can be filled with water to act as a radiation shield when the door is in the down (closed) position. If the door is filled with water, the water must be pumped from the

door before the door can be raised. Above the door is a reinforced concrete structure into which the door is raised to open the tunnel. Electric hoists used for opening and closing the door are located on the top of this concrete structure.

The storage area is that portion of the tunnel that extends southward from the water-fillable door. Inside dimensions of Tunnel Number 1 are 109.1 meters long, 6.7 meters high, and 5.9 meters wide. Ceiling and walls are 35.6-centimeters thick and constructed of 30.5- by 35.6-centimeter creosote pressure-treated Douglas fir timbers arranged side by side. The first 30.5 meters of the east wall are constructed of 0.9-meter-thick reinforced concrete. A 40.8-kilogram mineral-surface roofing material was used to cover the exterior surface of the timbers before placement of 2.4 meters of earth fill. The earth cover serves as protection from the elements and as radiation shielding. The timbers that form the walls rest on reinforced concrete footings 0.9 meter wide by 0.3 meter thick. The floor consists of a railroad track laid on a gravel bed. The space between the ties is filled to top-of-tie with gravel ballast. The tracks are on a 1.0 percent downward slope to the south to ensure that the railcars remain in their storage position. A railcar bumper is located 2.4 meters from the south end of the tracks to act as a stop. The capacity of the storage area is eight, 12.8-meter-long railcars.

In June 1960, the first two railcars were loaded with a single, approximately 12.5-meter-long, failed separation column and placed in Tunnel Number 1. Between June 1960 and January 1965, six more railcars were placed in Tunnel Number 1, filling the tunnel. After the last car was placed in the northern-most storage position (Position 8), the water-fillable door was closed, filled with water, and deactivated electrically.

Construction of Tunnel Number 2 was started and completed in 1964. Like Tunnel Number 1, Tunnel Number 2 consists of three functional areas: the water-fillable door, the storage area, and the vent shaft. Construction of Tunnel Number 2 differs from that of Tunnel Number 1 as follows.

- A combination of steel and reinforced concrete was used in the construction of the storage area for Tunnel Number 2 rather than wood timbers, as used in Tunnel Number 1.

- Tunnel Number 2 is longer, having a storage capacity of five times that of Tunnel Number 1.

- The floor of Tunnel Number 2, outboard of the railroad ties, slopes upward to a height of approximately 1.8 meters above the railroad bed, whereas the floor in Tunnel Number 1 remains flat all the way out to the side walls.

- The railroad tunnel approach to Tunnel Number 2 angles eastward then angles southward to parallel Tunnel Number 1. The approach to Tunnel Number 1 is a straight extension southward from the PUREX Plant. Center-line to center-line distance between the two tunnels is approximately 18.3 meters.

The physical structure of the water-fillable door at the north end of Tunnel Number 2 essentially is identical to the water-fillable door for Tunnel Number 1. The water-fillable door for Tunnel Number 2 is approximately 57.9 meters south and 18.3 meters east of the water-fillable door for Tunnel Number 1. As of April 1996, the door is empty and there is no plan to fill the door.

The storage area of Tunnel Number 2 is that portion of the tunnel extending southward from the water-fillable door. Construction of this portion of Tunnel Number 2 consists of a 10.4-meter diameter, steel (0.5 centimeter plate), semicircular-shaped roof, supported by internal I-beam wales attached to external, reinforced concrete arches. The concrete arches are 0.4 meter thick and vary in width from 0.4 to 1.8 meters. The arches are spaced on 4.8 meter centers. This semicircular structure is supported on reinforced concrete grade beams approximately 1.8 meters wide by 1.2 meters thick (one on each side) that run the full length of Tunnel Number 2. The interior and exterior surfaces of the steel roof are coated with a bituminous coating compound to inhibit corrosion. The entire storage area is covered with 2.4 meters of earth fill to serve as radiation shielding.

The nominal inside dimensions of Tunnel Number 2 are 514.5 meters long, 7.9 meters high, and 10.4 meters wide. However, because of the arch-shaped cross-section of Tunnel Number 2 and entry clearance at the water-fillable door, the usable storage area (width and height above top-of-rail) is 6.7 meters high and 5.8 meters wide, the same dimensions as for Tunnel Number 1. The floor consists of a railroad track laid on a gravel bed. The space between ties is filled to top-of-tie with gravel ballast. Commencing at the ends of the 2.4-meter-long ties, the earth floor is sloped upward on a 1 (vertical) to 1 1/2 (horizontal) grade. The tracks are on a 1/10 of 1 percent downgrade slope to the south to ensure the railcars remain in their storage position. A railcar bumper is located 2.4 meters from the south end of the tracks to act as a stop. The capacity of the storage area is 40, 12.8-meter-long railcars.

The first railcar was placed in storage in December 1967. Table 1 contains an approximate inventory of waste stored in the PUREX Storage Tunnels.

The only free-liquid dangerous waste stored in the tunnels is mercury. The mercury is contained within thick-walled 0.8 centimeter thermowells constructed from 7.6-centimeter Schedule 80, 304L stainless steel pipe. The top of the thermowell is closed with a 304L stainless steel nozzle plug with a metal-to-metal seal. The amount of mercury per thermowell is less than 1.7 liters.

Other liquid containers, such as large discarded process tanks or vessels, are stored in the PUREX Storage Tunnels. The containers in storage are empty [per WAC 173-303-160(2)(a)]. Before storage, the vessels have been flushed and in recent years the final rinsate sampled and analyzed to verify that the residual heel is not a dangerous waste.

The only stored dangerous waste that is either reactive or ignitable is silver nitrate in the silver reactors, which is designated as ignitable (D001) [WAC 173-303-090(5)]. The potential for ignition is considered to be negligible because this material is dispersed on ceramic packing and is physically isolated from contact with any combustible material or ignition source.

1.1 PROCESS AND ACTIVITIES

The function of the PUREX Tunnels is to store mixed waste until the waste can be processed for final disposal. When waste is to be placed in the storage tunnels, a work plan, describing the overall transfer activities, and a storage tunnel checklist are prepared. The work plan and storage tunnel checklist are routed for review and concurrence by key personnel and forwarded to management for approval.

1.2 PHYSICAL CHARACTERIZATION OF MATERIAL TO BE STORED

Physical characterization of waste includes an evaluation of the following physical properties:

- Length, width, and height
- Gross weight and volume
- Preferred orientation for transport and storage
- Presence of dangerous waste constituents.

Information sources used in physical characterization include equipment fabrication and installation drawings, operational records, and process knowledge. Physical characterization provides information necessary to appropriately describe the waste material. Such information also is used to design and fabricate, if required, supports on the railcar.

Before removal from service, the equipment could be flushed to minimize loss of products, to reduce radioactive contamination, and to reduce dangerous waste constituents present in a residual heel to nonregulated levels. When equipment is flushed, analysis of the rinsate is used to determine when these goals have been achieved.

1.3 IDENTIFICATION/CLASSIFICATION AND QUANTITIES OF DANGEROUS WASTE MANAGED WITHIN THE PUREX STORAGE TUNNELS

Because dangerous waste is an integral part of radioactively contaminated material, the dangerous waste is managed as mixed waste. Table 1 contains an inventory of waste stored within the PUREX Storage Tunnels.

2.0 WASTE ANALYSIS PARAMETERS

Analytical requirements were selected on the basis of knowledge required for the safe handling and storage of the waste within the PUREX Storage Tunnels, including any operational compliance issues.

2.1 WASTE IDENTIFICATION

A prerequisite step in proper waste management is to adequately address whether waste being considered for management within the PUREX Storage Tunnels falls within the scope of this unit's permit. This includes identifying any dangerous waste in accordance with regulatory and permit requirements and applicability of any land disposal restrictions.

This section provides information on how the chemical and physical characteristics of the mixed waste currently stored in the PUREX Storage Tunnels were determined so that the waste is stored and managed properly.

Regulated material presently stored in the PUREX Storage Tunnels contains the following dangerous waste:

- Lead
- Mercury
- Silver and silver salts
- Chromium
- Cadmium
- Barium
- Mineral oil.

Because the dangerous waste is an integral part of radioactively contaminated material, this material is managed as a mixed waste. Table I provides an approximation of the total amount of waste contained in the PUREX Storage Tunnels.

Storage of non-PUREX Plant waste is reviewed on a case-by-case basis. Sampling, chemical analysis, process knowledge (as discussed in the following section), and/or inventory information from waste tracking forms provided from other onsite sources are required to confirm the characteristics and quantities of mixed waste to be stored. Future waste and dangerous constituents might not be in the same configuration or form as described in the following sections.

2.1.1 Lead

Lead stored was used in various capacities during past Hanford Facility operations. Primary functions of lead included use as weights, counterweights, and radiation shielding. Often the lead is encased in steel (carbon or stainless) to facilitate its attachment to various types of equipment.

Lead exhibits the characteristic of toxicity as determined by the toxicity characteristics leaching procedure and is designated D008 [WAC 173-303-090(8)]. The quantity of lead present could produce an extract greater than 500 milligrams per liter should the lead be exposed to a leachate. However, because the bulk of the lead is encased in steel, is stored inside a weather-tight structure, and is elevated above floor level on railcars that isolate the lead from other materials stored, the potential for exposure of bare lead to a leachate is considered negligible.

Sampling and chemical analysis is not performed on lead associated with the material placed in the PUREX Storage Tunnels. Therefore, the accuracy of the estimate on the amount of lead presently stored in each tunnel is limited to the data available from process knowledge. Counterweights on equipment dunnage and lead used for shielding cannot be quantified by existing historical records and are not included in the amount of lead listed on Table 1. However, if removed from the tunnels, the material will be examined and any suspect attachments will be removed, evaluated, and disposed of in accordance with established methods.

2.1.2 Mercury

Mercury is contained within thermowells that are an integral part of irradiated reactor fuel dissolvers used at the PUREX Plant. The dissolvers are large 304L stainless steel process vessels that are approximately 2.7 meters in diameter, 7.3 meters tall, and weigh approximately 26,309 kilograms. The outer shell is constructed of a 1-centimeter-thick plate. The dissolvers were used in decladding and dissolving irradiated reactor fuel in the PUREX Plant.

Depending on the specific dissolver in question, 19.1 or 45.4 kilograms of mercury (1.4 or 1.77 liters) were poured into each of the two thermowells per dissolver (38.2 or 90.8 kilograms total per dissolver) following vertical installation of the dissolvers inside the PUREX canyon and before the dissolver was installed in a process cell. The mercury served to transfer heat from the dissolver interior to the thermohm temperature sensor mounted within the thermowell. This mercury remains within the thermowells of discarded dissolvers. In preparation for storage, the thermohms were removed and the upper end of each thermowell was plugged with a 304L stainless steel nozzle plug. In storage, the discarded dissolver rests in an inclined position in a cradle on the railcar. The mercury contained in the thermowells remains in the lower portion of each thermowell and, under normal conditions, is never in contact with the mechanical closure on the nozzle end of the thermowell.

Mercury exhibits the characteristic of toxicity as determined by the toxicity characteristics leaching procedure and is designated D009 [WAC 173-303-090(8)].

The potential for mercury to become exposed to leachate is considered negligible. The PUREX Storage Tunnels are designed and constructed as weather-tight structures. Further, the mercury is encased in a stainless

steel pipe within a stainless steel vessel that is stored on a railcar above the floor level of the tunnels. Therefore, exposure of the mercury stored in the tunnels to leachate is not considered a credible occurrence.

Sampling and chemical analysis is not performed on mercury associated with the dissolvers stored in Tunnel Number 2. The quantity of mercury present in each thermowell is documented on Table 1.

2.1.3 Silver

Silver, mostly in the form of silver salts deposited on unglazed ceramic packing, is contained within the discarded silver reactors stored in Tunnel Number 2. The silver reactors were used to remove radioactive iodine from the offgas streams of the irradiated reactor fuel dissolvers. The reactor vessel is approximately 1.4 meters in diameter by 4.1 meters tall and is constructed of 1-centimeter 304L stainless steel. The vessel contains two 1.2-meter-deep beds of packing. Each bed consists of a 30.5-centimeter depth of 2.5-centimeter unglazed ceramic saddles topped with a 0.6-meter depth of 1.3-centimeter unglazed ceramic saddles. The two beds are separated vertically by a distance of about 0.6 meter, and each bed rests on a support made of stainless steel angles and coarse screen. The packing was coated initially with 113.4 kilograms of silver nitrate used for iodine retention. Nozzles on the top of the reactor were provided to allow flushing and/or regeneration of the packing with silver nitrate solution as the need arose.

Because of competing reactions, which include conversion of silver nitrate to silver iodide, reduction of silver nitrate to metallic silver, and formation of silver chloride, the packing of a stored silver reactor contains a mixture of silver nitrate, silver halides, and silver fines.

Silver salts exhibit the characteristics of toxicity as determined by the toxicity characteristics leaching procedure and are designated D011 [WAC 173-303-090(8)]. Also, silver salts exhibit the characteristic of ignitability and are designated as D001 [WAC 173-303-090(5)].

The potential of silver, including silver salts, stored in the PUREX Storage Tunnels to become exposed to leachate is considered negligible. Silver is contained within a stainless steel vessel, stored inside a weather-tight structure, and elevated above floor level on a railcar. Therefore, exposure of the silver stored in the tunnels to leachate is not considered to be a credible occurrence. Also, the contained silver is isolated from contact with any combustibles; therefore, the possibility of ignition is considered to be extremely remote.

Provisions for taking samples of the packing were not provided in the design of the vessels. Therefore, sampling and chemical analysis are not performed for silver salts before placing a silver reactor in storage. However, for accountability, the total silver content (Table 1) is considered to be silver nitrate, the salt that exhibits the characteristics of both ignitability and toxicity.

The quantity of silver salts contained within a discarded silver reactor is a function of silver nitrate regeneration history. Operating records (process knowledge) of regenerations and flushes are used to estimate the total accumulation of silver within each reactor.

2.1.4 Chromium

Presently, chromium stored in Tunnel Number 2 is contained within a failed concentrator removed from the PUREX Plant, and within stainless steel containers received from the 324 Building. The concentrator is a vertical tube structure that was used to concentrate aqueous streams from the final uranium cycle, final plutonium cycles, final neptunium cycles, and condensate from the acid recovery system for recycle. Following service, the concentrator was inspected and found to contain silicate solids with high levels of chromium from the corrosion of stainless steel. The existence of chromium within the 324 Building waste was determined through process knowledge.

Chromium exhibits the characteristic of toxicity as determined by the toxicity characteristics leaching procedure and is designated D007 [WAC 173-303-090(8)].

The potential for the chromium stored in Tunnel Number 2 to become exposed to leachate is considered negligible. Tunnel Number 2 is designed and constructed to be weather-tight. Further, the chromium is encased within stainless steel vessels and containers that are stored on railcars above the floor level of the tunnel. Therefore, exposure of the chromium stored in the tunnel to leachate is not considered a credible occurrence.

The quantity of chromium within the concentrator was estimated by calculating the volume of silicate solids and the percentage of chromium within the silicate solids. The quantity of chromium in the 324 Building waste was based on process knowledge.

2.1.5 Cadmium

Presently, cadmium stored in the PUREX Storage Tunnel Number 2 is associated with radiation shielding and with a dissolver moderator removed from the PUREX Plant, and within stainless steel containers received from the 324 Building. The cadmium was used to shield equipment from radiation and consists of sheets of the metal attached to lead, both of which could be encased in steel. The cadmium received from the 324 Building was used in waste technology research and development programs.

The dissolvers are annular vessels that are geometrically favorable for criticality safety. The dissolvers were placed over cadmium lined (neutron absorbers) moderators for additional criticality safety. The moderator is a centrally located, cylindrical, cadmium-jacketed 0.08-centimeter-thick concrete 15.2-centimeter-thick neutron absorber. The moderators are approximately 4.4 meters tall by approximately 1.5 meters outer diameter.

Cadmium exhibits the characteristic of toxicity as determined by the toxicity characteristics leaching procedure and is designated D006 [WAC 173-303-090(8)]. If exposed to a leachate, the quantity of cadmium present could produce an extract having a concentration of greater than or equal to 1 milligram per liter, but less than 100 milligrams per liter; therefore, the mixed waste is managed as a WT02 [WAC 173-303-100(5)].

The potential for the cadmium stored in Tunnel Number 2 to become exposed to leachate is considered negligible. Tunnel Number 2 is designed and constructed to be weather-tight. Further, the cadmium is stored on railcars above the floor level of the tunnel. Therefore, exposure of the cadmium stored in the tunnel to leachate is not considered a credible occurrence.

2.1.6 Barium

Presently, barium is stored in Tunnel Number 2 in stainless steel containers received from the 324 Building. The waste was generated during numerous research and development programs conducted in B-Cell of the Waste Technology Engineering Laboratory (324 Building). The existence of barium within the 324 Building waste was determined through process knowledge.

Barium exhibits the characteristic of toxicity as determined by the toxicity characteristics leaching procedure and is designated D005 [WAC 173-303-090(8)].

The potential for barium stored in Tunnel Number 2 to become exposed to leachate is considered negligible. Tunnel Number 2 is designed and constructed to be weather-tight. Further, the barium is encased in steel containers stored on a railcar above the floor level of the tunnel. Therefore, exposure of the barium stored in the tunnel to leachate is not considered a credible occurrence.

2.1.7 Mineral Oil

Presently, mineral oil is stored in Tunnel Number 2 in stainless steel containers received from the 324 Building. The mineral oil was used in the B-Cell viewing windows in the 324 Building. Oil leaking from the windows was absorbed on rags and clay absorbent material.

The material safety data sheet for the mineral oil lists a lethal dose (LD_{50}) of 2 grams per kilogram (dermal rabbit). Therefore, the oil designates as a Toxic Category A WT02 [WAC 173-303-100(5)].

The potential for the absorbed mineral oil stored in Tunnel Number 2 to become exposed to leachate is considered negligible. Tunnel Number 2 is designed and constructed to be weather-tight. Further, the mineral oil is encased in steel containers stored on a railcar above the floor level of the tunnel. Therefore, exposure of the mineral oil stored in the tunnel to leachate is not considered a credible occurrence.

2.1.8 Identification of Incompatible Waste

The next step is to ensure that sufficient information concerning the waste has been provided so the waste can be managed properly. This includes identifying incompatible waste. These safety issues primarily are related to prevention of unwanted chemical reactions that could create a catastrophic situation, such as a fire, an explosion, or a large chemical release.

2.1.9 Operational Considerations

Sufficient information must be available to ensure that incoming waste meets operational acceptance limits, e.g., physical size, radiation limits, and WAC 173-303 requirements. These operating specifications are limits and controls imposed on a process or operation that, if violated, could jeopardize the safety of personnel, and could damage equipment, facilities, or the environment. Operating specifications have been established from operating experience, process knowledge, and calculations.

2.2 PARAMETER AND RATIONALE SELECTION PROCESS

This WAP describes the process to ensure that the dangerous waste components of the material stored in the tunnels are properly characterized and designated so that dangerous and mixed waste is managed properly.

The parameters considered for waste designation under WAC 173-303-070(3) and the rationale for their application are discussed in the following sections.

2.2.1 Discarded Chemical Products

The first category of dangerous waste designation is "Discarded Chemical Products" (WAC 173-303-081). The waste stored in the tunnels does not fit the definitions in WAC 173-303-081 for a discarded chemical product. Therefore, the waste stored in the PUREX Storage Tunnels is not designated as a discarded chemical product.

2.2.2 Dangerous Waste Sources

The second category of dangerous waste designation is "Dangerous Waste Sources" (WAC 173-303-082). The waste stored in the tunnels is not listed on the "Dangerous Waste Sources List" (WAC 173-303-9904). Therefore, the waste stored in the PUREX Storage Tunnels is not designated as a dangerous waste source.

2.2.3 Dangerous Waste Characteristics

The third category of dangerous waste designation is "Dangerous Waste Characteristics" (WAC 173-303-090). The characteristics are as follows.

- Characteristic of Ignitability--Although the solid silver nitrate has not been tested in accordance with Appendix F of 49 CFR 173, the waste is assumed to be an oxidizer as specified in 49 CFR 173.127(a). Therefore, the silver nitrate waste is assumed to exhibit the characteristic of ignitability under WAC 173-303-090(5) and is designated as D001.

- Characteristic of Corrosivity--Some of the material stored within the tunnels either has contained or has been in contact with corrosive liquids. The standard operating procedure has been to flush vessels with water to recover as much special nuclear material as practical. Also, flushing removes much of the radioactive contamination, minimizing the spread of contamination during handling. Currently, the final aqueous rinse is sampled and analyzed to confirm that the pH is greater than 2 and less than 12.5. Therefore, the waste stored in the PUREX Storage Tunnels is not designated as corrosive waste.

- Characteristic of Reactivity--The waste stored in the tunnels does not meet any of the definitions of reactivity as defined in WAC 173-303-090(7). The waste material is not unstable, does not react violently with water, does not form explosive mixtures, or does not generate toxic gases. Therefore, the waste stored in the PUREX Storage Tunnels is not designated as reactive waste.

- Characteristic of Toxicity--Lead, mercury, silver, chromium, and cadmium are identified on the Toxicity Characteristics list. The quantity of these materials stored in the tunnels is sufficient that, should the substances come in contact with a leachate (an event considered unlikely), the concentration of the extract could be above the limits identified in the list. Therefore, this waste is designated D006, D007, D008, D009, and D011.

  The PUREX Storage Tunnels also are permitted for selenium (D010). Currently, there is no waste stored in the tunnels that is designated for D010; however, there is a potential for waste with this waste number to be stored within the tunnels.

2.2.4 Dangerous Waste Criteria

The fourth category of dangerous waste designation is "Dangerous Waste Criteria" (WAC 173-303-100). The criteria are as follows:

- Toxicity Criteria--Cadmium meets the toxicity criteria in WAC 173-303-100(5) when performing a book designation. Because of the concentrations present, the waste containing these constituents is

designated as dangerous waste (DW) and is assigned the dangerous waste number of WT02.

- Persistence Criteria--Currently, no waste stored in the tunnels has been designated as persistent per WAC 173-303-100(6).

2.2.5 Waste Designation Summary

The mixed waste currently stored in the PUREX Storage Tunnels is designated as follows:

- Lead--D008; EHW
- Mercury--D009; EHW
- Silver and silver salts--D001, D011; EHW
- Chromium--D007; EHW
- Cadmium--D006, WT02; DW
- Barium--D005; EHW
- Mineral Oil--WT02; DW.

2.3 RATIONALE FOR PARAMETER SELECTION

Refer to Section 2.2.

2.4 SPECIAL PARAMETER SELECTION

Refer to Section 2.2.

3.0 SELECTION OF SAMPLING PROCEDURES

The following sections discuss the sampling methods and procedures that will be used. Sampling usually will be in accordance with requirements contained in the pertinent sampling analysis plan, procedures, and/or other documents that specify sampling and analysis parameters.

3.1 SAMPLING STRATEGIES

The only analysis presently used in support of the PUREX Storage Tunnels operation is a corrosivity check on the final in-place aqueous rinse of discarded vessels before the vessels are released for storage. The pH is determined by a pH meter using U.S. Environmental Protection Agency (EPA) Test Method 9040 or 9041 in *Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods* (EPA 1986). The RCRA sampling will not be performed on any waste currently stored in the PUREX Storage Tunnels.

Waste received that is not generated at the PUREX Plant could require sampling strategies associated with this waste that will be developed on a case-by-case basis.

3.1.1 Sampling Methods

Process knowledge of the characteristics and the quantities of the dangerous waste to be stored in the PUREX Storage Tunnels is considered sufficient to properly designate and manage the stored waste.

The waste currently stored in the tunnels is lead, mercury, chromium, cadmium, barium, mineral oil, silver, and silver salts. Sampling and chemical analysis of the lead, mercury, cadmium, barium, mineral oil, or chromium to confirm their presence would not provide additional data beneficial to proper management of the waste and would not be in compliance with as low as reasonably achievable (ALARA) principles. The silver salts are dispersed over a large area on ceramic packing contained within a large stainless steel reactor vessel. Representative sampling of the ceramic packing is not considered to be practical and therefore was not performed.

If RCRA sampling is required for operation of the PUREX Storage Tunnels, representative sampling methods referenced in WAC 173-303-110 or some other method approved by the Washington State Department of Ecology (Ecology) will be used.

For waste received from other Hanford Facility activities, existing sampling, chemical analysis, and/or process knowledge documentation is used to confirm the characteristics and quantities of mixed waste to be stored. Storage of non-PUREX Facility waste is reviewed on a case-by-case basis.

3.1.2 Frequency of Analyses

Because the dangerous waste components of mixed waste stored in the PUREX Storage Tunnels are stable and will remain undisturbed for a long time, the waste designations and quantities present will remain the same as assigned at the time of storage. Therefore, repeated analysis is not considered necessary to ensure that waste designation data are representative.

3.2 SELECTION OF SAMPLING EQUIPMENT

The only analysis presently used in support of the PUREX Storage Tunnels operation is for corrosivity on the final in-place aqueous rinse of discarded vessels before the vessels are released for storage. The pH is determined by Method 9040 or 9041 (SW-846). The RCRA sampling methods, as referenced in WAC 173-303-110, will not be performed on any waste currently stored in the PUREX Storage Tunnels.

3.3 MAINTAINING AND DECONTAMINATING FIELD EQUIPMENT

All RCRA sampling equipment used to collect and transport samples must be free of contamination that could alter test results. Equipment used to obtain and contain samples must be clean. Acceptable cleaning procedures for sample bottles and equipment include, but are not limited to, washing with soap or solvent, and steam cleaning. After cleaning, cleaning residues must be removed from all equipment that could come into contact with the waste. One method to remove these residues would be a solvent (acetone or other suitable solvent) rinse followed by a final rinse with deionized water. Equipment must be cleaned before use for another sampling event.

After completion of sampling, equipment should be cleaned as indicated previously. If decontamination of the equipment is not feasible, the sampling equipment should be disposed of properly.

3.4 SAMPLE PRESERVATION AND STORAGE

Following RCRA sampling, sample preservation follows methods set forth for the specific analysis identified. Preservation is in accordance with the methods stated in SW-846 or any of the test methods adopted by the Hanford Facility that meet WAC 173-303 requirements. No preservation method will be used when there are ALARA concerns.

3.5 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

The only test method presently used in support of the PUREX Storage Tunnels operation is a corrosivity check on the final in-place aqueous rinse of discarded vessels before the vessels are released for storage. The RCRA sampling will not be performed on any waste currently stored in the PUREX Storage Tunnels. Field duplicates, field blanks, trip blanks, and equipment blanks will not be taken. Split samples could be taken at the request of Ecology.

Generally, quality assurance and quality control (QA/QC) requirements for sampling will be divided between paperwork requirements, such as chain-of-custody, and sampling and analysis activities. This section addresses sampling QA/QC requirements. Analytical QA/QC is discussed in Section 4.0.

A chain-of-custody procedure is required for all sampling identified by this WAP. At a minimum, the chain of custody must include the following: (1) description of waste collected, (2) names and signatures of samplers, (3) date and time of collection and number of containers in the sample, and (4) names and signatures of persons involved in transferring the samples.

3.6 HEALTH AND SAFETY PROTOCOLS

The safety and health protocol requirements established for the Hanford Site must be followed for all RCRA sampling activities required by this WAP.

4.0 LABORATORY SELECTION AND TESTING AND ANALYTICAL METHODS

This section discusses laboratory selection and the types of acceptable analytical methods for RCRA samples.

4.1 LABORATORY SELECTION

Laboratory selection is limited as only a few laboratories are equipped to handle mixed waste because of the special equipment and procedures that must be used to minimize personnel exposure to radiation. Laboratory selection depends on laboratory capability, nature of the sample, timing requirements, and cost. At a minimum, the selected laboratory must have the following:

- A comprehensive QA/QC program (both qualitative and quantitative)
- Technical analytical expertise
- An effective information management system.

These requirements will be met if the selected laboratory follows the pertinent requirements contained in the *Hanford Analytical Services Quality Assurance Plan* (DOE/RL-94-55). The selected laboratory also can meet these requirements by having some other type of QA/QC program as long as equivalent data quality is achieved.

4.2 TESTING AND ANALYTICAL METHODS

The testing and analytical methods for corrosivity used by the various onsite analytical laboratories are outlined in SW-846. These methods will in some cases deviate from SW-846 and American Society for Testing and Materials-accepted specifications for holding times, sample preservation, and other specific analytical procedures. These deviations are discussed in *Analytical Methods for Mixed Waste Analyses at the Hanford Site* (DOE/RL-94-97).

5.0 WASTE RE-EVALUATION FREQUENCIES

Re-evaluation of waste within the PUREX Storage Tunnels will not occur because of high radiation levels and the way the railcars are positioned in the tunnels. The waste is expected to remain stable.

6.0 SPECIAL PROCEDURAL REQUIREMENTS

The following sections describe special procedural requirements associated with waste in the PUREX Storage Tunnels.

6.1 PROCEDURES FOR RECEIVING WASTES GENERATED OFFSITE

The PUREX Storage Tunnels do not accept waste generated off the Hanford Site.

6.2 PROCEDURES FOR IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE

Presently, the only ignitable, reactive, or incompatible dangerous waste stored in the PUREX Storage Tunnels is the silver nitrate coating on the ceramic packing inside the silver reactors. This material is confined to the interior of a large stainless steel vessel (Section 2.1.3) that separates this material from all other waste material stored in the tunnel. The requirements in WAC 173-303-395(1)(a) require 'No Smoking' signs be conspicuously placed wherever there is a hazard present from ignitable or dangerous waste. 'No Smoking' signs are not considered appropriate at the PUREX Storage Tunnels because the tunnels are a designated radiation area. Smoking is not allowed in any radiation area on the Hanford Site and rules prohibiting smoking are strictly enforced. Because the posting of radiation area barriers serves to achieve the no smoking intent of WAC 173-303-395(1)(a), posting and maintaining 'No Smoking' signs are not considered appropriate.

Isolated areas within the PUREX Storage Tunnels have radiation levels in excess of 5 roentgen per hour. Personnel entry into such radiation areas to make periodic inspections [e.g., an annual fire inspection as required by WAC 173-303-395(1)(d) for storage areas containing ignitable waste] would be inconsistent with ALARA guidelines of the *Atomic Energy Act of 1954*. Therefore, such inspections are not performed.

6.3 PROVISIONS FOR COMPLYING WITH LAND DISPOSAL RESTRICTION REQUIREMENTS

Operation of the PUREX Storage Tunnels does not involve land disposal or treatment of dangerous waste. The information provided by the generating unit regarding land disposal restrictions of dangerous waste is sufficient to operate the PUREX Storage Tunnels in compliance with land disposal restriction requirements. When final disposition of the waste occurs, this information will be passed on for final treatment or disposal of the waste.

6.4 DEVIATIONS FROM THE REQUIREMENTS OF THIS PLAN

Management may approve deviations from this plan if special circumstances arise that make this prudent. These deviations must be documented in writing with a copy to be to retained by the management.

7.0 RECORDKEEPING

Records associated with this waste analysis plan and waste verification program are maintained on the Hanford Facility. These records will be maintained until closure of the PUREX Storage Tunnels. Records associated with the waste inventory will be maintained for 5 years.

8.0 REFERENCES

DOE/RL-94-55, *Hanford Analytical Services Quality Assurance Plan*, Rev. 2, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-94-97, *Analytical Methods for Mixed Waste Analyses at the Hanford Site*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, 1986, *Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods*, SW-846, 3rd ed., U.S. Environmental Protection Agency, Washington, D.C.

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Table 1. PUREX Storage Tunnels Inventory. (sheet 1 of 4)

PUREX #1 STORAGE TUNNEL (218-E-14)

TUNNEL IS AT ITS CAPACITY AS OF 1/22/65

PUREX #1 Storage Tunnel is located at the southeast end of the PUREX Plant and is an extention of the railroad tunnel. The storage area is approximately 109 meters long, 6.9 meters high and 5.8 meters wide. The tracks have a one percent downgrade toward the south end of the tunnel. The capacity of the Storage Tunnel is eight modified railroad cars, 12.8 meters long.

position		
1. & 2.	HA COLUMN AND MISC JUMPERS IN BOX PLACED IN TUNNEL #1 ON 6/60 HA 4,700 CU. FT., 400 CURIES, 5 rem/hr. @ 50', JUMPRS 2,190 CU. FT., 2,000 CURIES, Pb - -115 Kg.	
3.	E-F11 #1 (1WW WASTE) CONCENTRATOR FAILED 7/24/60. PLACED IN TUNNEL #1 ON 7/29/60, 12.5 rem/hr. @ 100', 1,800 CU. FT., 40, 000 CURIES AFTER FIFTY-FIVE MONTHS SERVICE.	
4.	G-E2 CENTRIFUGE. MISC JUMPERS IN BOX AND TWO TUBE BUNDLES. PLACED IN TUNNEL #1 ON 12/24/60 (FUG SER# 762) 2,465 CU. FT., 3,000 CURIES, Pb - -115 Kg., 1.5 rem/hr. @ 150'.	
5.	E-H4 (3WB) CONCENTRATOR FAILED 1/4/61. PLACED IN TUNNEL #1 ON 1/4/61, 150 mrem/hr. @ 50', 2,336 CU. FT., 1,000 CURIES. AFTER FIVE YEARS SERVICE.	
6.	E-F6 (2WW WASTE) ORIGINAL CONCENTRATOR FAILED 4/21/61. PLACED IN TUNNEL #1 ON 4/21/61, 5 rem/hr. @ 20', 2,336 CU. FT., 700 CURIES. AFTER FIVE YEARS FOUR MONTHS SERVICE.	
7.	E-F11 (1WW WASTE) #2 CONCENTRATOR FAILED 2/1/62. PLACED IN TUNNEL #1 ON 2/6/62, 25 rem/hr. @ 150', 2,336 CU. FT., 40,000 CURIES. AFTER EIGHTEEN MONTHS SERVICE.	
8.	E-F8 (2WW WASTE) #3 SPARE CONCENTRATOR FAILED 5/23/64. PLACED IN TUNNEL #1 ON 1/22/65 FLAT CAR 2621. 2,400 CU. FT., 700 CURIES, 5 rem/hr. @ 20'.	

Table 1. PUREX Storage Tunnels Inventory. (sheet 2 of 4)

PUREX #2 STORAGE TUNNEL (218-E-15)

PUREX #2 Storage Tunnel is located at the southeast end of the PUREX Plant and is an extention of the railroad tunnel. The storage area is approximately 514.5 meters long, 7.9 meters high and 10.4 meters wide. The tracks have a one percent downgrade toward the south end of the tunnel. The capacity of the Storage Tunnel is 38-40 modified railroad cars, 12.8 meters long. The Tunnel contains 21 cars as of 2/95.

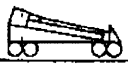
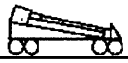
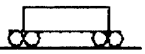
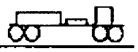
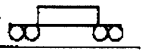
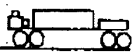
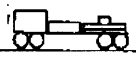
position		
1.	E-F6 # (2WW WASTE) CONCENTRATOR, TK F 15-2, ONE TUBE BUNDLE AND AGITATOR MOTORS PLACED IN TUNNEL ON 12/12/67 ON CAR 61439 2,400 CU. FT., 700 CURIES, 1.3 rem/hr. @ 100'.	
2.	E-F6 #5 (E-H4 SWB) CONCENTRATOR, TWO TUBE BUNDLES PLACED IN TUNNEL ON 3/26/69 ON CAR MILW 60983 2,400 CU. FT., 500 CURIES, 800 mrem/hr. @ 2'.	
3.	E-F6 #6 (2WW WASTE) CONCENTRATOR, TWO TUBE BUNDLES FAILED PLACED IN TUNNEL ON 3/19/70 ON CAR 3612. 2, 400 CU. FT., 700 CURIES, 500 rem/hr. @ 2'.	
4.	L CELL PACKAGE IN A SEALED STEEL BOX (H2-66012) PLACED IN TUNNEL ON 12/30/70 ON CAR MILW 60039 2,400 CU. FT., 500 GRMS Pu, 200 mrem/hr. @ CONTACT.	
5.	F2 SILVER REACTOR, F6 DEMISTER, VESSEL VENT LINE STEEL CAT-WALK AND GUARD RAILS. PLACED IN TUNNEL ON 2/26/71 ON GONDOLA CAR 4610. 2,400 CU. FT., 20 CURIES, Ag - ~625 Kg, 2 rem/hr. @ CONTACT.	
6.	MODIFIED A3-1 TOWER, SCRUBBER, LID AND VAPOR LINE PLACED IN TUNNEL ON 12/12/71 ON GONDOLA CAR 4611. 2,400CU. FT., 10 CURIES, 1 rem/hr. @ CONTACT.	
7.	A3 DISSOLVER PLACED IN TUNNEL ON 12/22/71 ON NINE FT. SHORTENED CAR 858 2,400 CU.FT., 50 CURIES, Hg - ~45 Kg, 5 rem/hr. @ 5'.	
8.	A1W1 FUEL ENDS IN STEEL LINER BOX AND NPR FUEL HANDLING EQUIPT. USED WITH THE SUSPECTED CANISTERS, ON CAR 19806 PLACED IN TUNNEL ON 8/29/72. 800 CU. FT., 17,500 CURIES, 10 rem/hr. @ 150'.	
9.	C3 DISSOLVER PLACED IN TUNNEL ON 9/30/72 ON CAR 19811 1590 CU. FT., 50 CURIES, Hg - ~45 Kg., 5 rem/hr. @ 5'.	
10.	E-H4 (3WB) CONCENTRATOR, #61 TUBE BUNDLE, PROTOTYPE COOLING COIL AND A F-F1 FILTER TANK. PLACED IN TUNNEL 8/30/83 ON CAR CDX-1. 2,400 CU. FT., 500 CURIES, 800 mrem/hr. @ 2'.	
11.	A3 DISSOLVER (VESSEL #10 AND HEATER VESSEL #6) PLACED IN TUNNEL ON 1/18/86 ON CAR 3613 3,960 CU. FT., 0.81 CURIES, Hg - ~40 Kg., Cd - ~43 Kg., 3 mrem/hr. @ 3'.	
12.	WHITE BOX (H2-58456) CONTAINING EIGHT TUBE BUNDLES #S 57, 60, 62, 64, 67, 68, 74, AND 76 PULSER #5 AND OLD HEATER DISS LID OLD STYLE DUMPING TRUNNIONS (9), PLACED IN TUNNEL ON 1/20/86 ON CAR 3611 5,435 CU. FT., 540 CURIES, 2 rem/hr. @ 3'.	

Table 1. PUREX Storage Tunnels Inventory. (sheet 3 of 4)

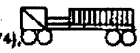
PUREX #2 STORAGE TUNNEL (218-E-15)

position

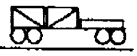
13. J5 TANK (VESSEL #30). F1 COND (VESSEL #13) AND F12-8 CELL BLK. OLD FOUR-WAY DUMPER. DISS YOKE AND FLANGE PLATE, 8 rem/hr. @ 1'. PLACED IN TUNNEL ON 1/21/86 ON CAR 19806. 2,500 CU. FT., 90 CURIES.



14. L-1 PULSER, 2-COLUMN CARTRIDGES, 1-JUMPER CUTTER, 3-JUMPER ALIGNMENT TOOLS, 9-EXTERIOR DUMPING TRUNNIONS, 10-PUMPS, 3-AGITATORS, 4-TUBE BUNDLES, 2-VENT JUMPERS AND 7-YOKES. PLACED IN TUNNEL ON 11/16/87 ON CAR PX-10 (10A-19360) & RACK H2-66629.50. 60 TONS, 3,600 CU. FT., 33,740 CURIES(REF:LETTER 12110-88-074), Pb - ~2540 Kg., 5 rem/hr. @ 15'.

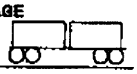


15. SILVER REACTOR, E-F2 STEAM HEATER AND STORAGE LINER (H2-65095) FULL OF CUT UP JUMPERS PLACED IN TUNNEL ON 5/13/88 ON CAR PX-9 (10A-19509) & S/R CRADLE SK-GLR-11-2-87. 20 TONS, 2,775 CU. FT., 240 CURIES (REF: LETTER 12110-88-074), Cd - ~13 Kg., Ag - ~115 Kg., Pb - ~230 Kg., 20 mrem/hr. @ 20'.

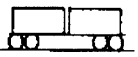


16. E-J8-1 UNITIZED CONCENTRATOR VESS #1 H2-52477, FAILED 3/11/89 PLACED ON STORAGE CAR H2-99808, PX-6 (10A-19028) AND INTO #2 TUNNEL 4/6/89 GRAVEYARDS. EST. 42 TONS, 6,000 CU. FT. 1.5 CURIES (REF: LETTER 12113-89-027), 0.5 mrem/hr. @ 10'.

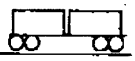
17. NORTH STORAGE LINER H2-65095 CONTAINING SIX PUMPS, ONE AGITATOR AND CUT UP JUMPER (14 TONS). SOUTH STORAGE LINER H2-65095 CONTAINING ONE PUMP, ONE #15 YOKE AND CUT UP JUMPERS (11.5 TONS). PLACED ON STORAGE CAR PX-19 (10A-19030) AND INTO #2 TUNNEL 8/5/89 DAYS. EST 25.5 TONS, 2,574 CU. FT. 3.0 CURIES (REF: LETTER 12113-89-051), 80 mrem/hr. @ 1'.



18. T-F5 ACID ABSORBER, ID#1-T-F5/F-188713, H2-52555 AND H2-52487/456. PLACED ON STORAGE CAR PX-2 AND INTO #2 TUNNEL 4/8/94. EST 22 TONS, 835 CU. FT., 185 CURIES, 90 mrem/hr. @ CONTACT.



19. FOUR METAL LINER STORAGE BOXES H-2-65095-3/H-2-100187-0 CONTAINING FAILED JUMPERS AND MISCELLANEOUS OBSOLETE CANYON EQUIPMENT ITEMS. PLACED ON STORAGE CAR PX-25 AND INTO #2 TUNNEL 9/16/94. EST 60 TONS, 4032 CU. FT., 927 CURIES, 30 mrem/hr. @ 2'.



20. E-H4-1 UNITIZED CONCENTRATOR (H-2-52477/662153)/(E-H4-1). PLACED IN TUNNEL ON 1/27/95 ON CAR PX-28. EST 40 TONS, 5,760 CU. FT., 3,070 CURIES, Cr - ~8 Kg., 1000 mrem/hr. @ 5'.

21. TANK E-5 (H-2-52458)/(F-188956), LEAD STORAGE BOX ASSEMBLY (H-2-131629)/(H-2-131529-1), H4 CONCENTRATOR TOWER (H-2-55102)/ (F-223017-CBT-4), HOT SHOP COVER PLATE (H-2-52222)/("Q"), TUBE BUNDLE WASH CAPSULE (H-2-58647), DISSOLVER CHARGING INSERT (H-2-75675)/ (H-2-75675-1), LIFTING YOKE #7A (H-2-66837), LIFTING YOKE #9 (H-2-52456). PLACED IN TUNNEL ON 2/6/95 ON CAR PX-3609. EST 44 TONS, 3,457 CU. FT., 26,000 CURIES, Pb - ~1930 Kg., 1000 mrem/hr. @ 4'.

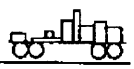


Table 1. PUREX Storage Tunnels Inventory. (sheet 4 of 4)

PUREX #2 STORAGE TUNNEL (218-E-15)

position	
22.	METAL LINER BOX (H-2-65095) CONTAINING JUMPERS AND FAILED/ OBSOLETE CANYON EQUIPMENT, F7 NEUTRON MONITOR (H-2-75825), LEAD STORAGE BOX (H-2-131629) CONTAINING JUMPER COUNTERWEIGHTS AND MISCELLANEOUS LEAD ITEMS, SCRAP HOPPER (H-2-57347) CONTAINING MISCELLANEOUS CANYON EQUIPMENT, CANISTER CAPPING STATION (H-2-621651), TEST CANISTER CONTAINING VARIOUS LENGTHS OF CARBON STEEL PIPE. PLACED IN TUNNEL 3-11-96 ON CAR #3618. ESTIMATED WEIGHT 22 TONS, 1,712 CU. FT., 15 CURIES, Pb - ~3,232 Kg., Cd - ~2 Kg., 100 mrem/hr. @ 1'.
23.	TWO BURIAL BOXES (H-2-100187) CONTAINING JUMPERS AND FAILED/ OBSOLETE CANYON EQUIPMENT, LIFTING YOKE (H-2-69652). PLACED IN TUNNEL 3-11-96 ON CAR #PX-31. ESTIMATED WEIGHT 21 TONS, 2,116 CU. FT., 2 CURIES, 10 mrem/hr. @ 1'.
24.	CONCRETE BURIAL BOX (H-1-44980) STORING 8 CONTAINERS OF 324 BUILDING, B-CELL WASTE. FOR ADDITIONAL DETAILS, SEE PUREX WORK PLAN WP-P-95-60. PLACED IN TUNNEL ON CAR #PX-29, ON APRIL 26, 1996. ESTIMATED WEIGHT 36 TONS, 1,890 CU. FT., < 244,000 CURIES, ~15 mrem/hr. @ 150'. Pb - ~1,802 kg., Cd - ~10.5 kg., absorbed oil - ~8.5 kg., Cr - ~1 kg., Ba - ~ 8 kg, ~24 g Pu.
25.	CONCRETE BURIAL BOX (H-1-44980) STORING 9 CONTAINERS OF 324 AND 325 BUILDING WASTE. FOR ADDITIONAL DETAILS, SEE PUREX WORK PLAN WP-P-96-015. PLACED IN TUNNEL ON CAR #10A-3618, ON JUNE 12, 1996. ESTIMATED WEIGHT 46.5 TONS, 1,890 CU. FT., < 1.75 M CURIES, ~200 mrem/hr. @ 150'. Ba - ~4 g., Cd - <1 g., Cr - ~ 2 g., Pb - < 1 g, ~43 g Pu.
26.	20,000 GALLON LIQUID WASTE TANK CAR HO-10H-18580, EMPTY PER RCRA, PLACED IN TUNNEL ON JUNE 19, 1996, APPROXIMATELY 30 TONS, 5 CURIES, 100 mrem/hr. @ 3', ~53 g Pu.
27.	20,000 GALLON LIQUID WASTE TANK CAR HO-10H-18579, EMPTY PER RCRA, PLACED IN TUNNEL ON JUNE 19, 1996, APPROXIMATELY 30 TONS, 9 CURIES, 300 mrem/hr. @ 3', ~131 g Pu.
28.	20,000 GALLON LIQUID WASTE TANK CAR HO-10H-18582, EMPTY PER RCRA, PLACED IN TUNNEL ON JUNE 19, 1996, APPROXIMATELY 30 TONS, 23 CURIES, 650 mrem/hr. @ 3', ~11 g Pu.

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	Chris R. Haas	Date 07/02/96
Project Title/Work Order		EDT No. N\A
PUREX Storage Tunnels Waste Analysis Plan		ECN No. 632514

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
R. W. Bailey	S6-15	X			
R. C. Bowman	H6-24	X			
R. X. Gonzalez	R3-79	X			
C. R. Haas	S6-21	X			
D. G. Hamrick	S6-15	X			
D. G. Harlow	S6-19	X			
W. G. Jasen	S6-19	X			
G. J. LeBaron	S6-19	X			
C. P. Strand	H6-24	X			
C. N. Villalobos	S6-19	X			
Central Files (2)	A3-88	X			

A-6000-135 (01/93) WEF067

Davisson, Tracy E

From: Holloway, Jerry N
Sent: Tuesday, May 9, 2017 4:29 PM
To: Heeter, Mark A; Henderson, Destry J; Gray, Dee
Subject: FW: PUREX storage tunnels dangerous waste permit 1990 attached...
Attachments: Purex Storage Tunnels dangerous waste Permit 1990.pdf

Fyi

-----Original Message-----
From: Lawson, John R [John_R_Lawson@rl.gov]
Received: Tuesday, 09 May 2017, 9:05AM
To: Bengtson, Peter J [Peter_J_Bengtson@rl.gov]; Holloway, Jerry N [Jerry_N_Holloway@rl.gov]; Britton, John C [John_C_Britton@rl.gov]; McKenna, Mark [Mark_Mckenna@rl.gov]
Subject: PUREX storage tunnels dangerous waste permit 1990 attached...

START

0010883
1 of 3

DOE/RL-90-24
Volume 1 of 3

PUREX Storage Tunnels Dangerous Waste Permit Application

Date Published
September 1990

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United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

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STATE ENVIRONMENTAL POLICY ACT (SEPA)
CHECKLIST

FOR THE

PUREX STORAGE TUNNELS

REVISION 0

SEPTEMBER 20, 1990

WASHINGTON ADMINISTRATIVE CODE
ENVIRONMENTAL CHECKLIST FORMS
[WAC 197-11-960]

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SEPA ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project:

Permitting of the Plutonium-Uranium Extraction (PUREX) Storage Tunnels. Information contained in this checklist pertains only to the PUREX Storage Tunnels. In the context of the checklist, 'site' refers only to those areas that are immediately underlain by the underground storage tunnels.

2. Name of applicants:

U.S. Department of Energy-Richland Operations; and
Westinghouse Hanford Company

3. Address and phone number of applicant and contact person:

U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

Contact Persons:

R. D. Izatt, Director
Environmental Restoration Division
(509) 376-5441

R. E. Lerch, Manager
Environmental Division
(509) 376-5556

4. Date checklist prepared:

September 20, 1990

5. Agency requesting the checklist:

State of Washington
Department of Ecology
Mail Stop PV-11
Olympia, WA 98504

6. Proposed timing or schedule (including phasing, if applicable):

The PUREX Storage Tunnels are parallel branches of an earth-covered railroad tunnel that extend southward from the east end of the PUREX Plant. Construction of Tunnel Number 1 was completed in 1956 as part of the PUREX Facility construction project. Tunnel Number 1 was first used for storage of radioactively contaminated process equipment in June 1960 and was filled to capacity in January 1965. Construction of Tunnel Number 2 was carried out in 1964. This second tunnel was first used for storage in December 1967 and presently is filled to less than half its storage capacity. Closure of the PUREX Storage Tunnels as a dangerous waste unit will take place in conjunction with the final disposition of equipment from the PUREX

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Plant. Ultimately, the PUREX Storage Tunnels will be decommissioned. The exact method of decommissioning will be determined at a later date and will be addressed in required planning documentation at that time. Decommissioning activities are outside the scope of the Resource Conservation and Recovery Act (RCRA) and the Washington Administrative Code (WAC) as they pertain to this proposal.

7. **Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.**

The PUREX Storage Tunnels will be clean closed. Closure of the tunnels will result in the initiation of several activities. All stored equipment will be retrieved from the tunnels, processed within the PUREX Plant, and/or disposed of in an appropriate manner. Closure also will necessitate the testing of the tunnel floor and underlying soils and the removal of any flooring materials and soils contaminated with dangerous waste. Closure activities will be dictated by PUREX Plant waste storage/disposal closure needs and by the remedial action selected for Tri-Party Agreement Operable Units 200-PO-1 and 200-PO-2, in which the PUREX Storage Tunnels lie. Following clean closure of the PUREX Storage Tunnels, the tunnels may be used for the storage of nonregulated materials.

8. **List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.**

- This SEPA Checklist is being submitted as a part of the *PUREX Storage Tunnels Dangerous Waste Permit Application* (DOE/RL-90-24).

- A RCRA Part A Dangerous Waste Permit Application for PUREX Storage Tunnels was submitted to the Washington State Department of Ecology (Ecology) in November, 1987. A revision to the Part A Permit Application is being submitted concurrently with the PUREX Storage Tunnels Part B Permit Application.

- The PUREX Storage Tunnels are discussed in the following National Environmental Policy Act documentation: *Environmental Impact Statement, Operation of PUREX and Uranium Oxide Plant Facilities*, DOE/EIS-0089 (U.S. Department of Energy, 1983, Washington, D.C.).

- Final closure and disposition of the PUREX Storage Tunnels will be coordinated with the 200-PO-1 and 200-PO-2 operable units, in which the tunnels lie. The PUREX Storage Tunnels may be addressed as a part of investigations of the operable units.

- Storage Tunnel Number 2 has an operating stack (296-A-10), which is registered with the Washington State Department of Health (DOH) for radionuclide emissions (*Registration for the Hanford Site: Sources of Radioactive Emissions*, DOE/RL 89-08, U.S. Department of Energy, 1989, Richland, Washington). The Tunnel Number 1 stack is not in operation and has been sealed. It is, therefore, not registered under the *Clean Air Act*. Supplemental information on all registered PUREX Plant stacks was submitted to the DOH in *State of Washington Department of Health, Radioactive Air Emissions Permit FF01:*

Supplemental Information, DOE/RL-90-34 (U.S. Department of Energy, 1990, Richland, Washington).

Additional environmental information regarding the 200 Area plateau and the Hanford Site, in general, can be found in the following references:

- *Final Environmental Impact Statement - Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes*, DOE/EIS-0113 (U.S. Department of Energy, 1987, Richland, Washington),
- *Hanford Site National Environmental Policy Act (NEPA) Characterization, Revision 2*, PNL-6415 (Pacific Northwest Laboratory, 1990, Richland, Washington),
- *Draft Environmental Impact Statement - Decommissioning of Eight Surplus Production Reactors at the Hanford Site, Richland, Washington*, DOE/EIS-0119D (U.S. Department of Energy, 1989, Washington, D.C.), and
- *Archaeological Survey of the 200 East and 200 West Areas, Hanford Site, Washington*, PNL-7264 (Pacific Northwest Laboratory, 1990, Richland, Washington).

9. **Do you know whether applications are pending for government approvals of other proposals directly affecting property covered by your proposal? If yes, explain.**

No applications are known to be pending for government approval of other proposals which would directly affect property covered by this proposal.

10. **List any government approvals or permits that will be needed for your proposal, if known.**

Ecology, the U.S. Department Of Health, and the U.S. Environmental Protection Agency are the only agencies authorized to approve and/or permit operation of the PUREX Storage Tunnels under requirements authorized by RCRA, the *Clean Air Act* (42 USC 7401 et seq.), and WAC 173, and WAC 402.

11. **Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site.**

Radioactively contaminated equipment from the PUREX Plant that cannot feasibly be decontaminated to acceptable levels or is too large to fit within a standard U.S. Department of Transportation-approved shipping container is a potential candidate for storage in the PUREX Storage Tunnels. Most of the major pieces of equipment used at the PUREX Plant are too radioactive and too large to be considered for shipment from the PUREX Facility and, therefore, must be placed in the tunnels. Some of this equipment contains small amounts of dangerous waste (elemental lead, elemental mercury, or silver salts). Closure of the PUREX Storage Tunnels will take place in conjunction with the final disposition of equipment from the PUREX Plant. Following clean closure, the tunnels may be used for the storage of nonregulated materials.

The storage tunnels are an extension of the rail spur on which irradiated reactor fuels are delivered to the PUREX Plant for chemical processing. Each storage tunnel is isolated from the PUREX Plant railroad tunnel by a water-fillable shielding door. Failed and/or obsolete equipment selected for storage in the tunnels is loaded onto modified railcars that serve as transport and storage platforms while the equipment is in storage. A remote-controlled, battery-powered locomotive is used to position each loaded railcar into a storage tunnel.

Tunnel Number 1 is filled to capacity and contains 8, 42-foot long railcars, positioned end to end along the length of the tunnel. The inside dimensions of Tunnel Number 1 are 358 feet long, 22 feet high, and 19 feet wide. Tunnel Number 2 contains 17 railcars (as of January 1, 1990) and has the capacity to contain 40 railcars, end to end. The inside dimensions of Tunnel Number 2 are 1,688 feet long, 26 feet high, and 34 feet wide.

A vent shaft is located at the south end of each tunnel. Each shaft is approximately 5 feet by 5 feet square in cross section, extends approximately 1 foot above grade, and is capped with a 20-foot-tall exhaust stack. The Tunnel Number 1 exhaust fan has been sealed and electrically deactivated. The Tunnel Number 2 exhaust fan continues to operate.

At the time of construction, 8 feet of earth fill was placed over the roof of each storage area to serve as radiation shielding. At the time of construction, the earth fill was gently sloped and uniformly contoured to provide side slopes of 2 (horizontal) to 1 (vertical) for stability.

12. **Give the location of the proposal. Give sufficient information for a person to understand the precise location of the proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available.**

The PUREX Storage Tunnels extend southward from the east end of the PUREX Plant, in the southeast quarter of the Hanford Site 200 East Area, on the 200 Area Plateau. A legal description, maps, and plans of the area will be contained in the RCRA Part B Permit Application for which this SEPA Checklist was prepared. The PUREX Plant is located in the SE 1/4 of Section 2, T12N, R26E, and the Storage Tunnels extend southward into the NE 1/4 of Section 11, T12N, R26E of the Willamette Base and Meridian.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

Gently sloping

b. What is the steepest slope on the site (approximate percent slope)?

During construction, the soil overburden covering the PUREX Storage Tunnels was contoured to provide side slopes of 2 (horizontal) to 1 (vertical) for stability. The approximate slope of the land adjacent to the PUREX Storage Tunnels site is less than two percent.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

The soil at the proposed site is coarse sand and gravel. No farming is allowed on the site.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate the source of the fill.

No filling or grading is proposed until final disposition is determined. At that time, the site may be leveled to a grade equal to that of the surrounding terrain.

f. Could erosion occur as a result of clearing, construction, or use? If so, describe.

No.

g. Approximately what percentage of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Assuming the PUREX Storage Tunnels are clean closed, none of the site will be covered with impervious surfaces.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if there are any?

At construction, the soil overburden that covers the PUREX Storage Tunnels was contoured to a 2 to 1 slope for stability. Natural vegetation has been allowed to cover the tunnel mounds to minimize both wind and water erosion. If the PUREX Storage Tunnels are eventually demolished, the surface will be contour-graded and revegetated to protect the site from erosion.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Tunnel Number 2 emits extremely low levels of radionuclides to the atmosphere. In *Registration for the Hanford Site: Sources of Radioactive Emissions*, DOE/RL 89-08 (U.S. Department of Energy, 1989, Richland, Washington), the Tunnel Number 2 vent shaft stack (296-A-10) is reported to have emitted less than 2.02 E-07 curies gross alpha and less than 7.22 E-07 curies gross beta in calendar year 1988. Closure and final disposition activities could result in the generation of minor amounts of dust and exhaust from heavy equipment and trucks.

b. Are there any off-site sources of emissions or odors that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to the air, if any?

A single stage high-efficiency particulate air filter is installed in the vent system for each of the PUREX Storage Tunnels. The exhaust fan in Tunnel Number 2 maintains a slight negative pressure within the tunnel by exhausting approximately 4,000 cubic feet per minute of air. The exhaust air is continuously sampled, and collected particulates are analyzed weekly for total alpha and total beta activity.

The Tunnel Number 1 water-fillable door was sealed in 1965 when the tunnel was filled to capacity. In addition, the vent stack was sealed and electrically deactivated.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

No.

2) Will the project require any work over, in, or adjacent to (within 200 feet of) the described waters? If yes, please describe and attach available plans.

No.

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3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities, if known.

If the water-fillable doors to the tunnels are filled (as the door to Tunnel Number 1 currently is), the water must be pumped from the doors before they can be opened. Approximately 28,000 gallons of untreated river water is used to fill each door. When the doors are emptied, this water is released to one of three soil column discharge locations: the 216-B-3 Pond System, the 216-A-30 Crib, or a nearby area where the surface discharge will not migrate to the tunnel storage areas. Any water discharged to the soil column may ultimately reach the groundwater.

2) Describe waste materials that will be discharged into the ground from septic waste tanks or other sources, if any (for example: domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None.

c. Water Run-off (including storm water):

1) Describe the source of run-off (including storm water) and methods of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The Hanford Site receives 6 to 8 inches of precipitation annually. Storm water run-off is diverted away from the storage area of the PUREX Storage Tunnels by the sloped soil overburden and eventually infiltrates into the porous soils in the general vicinity. If the PUREX Storage Tunnels are demolished, the ground surface will be essentially flattened, and precipitation will infiltrate directly into the soil.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No.

d. Proposed measures to reduce or control surface, ground, and run-off water impacts, if any:

The only dangerous waste existing in the PUREX Storage Tunnels as a free liquid is elemental mercury, which is doubly contained within stored equipment. Most elemental lead and all silver salts in the PUREX Storage Tunnels are stored within containers on the railcars. (See Section 4.0 of the accompanying RCRA Part B Permit Application.)

For any liquid contaminant to impact groundwater quality, it would first have to breach its containment vessel. Leachate could potentially result from leakage of nonregulated (radioactive) liquid heels remaining in some of the equipment stored in the PUREX Storage Tunnels. However, catch pans filled with absorbent presently are placed on the railroad car transporter under equipment where such leakage could occur, thereby mitigating the potential migration of waste material to the groundwater via this route.

The storage area of each tunnel has a roof and wall system designed to prevent infiltration of surface water into the PUREX Storage Tunnels. The external surfaces of the roof and wall timbers of Tunnel Number 1 are covered with 90-pound roofing material. For Tunnel Number 2, the semicircular shaped, bituminous-coated steel roof construction provides infiltration protection. In addition, the 8-feet thick layer of soil overburden and the surrounding surface area have been contoured to alleviate ponding and to divert surface water away from the PUREX Storage Tunnels. The potential for leaching any dangerous or hazardous material stored in the tunnels is essentially eliminated by the actions taken to prevent surface water from infiltrating the tunnels.

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4. Plants

a. Check the types of vegetation found on the site:

___ deciduous tree: alder, maple, aspen, other
___ evergreen tree: fir, ceder, pine, other
X shrubs
X grass
___ pasture
___ crop or grain
___ wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
___ water plants: water lily, eelgrass, milfoil, other
X other types of vegetation

Natural vegetation has been allowed to cover the tunnel mounds to minimize both wind and water erosion. The vegetation consists of sagebrush, grasses, and other common central Washington desert plant species.

b. What kind and amount of vegetation will be removed or altered?

The original vegetation at the site was disturbed during construction. If the PUREX Storage Tunnels are demolished, the natural vegetation that has regrown to cover the site will be disturbed. If this occurs, the surface will be contour-graded and revegetated to protect the site from erosion.

c. List threatened or endangered species known to be on or near the site.

None. However, additional information concerning endangered and threatened plants on the Hanford Site can be found in the environmental documents referred to in the answer to Checklist question A.8.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

As mentioned previously, native plants have been allowed to cover the site of the PUREX Storage Tunnels. The site will be revegetated if disturbed.

5. Animals

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, <u>songbirds</u>, <u>other</u>
mammals: <u>deer</u>, bear, elk, beaver, <u>other</u>
fish: bass, salmon, trout, herring, shellfish, other

A variety of insects, birds, and small mammals common to the Hanford Site, including pigeons, songbirds, rodents, and hares, have been observed at or near the PUREX Storage Tunnels site. Larger mammals

commonly seen in the vicinity include deer and coyote. Additional information on birds and animals on the Hanford Site can be found in the environmental documents referred to in the answer to Checklist question A.8.

b. List any threatened or endangered species known to be on or near the site.

None. However, additional information concerning endangered and threatened species on the Hanford Site can be found in the environmental documents referred to in the answer to Checklist question A.8.

c. Is the site part of a migration route? If so, explain.

The site is part of the region-wide Pacific flyway for waterfowl.

d. Proposed measures to preserve or enhance wildlife, if any:

The PUREX Storage Tunnels are covered with a minimum of 8 feet of soil to isolate their contents from local fauna.

6. **Energy and Natural Resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electricity is used to power the PUREX Storage Tunnels water-fillable shielding doors and the ventilation systems. The locomotive used to position each loaded railcar into a storage tunnel is battery-operated. Diesel fuel, gasoline, and oil will be used to operate equipment during final disposition.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Not applicable.

7. **Environmental Health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

Dangerous waste contained within the PUREX Storage Tunnels includes elemental mercury, elemental lead, and silver salts. None of this

waste presents a risk to plant personnel, the public, or the environment.

The silver nitrate fraction of the mixture of silver salts exhibits the characteristic of ignitability as defined in 49 CFR 173.151. However, this material is contained within stainless steel vessels, and ignition of the material is not considered to be a credible event. The risk of fire associated with the storage of silver nitrate is considered to be extremely low.

1) Describe special emergency services that might be required.

Hanford Site security, fire response, and ambulance services are on call at all times in the event of an onsite emergency.

2) Proposed measures to reduce or control environmental health hazards, if any:

The PUREX Storage Tunnels are located approximately 23 miles from Richland, Washington, the nearest population center. This isolation, coupled with multiple security barriers, prevents unauthorized access to the PUREX Storage Tunnels. Approval for each entry is evaluated on a case-by-case basis. Access to the PUREX Storage Tunnels by plant employees is restricted only to those persons having proper training and management approval.

The management practice of keeping personnel radiological exposures to as low as reasonably achievable (ALARA) levels is adhered to strictly. Personnel entering the PUREX Storage Tunnels are required to wear special protective clothing and respirators. The soil overburden serves as radiation shielding. Operations at the PUREX Storage Tunnels are carefully managed to assure that all activities are conducted in a safe and environmentally sound manner.

At the time of closure, all stored equipment will be removed from the tunnels and appropriately dispositioned. Upon closure, it is anticipated that the unit will meet federal and state standards for RCRA clean closure.

b. Noise

1) What type of noise exists in the area which may affect your project (for example: traffic, equipment, operation, other)?

None.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Operation of the PUREX Storage Tunnels requires infrequent use of a battery-powered locomotive to push railcars into position. This operation does not generate excessive noise. Depending on the final disposition option selected, heavy construction equipment may be used to demolish the unit. However, the remote location of the 200 East Area will prevent any detectable increase in noise levels off the Hanford Site.

3) Proposed measures to reduce or control noise impacts, if any:

Construction equipment will meet manufacturer's requirements for noise suppression.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

The PUREX Storage Tunnels are located within the 200 East Area of the Hanford Site. The Hanford Site is owned by the U. S. Government and is used for the production of special nuclear materials and the management of wastes associated with the production of those materials.

b. Has the site been used for agriculture? If so, describe.

No portion of the Hanford Site, including the site of the PUREX Storage Tunnels, has been used for agricultural purposes since 1943.

c. Describe any structures on the site.

Construction details of the PUREX Storage Tunnels are provided in Chapter 2.0 and Appendices 2A through 2E of the accompanying RCRA Part B Permit Application. Each storage tunnel consists of three areas: a water-fillable door, a storage area, and a vent shaft. The water-fillable doors are approximately 24.5 feet high, 21.5 feet wide, and 7 feet thick. Electric hoists for raising (opening) and lowering (closing) the doors are located on top of the concrete door enclosures. The door to Tunnel Number 1 has been sealed and electrically deactivated.

Tunnel Number 1 is constructed primarily of treated Douglas Fir timbers, covered with a 90-pound mineral-surface roofing material. Eight feet of earth fill placed over the roof timbers serve as radiation shielding. The floor consists of a railroad track laid on a gravel bed that slopes on a 1.0 percent grade southward. The inside dimensions of Tunnel Number 1 are 358 feet long, 22 feet high, and 19 feet wide.

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A combination of steel and reinforced concrete was used to construct the storage area of Tunnel Number 2. Tunnel Number 2 has a 34-foot diameter, nearly semicircular, steel roof supported by internal I-beam wales attached to external, reinforced concrete arches. The structure is supported on reinforced concrete-grade beams that run the full length of the tunnel. The interior and exterior surfaces of the steel roof are coated with a bituminous coating compound to inhibit corrosion, and the entire storage area is covered with 8 feet of earth fill which serves as radiation shielding. The floor consists of a railroad track laid on a gravel bed that slopes on a one-tenth of 1 percent grade southward. The inside dimensions of Tunnel Number 2 are 1,688 feet long, 26 feet high, and 34 feet wide.

A vent shaft is located at the south end of each tunnel. The shafts are constructed of reinforced concrete and are approximately 5 feet by 5 feet square in cross section. Each shaft extends approximately 1 foot above grade and is capped with a single high-efficiency particulate air filter, a 10,000 cubic feet per minute exhaust fan, and a 20-foot-tall exhaust stack. The exhaust fan on Tunnel Number 1 has been deactivated, and the fan on Tunnel Number 2 has been damped to provide only about 4,000 cubic feet per minute exhaust flow.

d. Will any structures be demolished? If so, what?

No structures will be demolished as a part of this proposal. It is not known whether or not any structures will be demolished in the future. The exact method of decommissioning will be determined at a later date and will be addressed in required planning documentation at that time.

e. What is the current zoning classification of the site?

The Hanford Site is zoned by Benton County as an Unclassified Use (U) district.

f. What is the current comprehensive plan designation of the site?

The 1985 Benton County Comprehensive Land Use Plan designates the Hanford Site as the "Hanford Reservation." Under this designation, land on the Site may be used for "activities nuclear in nature." Non-nuclear activities are authorized "if and when DOE approval for such activities is obtained."

g. If applicable, what is the current shoreline master program designation of the site?

Does not apply.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

None.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Does not apply.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Does not apply. (See answer to Checklist question B.8.f.)

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high-, middle-, or low-income housing.

None.

b. Approximately how many units, if any, would be eliminated? Indicate whether high-, middle-, or low-income housing.

None.

c. Proposed measures to reduce or control housing impacts, if any:

Does not apply.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The tallest aboveground structures associated with the PUREX Storage Tunnels are the existing water-fillable doors, which are approximately 24.5 feet high. Electric hoists for raising (opening) and lowering (closing) the doors and steel handrails are located on top of the concrete door enclosures.

b. What views in the immediate vicinity would be altered or obstructed?

None.

c. Proposed measures to reduce or control aesthetic impacts, if any:

If the PUREX Storage Tunnels are demolished, the surface will be leveled to a grade equal to that of the surrounding terrain, and disturbed areas will be revegetated.

11. **Light and Glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

None.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any:

Does not apply.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

None.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Does not apply.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any?

Does not apply.

13. **Historic and Cultural Preservation**

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

No places or objects listed on, or proposed for, national, state, or local preservation registers are known to be on or next to the site.

The PUREX Storage Tunnels are located in an area which was extensively disturbed during construction of the PUREX facility. Additional information on the Hanford Site environment can be found in the environmental documents referred to in the answer to Checklist question A.8.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

There are no known archaeological, historical, or native American religious sites at or next to the PUREX Storage Tunnels. Additional information on the Hanford Site environment can be found in the environmental documents referred to in the answer to Checklist question A.8.

c. Proposed measures to reduce or control impacts, if any:

As appropriate, detailed cultural resource reviews will provide the vehicle for necessary approvals required under the National Historic Preservation Act.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

Does not apply.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

The site is not publicly accessible, and, therefore, is not served by public transportation.

c. How many parking spaces would the completed project have? How many would the project eliminate?

None.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The PUREX Storage Tunnels are an extension of the rail spur on which irradiated reactor fuels are delivered to the PUREX Plant for chemical processing. Failed and/or obsolete equipment selected for storage in

the tunnels is loaded on modified railcars that serve as transport and storage platforms while the equipment is in storage. A remote-controlled, battery-powered locomotive is used to position each loaded railcar into a storage tunnel.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

None.

g. Proposed measures to reduce or control transportation impacts, if any:

Does not apply.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

No.

b. Proposed measures to reduce or control direct impacts on public services, if any:

Does not apply.

16. Utilities

a. List utilities currently available at the site (electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other):

There are no electrical utilities, water supply systems, drains, fire detection systems, or communications systems provided inside the storage area of the PUREX Storage Tunnels. All electricity, water supply lines and drain lines used in the operation of the PUREX Storage Tunnels are external. Electricity, communications systems and other utilities are available within the PUREX Plant. Electricity from the PUREX Plant is used to power the PUREX Storage Tunnels water-fillable shielding doors, the ventilation system and to charge the locomotive batteries. Water for filling the water-fillable doors is also provided from the PUREX Plant raw water system.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No additional utilities are proposed.

SIGNATURES

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

R. D. Izatt, Director
Environmental Restoration Division
U.S. Department of Energy
Richland Operations Office

9/26/90
Date

R. E. Lerch, Manager
Environmental Division
Westinghouse Hanford Company

9/24/90
Date

9110310371

PUREX STORAGE TUNNELS
DANGEROUS WASTE PERMIT APPLICATION

FOREWORD

The Hanford Site is operated by the U.S. Department of Energy-Richland Operations Office. The PUREX Storage Tunnels are a storage unit located on the Hanford Site. The unit consists of two earth-covered railroad tunnels that are used for storage of process equipment (some containing dangerous waste) removed from the PUREX Plant. Radioactively contaminated equipment is loaded on railroad cars and remotely transferred into the tunnels for long-term storage. Storage of the mixed (dangerous and radioactive) waste associated with the equipment is regulated under the *Resource Conservation and Recovery Act of 1976*.

The Hanford Site is considered to be a single facility. The single dangerous waste permit identification number issued to the Hanford Site by the U.S. Environmental Protection Agency and the Washington State Department of Ecology is U.S. Environmental Protection Agency/State Identification Number WA7890008967. This identification number encompasses a number of waste management units within the Hanford Site. All waste management activities carried out under the assigned identification number are considered to be 'onsite' as defined in the Washington State Department of Ecology *Dangerous Waste Regulations*, Washington Administrative Code 173-303.

Westinghouse Hanford Company is a major contractor to the U.S. Department of Energy-Richland Operations Office and serves as a co-operator of the PUREX Storage Tunnels, the waste management unit addressed by this permit application.

The PUREX Storage Tunnels Dangerous Waste Permit Application (Revision 0) consists of both a Part A and Part B permit application and is based on information available as of August 31, 1990. An explanation of the Part A revision submitted with this document is provided at the beginning of the Part A section. In this Part A revision, the PUREX Storage Tunnels have been redesignated as a miscellaneous unit (Subpart X, 40 Code of Federal Regulations 264).

The Part B consists of 15 chapters addressing the organization and content of the Part B checklist prepared by the Washington State Department of Ecology (Ecology 1987). For ease of reference, the checklist section numbers, in brackets, follow chapter headings and subheadings. The Part B is written under the assumption that authority for administering Subpart X will be extended to the Washington State Department of Ecology by the time the PUREX Storage Tunnels permit is finalized and issued.

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DOCUMENT CONTENT

FOREWORD

ACRONYMS AND ABBREVIATIONS

PART A

PART B

1.0 INTRODUCTION

2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS [B]

3.0 WASTE CHARACTERISTICS [C]

4.0 PROCESS INFORMATION [D]

5.0 GROUNDWATER MONITORING [E]

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10.0 WASTE MINIMIZATION PLAN

11.0 CLOSURE AND POSTCLOSURE REQUIREMENTS [I]

12.0 REPORTING AND RECORDKEEPING

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14.0 CERTIFICATION [K]

15.0 REFERENCES

VOLUME I

APPENDICES

2A Hanford Site Maps

2B Construction Photographs

APPENDICES (cont)

2C	Construction Drawings	VOLUME 2
2D	Tunnel 1 Construction Specifications	VOLUME 3
2E	Tunnel 2 Construction Specifications	
2F	Tunnel Storage Checklist	
3A	Classification of Residual Tank Heels in the PUREX Storage Tunnels	
7A	Westinghouse Hanford Company Emergency Plan for PUREX Facility	
8A	Training Course Descriptions	
11A	The PUREX Storage Tunnels Engineering Study	

ACRONYMS

ALARA	as low as reasonably achievable
AMU	aqueous makeup
CFR	Code of Federal Regulations
DOE-RL	U.S. Department of Energy-Richland Operations Office
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
PUREX	plutonium-uranium extraction
railcars	railroad cars
RCRA	Resource Conservation and Recovery Act
WAC	Washington Administrative Code
Westinghouse Hanford	Westinghouse Hanford Company
WHC	Westinghouse Hanford Company

ABBREVIATIONS

~	approximate
e.g.	for example
ft	feet
i.e.	that is
in.	inch
mrem	millirem
%	percent
R.R.	railroad
Rt.	Route
sch	schedule
typ	typical

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PART A

The Part A, Form 1, included in this permit application was submitted to the Washington State Department of Ecology in May 1988. The Part A, Form 1, consists of three pages.

The original Part A, Form 3 (Revision 0), was submitted in November 1987. A revised Part A, Form 3, is submitted with this Part B permit application.

The revised Part A, Form 3 (Revision 1), included in this permit application is submitted to redesignate the PUREX Storage Tunnels as a miscellaneous unit. Additionally, dangerous waste code D001 has been added to address the ignitable characteristic of the silver nitrate stored in Tunnel Number 2. The estimated annual quantities of waste also have been modified to represent the maximum quantity of waste placed in the PUREX Storage Tunnels in any given year since initial operation. The Part A revision included in this permit application consists of five pages of Form 3, three figures, and one photograph.

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Please print or type in the unshaded areas only
(Fill in areas are spaced for pica type, i.e., 12 characters/inch)

FORM 3

DANGEROUS WASTE PERMIT APPLICATION

I. EPA/STATE I.D. NUMBER: W A 7 8 9 0 0 0 8 9 6 7

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (Year, Month, Day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA/STATE I.D. Number, or if this is a revised application, enter your facility's EPA/STATE I.D. Number in Section I above.

A. FIRST APPLICATION (Place an "X" below and provide the appropriate date)

☐ 1. EXISTING FACILITY (See instructions for definition of "existing facility". Complete item below.)

FOR EXISTING FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (Use the space to the right): 06 15 56

☐ 2. NEW FACILITY (Complete item below.)

FOR NEW FACILITIES, PROVIDE THE DATE (mo., day, & yr.) OPERATION IMMEDIATELY EXPECTED TO BEGIN: MO. DAY YR.

B. REVISED APPLICATION (Place an "X" below and complete Section I above)

☒ 1. FACILITY HAS AN INTERIM STATUS PERMIT

☐ 2. FACILITY HAS A FINAL PERMIT

III. PROCESSES — CODES AND DESIGN CAPACITIES

A. PROCESS CODE — Enter the code from the list of process codes below that best describes each process to be used at the facility. Two lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the Section III-C.

B. PROCESS DESIGN CAPACITY — For each code entered in column A enter the capacity of the process.
1. AMOUNT — Enter the amount.
2. UNIT OF MEASURE — For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER (barrel, drum, etc.)	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D80	GALLONS OR LITERS
LANDFILL	D81	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER
LAND APPLICATION	D82	ACRES OR HECTARES
OCEAN DISPOSAL	D83	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D84	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER (Treatment, chemical, thermal or biological treatments not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided; Section III-C.)	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
LITERS	L
CUBIC YARDS	Y
CUBIC METERS	C
GALLONS PER DAY	U
LITERS PER DAY	V
TONS PER HOUR	D
METRIC TONS PER HOUR	W
GALLONS PER HOUR	E
LITERS PER HOUR	H
ACRE-FEET	A
HECTARE-METER	F
ACRES	B
HECTARES	Q

EXAMPLE FOR COMPLETING SECTION III (shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

LINE NUMBER	A. PROCESS CODE (from above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 1	600	G	
X-2	T 0 3	20	E	
1	S 0 5	* 31,400**	Y	

LINE NUMBER	A. PROCESS CODE (from above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
5				
6				
7				

* Process Code S05 is being utilized to designate the PUREX Storage Tunnels as a "miscellaneous unit" per 40 CFR 264, Subpart X.

** Total storage volume.

Continued from the front.

III. PROCESSES (continued)

SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESS (see item "D4"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

The PUREX Storage Tunnels are a miscellaneous unit (505) used for storage of mixed waste. The two tunnels are designed to store discarded equipment. Since being placed into service, various types of equipment containing mixed waste have been stored in the tunnels on railcars. Not all equipment stored in the tunnels contain mixed waste.

The construction of Tunnel 1 was completed in 1956. The maximum storage volume of the tunnel is approximately 5,400 cubic yards (19 feet wide by 22 feet high by 350 feet long) and provides storage space for eight railcars. Between June 1960 and January 1965, all eight railcar positions were filled and the tunnel subsequently sealed. The combined volume of the equipment stored in Tunnel I is approximately 780 cubic yards.

The construction of Tunnel 2 was completed in 1964. The maximum storage volume of the tunnel is approximately 26,000 cubic yards (19 feet wide by 22 feet high by 1,680 feet long) providing storage space for 40 railcars. The first railcar was placed in Tunnel 2 in December 1967 and as of January 1990, 17 railcars have been placed in the tunnel. The combined volume of equipment stored on the 17 railcars presently in Tunnel 2 is approximately 1,780 cubic yards.

IV. DESCRIPTION OF DANGEROUS WASTES

A. DANGEROUS WASTE NUMBER — Enter the four digit number from Chapter 173-303 WAC for each listed dangerous waste you will handle. If you handle dangerous wastes which are not listed in Chapter 173-303 WAC, enter the four digit number(s) that describes the characteristics and/or the toxic contaminants of those dangerous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non—listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed dangerous waste: For each listed dangerous waste entered in column A select the code(s) from the list of process codes contained in Section III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non—listed dangerous wastes: For each characteristic or toxic contaminant entered in Column A, select the code(s) from the list of process codes contained in Section III to indicate all the processes that will be used to store, treat, and/or dispose of all the non—listed dangerous wastes that possess that characteristic or toxic contaminant.

Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D1; and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: DANGEROUS WASTES DESCRIBED BY MORE THAN ONE DANGEROUS WASTE NUMBER — Dangerous wastes that can be described by more than one Waste Number shall be described on the form as follows:

1. Select one of the Dangerous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other Dangerous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other Dangerous Waste Number that can be used to describe the dangerous waste.

EXAMPLE FOR COMPLETING SECTION IV (shown in line numbers X-1, X-2, X-3, and X-4 below) — A facility will treat and dispose of an estimated 900 pounds per year of sludge that is both ignitable and reactive. In addition, the facility will treat and dispose of three non—listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 3 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2			T 0 3 D 8 0	included with above

CONTINUE ON PAGE 3

Continued from page 2

NOTE: Photocopy this page before completing if you have more than 24 wastes to list

ID NUMBER (enter from page 1): WA7890008967

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

LINE NO.	A. DANGEROUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D.1)
1	D008	6,000*	P	S05	Storage/Other/Miscellaneous Unit
2	WT01				Included With Above
3	D009	100*	P	S05	Storage/Other/Miscellaneous Unit
4	WT01				Included With Above
5	D011	1,500*	P	S05	Storage/Other/Miscellaneous Unit
6	WT01				↓
7	D011		↓		Included With Above
8					
9					
10					
11					
12					
13					
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15					
16					
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18					
19					
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21					
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23					
24					
25					
26					

* Listed annual quantities represent the estimated maximum quantity of waste placed in either tunnel in a given year since the tunnels were placed in service. Listed annual waste quantities may be exceeded in future years of operation.

Continued from the front.

IV. DESCRIPTION OF DANGEROUS WASTES (continued)

C. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM SECTION D(1) ON PAGE 3.

The waste stored in the tunnels includes lead (D008) weights, counterweights, mercury (D009) in the dissolvers, and silver salts (D011) from the silver reactors. The silver salts are considered ignitible (D001) because of the presence of silver nitrate. These dangerous wastes are considered toxic extremely hazardous waste (WT01).
The estimated amount of mixed waste currently stored in the tunnels is as follows.

TUNNEL NUMBER	DANGEROUS WASTE	AMOUNT[1]	LOCATION IN TUNNELS[2]
1	Lead (elemental)	500 lbs	Positions 2 and 4
2	Silver Salts[3]	1,625 lbs[4]	Positions 5 and 15
	Mercury (elemental)	284 lbs	Positions 7, 9, and 11
	Lead (elemental)	6,084 lbs	Positions 14 and 15

1 - The amounts indicated are approximates in pounds (lbs).
2 - Railcar positions start from the south end of the tunnel (Position 1 farthest south).
3 - A mixture of silver nitrate, silver halides and silver fines.
4 - Expressed as pounds-equivalent of silver nitrate.

V. FACILITY DRAWING

All existing facilities must include on the space provided on page 5 a sketch drawing of the facility (see instructions for more detail).

VI. PHOTOGRAPHS

All existing facilities must include photographs (aerial or ground-level) that clearly delineate the existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

VII. FACILITY GEOGRAPHIC LOCATION This information is provided on the attached drawings and photos

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)

VIII. FACILITY OWNER

☒ A. If the facility owner is also the facility operator as listed in Section VII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

☐ B. If the facility owner is not the facility operator listed in Section VII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code & no.)

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME (print or type)	SIGNATURE	DATE SIGNED
John D. Wagoner Manager, Richland Operations United States Department of Energy	Edward D. Bellamy	9-18-90

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

NAME (print or type)	SIGNATURE	DATE SIGNED
SEE ATTACHMENT		

CONTINUE ON PAGE 5

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

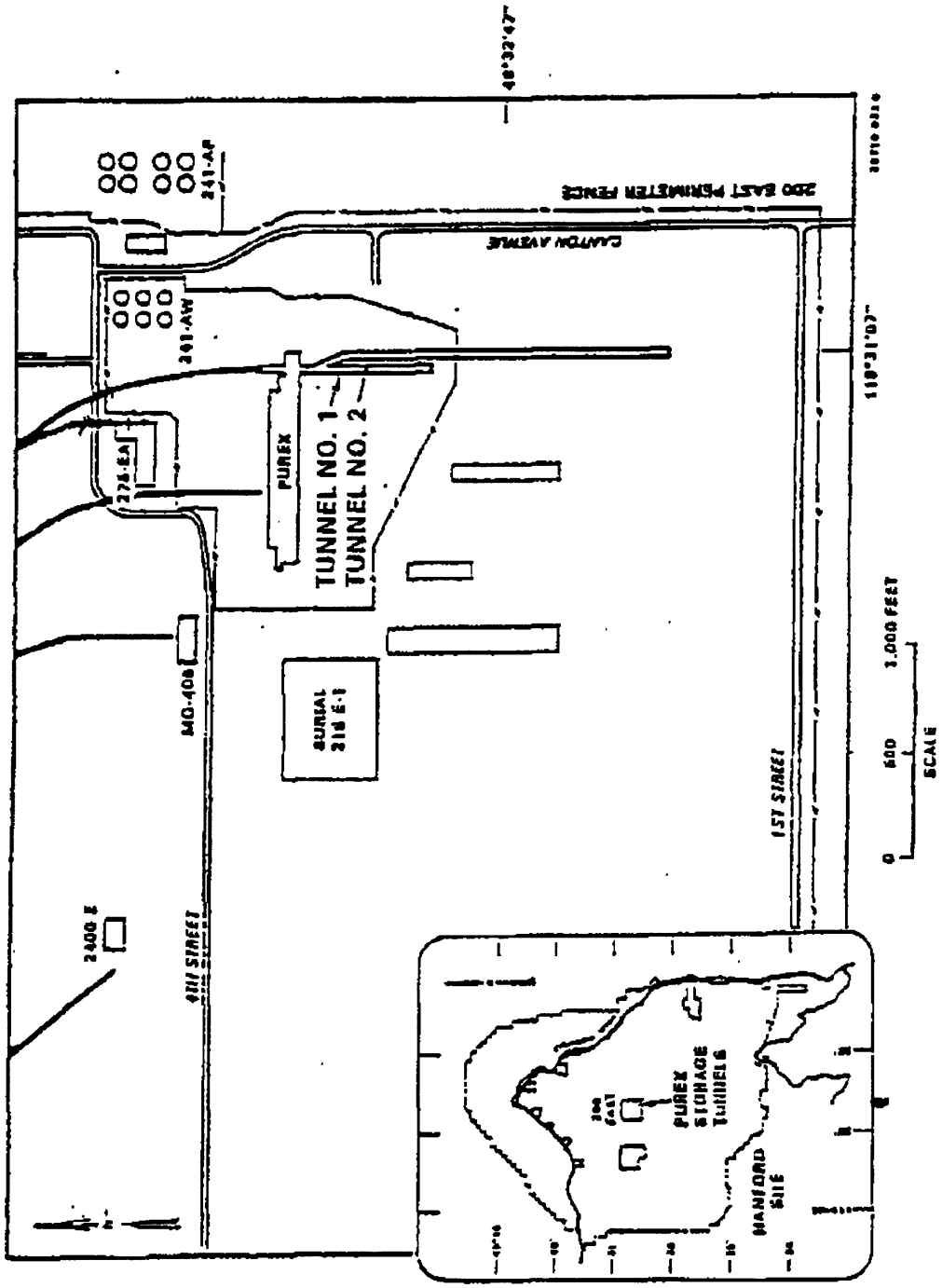
Edward D. Fielding
Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

9/18/90
Date

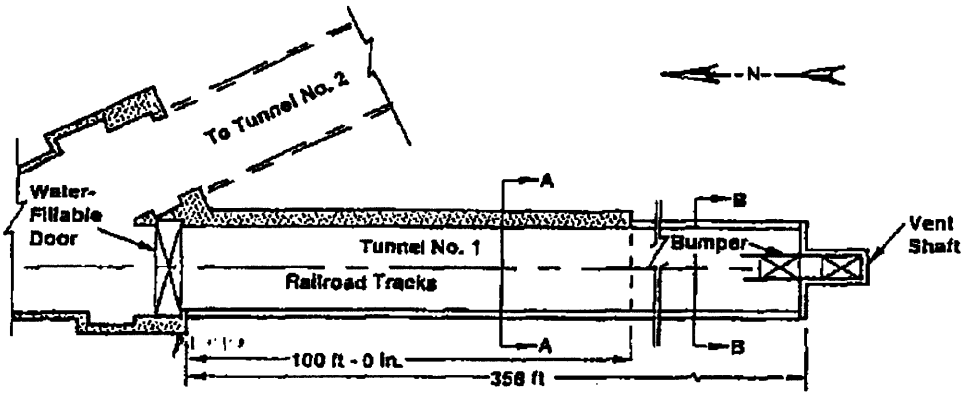
Roger Nichols
Co-operator
Roger C. Nichols, President
Westinghouse Hanford Company

8/21/90
Date

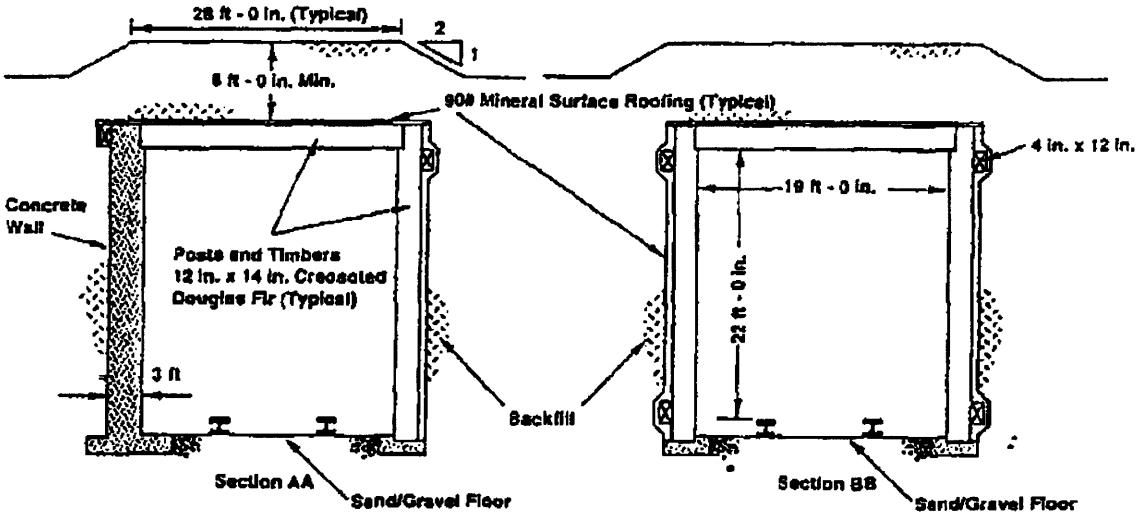
PUREX STORAGE TUNNELS
SITE PLAN



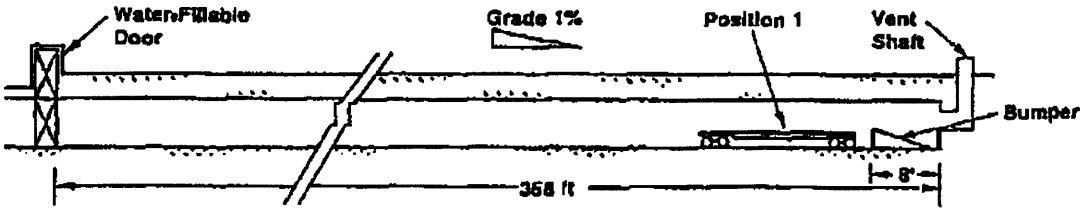
PUREX Tunnel No. 1 - Details



Tunnel No. 1 - Plan View



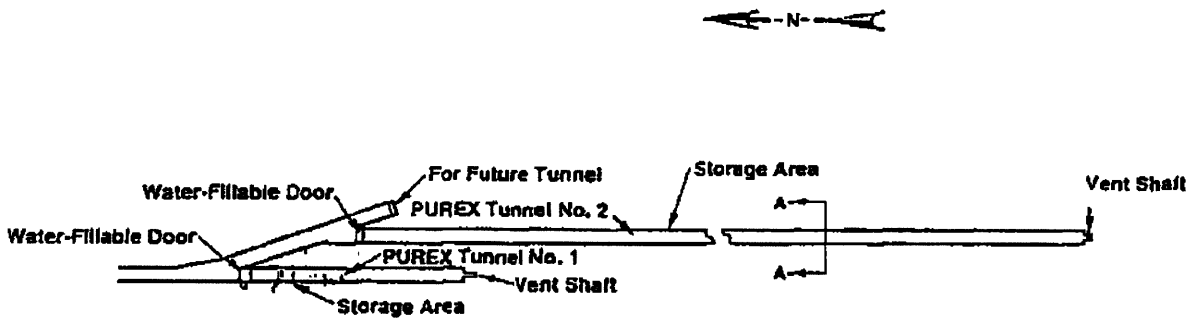
PUREX Tunnel No. 1 - Section Views



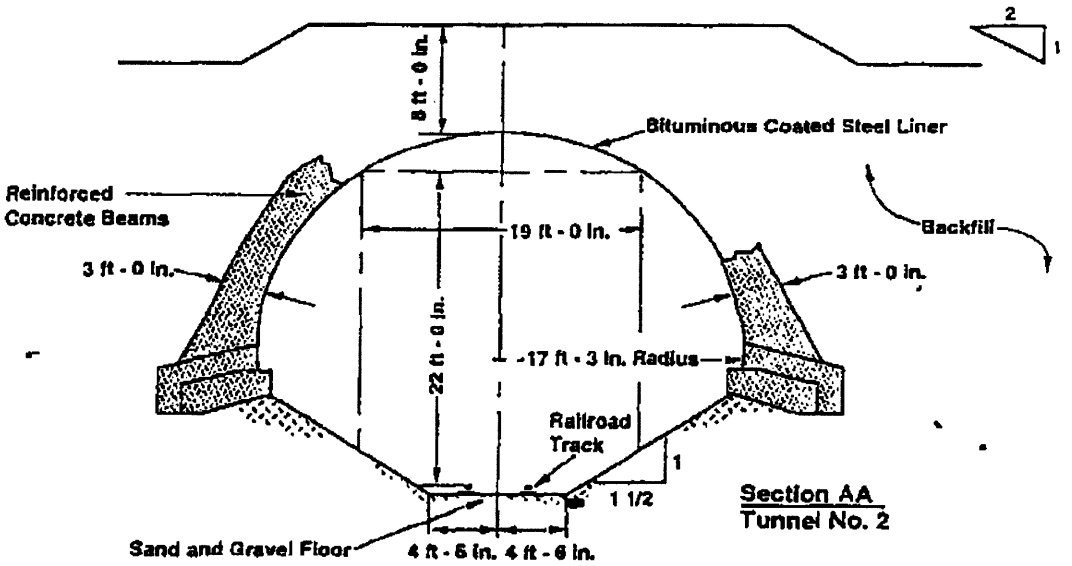
PUREX Tunnel No. 1 - Elevation View

78910032.2

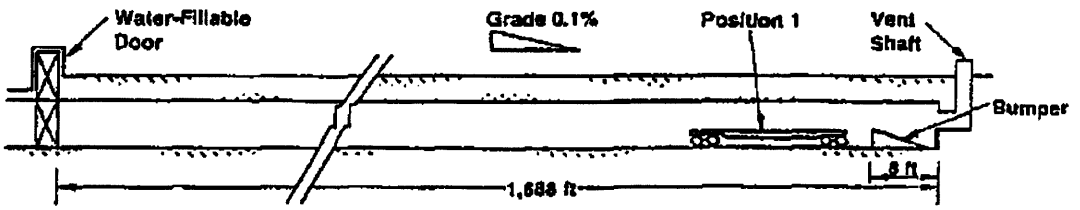
PUREX Tunnel No. 2 - Details



PUREX Tunnels - Plan View



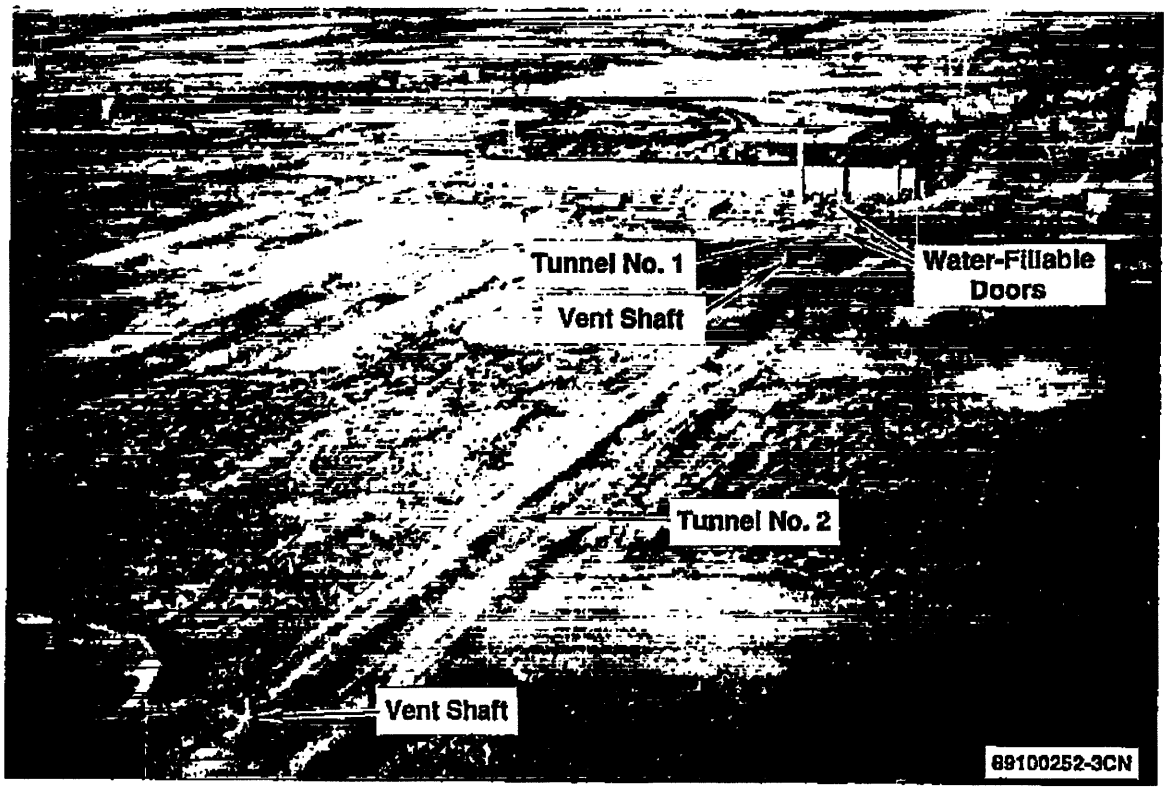
Section AA
Tunnel No. 2



PUREX Tunnel No. 2 - Elevation View

78910032.1

PUREX STORAGE TUNNELS



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119°31'07"

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PART B

This permit application for the PUREX Storage Tunnels consists of 15 chapters and 10 appendices.

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1.0 INTRODUCTION

This chapter briefly describes the permitting approach for the PUREX (plutonium-uranium extraction) Storage Tunnels and provides an overview of the contents of the *PUREX Storage Tunnels Dangerous Waste Permit Application*.

1.1 THE PUREX STORAGE TUNNELS PERMITTING

The PUREX Storage Tunnels are a mixed waste storage unit consisting of two underground railroad tunnels: Tunnel Number 1 designated 218-E-14 and Tunnel Number 2 designated 218-E-15. The two tunnels are connected by rail to the PUREX Plant and combine to provide storage space for 48 railroad cars (railcars).

The PUREX Storage Tunnels provide a long-term storage location for process equipment removed from the PUREX Plant. Equipment transfers into the PUREX Storage Tunnels are made on an as-needed basis. Radioactively contaminated equipment is loaded on railcars and remotely transferred by rail into the PUREX Storage Tunnels. Railcars act as both a transport means and a storage platform for equipment placed into the tunnels.

The tunnels are weather-tight structures covered by 8 feet of earth. This design serves to protect the stored equipment from exposure to natural elements, provides external radiation shielding from the radioactive equipment stored inside the tunnels, and provides for the protection of the environment.

Tunnel Number 1 was completed in 1956 as part of the PUREX Facility* construction project and provides storage space for eight railcars. Tunnel Number 1 was filled to capacity in 1965 and subsequently was sealed. Tunnel Number 2 was an expansion project constructed in 1964. This tunnel is different in design and is considerably longer than Tunnel Number 1, providing storage space for a total of 40 railcars. As of January 1, 1990, there are 17 railcars stored in Tunnel Number 2.

All equipment stored in the tunnels has been involved in PUREX Plant process operations and, as a result, is radioactive. While all of the equipment is radioactive, most equipment placed in the tunnels for storage does not contain dangerous waste. The dangerous waste associated with the equipment is either attached to, or contained within, the equipment.

---

* For purposes of the *Resource Conservation and Recovery Act*, the Hanford Site is considered to be a single facility consisting of a number of waste management units. The term 'facility' also is commonly used in building nomenclature throughout the Hanford Site, e.g., PUREX Facility and Fast Flux Test Facility. The PUREX Facility in this permit application is used in a nomenclatorial sense and includes the PUREX Plant, PUREX Storage Tunnels, and other ancillary buildings.

The PUREX Storage Tunnels are classified as a miscellaneous unit and are being permitted under the provisions of U.S. Environmental Protection Agency (EPA) regulations in Subpart X of 40 Code of Federal Regulations (CFR) 264. Classification as a miscellaneous unit was determined to be appropriate because the PUREX Storage Tunnels do not conform to the description of any existing unit provided in Washington State Department of Ecology (Ecology) *Dangerous Waste Regulations*, Washington Administrative Code (WAC) 173-303-040 and 40 CFR 260.

This Part B is written under the assumption that authority for the administration of Subpart X will be extended to Ecology by the time the PUREX Storage Tunnels permit is finalized and issued.

Subpart X of 40 CFR 264 requires that miscellaneous unit permit terms and conditions address appropriate requirements provided for other treatment, storage, and/or disposal facilities. The construction and operation of the PUREX Storage Tunnels most closely resembles that of a container storage facility; therefore, appropriate requirements for a container storage facility are addressed throughout the permit application. However, because of the high levels of radiation present inside the PUREX Storage Tunnels, certain inspection and labeling requirements prescribed for a container storage facility are not feasible and alternatives are necessary. These alternatives serve to meet the intent of the requirements prescribed by WAC 173-303 and to maintain radiation exposure to personnel as low as reasonably achievable (ALARA). The rationale for operations associated with the PUREX Storage Tunnels are addressed further in a proposed petition for rulemaking change submitted to Ecology and the EPA (Freeberg 1989) in fulfillment of a September 1989 *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) milestone (Milestone M-21-01) (Ecology et al. 1989). This proposed petition identifies areas where it is not practical to perform inspections and other activities prescribed by the *Resource Conservation and Recovery Act* (RCRA) because of radiological hazards present at certain Hanford Site waste management units.

This permit application addresses only the PUREX Storage Tunnels. Other treatment, storage, and/or disposal units that are part of the PUREX Facility will be addressed under a separate Part B permit application.

1.2 THE PUREX STORAGE TUNNELS PART B PERMIT APPLICATION CONTENTS

The PUREX Storage Tunnels Part B Permit Application consists of 15 chapters:

- Introduction (Chapter 1.0)
- Facility Description and General Provisions (Chapter 2.0)
- Waste Characteristics (Chapter 3.0)
- Process Information (Chapter 4.0)

- Groundwater Monitoring (Chapter 5.0)
- Procedures to Prevent Hazards (Chapter 6.0)
- Contingency Plan (Chapter 7.0)
- Personnel Training (Chapter 8.0)
- Exposure Information Report (Chapter 9.0)
- Waste Minimization Plan (Chapter 10.0)
- Closure and Postclosure Requirements (Chapter 11.0)
- Reporting and Recordkeeping (Chapter 12.0)
- Other Relevant Laws (Chapter 13.0)
- Certification (Chapter 14.0)
- References (Chapter 15.0).

A brief description of each chapter is provided in the following sections.

1.2.1 Facility Description and General Provisions (Chapter 2.0)

This chapter provides a general description of the PUREX Facility, the PUREX Plant, and the PUREX Storage Tunnels. A brief description and history of the Hanford Site also are provided.

1.2.2 Waste Characteristics (Chapter 3.0)

This chapter describes the physical, chemical, and biological characteristics of the dangerous waste stored within the PUREX Storage Tunnels. A waste analysis plan is included that provides the methodology for determining waste types.

1.2.3 Process Information (Chapter 4.0)

This chapter covers the detailed operation of the PUREX Storage Tunnels. The information describes procedures for removal of equipment from the PUREX Plant through final placement of the equipment into the PUREX Storage Tunnels.

1.2.4 Groundwater Monitoring (Chapter 5.0)

This chapter explains that the PUREX Storage Tunnels are not operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill. Therefore, groundwater monitoring is not required.

1.2.5 Procedures to Prevent Hazards (Chapter 6.0)

This chapter discusses hazard prevention and emergency preparedness equipment, structures, and procedures.

1.2.6 Contingency Plan (Chapter 7.0)

This chapter provides information on contingency planning to ensure that the PUREX Facility has measures in place to lessen the potential impact on the public health and the environment in the event of an emergency.

1.2.7 Personnel Training (Chapter 8.0)

This chapter outlines the training program for PUREX Facility employees whose primary duties at the PUREX Storage Tunnels are identified as being associated with dangerous waste management.

1.2.8 Exposure Information Report (Chapter 9.0)

This chapter explains that the PUREX Storage Tunnels will not store, treat, or dispose of dangerous waste in a surface impoundment or a landfill. Therefore, exposure information is not required.

1.2.9 Waste Minimization Plan (Chapter 10.0)

This chapter explains that the PUREX Storage Tunnels are not generators of regulated dangerous waste. Therefore, a waste minimization plan is not required.

1.2.10 Closure and Postclosure Requirements (Chapter 11.0)

This chapter describes how the PUREX Storage Tunnels will be decontaminated and closed. A closure schedule is provided. The unit is to be clean closed; therefore, no postclosure plan is included.

1.2.11 Reporting and Recordkeeping (Chapter 12.0)

This chapter summarizes commitments for reporting and recordkeeping that are applicable to the PUREX Storage Tunnels.

1.2.12 Other Relevant Laws (Chapter 13.0)

This chapter discusses federal and state laws that govern the operation of the PUREX Storage Tunnels, other than the RCRA, as amended, and the *State of Washington Hazardous Waste Management Act of 1976*, as amended.

1.2.13 Certification (Chapter 14.0)

This chapter contains the required certification signed by officials of the U.S. Department of Energy-Richland Operations Office (DOE-RL) and Westinghouse Hanford Company (Westinghouse Hanford) indicating that the information provided is true, accurate, and complete.

1.2.14 References (Chapter 15.0)

References used throughout this Part B permit application are listed in this chapter. All references listed here will be made available for review, upon request, to any regulatory agency or public commentor. References can be obtained by contacting the following:

Administrative Records Specialist
Public Access Room H4-22
Westinghouse Hanford Company
P. O. Box 1970
Richland, Washington 99352

1.3 ACRONYMS AND ABBREVIATIONS

Acronyms and abbreviations used throughout this Part B permit application are located at the beginning of the document between the Foreword and the Part A permit application.

1.4 PERMIT MODIFICATIONS

This section identifies how changes to the PUREX Storage Tunnels Dangerous Waste Permit are to be handled.

1.4.1 Minor Modifications

On issuance of the PUREX Storage Tunnels Dangerous Waste Permit, the following changes to this permit will be considered as minor modifications:

- Correction of typographical errors
- Change of contractor that co-operates the PUREX Storage Tunnels with the DOE-RL

- Addition and/or deletion of dangerous waste codes for waste to be stored as a result of changing regulations

- Changes in the annual quantities of permitted waste to be handled

- Changes to the lists of building emergency coordinators or equipment identified in the contingency plan

- Incorporation of text changes resulting from contingency plan modifications handled in accordance with Section 1.4.2

- Changes to the PUREX Storage Tunnels site and/or facility and associated changes to drawings that do not impact construction and/or operational requirements governed by WAC 173-303

- Changes in the estimated quantities or waste present at closure of the PUREX Storage Tunnels

- Changes in operations that require permit revision but have no impact on compliance with WAC 173-303

- Revision of forms included in the Permit

- Inclusion of new and/or updated maps

- All other changes to the Permit that have no impact on compliance with WAC 173-303.

1.4.2 Other Modifications

The WAC 173-303 requirements for contingency plans are satisfied in the following documents: the DOE-RL emergency plan and procedures manuals, the *Westinghouse Hanford Company Emergency Plan* (WHC 1989b), and the *Westinghouse Hanford Company Emergency Plan for PUREX* Facility (WHC 1990).

The cited contingency plan documents also serve to satisfy a broad range of other requirements (e.g., Occupational Safety and Health Administration and U.S. Department of Energy Orders). Therefore, revisions made to portions of the contingency plan documents that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to review or approval by Ecology.

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900916.0845

9 1 1 1 3 7 1 5 3 7

2.0 FACILITY DESCRIPTION AND GENERAL PROVISIONS [B]

This chapter briefly describes the Hanford Site and provides a general overview of the PUREX Storage Tunnels, including the following:

- General description
- Topography
- Location information
- Traffic information
- Performance standards
- Buffer monitoring zones
- Spills and discharges
- Manifest system.

2.1 GENERAL DESCRIPTION [B-1]

This section contains a discussion of the general Hanford Site operating areas and provides an introduction to the PUREX Storage Tunnels. The Hanford Site is considered to be a single facility. Waste from all DOE-RL operations on the Hanford Site is generated under the common U.S. Environmental Protection Agency (EPA)/State Identification Number WA7890008967. All waste management activities carried out under the assigned identification number are considered to be 'onsite' as defined in WAC 173-303. A more detailed discussion of the waste characteristics and operating methods of the PUREX Storage Tunnels is given in Chapters 3.0 and 4.0, respectively.

2.1.1 The Hanford Site

The Hanford Site covers approximately 560 square miles of semiarid land that is owned by the U.S. Government and managed by the DOE-RL. For purposes of RCRA and WAC 173-303, the DOE-RL is the owner/operator and Westinghouse Hanford is a co-operator, with the DOE-RL, of certain hazardous waste management units on the Hanford Site. The Hanford Site is located northwest of the city of Richland, Washington (Figure 2-1). The city of Richland adjoins the southeasternmost portion of the Hanford Site boundary and is the nearest population center. In early 1943, the U.S. Army Corps of Engineers selected the Hanford Site as the location for reactor, chemical separation, and related activities for the production and purification of special nuclear materials.

Activities at the Hanford Site are centralized in numerically designated areas. The reactors are located along the Columbia River in the 100 Areas.

The reactor fuel processing and waste management units are in the 200 Areas, which are on a plateau approximately 7 miles from the Columbia River.

The 300 Area, located adjacent to and north of Richland, contains the reactor fuel manufacturing plants and the research and development laboratories. The 400 Area, 5 miles northwest of the 300 Area, contains the Fast Flux Test Facility used for testing liquid metal reactor systems. The 600 Area is the identifier for all locations not specifically given an area designator. Adjacent to and north of Richland, the 1100 Area contains buildings associated with administration, maintenance, transportation, and materials procurement and distribution. The 3000 Area, between the 1100 Area and the 300 Area, contains engineering offices and administrative offices. Administrative buildings also are located in the 700 Area, which is in downtown Richland.

Plate 2-1 in Appendix 2A provides a general overview of the Hanford Site and contiguous area (Drawing H-6-958). Plate 2-1 illustrates the following:

- Legal boundary
- Contours (at 20-foot intervals) sufficient to show surface water flow
- Fire control services on the Hanford Site
- Access roads, internal roads, railroads, perimeter gates, and barricades
- Longitudes and latitudes.

2.1.2 The 200 East Area

The 200 East Area (Figure 2-2) is located near the center of the Hanford Site and is situated on a plateau (elevation 710 feet) approximately 7 miles west of the Columbia River (elevation 350 feet). The 200 East Area is approximately 23 miles north northwest of the city of Richland and the closest public access is Washington State Highway 240, which is about 4 miles southwest of the 200 East Area perimeter security fence.

Designated dangerous waste treatment, storage, and/or disposal units within 1,000 feet of the PUREX Storage Tunnels are listed in Table 2-1. In accordance with WAC 173-303-806(4)(a)(xviii)(L), the locations of these treatment, storage, and/or disposal units are shown on Plate 2-2 in Appendix 2A (Drawing H-2-79998).

2.1.3 The PUREX Facility

The PUREX Facility (Figure 2-3) is located in the southeast corner of the 200 East Area. The PUREX Facility includes all buildings and structures that lie within the double fence security protected area, plus the office trailer complex located adjacent to but outside of the northwest corner of

the protected area. The trailer complex contains engineering, training, and administrative personnel who provide direct support to the PUREX Facility. The PUREX Facility is used to recover the plutonium product and the reusable uranium content of irradiated reactor fuel. A series of liquid-liquid extraction processes are used to separate the plutonium and uranium from radioactive fission products and to separate the plutonium from the uranium.

Irradiated reactor fuel is processed in the PUREX Processing Building 202-A (commonly referred to as the PUREX Plant). A cutaway and section of the 202-A Building are shown in Figures 2-4 and 2-5, respectively. This building is a reinforced concrete structure 1,005 feet long, 119 feet wide (at its maximum), and 100 feet high with about 40 feet of this height below grade. The building consists of three main structural components: (1) a thick-walled, concrete canyon containing remotely operated process equipment (in cells below grade); (2) the pipe and operating, sample, and storage galleries; and (3) a steel and transite annex that includes offices, process control rooms, laboratories, and the building services. The portion of the canyon below grade is subdivided into a row of process cells paralleled by an exhaust air tunnel and pipe trench through which intercell solution transfers are made. The air tunnel exhausts the ventilation air from the cells to the main ventilation filters and stack.

A craneway is located above the cells and pipe trench and extends almost the full length of the canyon building. In the craneway are three gantry-type maintenance cranes that are used to handle cell cover blocks, remotely remove and replace process cell equipment, and charge irradiated reactor fuel into the dissolvers. The galleries contain service piping to the cells, samplers for obtaining process samples, and electrical switchgear.

A railroad spur enters the PUREX Facility from the north and extends into the east end of Building 202-A (Figures 2-2 and 2-3). The railroad spur enters the building below grade through a vertical door that leads into an area known as the railroad tunnel. It is via this railroad tunnel that irradiated reactor fuel is received at the PUREX Plant. The railroad tunnel also is used to receive replacement equipment to be installed in the canyon processing area. Access from the railroad tunnel to the canyon processing area is through a horizontal door located in the ceiling of the railroad tunnel. The horizontal door lies beneath the canyon craneway and to the west of the crane maintenance area. Figure 2-4 shows this door open (slid northward) to allow crane access to the reactor fuel cask car positioned beneath the upper canyon floor. Access to the PUREX Storage Tunnels (Section 2.1.4) is via the railroad tunnel. The reinforced concrete walls and roof of the railroad tunnel that extend southward have been deleted from Figure 2-4 to show the cask car and the extended railroad track.

2.1.4 The PUREX Storage Tunnels

The PUREX Storage Tunnels branch off from the railroad tunnel and extend southward from the east end of the PUREX Plant (Figure 2-3). The tunnels are used for storage of failed and/or obsolete process equipment that is removed from the PUREX Plant. Each storage tunnel is isolated from the railroad

tunnel by a water-fillable shielding door. There are no electrical utilities, water lines, drains, fire detection and suppression, radiation monitoring, or communication systems provided inside the storage area of the PUREX Storage Tunnels.

Equipment selected for storage in the PUREX Storage Tunnels is loaded on railcars that have been modified to serve as both transport and storage platforms. A remote-controlled, battery-powered locomotive is used to position the railcar in the storage tunnel. The railcar storage positions are numbered sequentially, commencing with Position 1 that abuts the railstop bumper at the south end of each tunnel. Position 2 is the location of the railcar that abuts the railcar in Position 1 and so forth. The railcars and equipment remain in the storage tunnel until retrieval is required. Each railcar is retrievable; however, because the railcars are stored on a single, dead-end railroad spur inside each storage tunnel, the railcars can be removed only in reverse order to that of being placed into storage (i.e., last in, first out).

Equipment transfers into the PUREX Storage Tunnels are infrequent and are not a manpower-intensive operation. Personnel with responsibilities for management, operation, and maintenance of the PUREX Storage Tunnels are PUREX Facility employees that have other responsibilities associated with the operation of the PUREX Plant. A more detailed description of the operation of the PUREX Storage Tunnels is provided in Chapter 4.0.

2.1.4.1 Tunnel Number 1 (218-E-14). Construction of Tunnel Number 1 was completed in 1956 as part of the PUREX Facility construction project. Tunnel Number 1 consists of three areas: the water-fillable door, the storage area, and the vent shaft (Figure 2-6).

The water-fillable door is located at the north end of Tunnel Number 1 and separates the storage tunnel from the PUREX railroad tunnel. The door is 24.5 feet high, 21.5 feet wide, and 7 feet thick, and is constructed of 1/2-inch steel plate. The door is hollow so that it may be filled with water to act as a radiation shield when it is in the down (closed) position.

If the door is filled with water, the water must be pumped from the door before the door can be raised. The water pumped from the door will discharge to B Pond via a 6-inch line that connects to the PUREX Plant cooling water line.

Above the door is a reinforced concrete structure that encloses the door when the door is raised to the open position. Electric hoists used for opening and closing the door are located on the top of the door housing.

Pumps and valves used for filling and draining the door are located in a room northwest of the door closure. Operational controls are located in the PUREX Plant on the north wall at the east end of the pipe and operation gallery. Water used for filling the door is supplied by a 3-inch raw water line (Drawing H-2-55587 in Appendix 2C).

Beneath the water-fillable door is a sump with a 6-inch drain that connects to the PUREX Plant steam condensate discharge line. The steam condensate discharge line flows to the 216-A-30 Crib, which is located approximately 2,000 feet east of Tunnel Number 2.

The storage area is that portion of the tunnel that extends southward from the water-fillable door. The inside dimensions of Tunnel Number 1 are 358 feet long, 22 feet high, and 19 feet wide. The ceiling and walls are 14 inches thick and constructed of 12- by 14-inch creosote pressure-treated Douglas fir timbers arranged side by side. The first 100 feet of the east wall is constructed of 3-foot-thick reinforced concrete (Section AA of Figure 2-6). A 90-pound mineral-surface roofing material was used to cover the exterior surface of the timbers before placement of 8 feet of earth fill. The earth cover serves as radiation shielding. The timbers that form the walls rest on reinforced concrete footings 3 feet wide by 1 foot thick. The floor consists of a railroad track laid on a gravel bed. The space between the ties is filled to top-of-tie with gravel ballast. The tracks are on a 1.0 percent downward slope to the south to ensure that the railcars remain in their storage position. A railcar bumper is located 8 feet from the south end of the tracks to act as a stop. Top-of-track elevation is 693 feet at the water-fillable door and the track slopes to an elevation of 689 feet 5 inches at the end of the tunnel. The capacity of the storage area is eight, 42-foot-long railcars.

From 1962 through 1980, a total of nine pipe risers were installed through the roof of Tunnel Number 1. Seven of the nine risers were used for wood sampling of the tunnel ceiling timbers. The other two risers were used to obtain air samples and temperature data of the internal environment of the tunnel. Presently all of these risers are capped. For more detail on these pipe risers, refer to Drawing H-2-55587 in Appendix 2C and Figure 2 in Appendix 11A.

The results of the wood strength survey (conducted in 1980) concluded that the wood beams in Tunnel Number 1 were within standards for present day wood. Design calculations performed at the time also found the tunnel to be "within safe limits" (Silvan 1980). Air sampling conducted in Tunnel Number 1 did not identify the presence of any combustible gases and found oxygen levels to be at about 21 percent with carbon dioxide at about 0.3 percent. The reported temperature in Tunnel Number 1 holds consistently at 60 °F (Ramboek and Foster 1972).

A vent shaft is located at the south end of Tunnel Number 1. The shaft is approximately 5 feet by 5 feet in cross section and is constructed of reinforced concrete. The vent stack extends approximately 1 foot above grade and is capped with a single-stage, high-efficiency particulate air filter, a 10,000 cubic foot per minute exhaust fan, and a 20-foot tall exhaust stack. Subsequent to filling Tunnel Number 1 to capacity, the tunnel was sealed. Part of the sealing activities included blanking the exhaust system upstream of the air filters to prevent interaction of the tunnel air with external air. A further discussion of the tunnel ventilation system is provided in Chapter 4.0, Section 4.1.7.

In June 1960, the first two railcars were loaded with a single, approximately 41-foot-long, failed separation column and placed in Tunnel Number 1. Between June 1960 and January 1965, six more railcars were placed in Tunnel Number 1, filling the capacity of the tunnel. After the last car was placed in the northern-most storage position (Position 8), the water-fillable door was closed, filled with water, and deactivated electrically, as was the exhaust system. Table 3-1 in Chapter 3.0 lists the dangerous materials stored in Tunnel Number 1.

2.1.4.2 Tunnel Number 2 (218-E-15). Construction of Tunnel Number 2 was started and completed in 1964. Like Tunnel Number 1, Tunnel Number 2 consists of three functional areas: the water-fillable door, the storage area, and the vent shaft. Construction of Tunnel Number 2 differs from that of Tunnel Number 1 as follows.

- A combination of steel and reinforced concrete was used in the construction of the storage area for Tunnel Number 2 (Figure 2-7) rather than wood timbers, as used in Tunnel Number 1.

- Tunnel Number 2 is longer, having a storage capacity of five times that of Tunnel Number 1.

- The floor of Tunnel Number 2, outboard of the railroad ties, slopes upward to a height of approximately 6 feet above the railroad bed, whereas the floor in Tunnel Number 1 remains flat all the way out to the side walls.

- The PUREX railroad tunnel approach to Tunnel Number 2 angles eastward then angles southward to parallel Tunnel Number 1 (Figure 2-7). The approach to Tunnel Number 1 is a straight extension southward from the PUREX Plant. Center-line to center-line distance between the two tunnels is approximately 60 feet.

The physical structure of the water-fillable door at the north end of Tunnel Number 2 is essentially identical to the water-fillable door for Tunnel Number 1. The water-fillable door for Tunnel Number 2 is approximately 190 feet south and 60 feet east of the water-fillable door for Tunnel Number 1 and is inside the PUREX Facility security protected area (Figure 2-3).

Controls for operation of the water-fillable door are located above the tunnel on the east exterior wall of the door enclosure (Chapter 4.0, Figure 4-1). Water used to fill the door is provided via a hydrant that is supplied from the PUREX Plant raw water line (Drawing H-2-63180). Drawing H-2-63180 also shows the sump beneath the door to drain to the 216-A-30 Crib by way of the PUREX Plant steam condensate discharge line. Chapter 4.0, Section 4.1.3.4, provides additional operational information on the Tunnel Number 2 water-fillable door. The door is presently empty. Procedures for filling and draining the door are presented in Chapter 4.0, Section 4.1.

The storage area of Tunnel Number 2 is that portion of the tunnel extending southward from the water-fillable door. Construction of this portion of Tunnel Number 2 consists of a 34-foot-diameter, steel (3/16-inch plate), semicircular-shaped roof, supported by internal I-beam wales attached to external, reinforced concrete arches. The concrete arches are 1 foot 3 inches thick and vary in width from 2 1/2 to 6 feet. The arches are spaced on 15 feet 8 3/4-inch centers. This semicircular structure is supported on reinforced concrete grade beams approximately 6 feet wide by 4 feet thick (one on each side) that run the full length of Tunnel Number 2. The interior and exterior surfaces of the steel roof are coated with a bituminous coating compound to inhibit corrosion. The entire storage area is covered with 8 feet of earth fill to serve as radiation shielding.

The nominal inside dimensions of Tunnel Number 2 are 1,688 feet long, 26 feet high, and 34 feet wide. However, because of the arch-shaped cross section of Tunnel Number 2 and entry clearance at the water-fillable door, the usable storage area (width and height above top-of-rail) is 22 feet high and 19 feet wide, the same dimensions as for Tunnel Number 1. The floor consists of a railroad track laid on a gravel bed. The space between ties is filled to top-of-tie with gravel ballast. Commencing at the ends of the 8-foot-long ties, the earth floor is sloped upward on a 1-foot (vertical) to 1 1/2-foot (horizontal) grade. The tracks are on a 1/10 of 1 percent downgrade slope to the south to ensure the railcars remain in their storage position. A railcar bumper is located 8 feet from the south end of the tracks to act as a stop. Top-of-track elevation is 693 feet at the water-fillable door and slopes downward to an elevation of 691 feet 4 inches at the end of the tunnel. The capacity of the storage area is 40, 42-foot-long railcars.

There are 17 tunnel ports located along the ridge of the tunnel roof (for details see Drawing H-2-58195 in Appendix 2C) . The ports are on 96-foot centers. A 3-inch diameter bar plug is located in the center of each tunnel port and is secured in place with a length of chain and a padlock. The PUREX Plant operations administers access control of these tunnel ports.

The vent shaft is located at the south end of Tunnel Number 2. The shaft is approximately 5 feet by 5 feet in cross section and is constructed of reinforced concrete. The vent shaft extends approximately 1 foot above grade and is capped with an exhaust system consisting of a single-stage, high-efficiency particulate air filter, a 10,000 cubic foot per minute exhaust fan, and a 20-foot-tall exhaust stack. The exhaust system currently is active; however, the exhaust fan has been dampered to provide only about 4,000 cubic feet per minute of exhaust flow. A further discussion of the tunnel ventilation system is provided in Chapter 4.0, Section 4.1.7.

The first railcar was placed in storage in December 1967. As of January 1, 1990, a total of 17 railcars have been placed in Tunnel Number 2. Table 3-1 in Chapter 3.0 lists the dangerous materials stored in Tunnel Number 2.

2.1.4.3 Construction Photographs. Photographs taken during construction of the PUREX Storage Tunnels are provided in Appendix 2B.

2.1.4.4 Construction Drawings and Specifications. The PUREX Storage Tunnels construction specifications and design drawings are included in Appendices 2C, 2D, and 2E.

2.2 TOPOGRAPHIC MAP [B-2]

A topographic map, showing a distance of at least 1,000 feet around the PUREX Storage Tunnels, is located in Plate 2-2 in Appendix 2A. This map is at a scale of 1 centimeter equals 20 meters. The contour interval clearly shows the pattern of surface water flow in the vicinity of and from each storage tunnel. The map contains the following information:

- Map scale
- Date
- Prevailing wind speed and direction
- A north arrow
- Surrounding land use
- Access control fences
- Monitoring and sampling well locations
- Building locations
- Treatment, storage, and/or disposal operation locations
- Location of the PUREX Storage Tunnels.

A legal description of the PUREX Storage Tunnels is provided in Plate 2-3 in Appendix 2A.

2.3 LOCATION INFORMATION [B-3]

This section describes the location of the PUREX Storage Tunnels in relation to seismic, floodplain, and shoreline considerations.

2.3.1 Seismic Consideration [B-3a]

The PUREX Storage Tunnels are located in Benton County, Washington, and are not within one of the political jurisdictions identified in Appendix VI of 40 CFR 264 and WAC 173-303-420(3)(c). Therefore, no further demonstration of compliance with the seismic standard is required.

2.3.2 Floodplain Standard [B-3b]

Three sources of potential flooding of the unit were considered: (1) the Columbia River, (2) the Yakima River, and (3) storm-induced run-off in ephemeral streams draining the Hanford Site. No perennial streams occur in the central part of the Hanford Site.

The Federal Emergency Management Agency has not prepared floodplain maps for the Columbia River through the Hanford Site. The flow of the Columbia River is largely controlled by several upstream dams that are designed to reduce major flood flows. Based on a U.S. Army Corps of Engineers study of the flooding potential of the Columbia River that considered historic data and water storage capacity of the dams on the Columbia River (COE 1969), the U.S. Department of Energy (ERDA 1976) has estimated the probable maximum flood (Figure 2-8). The estimated probable maximum flood would have a larger floodplain than either the 100- or 500-year floods. The PUREX Storage Tunnels are well above the elevation of the Columbia River probable maximum flood and therefore are not within the 100- or 500-year floodplain.

The 100-year floodplain for the Yakima River, as determined by the Federal Emergency Management Agency (FEMA 1980), is shown in Figure 2-9. The PUREX Storage Tunnels are not within the floodplain.

The only other potential source of flooding of the PUREX Storage Tunnels is run-off from a large precipitation event in the Cold Creek watershed. This could result in flooding of the ephemeral Cold Creek. Skaggs and Walters (1981) have given an estimate of the probable maximum flood using conservative values of precipitation, infiltration, surface roughness, and topographic features. The resulting flood area (Figure 2-10) would not affect the PUREX Storage Tunnels. The 100-year flood would be less than the probable maximum flood.

2.3.2.1 Demonstration of Compliance [B-3b(1)]. The PUREX Storage Tunnels are not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.2.1.1 Flood Proofing and Flood Protection Measures [B-3b(1)(a)]. The PUREX Storage Tunnels are not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.2.1.2 Flood Plan [B-3b(1)(b)]. The PUREX Storage Tunnels are not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.2.2 Plan for Future Compliance with Floodplain Standard [B-3b(2)]. The PUREX Storage Tunnels are not located within a 100-year floodplain. Therefore, no demonstration of compliance is required.

2.3.3 Shoreline Standard [B-3c]

The PUREX Storage Tunnels are not located within 'shorelines of the state' or 'wetlands' as defined in the *Shoreline Management Act of 1971*. The PUREX Storage Tunnels are located on the Hanford Site, which is owned by the U.S. Government and operated by the DOE-RL.

2.3.4 Sole Source Aquifer Criteria [B-3d]

The PUREX Storage Tunnels are not located over a 'sole source aquifer' as defined in Section 1424(e) of the *Safe Drinking Water Act of 1974*.

2.4 TRAFFIC INFORMATION [B-4]

The regional highway network traversing the Hanford Site (Washington State Highways 24 and 240 and Route 10, and that portion of Route 4S south of the Wye Barricade) and the restricted access roadways are shown in Figure 2-1.

Roadways on the Hanford Site north of the Wye Barricade and within the 300 and 400 Areas are restricted to authorized personnel. The PUREX Storage Tunnels are located approximately 5 miles from the nearest roadway (Washington State Highway 240) that has unrestricted public access. Estimated traffic volumes, in vehicles per day, are shown in Figure 2-11. The majority of traffic is passenger vehicles used for commuting and conducting company business. Approximately 10 percent of the traffic volume is trucks, and these trucks are mainly delivery, construction, and maintenance vehicles.

2.4.1 Hanford Site Roadways

Plate 2-1 in Appendix 2A and Figure 2-11 show the major roads throughout the Hanford Site. These roads are classified as either primary or secondary routes. The primary routes include Routes 4N, 4S, 10, 2N, 2S, 3, 6, and 11A, as well as various avenues within each area. The primary routes are constructed of bituminous asphalt (usually 2 inches thick, but the thickness of the asphalt layer will vary with each road) with an underlying aggregate base in accordance with U.S. Department of Transportation requirements. The secondary routes are constructed of layers of an oil and rock mixture with an underlying aggregate base. The aggregate base consists of various types and sizes of rock found onsite. Currently, no load-bearing capacities for these roads are available; however, loads as large as 140 pounds per square inch have been transported without observable damage to road surfaces. All roads meet the requirements for the American Association of State Highway and Transportation Officials HS-20-44 load rating (AASHTO 1983). An HS-20-44 loading represents a two-axle tractor (front axle loading of 8,000 pounds and rear axle loading of 32,000 pounds) plus a single-axle trailer with a 32,000-pound axle loading.

2.4.2 The PUREX Storage Tunnels Roadway Access

The paved roads providing access to the 200 East Area and the PUREX Facility also provide adequate all-weather access to the external features of the PUREX Storage Tunnels (Figure 2-2). A paved parking area is provided outside of the double fence security protected area northwest of the main gate.

2.4.3 The PUREX Storage Tunnels Railroad Access

Railroad access to the PUREX Storage Tunnels is by an extension of the railroad spur that services the PUREX Plant (Figures 2-2 and 2-3).

2.4.4 Traffic Control Signs, Signals, and Procedures

Standard traffic control signs are used throughout the Hanford Site (i.e., hexagonal stop signs, triangular yield signs). Speed limits are posted throughout the Hanford Site, and the maximum posted speed is 55 miles per hour on major thoroughfares. Inside the 200 East Area, posted speeds are reduced to a maximum of 35 miles per hour, with caution postings in select areas as low as 10 miles per hour.

2.5 PERFORMANCE STANDARDS [B-5]

The PUREX Storage Tunnels serve to minimize the exposure of personnel to mixed and radioactive waste and to prevent such waste from reaching the environment.

In addition, measures are taken to ensure that the PUREX Storage Tunnels are maintained and operated to the maximum extent practicable given the limits of technology, in a manner that prevents:

- Degradation of groundwater quality
- Degradation of air quality by open burning or other activities
- Degradation of surface water quality
- Destruction or impairment of flora or fauna outside of the PUREX Storage Tunnels
- Excessive noise
- Negative aesthetic impacts
- Unstable hillsides or soils

- Use of processes that do not treat, detoxify, recycle, reclaim, and recover waste material to the extent economically feasible

- Endangerment of the health of employees or the public near the PUREX Storage Tunnels.

The measures taken to prevent each of the above negative effects from occurring are described in the following sections.

2.5.1 Measures to Prevent Degradation of Groundwater Quality

The storage area of each tunnel has a roof and wall system designed to prevent infiltration of surface water into the PUREX Storage Tunnels. The external surfaces of the roof and the wall timbers of Tunnel Number 1 are covered with 90-pound mineral surface roofing material. For Tunnel Number 2, the semicircular shaped, bituminous-coated steel roof construction provides infiltration protection. In addition, the 8-foot soil overburden and surrounding surface area have been contoured to alleviate ponding and to divert surface water away from the PUREX Storage Tunnels.

Other potential sources of leachate include the water contained in the water-fillable door (Tunnel Number 1 door is presently filled; Tunnel Number 2 door is presently empty) and nonregulated liquid heels remaining in some of the equipment stored in the tunnels. To mitigate spills of the equipment heels during transport, catch pans, sized to collect possible leakage, are presently placed on the railcars under the equipment where such leakage could occur. A sump with a drain also is present beneath each water-fillable door to prevent water from over filling and/or leakage from entering the tunnel storage area.

The potential for the equipment heels or the water-fillable doors leaking and coming into contact with dangerous waste is not considered to be a credible occurrence. However, should any liquid from either the equipment or the water-fillable door leak, the generation of a mixed waste leachate is not considered likely because all mixed waste is stored above the floor level on railcars and is either encased or stored in a storage container.

The only liquid dangerous waste stored in either tunnel is the elemental mercury stored in Tunnel Number 2. The mercury is sealed in a stainless steel thermowell within a stainless steel vessel which is stored above the floor level on a railcar. A spill or leak of mercury is not considered to be a probable occurrence.

Periodic inspection of the stored waste is precluded by ALARA considerations (Chapter 6.0, Section 6.2). Therefore, should a leak occur, this unlikely event would go undetected until closure. Cleanup of the spill will be performed during closure activities in accordance with the criteria outlined in Chapter 11.0, Section 11.1.4.5.

2.5.2 Measures to Prevent Degradation of Air Quality by Open Burning or Other Activities

The Tunnel Number 1 exhaust system was deactivated in January 1965 when the storage tunnel was filled to capacity. Presently, no ventilation is provided to Tunnel Number 1 as the exhaust vent has been blanked off ahead of the filter housing.

Tunnel Number 2 has an operating stack (296-A-10) registered for radionuclide emissions with the Washington State Department of Health. The exhaust air from the tunnel stack is sampled continuously in accordance with the controls for radioactive airborne emissions established in the *Environmental Compliance Manual*, WHC-CM-7-5, Part D (WHC 1989a). Collected particulates are analyzed for total alpha and total beta activity weekly. Air samples are obtained from a continuous air monitor via a three-quarter inch sample tap, located downstream of the high-efficiency particulate air filters on the exhaust stack. The continuous air monitor is of a design that meets the criteria specified in ANSI N13.1 (ANSI 1969) and ANSI N42.18 (ANSI 1980), and is inspected daily and source checked monthly.

Monitoring for nonradioactive airborne emissions is not performed as the dangerous waste stored in the tunnels is not considered to have a credible potential (based on applicable analysis of safety analysis reports, environmental plan documentation, and operational history). Emissions are not expected to exceed the quantifiable release standard specified in WHC-CM-7-5, Table C-1 (Table C-1 is based on federal, state, and local criteria contained in 40 CFR 52, 40 CFR 372, WAC 173-400, and Benton-Franklin-Walla Walla Counties Air Pollution Control Authority 80-7).

A further discussion of the tunnel ventilation system is provided in Chapter 4.0, Section 4.1.7.

2.5.3 Measures to Prevent Degradation of Surface Water Quality

The measures taken to prevent surface water from entering the PUREX Storage Tunnels are discussed in Section 2.5.1.

2.5.4 Measures to Prevent Destruction or Impairment of Flora or Fauna Outside of the Facility

The activities associated with the PUREX Storage Tunnels do not appear to have altered the flora and fauna outside the unit for the over 30 years the unit has been in operation. The PUREX Storage Tunnels are covered with 8 feet of soil to isolate the contents from local flora or fauna.

2.5.5 Measures to Prevent Excessive Noise

Operation of the PUREX Storage Tunnels requires infrequent use of a battery-powered locomotive to push railcars into storage position. This operation does not generate excessive noise.

2.5.6 Measures to Prevent Negative Aesthetic Impacts

The above grade portions of the PUREX Storage Tunnels consist of a reinforced concrete structure 11 feet by 28 feet by 18 feet that encloses the water-fillable door on the north end of each storage tunnel. A filter housing, exhaust fan, and 20-foot-tall exhaust stack are present on the south end of each storage tunnel. Between these extremity structures, the soil overburden is gently sloped and uniformly contoured to provide a positive aesthetic effect. The soil covering and natural vegetation that have been allowed to grow blend with the surrounding terrain and do not present a negative impact to the aesthetics of the area.

2.5.7 Measures to Prevent Unstable Hillsides or Soils

During construction, the soil overburden covering the PUREX Storage Tunnels was contoured to provide a side slope of 2 (horizontal) to 1 (vertical) for stability. In addition, natural vegetation has been permitted to cover the tunnel mounds to minimize water and wind erosion.

2.5.8 Measures to Prevent the Use of Processes That Do Not Treat, Detoxify, Recycle, Reclaim, and Recover Waste Material to the Extent Economically Feasible

The PUREX Storage Tunnels are a storage unit only. No waste is treated, detoxified, recycled, reclaimed, or recovered in any manner at this unit. Therefore, this requirement is not applicable to the PUREX Storage Tunnels.

2.5.9 Measures to Prevent Endangerment of the Health of Employees or the Public Near the Facility

The PUREX Storage Tunnels are located approximately 23 miles from the nearest population center, Richland, Washington. This isolation, coupled with multiple security barriers, prevents access to the PUREX Facility by the general public. Access to the PUREX Storage Tunnels by plant employees is restricted to only those employees who have a security clearance and management approval. Approval for each entry is evaluated on a case-by-case basis.

In addition to possessing a security clearance and having management approval, employees involved in storage operations at the PUREX Storage Tunnels are required to be trained as specified in Chapter 8.0. This training ensures employees are knowledgeable of applicable safety

requirements and are adequately skilled to prevent endangerment of themselves, co-workers, and the public during the operation of the tunnels.

The DOE-RL and Westinghouse Hanford policy is to limit radiation and chemical exposure of all employees to ALARA levels. To ensure ALARA goals are met, the following protective measures are employed.

- Radiation shielding is used.
- The distance from radiation sources is maximized.
- The time of occupancy in radiation zones is minimized.
- Protective clothing is worn.
- Personnel are accompanied by a health physics technician equipped with proper radiation detection instrumentation.
- All exhaust from the Tunnel Number 2 stack is filtered through a single-stage, high-efficiency particulate air filter before release.

The remote location of the facility coupled with stringent access controls are considered adequate protection to employees and the public, given the operation of the tunnels and the very low probably of a dangerous waste release.

2.6 BUFFER MONITORING ZONES [B-6]

Requirements for buffer monitoring zones have been deleted from WAC 173-303-440. Therefore, no discussion of the checklist items under buffer monitoring zones [B-6] will be included in this permit application.

2.7 SPILLS AND DISCHARGES INTO THE ENVIRONMENT [B-7]

Because of the design and operation of the PUREX Storage Tunnels (see Section 2.1.4) and the nature and limited volume of the dangerous waste stored within the tunnels (Chapter 3.0), spills and leaks of dangerous waste into the environment are not considered to be probable.

2.8 MANIFEST SYSTEM [B-8]

The PUREX Storage Tunnels are used solely for storage of process equipment from the PUREX Plant. Because none of the dangerous waste stored is from offsite sources, the requirements of WAC 173-303-370 do not apply to the PUREX Storage Tunnels. In lieu of a manifest system, the tunnel storage checklist (Appendix 2F) currently serves to document the source, quantity, dangerous characteristics, and storage location of each waste stored in the tunnels.

Storage activities conducted before January 1, 1990 have not been documented using the tunnel storage checklist. Equipment stored before January 1, 1990 has been characterized using historical operating logs, records, and process documentation. An inventory of equipment stored in the PUREX Storage Tunnels as of January 1, 1990 is included in Appendix 11A. A summary of the dangerous waste stored in Tunnel Number 1 and Tunnel Number 2 is included in Chapter 3.0, Table 3-1.

The tunnel storage checklist and other supporting documentation will be maintained at the Hanford Site for a minimum of 3 years following closure of the PUREX Storage Tunnels.

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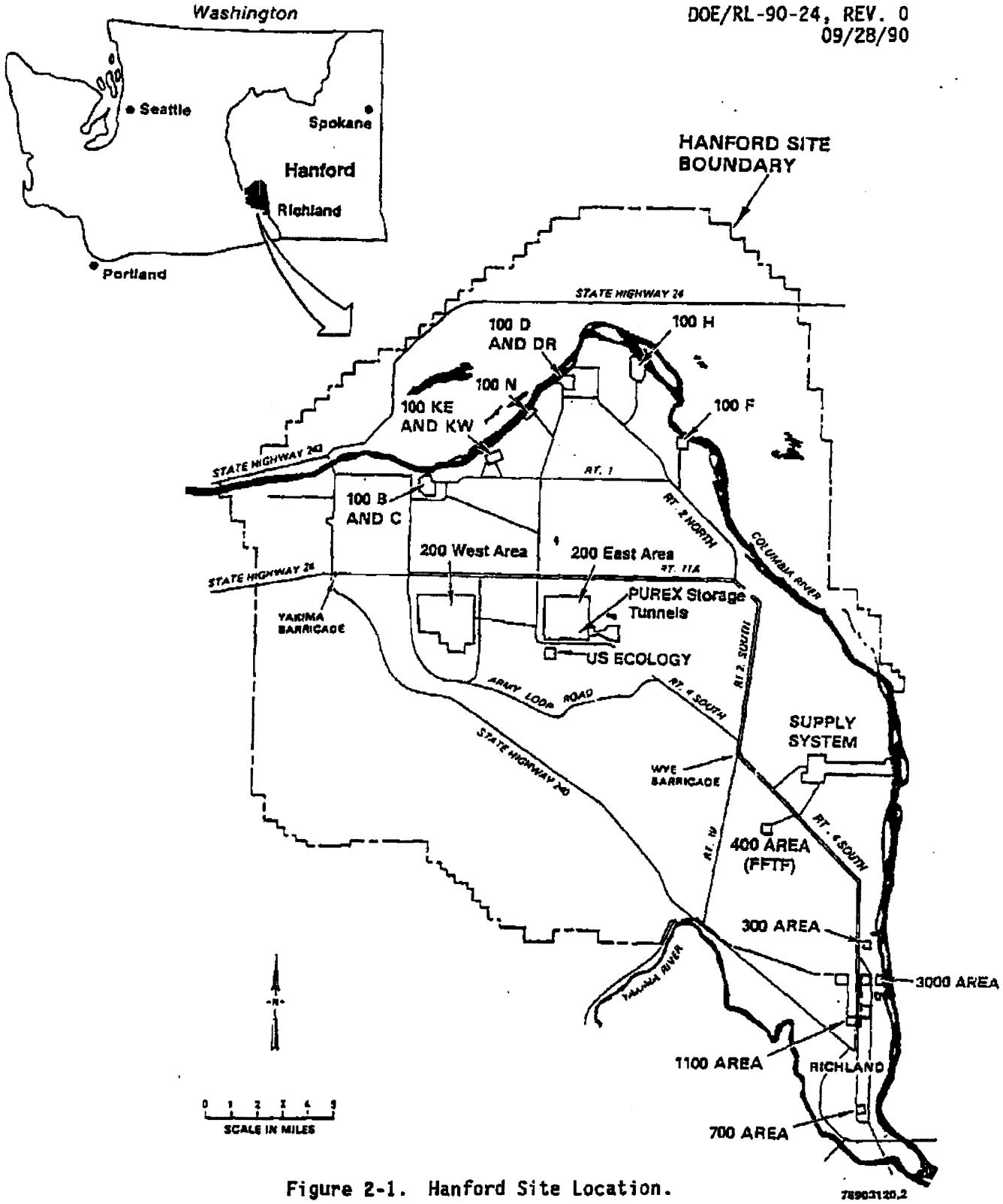

Figure 2-1. Hanford Site Location.

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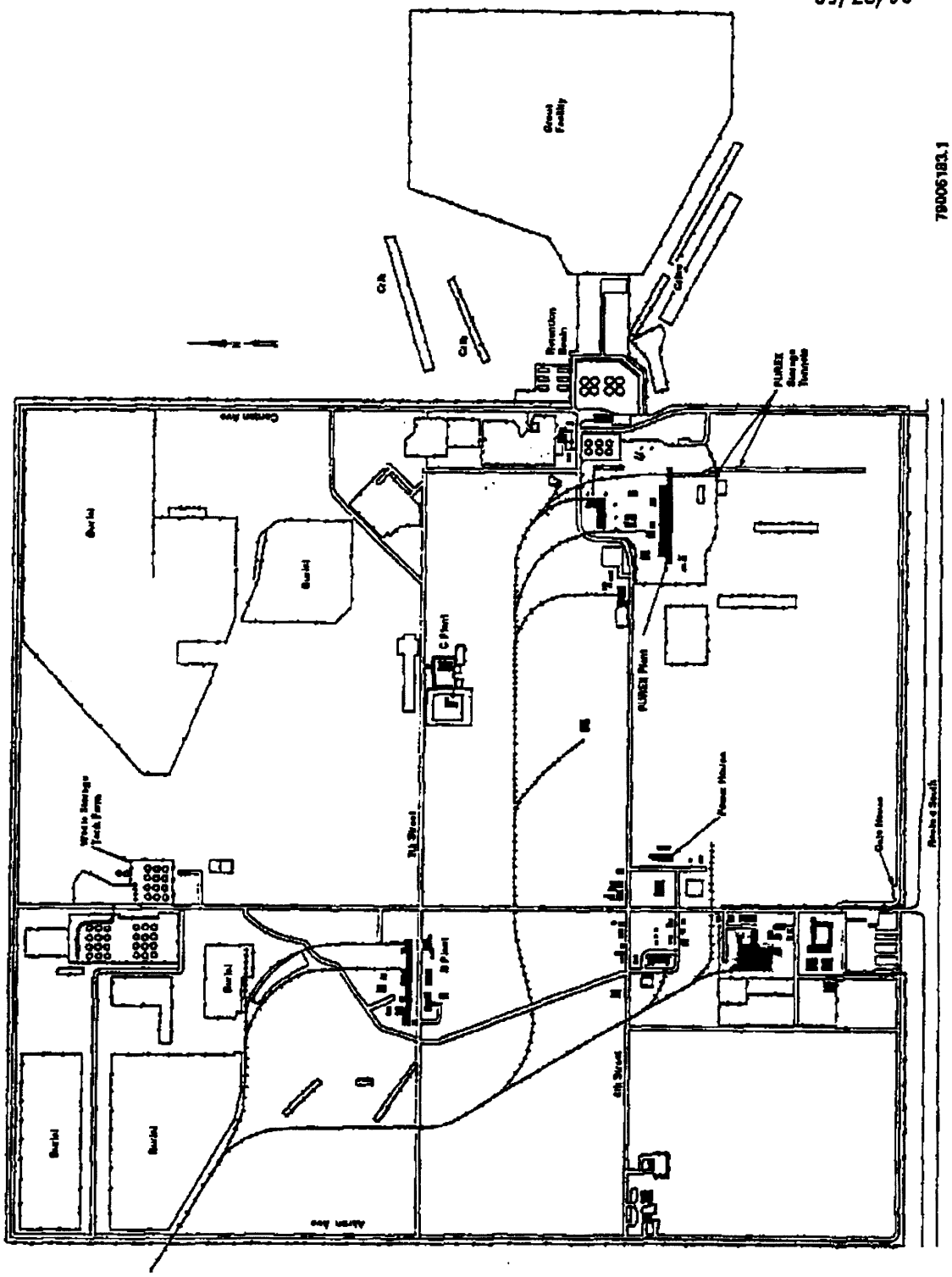

Figure 2-2. The 200 East Area.

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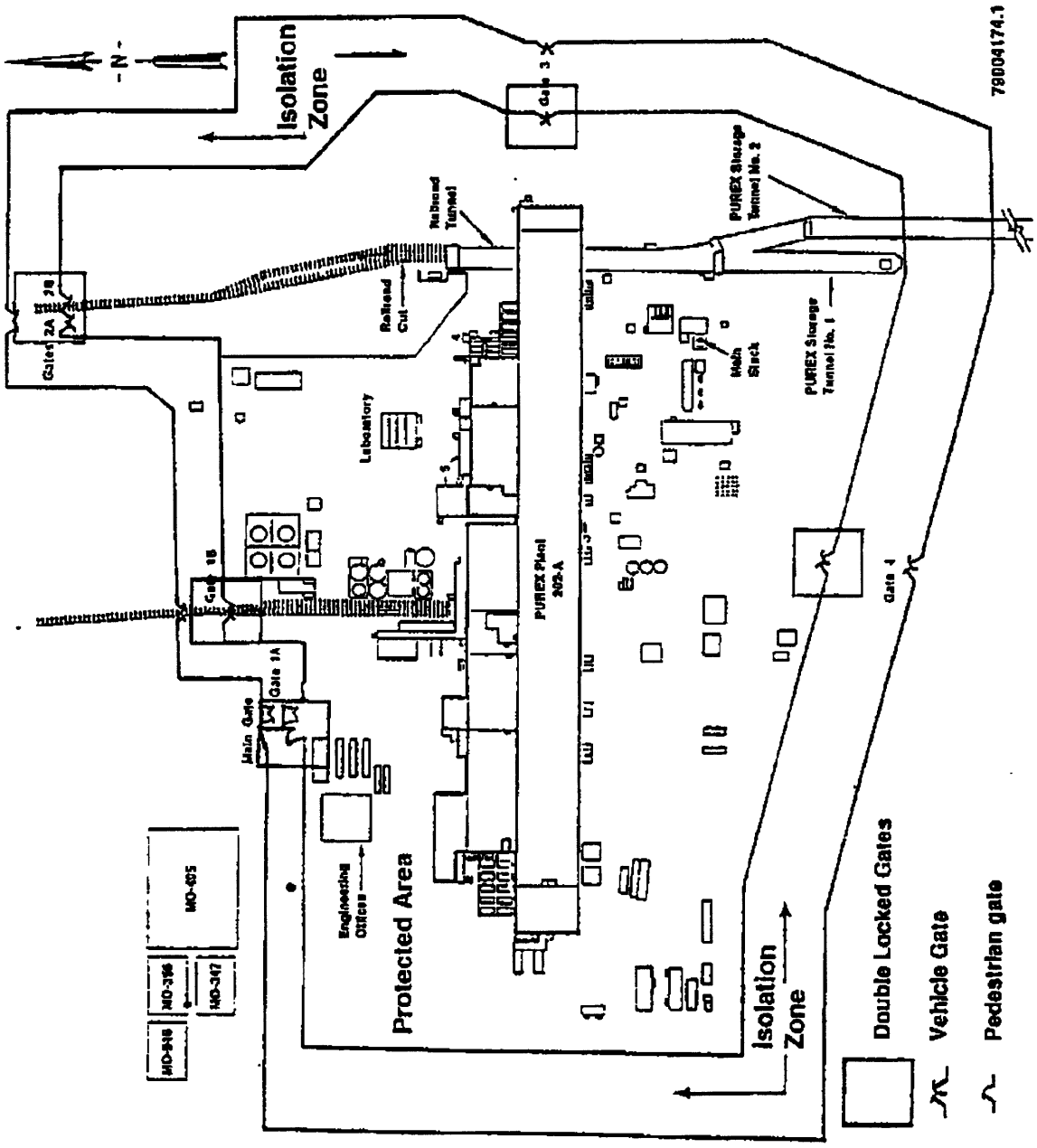

Figure 2-3. The PUREX Facility.

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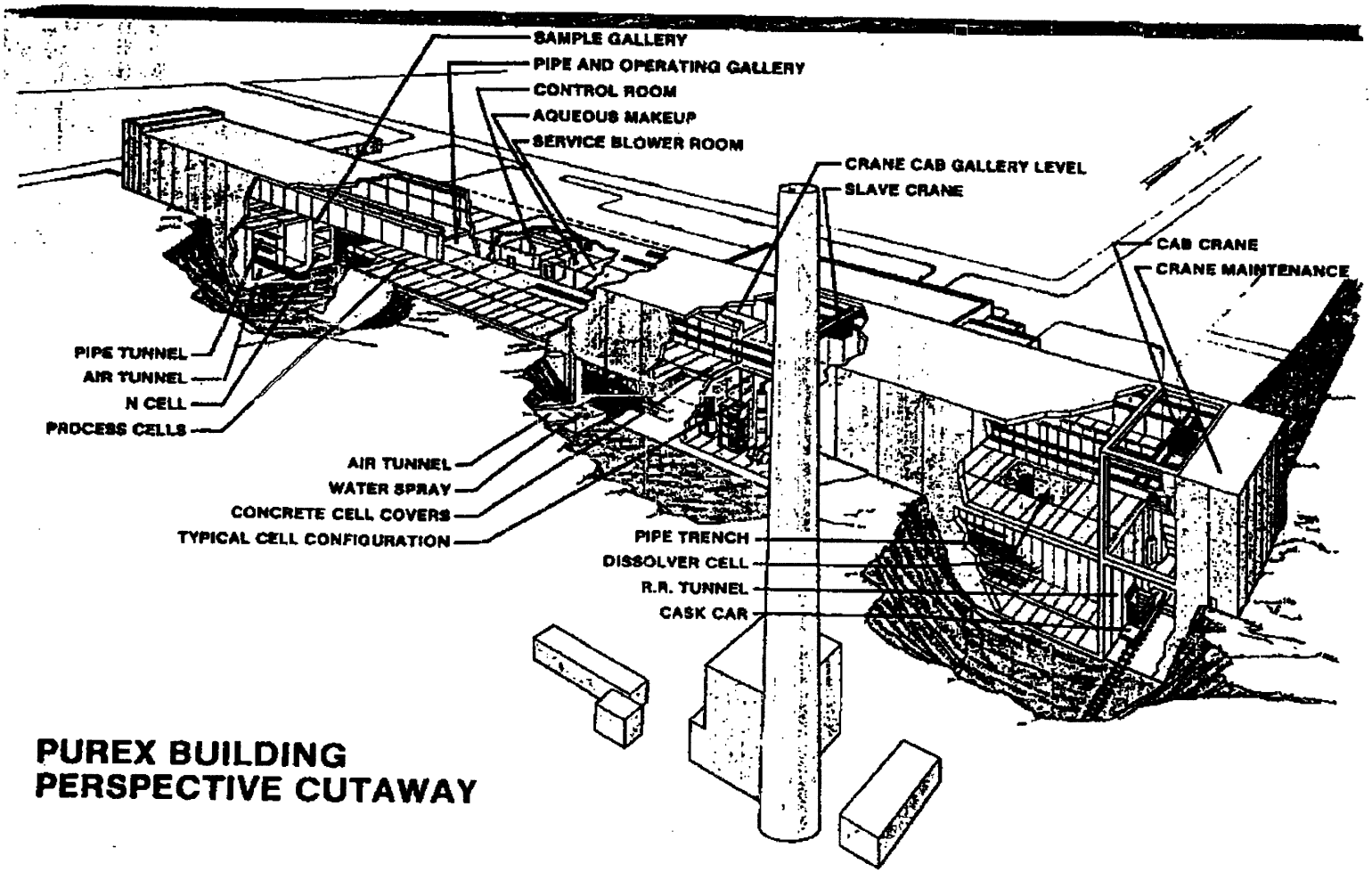

Figure 2-4. The PUREX Plant. (Processing Building 202-A)

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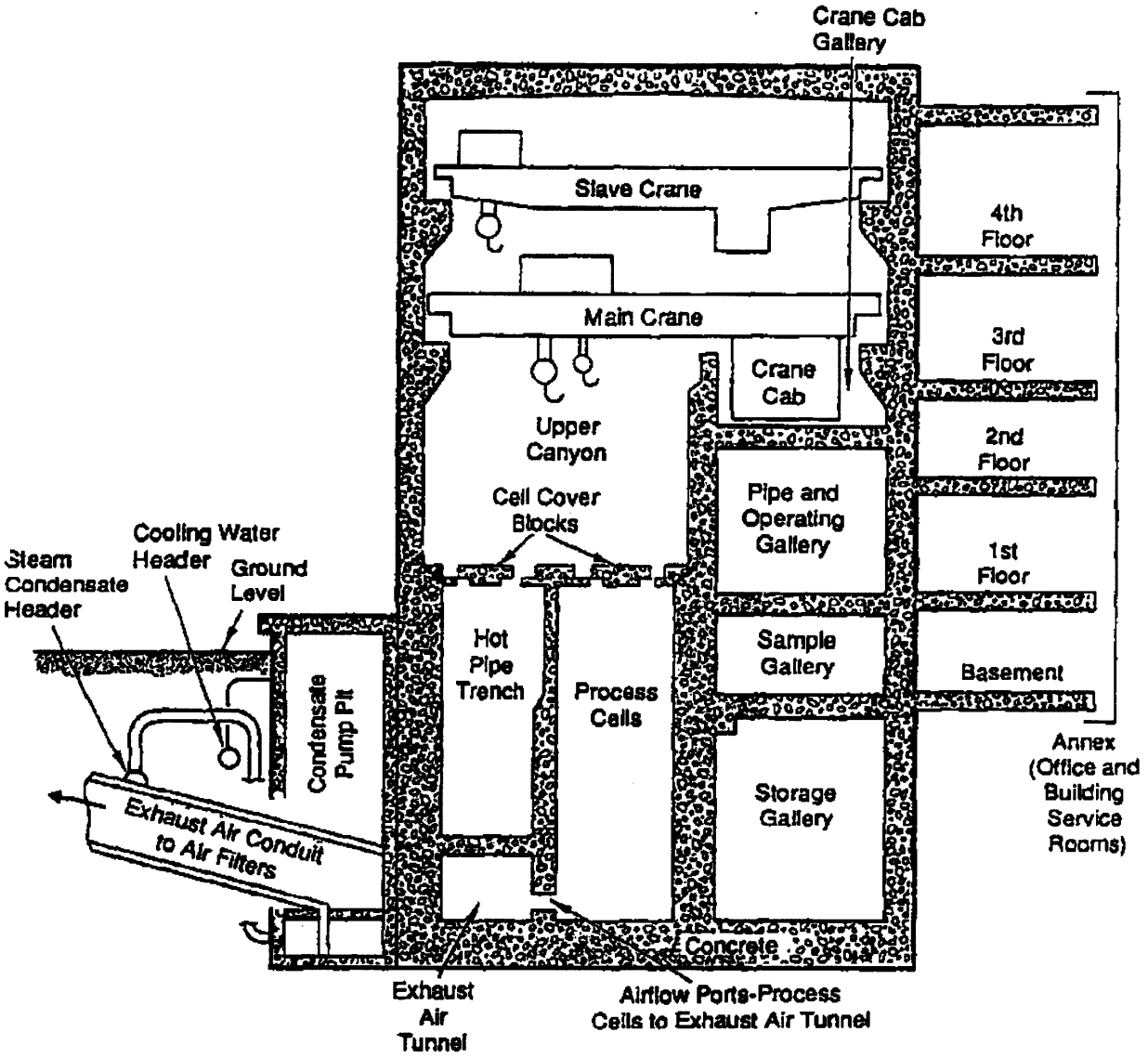

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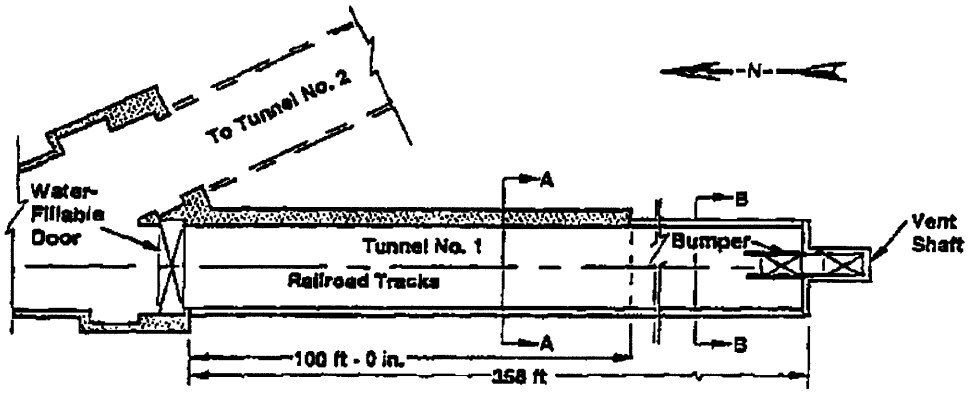
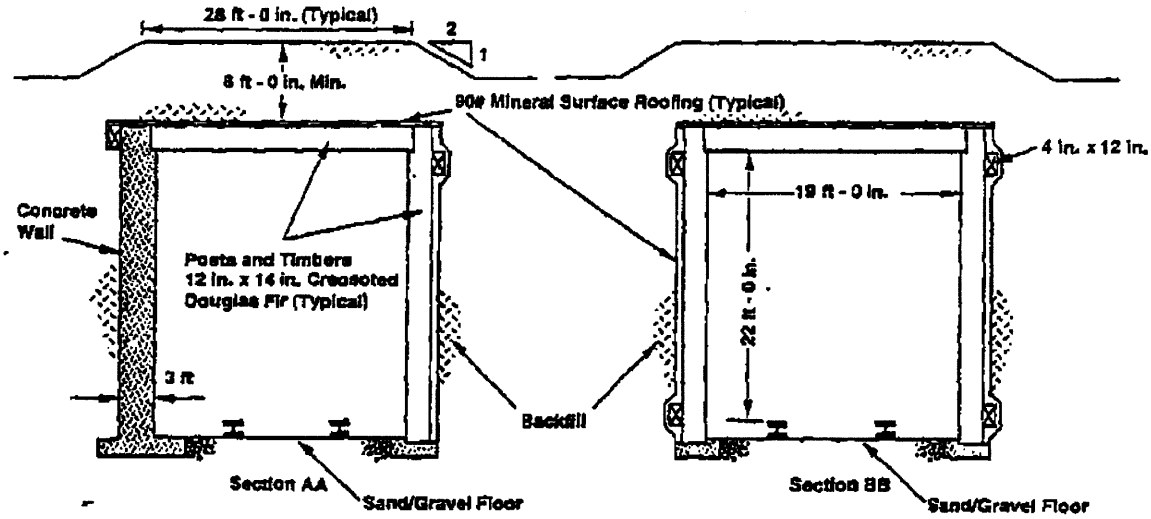
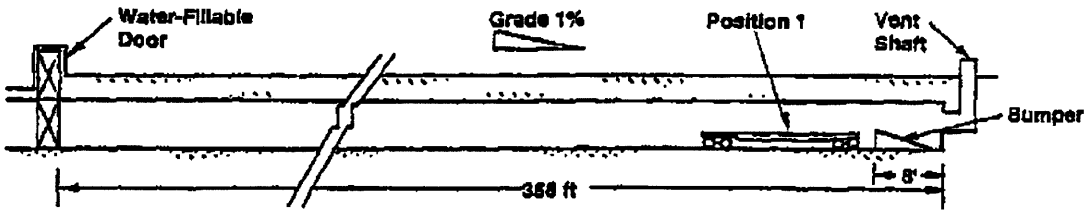
Figure 2-5. The PUREX Plant Cross Section (Looking West).



Tunnel No. 1 - Plan View



PUREX Tunnel No. 1 - Section Views



PUREX Tunnel No. 1 - Elevation View

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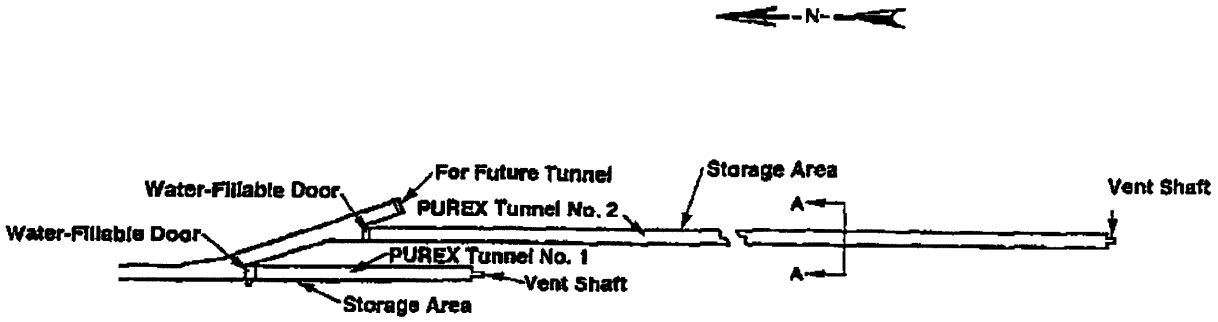
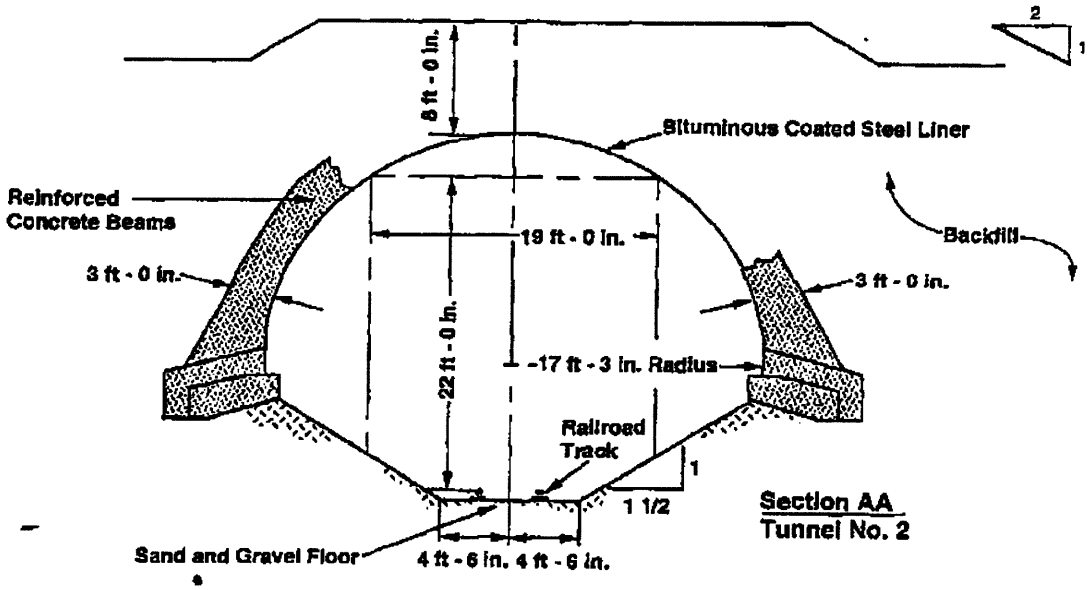
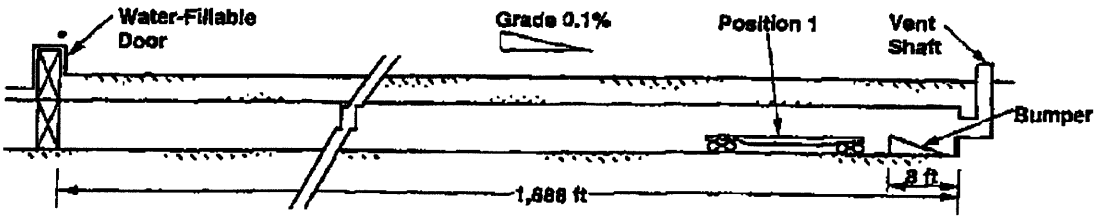
Figure 2-6. The PUREX Storage Tunnel Number 1.



PUREX Tunnels - Plan View





PUREX Tunnel No. 2 - Elevation View

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Figure 2-7. The PUREX Storage Tunnel Number 2.

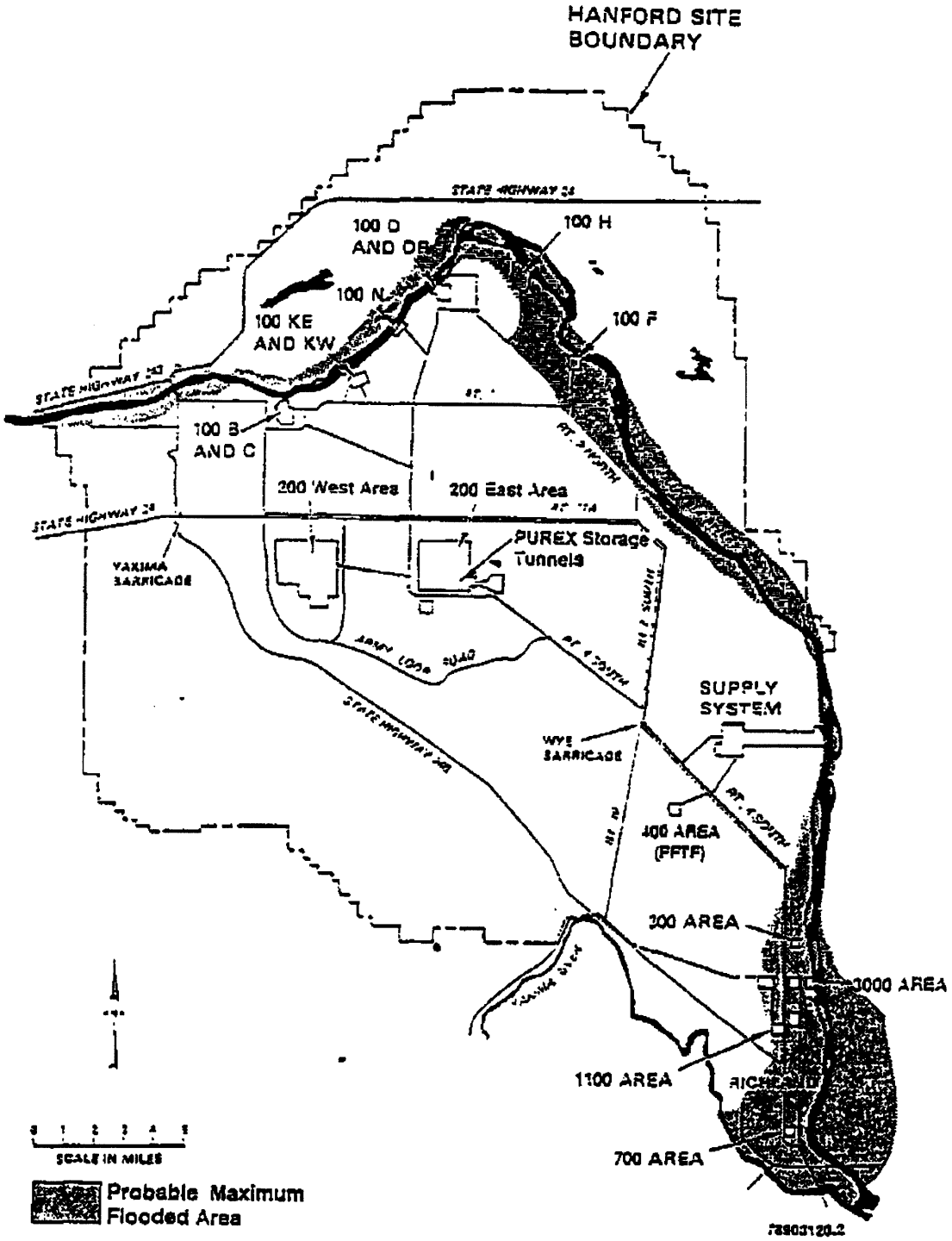

Figure 2-8. Columbia River Floodplain (ERDA 1976).

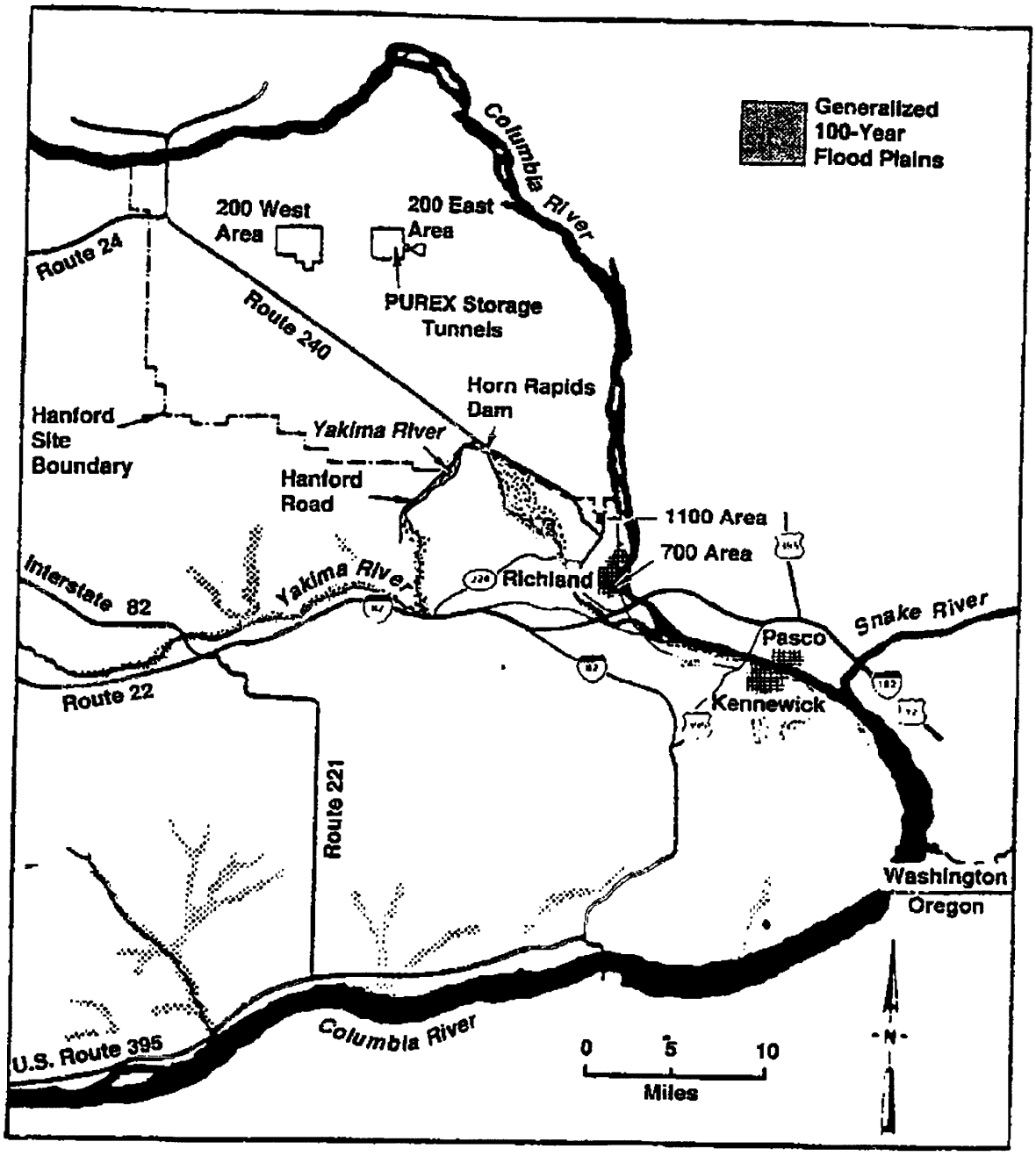

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Figure 2-9. Yakima River Floodplain.

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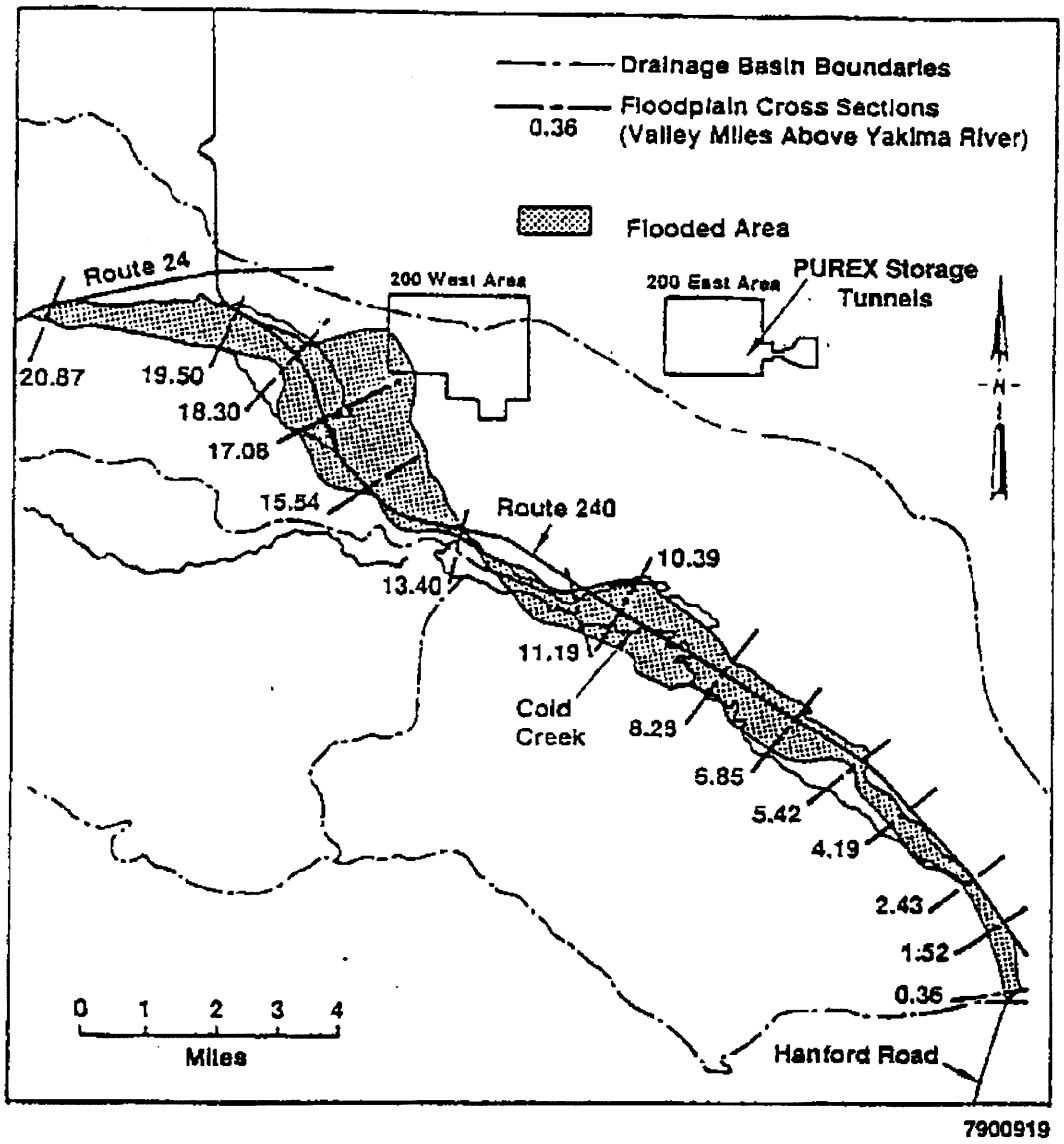

Figure 2-10. Cold Creek Watershed Floodplain (probable maximum flood).

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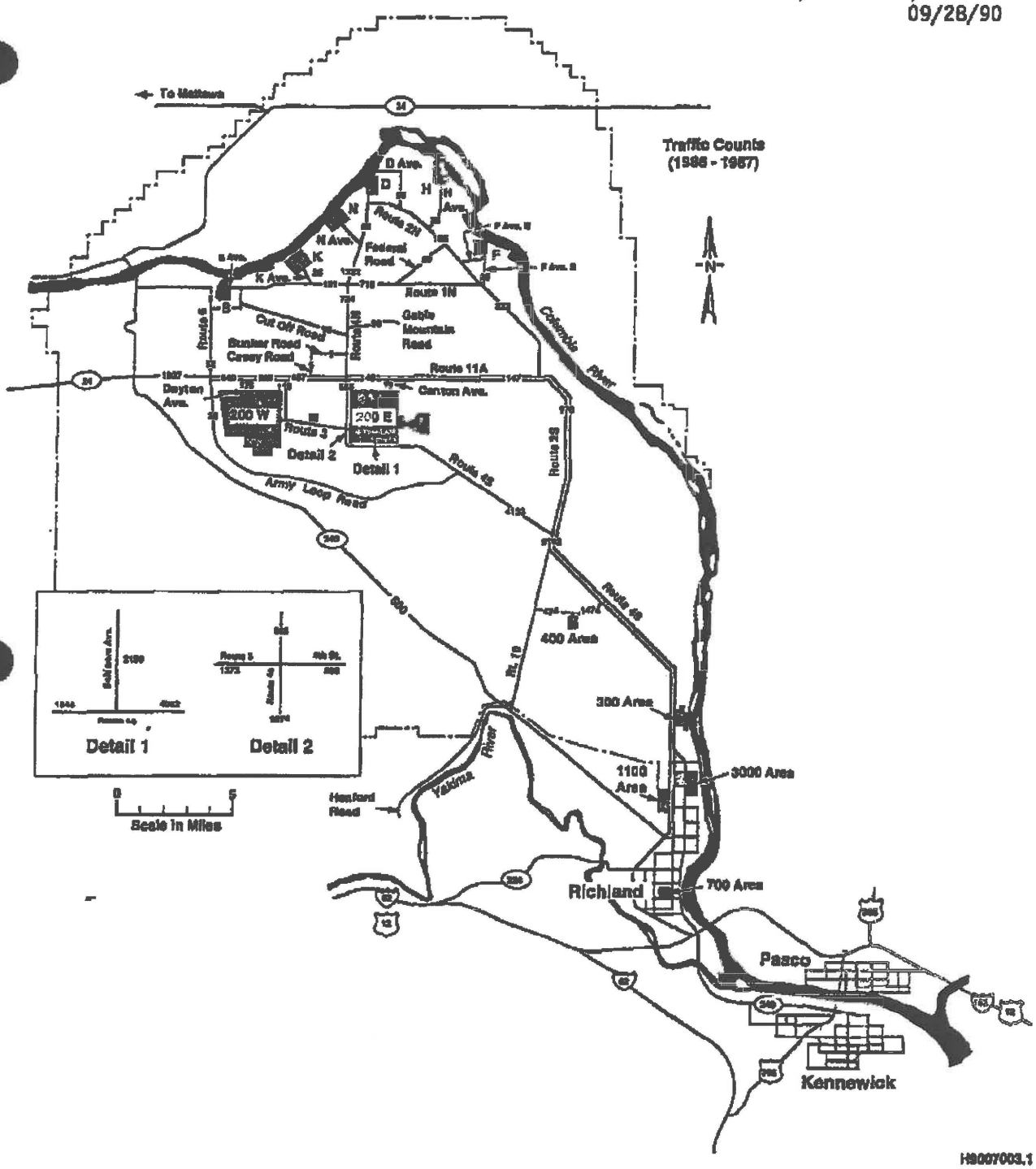

Figure 2-11. Estimated Traffic Volumes (vehicles per day).

Table 2-1. Dangerous Waste Treatment, Storage, and/or Disposal Units Within 1,000 Feet of the PUREX Storage Tunnels.

Unit	Permit	Type	Class
PUREX Facility	A/B	T/S	M
Double-Shell Tank Farms: • 241-AP • 241-AW	A/B	T/S	M
216-A-10 Crib	A/C	D	M
216-A-36B Crib	A/C	D	M

Unit = Name of unit that is designated for permitting as part of the Hanford Site (EPA/Ecology Identification Number WA7890008967).

Permit = Type of permit application that is required for the unit.

A - Part A
B - Part B
C - Closure and Postclosure Plan

Type = Waste unit operational classification.

T - Treatment
S - Storage
D - Disposal

Class = M - Unit contains radioactive and dangerous waste (mixed waste).

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APPENDIX

3A Classification of Residual Tank Heels in the PUREX Storage Tunnels . . . . . APP 3A-i

FIGURES

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TABLE

3-1. Dangerous Waste Material in the PUREX Storage Tunnels T3-1

3.0 WASTE CHARACTERISTICS [C]

This chapter provides information on the chemical, biological, and physical characteristics of the dangerous waste stored in the PUREX Storage Tunnels. A waste analysis plan is included to describe the methodology used in the characterization of the stored waste. Knowledge of the characteristics of the dangerous waste to be stored is used to ensure that the waste is managed properly.

The waste stored in the PUREX Storage Tunnels is generated at the PUREX Plant. All waste stored in the tunnels is radioactive as a result of contamination induced during processing of irradiated reactor fuel at the PUREX Plant. Because of this radioactivity and the large size of the discarded equipment, the waste is stored in the PUREX Storage Tunnels, which provide the necessary shielding for the protection of employees and the environment. As of January 1, 1990, only about one-third of the railcars in the PUREX Storage Tunnels (Appendix 11A, Appendix A) store discarded equipment that contains dangerous waste components (mixed waste).

3.1 CHEMICAL, BIOLOGICAL, AND PHYSICAL ANALYSES [C-1]

Certain equipment stored in the PUREX Storage Tunnels contains the following dangerous waste:

- Elemental lead
- Elemental mercury
- Silver salts.

Waste is attached to or contained within discarded equipment removed from the PUREX Plant. Because the dangerous waste is an integral part of discarded equipment that is radioactive, the equipment is managed as a mixed waste. Table 3-1 provides an approximation of the total amount of dangerous waste contained in the equipment stored in the PUREX Storage Tunnels as of January 1, 1990. Changes in the amount of dangerous waste stored will be updated annually in the "Treatment, Storage, and/or Disposal Facility Annual Dangerous Waste Report," Forms 4 and 5, submitted to Ecology (Chapter 12.0, Section 12.4.1.2.).

3.1.1 Elemental Lead

Historically, elemental lead was used as weight, counterweight, and radiation shielding in the fabrication of process equipment used at the PUREX Plant. Elemental lead was selected for use because of its high density (710 pounds per cubic foot as compared to 489 pounds per cubic foot for steel) and because it was readily available in various physical shapes (shot, sheet, bars, or poured shapes). Generally the lead was encased in steel (carbon or stainless) to facilitate its attachment to the process equipment. Since early 1987, the use of lead in the design and fabrication of new or

replacement equipment for the PUREX Plant has been discontinued wherever feasible.

A typical process pipe jumper design using lead-filled carbon steel pipe counterweights is shown in Figure 3-1. Counterweighted jumper assemblies are used to facilitate remote installation of in-cell process and service piping. To minimize the use of lead, pipe jumpers currently are being designed wherever possible to replace the lead-filled counterweights with steel bars having the same equivalent weight.

A typical lead counterweight used with equipment dunnage (carbon steel support structure) is shown in Figure 3-2. It is imperative that the equipment assembly be balanced vertically to facilitate remote handling with the overhead crane during installation and removal. New or replacement equipment assemblies currently are fabricated using carbon steel counterweight as required.

A jumper alignment tool (Figure 3-3) may contain as much as 1,500 pounds of lead. This tool is used as a weight to pull down the free end of a jumper so that the connecting parts are aligned vertically and the connection can be made. Restricted work space between equipment in the process cells makes the use of a high-density material, such as lead, a necessity. Similarly, the space restrictions around certain diaphragm-operated valves limit the selection of radiation-shielding materials to those of high-density materials, such as lead. Operating experience has shown that the useful life of the diaphragm material can be extended by shielding it from external radiation sources. Figure 3-4 shows a typical shielding arrangement for a diaphragm-operated valve.

Elemental lead exhibits the characteristic of toxicity as determined by the toxicity characteristic leaching procedure and is designated D008. The quantity of lead present could produce an extract greater than 500 milligrams per liter should it be exposed to a leachate; therefore, the mixed waste is managed as extremely hazardous waste and is further designated as WT01. However, because the bulk of the lead is encased in steel, is stored inside a weather-tight structure, and is elevated above floor level on railcars that isolate the lead from other materials stored within the tunnel, the potential for exposure of bare lead to a leachate is considered to be negligible.

Sampling and chemical analysis is not performed on lead associated with the radioactive discarded equipment placed in the PUREX Storage Tunnels. The quantity of lead is determined from a review of the fabrication drawings for each piece of equipment placed in storage. This approach is effective for equipment where the lead weight, counterweight, or shielding is specifically detailed. However, where only 'typical' details are shown, as in Figure 3-2, the addition of counterweights was a field fit operation and the size and location of each counterweight (if attached) was not recorded on the final 'as-built' assembly drawings. Therefore, the accuracy of the estimate of the amount of lead stored in each tunnel is limited to the data available from existing fabrication drawings. The estimated quantity of lead listed in Table 3-1 accounts only for the lead in alignment tools and jumper counterweights. Counterweights on equipment dunnage and lead used for

shielding cannot be quantified by existing historical records and are not included in the amount of lead listed. However, on closure, the equipment will be thoroughly examined visually and any suspect attachments will be removed, evaluated, and disposed of in accordance with established closure procedures.

3.1.2 Elemental Mercury

Elemental mercury stored in the PUREX Storage Tunnels is sealed inside thermowells that are an integral part of irradiated reactor fuel dissolvers used at the PUREX Plant. The dissolvers are large 304L stainless steel process vessels (Figure 3-5), which are approximately 9 feet in diameter, 24 feet tall, and weigh approximately 58,000 pounds. The outer shell is constructed of a 3/8-inch-thick plate. Dissolvers are used in decladding and dissolution of irradiated reactor fuel in the PUREX Plant.

There are two thermowells per dissolver located diametrically opposite each other (Figure 3-5). Each thermowell consists of a 9-foot 5-inch-length of 3-inch schedule 80, 304L stainless steel pipe with a 7 1/2-inch right angle lateral extension welded to the downside end. The lower end butts up against the outer surface of the internal slotted bar screen that separates the undissolved nuclear fuel elements from the outer solution chamber of the annular dissolver. Depending on the specific dissolver in question, 42 or 50 pounds of mercury (3/8 or 7/16 gallon) are poured into each thermowell (84 or 100 pounds total per dissolver). The mercury is added after the new dissolver is positioned vertically inside the PUREX canyon and before it is installed in a process cell. The mercury serves to transfer heat from the dissolver interior to the thermohm temperature sensor mounted within the thermowell. This mercury remains within the thermowells of discarded dissolvers. In preparation for storage, the thermohms are removed and the upper end of each thermowell is sealed with a 304L stainless steel nozzle plug. In storage, the discarded dissolver rests in an inclined position in a cradle on the railcar. The mercury contained in the thermowells remains in the lower portion of each thermowell and, under normal conditions, is never in contact with the mechanical closure on the nozzle end of the thermowell.

Elemental mercury exhibits the characteristic of toxicity as determined by the toxicity characteristic leaching procedure and is designated D009. If exposed to a leachate, the quantity of mercury present could produce an extract greater than 20 milligrams per liter; therefore, the mixed waste is managed as extremely hazardous waste and is further designated as WT01.

The potential for the mercury stored in the PUREX Storage Tunnels to become exposed to leachate is considered to be negligible. The PUREX Storage Tunnels are designed and constructed as weather-tight structures. Further, the mercury is encased in a stainless steel pipe within a stainless steel vessel that is stored on a railcar above the floor level of the tunnels. Therefore, exposure of the mercury stored in the tunnels to leachate is not considered to be a credible occurrence.

Sampling and chemical analysis is not performed on mercury associated with the dissolvers stored in Tunnel Number 2. The quantity of mercury present in each thermowell is documented on the fabrication drawings. Because the thermowells are sealed, the quantity of mercury present will not decrease with time due to evaporation.

3.1.3 Silver Salts

Silver in the form of silver salts deposited on unglazed ceramic packing is contained within the discarded silver reactors stored in Tunnel Number 2. The silver reactors (Figure 3-6) were used to remove radioactive iodine from the offgas streams of the irradiated reactor fuel dissolvers. The reactor vessel is approximately 4 1/2 feet in diameter by 13 1/2 feet tall and is constructed of 3/8-inch 304L stainless steel. The vessel contains two 46-inch-deep beds of packing. Each bed consists of a 12-inch depth of 1-inch unglazed ceramic saddles topped with a 34-inch depth of 1/2-inch unglazed ceramic saddles. The two beds are separated vertically by a distance of about 2 feet, and each bed rests on a support made of stainless steel angles and coarse screen. The packing is coated initially with 250 pounds of silver nitrate used for iodine retention. Nozzles on the top of the reactor are provided to allow flushing and/or regeneration of the packing with silver nitrate solution as the need arises.

Experience has shown that, after extended use, the silver reactors lose efficiency. This loss in efficiency normally occurs when about one-half of the silver on the packing has been converted to silver iodide. Other competing reactions such as reduction of silver nitrate to metallic silver and formation of silver chloride also occur and affect silver reactor efficiency. The chloride is introduced as an impurity in process chemicals. Therefore, regeneration of the silver reactor with fresh silver nitrate is performed periodically. Thus, the packing of a discarded silver reactor will contain a mixture of silver nitrate, silver halides, and silver fines.

Silver salts exhibit the characteristics of toxicity as determined by the toxicity characteristic leaching procedure and are designated D011. The quantity of silver present could produce an extract having greater than 500 milligrams of silver per liter should the salts be exposed to a leachate; therefore, the mixed waste is managed as extremely hazardous waste and is further designated as WT01. In addition, nitrates (per 49 CFR 173.151) exhibit the characteristic of ignitability and must also be designated as D001.

Silver salts are contained within a stainless steel vessel, stored inside a weather-tight structure, and elevated above floor level on a railcar. The potential for exposure of the silver salts to a leachate is considered to be negligible. Also, the contained salts are isolated from contact with any combustibles; therefore, the possibility of ignition is considered to be extremely remote.

Provisions for taking samples of the packing were not provided in the design of the vessels. Therefore, sampling and chemical analysis is not

performed for silver salts before placing a silver reactor in storage. However, for accountability purposes, the total silver content is considered to be silver nitrate, the salt that exhibits the characteristics of both ignitability and toxicity.

The quantity of silver salts contained within a discarded silver reactor is a function of silver salts regeneration history. Operating records (process knowledge) of regenerations and flushes are used to estimate the total accumulation of silver within each reactor.

3.1.4 Containerized Waste [C-1a]

The PUREX Storage Tunnels are being permitted as a miscellaneous unit under Subpart X 40 CFR 264 because the tunnels are not a typical containerized storage facility. That is, the bulk of the discarded equipment stored in the tunnels is not placed in a container; rather, this equipment is placed on a portable device (railcar) that is used as a storage platform. [Refer to container definition in WAC 173-303-040(15).] In general, the dangerous waste stored in the PUREX Storage Tunnels is encased or contained within carbon or stainless steel plate, pipe, or vessels. Therefore, the dangerous waste normally is not exposed to the tunnel environment.

The only free-liquid dangerous waste stored in the tunnels is elemental mercury. The mercury is contained within thick-walled (0.300-inch) thermowells constructed from 3-inch schedule 80, 304L stainless steel pipe. The top of the thermowell is closed with a 304L stainless steel nozzle plug with a metal-to-metal seal. The amount of mercury per thermowell is less than 1/2 gallon.

Other liquid containers, such as large discarded process tanks, are stored in the PUREX Storage Tunnels. These tanks are either 'empty' (per WAC 173-303) or have been flushed and the final rinsate sampled and analyzed to verify that the residual heel is not a dangerous waste (Appendix 3A).

The only stored dangerous waste that is either reactive or ignitable is silver nitrate in the silver reactors, which is designated as ignitable (D001). The potential for ignition from this source is considered to be negligible because this material is dispersed on ceramic packing and is physically isolated from contact with any combustible material and ignition source.

3.1.5 Waste in Tank Systems [C-1b]

Operation of the PUREX Storage Tunnels does not involve storage of dangerous waste in tank systems. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

3.1.6 Waste in Piles [C-1c]

Operation of the PUREX Storage Tunnels does not involve storage of dangerous waste in waste piles. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

3.1.7 Landfilled Wastes [C-1d]

Operation of the PUREX Storage Tunnels does not involve placement of dangerous waste in landfills. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

3.1.8 Wastes Incinerated and Wastes Used in Performance Tests [C-1e]

Operation of the PUREX Storage Tunnels does not involve burning of dangerous waste. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

3.1.9 Wastes to be Land Treated [C-1f]

Operation of the PUREX Storage Tunnels does not involve land treatment of dangerous waste. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

3.2 WASTE ANALYSIS PLAN [C-2]

The waste analysis plan describes the procedures used to operate the PUREX Storage Tunnels and to ensure that the dangerous waste components of the discarded equipment to be stored in the tunnels are properly characterized and designated. Proper characterization and designation are necessary to ensure that the dangerous waste is managed properly. Characterization analysis relies on a knowledge of the fabrication, process, and operating history to identify the existence and quantity of dangerous waste in the discarded radioactive equipment. Process knowledge has established that the only dangerous waste stored in the tunnels is elemental lead, elemental mercury, and silver salts. Whereas the mercury and silver are associated with specific types of equipment (the dissolver and silver reactors, respectively), lead counterweights may be associated with any piece of equipment that is handled as a balanced assembly in the PUREX Plant. Analysis of the equipment fabrication drawings is used to identify the presence of lead associated with the specific piece of equipment to be stored. Results of the waste analysis are documented on the tunnel storage checklist (Appendix 2F).

3.2.1 Parameters and Rationale [C-2a]

The parameters considered for waste designation under WAC 173-303-070(3) and the rationale for their application are discussed in the following sections.

3.2.1.1 Discarded Chemical Products. The first category of dangerous waste designation is "Discarded Chemical Products," WAC 173-303-081. Of the three dangerous wastes listed in Section 3.1, only elemental mercury is listed in the WAC 173-303-9903, "Discarded Chemical Products List." The mercury present in the dissolver thermowells does not fit any of the definitions in WAC 173-303-081 for a discarded chemical product. Consequently, mercury is regulated under the characteristics of toxicity rather than as a discarded chemical product. Therefore, the dangerous waste stored in the PUREX Storage Tunnels is not designated as a discarded chemical product.

3.2.1.2 Dangerous Waste Sources. The second category of dangerous waste designation is "Dangerous Waste Sources," WAC 173-303-082. Elemental lead, elemental mercury, and silver salts are not listed in WAC 173-303-9904, "Dangerous Waste Sources List." Therefore, the dangerous waste stored in the PUREX Storage Tunnels is not designated as a dangerous waste source.

3.2.1.3 Infectious Dangerous Waste. The third category of dangerous waste designation is "Infectious Dangerous Waste," WAC 173-303-083. None of the three dangerous wastes (elemental lead, elemental mercury, and silver salts) contain infectious materials as the wastes are not a result of the use of biological processes or their wastes. Therefore, the dangerous waste stored in the PUREX Storage Tunnels is not designated as an infectious dangerous waste.

3.2.1.4 Dangerous Waste Mixtures. The fourth category of dangerous waste designation is "Dangerous Waste Mixtures," WAC 173-303-084. Only silver salts constitute a mixture because the lead and mercury are not actually mixed together with another constituent. Although silver nitrate is listed in the EPA spill tables (40 CFR 302.4), the percentage of nitrate in relation with other silver compounds is unknown. Consequently, the silver is designated under the characteristics of toxicity rather than as a dangerous waste mixture. Therefore, the dangerous waste stored in the PUREX Storage Tunnels is not designated as a dangerous waste mixture.

3.2.1.5 Dangerous Waste Characteristics. The fifth category of dangerous waste designation is "Dangerous Waste Characteristics," WAC 173-303-090; the characteristics are as follows.

- Characteristic of Ignitability--The nitrate ion in the silver nitrate is an oxidizer as specified in 49 CFR 173.151. Therefore, the silver nitrate waste exhibits the characteristic of ignitability under WAC 173-303-090 and is designated as D001.

- Characteristic of Corrosivity--Most of the discarded equipment removed from the PUREX canyon either has contained or has been in contact with corrosive liquids. The standard operating procedure has

been to flush equipment with water to recover as much special nuclear material as practical. Also, flushing removes much of the radioactive material from the equipment, minimizing the spread of radioactive contamination during handling. Currently, the final aqueous rinse is sampled and analyzed to confirm that the pH is greater than 2 and less than 12.5. Therefore, the waste stored in the PUREX Storage Tunnels is not designated as corrosive waste. Past practices associated with equipment flushing are addressed in Appendix 3A.

- Characteristic of Reactivity--Elemental lead, elemental mercury, and silver salts do not meet any of the definitions of reactivity as defined in WAC 173-303-090. These dangerous waste materials are not unstable, do not react violently with water or form explosive mixtures, or generate toxic gases. Therefore, the dangerous waste stored in the PUREX Storage Tunnels is not designated as a reactive waste.

- Characteristic of Toxicity--Lead, mercury, and silver are toxic substances. The quantity of lead, mercury, and silver salts stored in the tunnels is sufficient that, should the substances come in contact with a leachate (an event considered unlikely), the concentration of the extract could be expected to be in the extremely hazardous waste range of greater than 500 milligrams per liter for either lead or silver or greater than 20 milligrams per liter for mercury. Therefore, these dangerous wastes are designated as extremely hazardous toxic waste, WT01, as well as toxic lead, D008; mercury, D009; and silver, D011.

3.2.1.6 Waste Designation Summary. The mixed waste stored in the PUREX Storage Tunnels is designated as extremely hazardous toxic waste. This designation is based on the potential extract concentration of either lead, mercury, or silver as shown in 'characteristic of toxicity'. In addition, silver salts are reported as a weight equivalent of silver nitrate and are designated as 'characteristic of ignitability'. The 'characteristic of toxicity' designation also is applied to elemental lead, elemental mercury, and silver salts.

3.2.2 Test Methods [C-2b]

The only test method presently used in support of the PUREX Storage Tunnels operation is a corrosivity check on the final aqueous rinse of discarded vessels before the vessels are released for storage. The pH is determined by a pH meter using EPA Test Method 5.2 in *Test Methods for the Evaluation of Solid Waste: Physical/Chemical Methods* (EPA 1986).

3.2.3 Sampling Methods [C-2c]

The only dangerous waste stored in the tunnels is elemental lead, elemental mercury, and silver salts. Sampling and chemical analysis of

either the lead or the mercury to confirm that it is elemental lead or elemental mercury would not provide additional data beneficial to proper management of the waste and the radiation exposure to personnel performing sampling would not be in compliance with ALARA principles; therefore, such sampling is not performed. The silver salts are nonuniformly distributed on ceramic packing contained within a large stainless steel reactor vessel. Representative sampling of the packing in place is not considered to be practical and therefore is not performed.

Process knowledge of the characteristics and the quantities of the dangerous waste to be stored in the PUREX Storage Tunnels is considered sufficient to properly designate and manage the dangerous waste stored therein; thus, the representative sampling methods listed in WAC 173-303-110 are not considered appropriate for the operation of the PUREX Storage Tunnels.

3.2.4 Frequency of Analyses [C-2d]

The discarded process equipment stored in the PUREX Storage Tunnels is unique in that the fabrication and operating history of each piece of equipment is different even among similar equipment. The fabrication records (i.e., as-built drawings and specifications) of each item to be stored are analyzed to determine if a dangerous waste component (e.g., lead counterweights) is present and in what amount. Where applicable, an analysis of operating history is used to establish the quantity of dangerous waste present. For example, the regeneration and flushing history of a specific silver reactor is analyzed because the total quantity of silver salts present is a function of its operating history.

Because the dangerous waste components of mixed waste stored in the PUREX Storage Tunnels are stable, the waste designations and quantities present will remain the same as assigned at the time of storage. Therefore, repeated analysis is not considered necessary to ensure that waste designation data are representative.

3.2.5 Additional Requirements for Wastes Generated Offsite [C-2e]

All waste placed in the PUREX Storage Tunnels is generated at the PUREX Plant. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

3.2.6 Additional Requirements for Ignitable, Reactive, or Incompatible Wastes [C-2f]

The only ignitable, reactive, or incompatible dangerous waste stored in the PUREX Storage Tunnels is the silver nitrate coating on the ceramic packing inside the silver reactors. This material is confined to the interior of a large stainless steel vessel (see Section 3.1.3) that separates this material from all other waste material stored in the tunnel. The

WAC 173-303-395(1)(a) requires 'No Smoking' signs be conspicuously placed wherever there is a hazard present from ignitable or dangerous waste. 'No Smoking' signs are not considered to be appropriate at the PUREX Storage Tunnels because the tunnels are a designated radiation area. Smoking is not allowed in any radiation area on the Hanford Site and rules prohibiting smoking are strictly enforced. Since the posting of radiation area barriers serves to achieve the no smoking intent of WAC 173-303-395(1)(a), posting and maintaining 'No Smoking' signs are not considered appropriate.

Isolated areas within the PUREX Storage Tunnels have radiation levels in excess of 5 roentgen per hour. Personnel entry into such radiation areas to make periodic inspections (e.g., an annual fire inspection as required by WAC 173-303-395(1)(d) for storage areas containing ignitable waste) would be inconsistent with ALARA guidelines of the *Atomic Energy Act of 1954*. Therefore, such inspections are not performed. The rationale for operations associated with the PUREX Storage Tunnels are addressed further in a petition for rulemaking submitted to Ecology (Freeberg 1989), in fulfillment of a Tri-Party Agreement milestone (Milestone M-22-01) (Ecology et al. 1989).

3.2.7 Land Disposal Restrictions

Operation of the PUREX Storage Tunnels does not involve land disposal of dangerous waste. Therefore, related requirements of RCRA Section 3004 are not applicable to the PUREX Storage Tunnels.

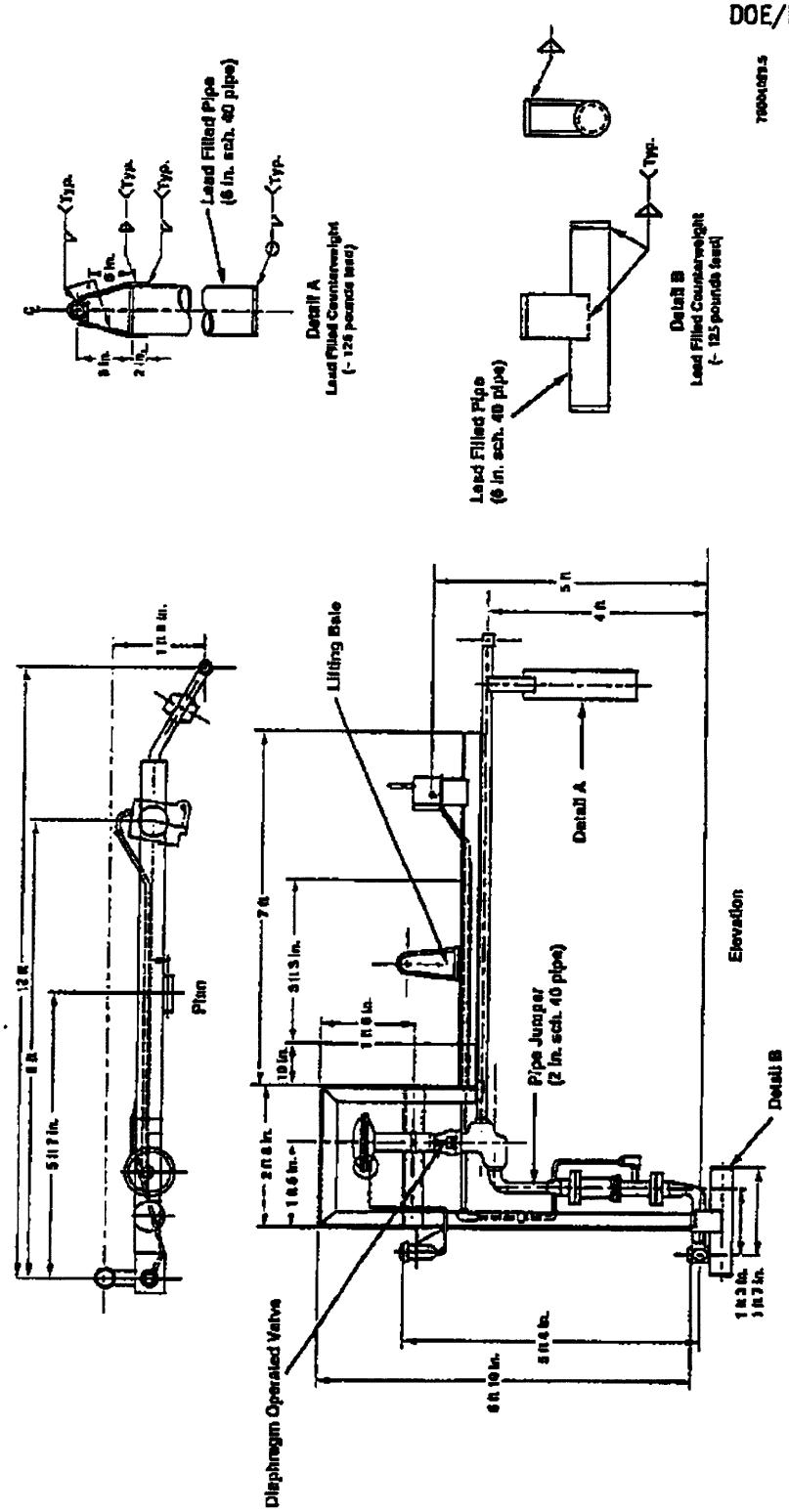


Figure 3-1. Jumper Assembly with Counterweight (typical).

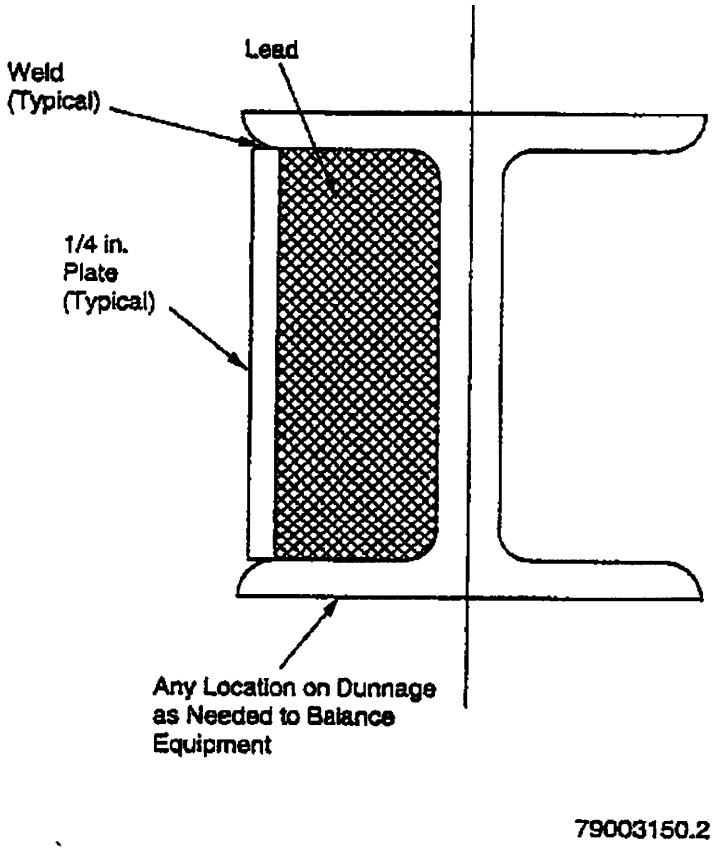


Figure 3-2. Equipment Dunnage Lead Counterweight (typical).

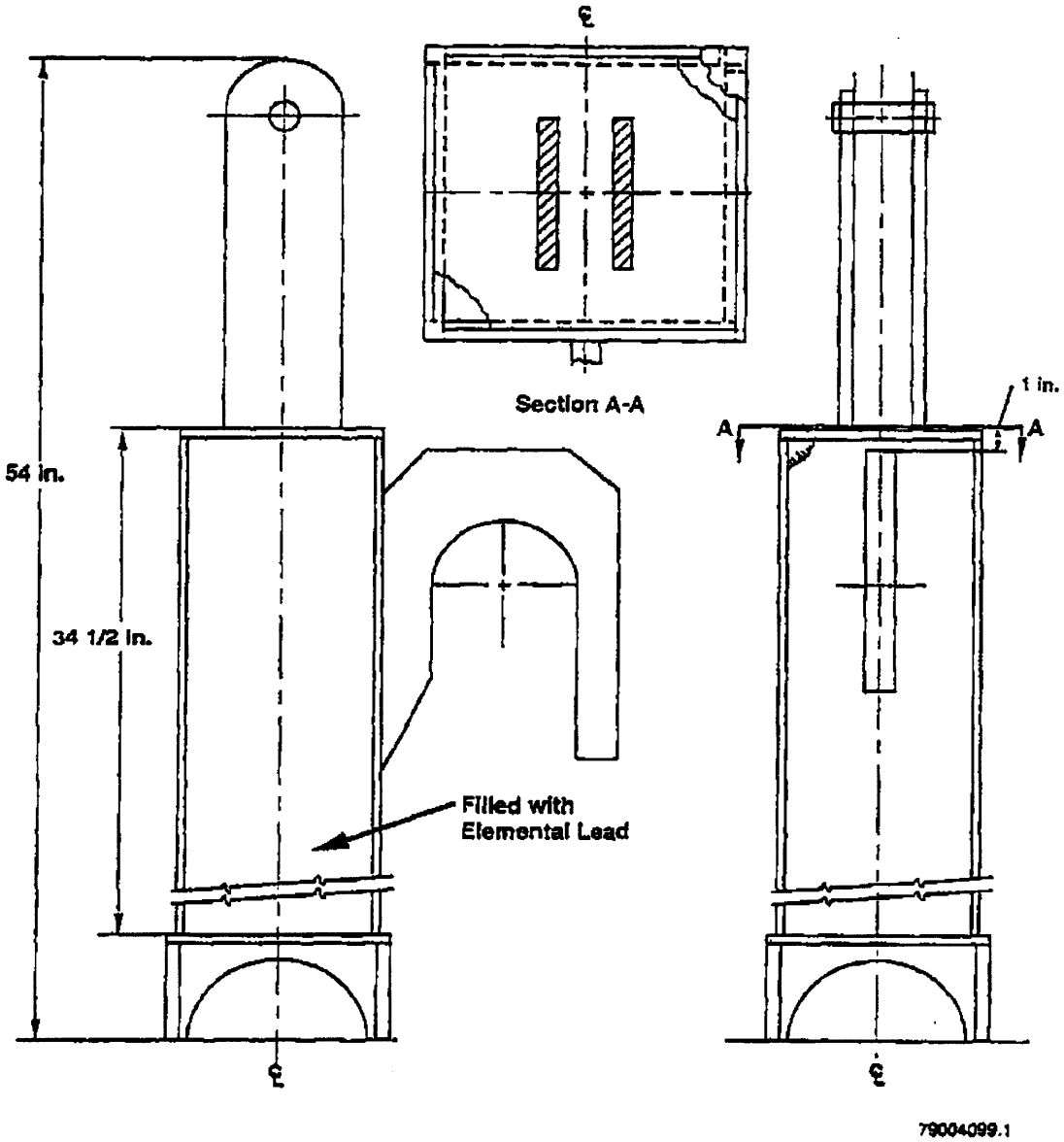


Figure 3-3. Jumper Alignment Tool.

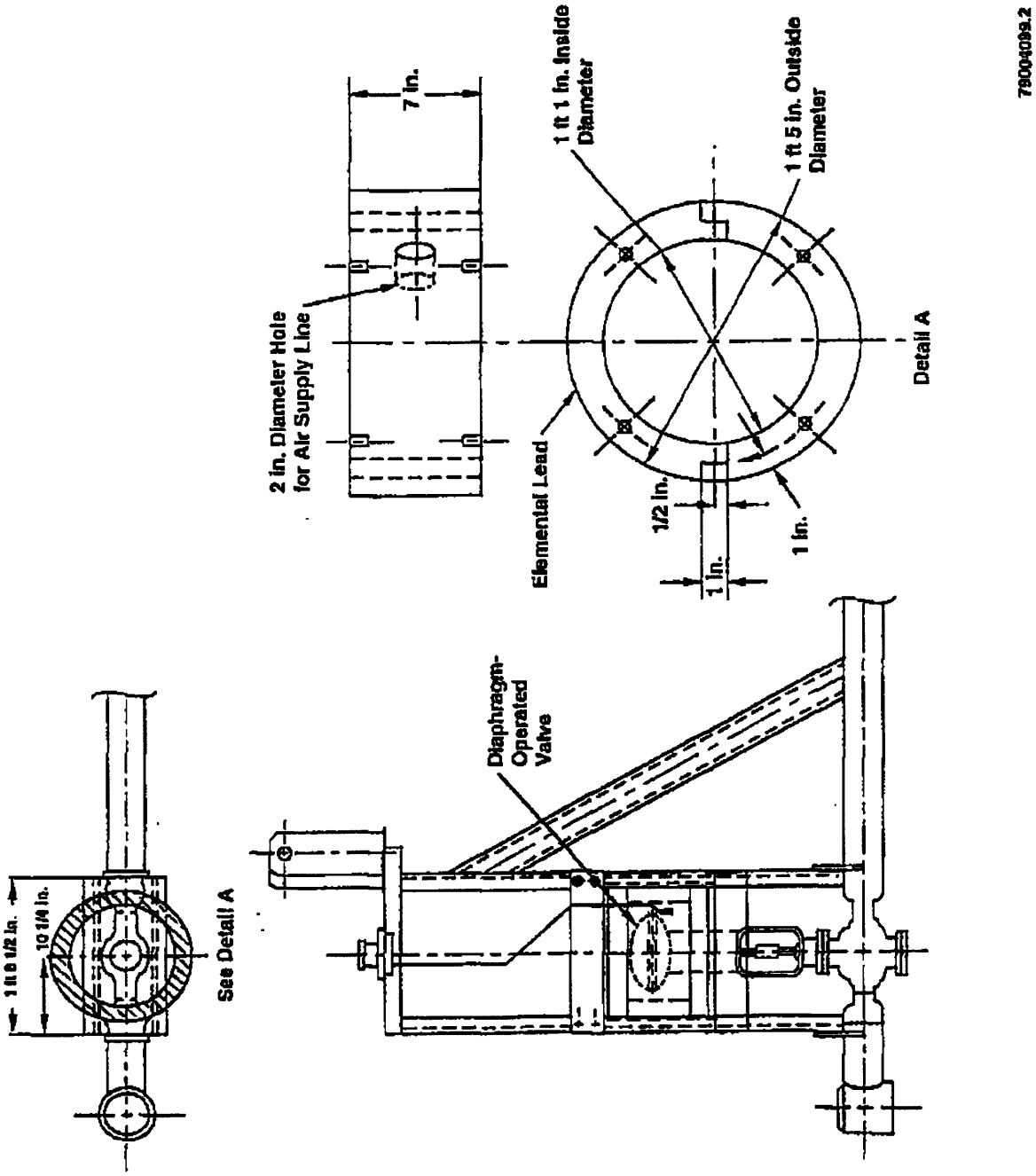
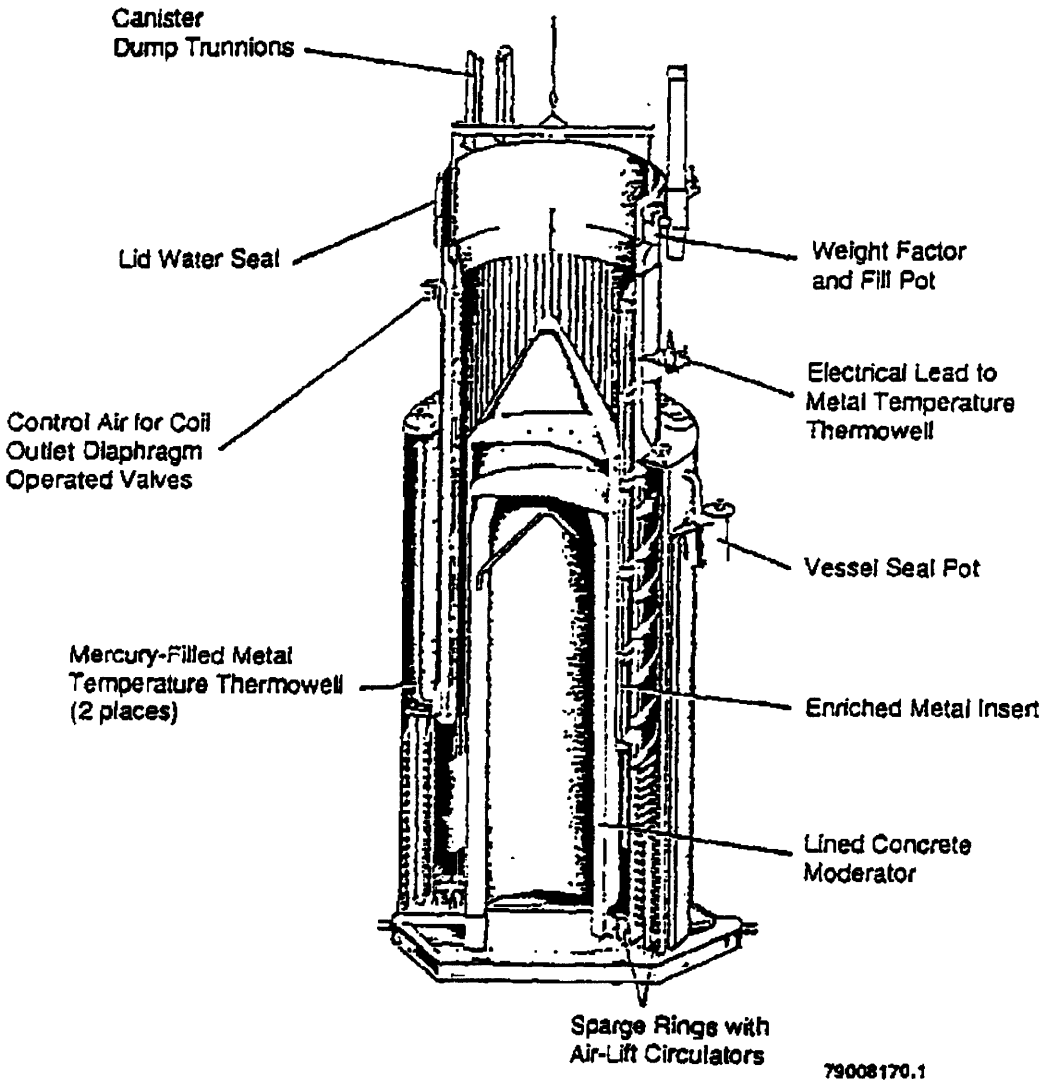


Figure 3-4. Diaphragm-Operated Valve Shielding.



Approximately 9 ft diameter, 24 ft tall, and 58,000 lbs.

Figure 3-5. A PUREX Plant Annular Dissolver.

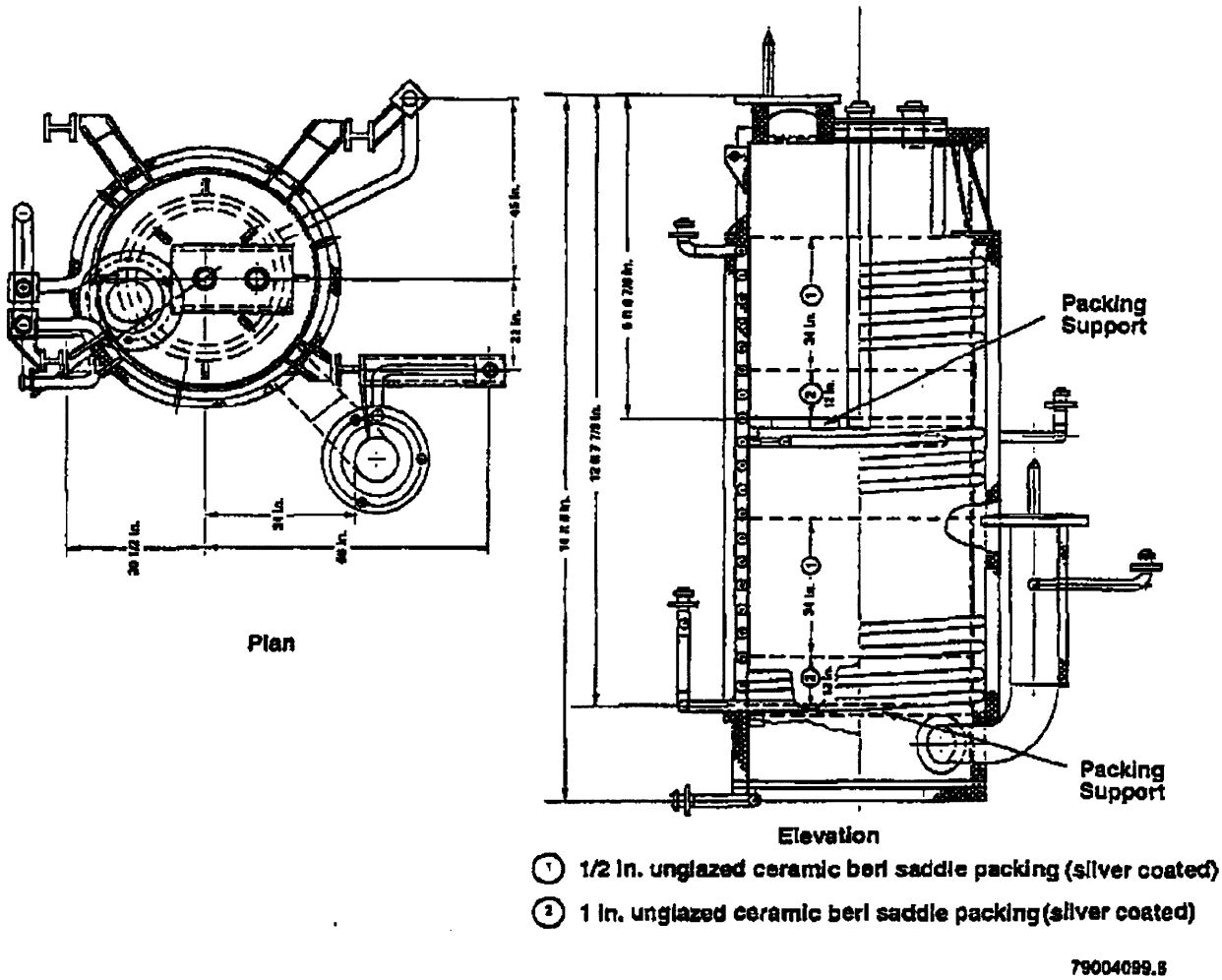


Figure 3-6. Silver Reactor.

900821.1400

Table 3-1. Dangerous Waste Material in the PUREX Storage Tunnels.

Dangerous Waste	Amount in pounds[a] (approximate)	Tunnel	Location[b]
Lead	500[d]	Number 1	2 and 4
Silver[c]	1,600[e]	Number 2	5 and 15
Mercury	300[f]	Number 2	7, 9, and 11
Lead	6,100[f]	Number 2	14 and 15

[a] Total quantity per tunnel rounded to nearest 100 pounds.

[b] Position of railcar. Numbering is in consecutive order with position 1 against the railcar bumper at the south end of each tunnel; position 2 is against railcar in position 1, and so forth.

[c] Expressed as silver nitrate weight equivalent.

[d] There is one box of pipe jumpers at each of two locations. It is estimated each box contain approximately 50 jumpers of which about 5 percent have lead counterweights that average 100 pounds lead per jumper. Therefore, estimated total weight of lead per box is approximately 250 pounds.

[e] The amount of silver remaining on the packing of a discarded silver reactor is a function of its regeneration/flushing history.

The assumptions are:

- A new silver reactor has 250 pounds of silver nitrate on its packing
- Periodic regeneration adds 125 pounds of silver nitrate per charge
- Chemical flushing removes all silver from packing.

The silver reactor in location 5 had 11 regeneration charges since its last chemical flush. The silver reactor in location 15 had only its initial charge of silver nitrate.

[f] Based on take-offs from fabrication drawing of the actual equipment in storage.

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FIGURE

4-1. Water-Fillable Door Exterior (Tunnel Number 2) F4-1

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4.0 PROCESS INFORMATION [D]

This chapter discusses the processes involved in the operation of the PUREX Storage Tunnels. The PUREX Storage Tunnels are used solely for the storage of discarded process equipment removed from the PUREX Plant. The discarded equipment stored in the tunnels has either failed in service or has become obsolete.

The PUREX Storage Tunnels are designed and constructed to provide a means of protecting personnel and the environment from radiation associated with the discarded equipment. The isolation provided by the PUREX Storage Tunnels also serves to protect personnel and the environment from the dangerous waste materials associated with the process equipment stored inside the tunnels. A physical description of the PUREX Storage Tunnels is provided in Chapter 2.0, Section 2.1.4.

The PUREX Storage Tunnels are being permitted as a miscellaneous unit under Subpart X of 40 CFR 264. Regulation 40 CFR 264.601 requires that permit terms and provisions address appropriate requirements provided for other treatment, storage, and/or disposal facilities. Because the operation and construction of the PUREX Storage Tunnels most closely resemble that of a container storage facility, requirements prescribed for a container storage facility, and considered appropriate, are addressed in this chapter.

4.1 OPERATION OF THE PUREX STORAGE TUNNELS

This section describes the selection, characterization, preparation, placement, and postplacement activities associated with storage of mixed waste in the PUREX Storage Tunnels. Except as noted, these activities also apply to the storage of radioactive waste placed in the PUREX Storage Tunnels.

4.1.1 Selection of Equipment to be Stored

Most of the major pieces of process equipment discarded from the PUREX Plant are radioactive and too large to be considered for shipment from the PUREX Facility. Therefore, the equipment must be placed in the PUREX Storage Tunnels until a facility capable of separating the dangerous waste, decontaminating the waste, and reducing the equipment size is available.

4.1.2 Physical Characterization of Equipment to be Stored

Physical characterization of equipment to be stored in the PUREX Storage Tunnels occurs after it is determined that the piece of equipment has failed or has become obsolete and must be removed from the PUREX Plant. Physical characterization of each piece of equipment takes place within the PUREX Plant and includes an evaluation of the following physical properties:

- Length, width, and height
- Gross weight and volume
- Preferred orientation for transport and storage
- Potential radioactivity level and source (e.g., mixed fission products and/or transuranic isotopes)
- Presence of dangerous waste.

Information sources used in physical characterization include equipment fabrication and installation drawings, operational records, and process knowledge. Physical characterization provides information necessary to appropriately describe the waste materials. Such information also is used to design and fabricate, if required, supports on the railcar and to determine the methods to be used in the removal of the equipment from its position in the process cells.

Specific equipment at the PUREX Plant is known to contain dangerous waste. The equipment includes dissolvers that contain elemental mercury, silver reactors that contain silver salts, and jumpers and other equipment that have elemental lead counterweights. Characteristics of these materials when stored as dangerous waste are described in Chapter 3.0.

4.1.3 Preparation for Tunnel Storage

The PUREX Plant operations management, with the concurrence of the appropriate cognizant engineer from PUREX Plant engineering, determines when a specific piece of process equipment is to be replaced. Plant operations prepares a canyon change order for the removal and replacement of the equipment and a tunnel storage checklist (Appendix 2F). The tunnel storage checklist is routed for review and concurrence by key personnel in PUREX Plant operations, engineering, health physics, nuclear safety, industrial safety, and quality control or quality assurance. After the concurrence signatures are obtained, the tunnel storage checklist is forwarded to the PUREX Plant Manager for approval.

4.1.3.1 Equipment Flushing. Before removal from service, the equipment is flushed to minimize loss of products, to reduce radioactive contamination, and to reduce to nonregulatory levels the concentration of any dangerous chemicals present in a residual heel. Currently, analysis of the rinsate is used to determine when these goals have been achieved. Where practical, the rinsate is returned to the process to minimize both product and chemical losses. The analysis of the final flush is retained as part of the PUREX Plant records.

The exterior surface of the equipment normally is flushed to remove radioactive contamination using a portable, high-pressure, water-spray wand. This flush generally occurs while the equipment is being hoisted from the

process cell. Past practices associated with equipment flushing are addressed further in Appendix 3A.

4.1.3.2 Railcar Preparation. Railcars (either flatbed or gondola-style cars) are modified to serve as dedicated storage platforms and transporters for process equipment placed in the PUREX Storage Tunnels. The wooden decking on the railcars is removed to minimize the amount of combustible material placed in the PUREX Storage Tunnels. The south coupler is disabled or removed to prevent the railcar from coupling to the railcar stored ahead. Brakes are disabled to ensure free wheeling of the railcar. Steel decking, catch pans filled with absorbent, and equipment cradles are provided as needed to modify the railcar for its specific task.

4.1.3.3 Locomotive Preparation. A remotely controlled, battery-powered, locomotive is used to move railcars into the PUREX Storage Tunnels. The locomotive can be used to retrieve the last car placed in the tunnel should the need arise. Preparatory activities associated with this locomotive include the following:

- Charging the batteries for both the locomotive and the radio transmitter
- Performing operational checks
- Installing a plastic shroud over the locomotive to facilitate decontamination
- Installing an anticoupling device on the south coupler of the locomotive
- Performing physical inspections of the railroad track within the railroad tunnel to ensure that the track switches are positioned properly and the track is clear of obstructions.

4.1.3.4 Water-Fillable Door Preparation. Each PUREX Storage Tunnel has a water-fillable door that isolates the storage area from the PUREX railroad tunnel (see Chapter 2.0, Section 2.1.4.1 for door description). Tunnel Number 1 was filled to capacity in 1965 and subsequently was sealed. As part of sealing the tunnel, the area surrounding the tunnel door (at the door frame interface) was sealed to prevent airflow from the storage tunnel to the railroad tunnel. At this time, the controls for operation of the tunnel door were electrically deactivated and presently are disabled. The Tunnel Number 1 water-fillable door is presently filled with water because of the close proximity of the stored radioactive equipment to the railroad tunnel. The water serves as radiation shielding, effectively reducing the dose rate at the door by a factor of 10.

Because the operation of Tunnel Number 1 is static and the tunnel is not expected to be entered until closure, procedures associated with the operation of the water-fillable doors will be addressed only for Tunnel Number 2. It should be noted that operation of the Tunnel Number 1 water-

fillable door is essentially the same as the operation of the Tunnel Number 2 water-fillable door.

Presently the water-fillable door to Tunnel Number 2 is empty and is not expected to be filled in the near future. In the event the door is filled, the water must be pumped from the door before it can be raised. The door is emptied by installing a throttle valve to the wall stub located on the exterior of the door housing (Figure 4-1). A length of fire hose is attached to the throttle valve and extended eastward from the tunnel to an area where the surface discharge will not migrate to the tunnel storage area. The inline pump is activated, the water is pumped from the door through the fire hose, and the water is discharged to the soil column. Operational checks are performed on the door hoists. Before performing operational checks on the water-fillable door, the operator verifies with the PUREX dispatcher that the railroad tunnel area is clear of personnel.

4.1.3.5 Other Preparation Tasks. Before equipment storage, the following preparatory tasks are completed.

- The PUREX railroad tunnel floor drains are verified to be unobstructed and free-flowing.
- The area under the horizontal overhead door and a section of the track approximately 20 feet on each end of the overhead door is washed down.
- The storage tunnel exhaust fan is verified as operating.
- A cord of predetermined length is attached to the north end of the railcar to provide storage location indication (optional-if needed).
- Placards are attached to the railcar in accordance with WAC 173-303-395(6) and 173-303-630(3) if the equipment to be stored contains dangerous waste components.

4.1.4 Placement of Discarded Equipment into Storage Position

With all preparations complete and with the approval of the PUREX shift operations manager, transferring the discarded equipment to the PUREX Storage Tunnels proceeds as follows.

- The railcar is positioned beneath the horizontal overhead door to the PUREX canyon.
- The overhead door is opened and the railcar is loaded as specified in the tunnel storage checklist.
- An inventory of items loaded on the railcar and a record of their location on the railcar is recorded in the tunnel storage checklist.
- After loading the railcar, the overhead door is closed.

- A health physics technician obtains a radiation level survey of the loaded railcar at a distance commensurate with ALARA practices.

- The water-fillable door is opened and the railcar is pushed by the locomotive into the storage tunnel to its storage position.

- Once the railcar is in position, the locomotive is backed out of the PUREX Storage Tunnel and the water-fillable door is closed.

4.1.5 Filling the Water-Fillable Door (Tunnel Number 2)

Should radiation shielding beyond that provided by the empty water-fillable door be necessary, the door can be filled with water. This is accomplished by connecting a fire hose from the water hydrant to the wall stub on the exterior of the door housing (Figure 4-1). Once the fire hose is in place, the hydrant is opened slowly and the door is filled with water. The hydrant is closed when a high-level indicator light illuminates. Although attendance by an operator is required at all times during filling operations, should the door overfill, excess water is channeled through a vent/spill pipe to the door sump. A 6-inch drain is provided in each door sump that connects to the PUREX Plant steam condensate discharge line. Water accumulated in the door sump flows via the 16-inch condensate line to the 216-A-30 Crib.

4.1.6 Postplacement Activities

The following postplacement activities conclude the tunnel storage task.

- The locomotive is placed beneath the horizontal door in the railroad tunnel.

- A health physics technician performs a radiation survey of the locomotive, the plastic shroud is removed, and the locomotive is decontaminated, as required.

- After decontamination, the locomotive is returned to its railroad spur in the railroad cut north of the PUREX Plant.

- A health physics technician performs a radiation survey of the railroad tunnel between the overhead door and the water-fillable door, and the area is decontaminated as required.

- The PUREX Plant operations management is notified of any unusual conditions observed during the storage activities and/or of any suggestions for improving future storage operations.

- The tunnel storage checklist is finalized by PUREX Plant operations and placed in PUREX Facility files.

4.1.7 Operation of the Tunnel Ventilation System

The design of both Tunnel Number 1 and Tunnel Number 2 included provisions for a filtered ventilation system (see Chapter 2.0, Section 2.1.4). The ventilation systems were designed to ventilate air from within the tunnels and prevent the release of airborne contamination.

4.1.7.1 Tunnel Number 1 Ventilation. Active ventilation of Tunnel Number 1 presently is not provided. Following the placement of the last railcar into Tunnel Number 1, the tunnel was sealed. As part of the sealing activities the ventilation fan was electrically deactivated and the exhaust stack and filter were isolated from the system by installing a blank in the tunnel exhaust duct upstream of the filters. Once closure activities are initiated, the ventilation system is planned to be reactivated. Operation of the ventilation system will be similar to that for Tunnel Number 2.

4.1.7.2 Tunnel Number 2 Ventilation. The Tunnel Number 2 ventilation system presently is active and is maintained in an operational condition. When the water-fillable door is closed, the exhaust system, which discharges approximately 4,000 cubic feet per minute, maintains a slight negative pressure in the tunnel. The exhaust air is replaced by infiltration around the water-fillable door and through the porosity of the tunnel structure, e.g., the rail-bed ballast. When the water-fillable door is open (during storage activities), inward airflow is maintained through the open door ports. This inward airflow channels airborne contamination away from both the railroad tunnel and the personnel following railcars (if allowed) into the storage tunnel. A high-efficiency particulate air filter provides filtration of all exhaust air before release to the atmosphere. The high-efficiency particulate air filter is tested in place at least annually to ensure particulate removal efficiency. Exhausted air is continuously sampled and analyzed weekly for airborne radionuclides.

4.2 CONTAINERS [D-1]

This section describes the various types of containment used to isolate the dangerous waste components of the discarded process equipment stored in the PUREX Storage Tunnels. The PUREX Storage Tunnels are considered to be a miscellaneous unit most closely resembling that of a container storage facility. The dangerous waste stored in the PUREX Storage Tunnels is contained and is not considered to pose a risk to Hanford Site personnel, the public, or to the environment.

4.2.1 Containers with Free Liquids [D-1a]

The only dangerous waste stored as a free liquid in the PUREX Storage Tunnels is elemental mercury. A small quantity, less than 1/2 gallon, of mercury is contained in each of the two thermowells attached to and contained within each dissolver (see Chapter 3.0, Figure 3-5). Primary containment of the mercury is provided by the all-welded construction of the thermowell itself, which is fabricated from 3-inch, schedule 80, 304L stainless steel

pipe. The open upper end of the thermowell was sealed with a 304L stainless steel nozzle plug in preparation for storage. The discarded dissolver rests on a cradle on its railcar in an inclined position. This ensures that the mercury remains in the lower portion of the thermowell and is not in contact with the mechanical closure on the nozzle end of the thermowell.

A secondary containment barrier for mercury, should it leak from the thermowell, is provided by the dissolver itself. The dissolver is a 304L stainless steel process vessel constructed from 3/8-inch thick plate and is approximately 9 feet in diameter. The dissolver is of all-welded construction and contains no drains or nozzle outlets in the bottom several feet of its lower section, which contains both thermowells.

The 304L stainless steel used to contain the elemental mercury is both compatible with the waste itself and with the storage environment. The potential for significant deterioration of either the primary or secondary containment barrier material before facility closure is considered to be negligible.

The dissolvers stored within the PUREX Storage Tunnels are not labeled as containing characteristic toxic mercury (D009). Procedures for labeling were not in place at the time the last railcar containing a discarded dissolver was placed into storage on January 18, 1986. Personnel access into the storage area for purposes such as labeling is not feasible because of the radiation levels and cannot be justified under ALARA. Based on ALARA, dangerous waste presently within the PUREX Storage Tunnels will remain unlabeled. However, future transfers of dangerous waste into the PUREX Storage Tunnels will be placarded as specified by WAC 173-303-395(6) and WAC 173-303-630(3).

4.2.2 Containers Without Free Liquids That Do Not Exhibit Ignitability or Reactivity [D-1b]

Three discarded jumper alignment tools stored in Tunnel Number 2 (Position 14) contain a total of approximately 2,500 pounds of elemental lead. Some of the process pipe jumpers stored in Tunnel Number 1 (Positions 2 and 4) and in Tunnel Number 2 (Positions 14 and 15) have attached counterweights that also contain elemental lead. The total amount of lead in Tunnel Number 1 is approximately 500 pounds. The total amount of lead in Tunnel 2 through Position 17 is approximately 6,100 pounds. Most lead is fully contained in all-welded encasements of either carbon steel or 304L stainless steel. The encasement is of nominally 1/4-inch thick material. The encasement serves as support, protection against mechanical damage, and protection of the lead from exposure to the process environment.

Cut-up pipe jumper assemblies with attached, encased counterweights intact are placed in steel burial box liners nominally 9 feet by 18 feet by 8 feet. This steel box provides secondary containment for the lead in the unlikely event the primary encasement should fail. Although this steel box is open on the top, the PUREX Storage Tunnels are enclosed; therefore, the containers are protected from the elements.

Both carbon steel and 304L stainless steel used to encase the lead are compatible with the waste and the storage environment. Significant deterioration of either the primary or secondary containment barrier materials before facility closure is considered not to be credible.

The process equipment that contains lead weights or that has encased lead weights attached is not labeled as containing characteristic toxic lead (D008). This procedure had not been identified as applicable as of May 13, 1988 when the last lead was placed in Tunnel Number 2. As stated in Section 4.2.1, personnel entry into the radiation zones of the tunnel storage area for purpose of labeling would be inconsistent with ALARA guidelines. However, future storage of equipment containing lead will be on railcars that are properly placarded.

4.2.3 Protection of Extremely Hazardous Waste in Containers [D-1c]

The amount of elemental lead, elemental mercury, and silver salts stored in the PUREX Storage Tunnels is sufficient to characterize this material as extremely hazardous waste. Because the PUREX Storage Tunnels are totally enclosed, protective covering from the elements and from run-on is provided for the storage of extremely hazardous waste. Periodic inspection of the equipment stored in the PUREX Storage Tunnels is not feasible because of radiation levels in excess of 5 roentgen per hour. Safe management of this waste is based on the following considerations.

- The operation of the PUREX Storage Tunnels is passive in that once a storage position is filled, the storage position will remain undisturbed until facility closure.
- The extremely hazardous waste is compatible with its storage container and the storage environment.
- The physical characteristics and limited volume of the extremely hazardous waste are such that, in the unlikely event the material is released from its primary container, no significant impact to the environment would occur.

4.2.4 Prevention of Reaction of Ignitable, Reactive, and Incompatible Waste in Containers [D-1d]

There is no reactive or incompatible waste known to be stored in the PUREX Storage Tunnels. The only dangerous waste stored in the PUREX Storage Tunnels that is considered an ignitable waste is the silver nitrate in Tunnel 2. The silver nitrate fraction of the silver salts, within the silver reactors, exhibits the characteristic of ignitability as defined in 49 CFR 173.151. The silver salts therefore are managed as an ignitable dangerous waste in accordance with WAC 173-303-395.

The risk of fire associated with the storage of silver nitrate in the PUREX Storage Tunnels is considered to be extremely low. This conclusion is based on the following considerations.

- The operation of the PUREX Storage Tunnels is passive in that once a storage position is filled, the storage position will remain undisturbed until facility closure.

- The silver nitrate is contained within large, heavy-walled, stainless steel vessels that isolate it from contact with any combustibles that may be in the tunnels.

- The silver nitrate is dispersed over a large surface area on a ceramic packing substraight and is not conducive to build-up of heat that could lead to spontaneous combustion.

- Personnel access to the occupied areas of the tunnels is not permitted, thereby precluding activities that could present a fire hazard (e.g., smoking, flame cutting, welding, grinding, etc.).

Although ignitable waste storage facilities are required by WAC 173-303-395(1)(d) to have inspections conducted at least yearly by a fire marshall or professional fire inspector familiar with the requirements of the uniform fire code, the radiation levels within the PUREX Storage Tunnels make such inspections impractical. These inspections are not considered appropriate or necessary for the safe operation of the facility because of the nature of the ignitable waste and the means of storage. The rationale for operations associated with the PUREX Storage Tunnels are addressed further in a petition for rulemaking submitted to Ecology and the EPA (Freeberg 1989) in fulfillment of a September 1989 Tri-Party Agreement milestone (Milestone M-21-01) (Ecology et al. 1989).

4.3 TANK SYSTEM [D-2]

Operation of the PUREX Storage Tunnels does not involve the storage of dangerous waste in tank systems. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

4.4 WASTE PILES [D-3]

Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in piles. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

4.5 SURFACE IMPOUNDMENTS [D-4]

Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

4.6 INCINERATORS [D-5]

Operation of the PUREX Storage Tunnels does not involve the incineration of dangerous waste. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

4.7 LANDFILLS [D-6]

Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in landfills. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

4.8 LAND TREATMENT [D-7]

Operation of the PUREX Storage Tunnels does not involve the land treatment of dangerous waste. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

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5.0 GROUNDWATER MONITORING [E]

The PUREX Storage Tunnels are being permitted as a miscellaneous unit under the provisions of 40 CFR 264 Subpart X. These regulations require that miscellaneous unit permit terms and provisions address appropriate requirements provided for other treatment, storage, and/or disposal facilities.

Appropriate requirements for a container storage facility are addressed for the PUREX Storage Tunnels as its construction and operation most closely resemble this type of facility. The PUREX Storage Tunnels are not operated as a surface impoundment, waste pile, land treatment unit, or landfill as defined in WAC 173-303-645(1)(a); therefore, groundwater monitoring is not required.

The Part B is written under the assumption that authority for administering Subpart X will be extended to Ecology by the time the PUREX Storage Tunnels permit is finalized and issued.

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6.0 PROCEDURES TO PREVENT HAZARDS [F]

This chapter discusses hazard prevention, emergency preparedness, structures, run-off controls, security barriers, inspection requirements, and emergency equipment in place at the PUREX Storage Tunnels.

The PUREX Storage Tunnels are being permitted as a miscellaneous unit under Subpart X of 40 CFR 264. Regulation 40 CFR 264.601 requires that permit terms and provisions address appropriate requirements provided for other treatment, storage, and/or disposal facilities. The operation and construction of the PUREX Storage Tunnels most closely resembles that of a container storage facility. Therefore, requirements prescribed for a container storage facility that are considered appropriate for the safe management of dangerous waste are addressed in this chapter.

6.1 SECURITY [F-1]

The following sections describe the security measures, equipment, and warning signs used to control entry into the PUREX Storage Tunnels.

6.1.1 Security Procedures and Equipment [F-1a]

The following sections describe the 24-hour surveillance system, barrier, and warning signs used to provide security and control access to the PUREX Storage Tunnels.

6.1.1.1 24-hour Surveillance System [F-1a(1)]. The entire Hanford Site is a controlled access area and is expected to remain so for the foreseeable future. The Hanford Site maintains around-the-clock surveillance for protection of government property, classified information, and special nuclear materials. The Hanford Patrol maintains a continuous presence of armed guards to provide Hanford Site security.

6.1.1.2 Barrier and Means to Control Entry [F-1a(2),(2a),(2b)]. Manned barricades are maintained around the clock at checkpoints on vehicular access roads leading to the Hanford Site. Access to the 200 East Area is gained through a manned barricade. All personnel entering or leaving the 200 East Area must display a U.S. Department of Energy-issued security identification badge indicating authorization to enter the area and submit to a search of personal items carried into and out of the area. Additional entrance procedures must be followed to enter designated radiation zones.

The PUREX Plant and the entry to the PUREX Storage Tunnels are surrounded by a double fence security system. The area within this double fence security system is called the 'protected area.' The outer fence is 7-foot-high chain link with a 1-foot barbed wire top. The inner fence is 7-foot-high chain link with a 1-foot barbed wire top surmounted with razor wire. The space between the two fences [called the 'isolation zone' (see Chapter 2.0, Figure 2-3)] is instrumented to detect and monitor movement and

objects. The fences are accessible from either side by security personnel. Access gates, to and from the protected area, are secured 24 hours a day, 7 days a week. Access to or from the protected area is for authorized vehicles and personnel only. Access is gained through designated and manned gates and only after complying with applicable security procedures.

Personnel entering the PUREX Plant are required to comply with additional security requirements. Entry requires the use of computer-recognized key cards, X-ray and visual examination of all items carried in, and personal inspection with metal detectors and by security personnel.

Entry into the PUREX Storage Tunnels is made from the PUREX Plant railroad tunnel. Personnel entering the PUREX Storage Tunnels must be qualified radiation zone workers and must obtain management approval made on a need-to-enter basis. Although a portion of Tunnel Number 2 lies outside the protected area, access to the tunnel interior can be made only through the PUREX Plant.

6.1.1.3 Warning Signs [F-1a(3)]. Warning signs are posted around the perimeter of the PUREX Facility. The signs are printed in English, legible from a distance of 25 feet, and visible from all angles of approach. Three types of signs are posted around the PUREX Facility and contain the following legends:

- No Trespassing. By Order Of The United States Department Of Energy
- Warning. This Area Patrolled By Police Dogs
- Notice. All Persons-Vehicles Subject To Search For Prohibited Articles.

Additionally, signs warning of the storage of dangerous waste are posted at the point of access at both storage tunnels.

6.1.2 Waiver [F-1b,b(1),b(2)]

Waiver of the security procedures and equipment requirements for the PUREX Storage Tunnels will not be requested. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

6.2 INSPECTION SCHEDULE [F-2]

This section describes the method and schedule for inspection of the PUREX Storage Tunnels. The purpose of inspection procedures at the PUREX Storage Tunnels is to prevent malfunctions, deteriorations, and discharges that may cause or lead to the release of radioactive or dangerous waste to the environment or pose a threat to human health. Abnormal conditions identified by inspections must be corrected on a schedule that prevents hazards to workers, the public, and the environment.

Because of the levels of radiation present within the PUREX Storage Tunnels, only external inspections are performed. The material stored within the tunnels consists of discarded process equipment removed from the PUREX Plant. This equipment is radioactive, resulting in radiation levels that exceed 5 roentgen per hour within certain areas of the tunnels. Additionally the PUREX Storage Tunnels are physically inaccessible to personnel as the design does not provide for manned entry. These are no shielded corridors nor does the tunnel width in either tunnel provide adequate space for personnel to safely pass by railcars in storage. Internal inspections required by RCRA have been considered and determined to be incompatible with the requirements of the *Atomic Energy Act*, which seeks to maintain personnel exposures ALARA. Internal inspections will be performed only at closure following the removal of the equipment stored within the tunnels. Inspection results will be documented and corrective action initiated in accordance with established closure procedures.

6.2.1 General Inspection Requirements [F-2a]

The content and frequency of inspections are described in this section. The inspection schedule and inspection reports are maintained with the tunnel storage records in the PUREX Facility. Inspection records are retained for a minimum of 3 years.

6.2.1.1 Types of Problems [F-2a(1)]. Information from inspections is recorded on inspection reports. The report forms are used to initiate corrective action, if necessary. The following identifies types of problems that could be expected to occur at the PUREX Storage Tunnels.

- External surfaces of the PUREX Storage Tunnels are observed for evidence of structural deterioration. Tunnel subsidence, erosion of the earth cover, and vent stack damage are of primary concern. Abnormal conditions are recorded, evaluated, and corrective action is initiated if necessary.

- The point of access to the PUREX Storage Tunnels is inspected to ensure that signs warning of dangerous waste are in tact, visible, and legible. Abnormal conditions are recorded, evaluated, and corrective action is initiated if necessary.

- The exhaust fan for Tunnel Number 2 is checked to denote operating status (Tunnel Number 1 fan is not in operation). This verification is conducted by observing an indicator light and a pressure differential gage located in the PUREX Plant operating records. Inspection results are recorded in the power control room logbooks. Abnormal conditions are evaluated and corrective action is initiated if necessary.

6.2.1.2 Frequency of Inspection [F-2a(2)]. Inspection of the PUREX Storage Tunnels exterior is conducted on a 6-month frequency and following any significant seismic event or severe weather condition (i.e., exceptionally high winds, heavy rainfall, or rapid run-off) that could potentially affect

the structural integrity of the PUREX Storage Tunnels. Tunnel access points also are inspected every 6 months. Tunnel Number 2 fan operation and differential pressure are checked daily.

6.2.2 Specific Process Inspection Requirements [F-2b]

The following sections describe specific process inspection requirements.

6.2.2.1 Container Inspection [F-2b(1)]. Within the PUREX Storage Tunnels, solid dangerous waste (jumpers, tools, valves, etc., that contain elemental lead) is stored in boxes loaded on railcars. Other dangerous waste (silver salts and elemental mercury) is contained within equipment stored directly on the railcars.

As described in Section 6.2, access to the interior of the PUREX Storage Tunnels for inspection purposes is not possible because of the radiation levels present within the tunnels. Although inspection requirements specified in WAC 173-303-395 and WAC 173-303-630 are applicable to container storage facilities, these inspections are not considered appropriate for the safe operation of the PUREX Storage Tunnels and will be performed only at closure.

6.2.2.2 Tank Inspection [F-2b(2),(2)a-(2)f]. Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in tanks. Therefore, the requirements of this section are not applicable.

6.2.2.3 Waste Pile Inspection [F-2b(3),(3)a-(3)d]. Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in piles. Therefore, the inspection requirements of this section are not applicable.

6.2.2.4 Surface Impoundment Inspection [F-2b(4),(4)a-(4)b]. Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in surface impoundments. Therefore, the inspection requirements of this section are not applicable.

6.2.2.5 Incinerator Inspection [F-2b(5),(5)a,(5)b]. Operation of the PUREX Storage Tunnels does not involve the incineration of dangerous waste. Therefore, the inspection requirements of this section are not applicable.

6.2.2.6 Landfill Inspection [F-2b(6),(6)a-(6)d]. Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in landfills. Therefore, the inspection requirements of this section are not applicable.

6.2.2.7 Land Treatment Facility Inspection [F2b(7),(7)a-(7)b]. Operation of the PUREX Storage Tunnels does not involve the land treatment of dangerous waste. Therefore, the inspection requirements of this section are not applicable.

6.3 WAIVER OR DOCUMENTATION OF PREPAREDNESS AND PREVENTION REQUIREMENTS [F-3]

The following sections document the preparedness and prevention measures taken at the PUREX Storage Tunnels. Future updates of this section and the PUREX Facility emergency plan contained in Appendix 7A are planned to implement U.S. Department of Energy Order 5000.3A.

6.3.1 Equipment Requirements [F-3a]

The following sections describe the internal and external communications systems and emergency equipment required.

6.3.1.1 Internal Communications [F-3a(1)]. The PUREX Storage Tunnels are not occupied and personnel entry is allowed only on a very limited basis and under close supervision. Normal and emergency communications equipment (portable two-way radios) is available for use and is maintained at the PUREX Plant.

6.3.1.2 External Communications [F-3a(2)]. External communications equipment for summoning emergency assistance from the Hanford Fire Department, the Hazardous Materials Response Team, and/or local emergency response teams is maintained and available for use at the PUREX Plant. External communication is by a telephone communication system, a two-way radio base station, and two-way portable radios. In addition, the following external communications equipment is available for notifying persons assigned to emergency response organizations.

- Fire alarm pull boxes (located at the PUREX Plant)--connected to a system monitored around the clock by the Hanford Fire Department.
- Telephone number 811--contact point for the Hanford Site; on notification, the Hanford Patrol Operations Center notifies and/or dispatches required emergency responders.
- Telephone Number 3-3800--single point of contact for the emergency duty officer; this number can be dialed from any Hanford Site telephone.
- Crash alarm telephone system--consists of selected telephones automatically connected to control stations.
- Two-way radio system (located at the PUREX Plant)--the system accesses the Hanford Site emergency network and can summon the Hanford Fire Department, Hanford Patrol, and/or any other assistance requested to handle emergencies.

6.3.1.3 Emergency Equipment [F-3a(3)]. A detailed list of equipment included in the emergency plan for the PUREX Facility is provided in Appendix 7A.

6.3.1.4 Water for Fire Control [F-3a(4)]. Water will not be used for fire control at the PUREX Storage Tunnels.

6.3.2 Aisle Space Requirement [F-3b]

Requirements for aisle space are not considered appropriate for the safe operation of the PUREX Storage Tunnels.

The WAC 173-303-340(3) requires that aisle space be maintained to allow the unobstructed movement of personnel, fire protection equipment, and decontamination equipment to any area of facility operation in an emergency unless it can be demonstrated that aisle space is not needed for any of these purposes. Radiation levels within the PUREX Storage Tunnels considerably exceed the level that is safe for personnel access. The high levels of radiation were anticipated in the design of the tunnels and provisions for aisle space were not included.

Probabilities for emergencies occurring within the PUREX Storage Tunnels such as a fire or a spill of a dangerous waste are considered extremely remote. However, should such an event occur, personnel access to mitigate the event would be limited to the external surfaces of the tunnels and that portion of the interior of the tunnels that is not occupied by the railcars and is determined to be a safe radiological working environment.

6.4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT [F-4]

The following sections describe preventive procedures, structures, and equipment.

6.4.1 Unloading Operations [F-4a]

Operation of the PUREX Storage Tunnels does not involve the loading or unloading of dangerous waste. All loading and unloading operations are conducted at the PUREX Plant. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

6.4.2 Run-Off [F-4b]

The design of the PUREX Storage Tunnels included consideration and provisions for the control of run-off. Construction of both tunnels included the application of a moisture barrier before placement of the soil overburden. On Tunnel Number 1, 90-pound mineral surface roofing (tarpaper) was applied to the external surfaces of the structural timbers (top and sides). The roofing material was nailed in place with an overlap of approximately 4 inches at all joints and seams. All interior and exterior steel surfaces of Tunnel Number 2 were coated with a 35-mil bituminous, solvent coal tar base, coating compound. The coating was applied using a

two-coat system, with each coat not less than 18 mils, ensuring a total dry film thickness of not less than 35 mils.

The soil overburden covering the PUREX Storage Tunnels also is contoured to provide a side slope of 2 (horizontal) to 1 (vertical). This construction serves to divert any seasonal or unanticipated run-off away from the storage area of the PUREX Storage Tunnels. Periodic inspections of the tunnel side slopes are conducted to ensure the contours remain in a condition that will preclude ponding and continue to divert run-off away from the tunnel storage areas. Further discussion of the design of the PUREX Storage Tunnels is provided in Chapter 2.0, Section 2.1.4.

6.4.3 Water Supplies [F-4c]

Water is supplied to the PUREX Storage Tunnels from the PUREX Plant. This water is used for the sole purpose of filling the water-fillable doors should it be determined necessary. There are no other sources or uses of water at the PUREX Storage Tunnels.

6.4.4 Equipment and Power Failures [F-4d]

The procedures, structures, and equipment used to mitigate the effects of equipment failure and power outage are described in the following sections.

6.4.4.1 Mitigation of the Effects of Equipment Failure. Safe operation of the PUREX Storage Tunnels is not contingent on continued operation of equipment. The only equipment associated with the PUREX Storage Tunnels is the remote-powered locomotive, the railcars, the water-fillable doors, and the ventilation system. Backup or redundant systems are not provided, as failure of the equipment, except for the high-efficiency particulate air filters, would not have the potential to result in a release of dangerous waste or radioactive material to the environment. Weekly monitoring of the stack exhaust sampling system coupled with the annual filter efficiency test provides a check of the integrity of the air filtering system. Mitigation of equipment failure is provided through routine and as-needed maintenance.

6.4.4.2 Mitigation of the Effects of Power Failure. Electrical power is required to operate the water-fillable doors and the ventilation fan in Tunnel Number 2. Backup or redundant systems are not provided, as failure of the equipment, except for the high-efficiency particulate air filters, would not have the potential to result in a release of dangerous waste or radioactive material to the environment.

6.4.5 Personnel Protection Equipment [F-4e]

Personnel protection equipment for personnel working in the PUREX Storage Tunnels is available and maintained at the PUREX Plant. Personnel

are trained and qualified in using the protective equipment and are checked routinely for mask fit.

Personnel entering the PUREX Storage Tunnels are required to wear special protective clothing and respiratory protection at all times because of the radioactive material stored in the PUREX Storage Tunnels. Protective clothing consists of two pairs of radiation protection coveralls, one pair of canvas shoe covers, rubber boots or rubber shoe covers, two pairs of gloves, a cloth cap and hood, and a full face respirator. Such equipment is considered to be sufficient protection from the dangerous waste stored within the PUREX Storage Tunnels.

6.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTE [F-5]

There is no reactive or incompatible waste stored in the PUREX Storage Tunnels. The only ignitable dangerous waste stored within the tunnels is silver nitrate. The silver nitrate is present within the silver reactors (deposited on unglazed ceramic packing) stored in Tunnel Number 2 (see Chapter 3.0, Table 3-1).

Although silver nitrate exhibits the characteristic of ignitability, it is contained within stainless steel vessels, stored on railcars above the floor level, and isolated from combustible materials and other dangerous waste. Additional measures to prevent reaction of the ignitable waste are not considered necessary.

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APPENDIX

7A Westinghouse Hanford Company Emergency Plan for PUREX Facility . . . . . APP 7A-i

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7.0 CONTINGENCY PLAN [G]

The WAC 173-303 requirements for contingency plans are satisfied in the following documents: the DOE-RL emergency plan and procedures manuals, the *Westinghouse Hanford Company Emergency Plan* (WHC 1989b), and the *Westinghouse Hanford Company Emergency Plan for PUREX Facility* (WHC 1990). The DOE-RL emergency plan and procedures manuals and the *Westinghouse Hanford Company Emergency Plan* are available for review upon request. The *Westinghouse Hanford Company Emergency Plan for PUREX Facility* is provided as Appendix 7A. A future update of the PUREX Facility emergency plan (Appendix 7A) is planned to implement U.S. Department of Energy Order 5000.3A.

The cited contingency plan documents also serve to satisfy a broad range of other requirements (e.g., Occupational Safety and Health Administration and U.S. Department of Energy Orders). Therefore, revisions made to portions of the contingency plan documents that are not governed by the requirements of WAC 173-303 will not be considered as a modification subject to review or approval by Ecology.

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8.0 PERSONNEL TRAINING [H]

This chapter outlines the training program developed and implemented by Westinghouse Hanford for the PUREX Facility employees whose duties have been identified as being associated with dangerous waste management.

The PUREX Facility training program uses existing Westinghouse Hanford courses augmented by courses developed specifically for the PUREX Facility. The program was designed to ensure that the PUREX Facility, including the PUREX Plant and the PUREX Storage Tunnels, is operated and maintained in accordance with requirements of the EPA, Ecology, Occupational Safety and Health Administration, and the U.S. Department of Energy.

8.1 OUTLINE OF THE TRAINING PROGRAM [H-1]

The PUREX Storage Tunnels are used for long-term storage of equipment removed from the PUREX Plant. Equipment transfers from the PUREX Plant to the PUREX Storage Tunnels are conducted on an as-needed basis and are not a manpower-intensive operation. Personnel involved with the transfer of equipment and in the operation and maintenance of the PUREX Storage Tunnels are PUREX Facility employees, trained and qualified through the PUREX Facility training program.

The PUREX Facility training program prepares employees to transfer equipment removed from the PUREX Plant to the designated PUREX Storage Tunnel in a safe, efficient, and environmentally sound manner. In addition to preparing employees to transfer equipment to the designated PUREX Storage Tunnel under normal conditions, the program ensures that employees are prepared to respond in a prompt and effective manner should abnormal or emergency conditions occur. Emergency response training is consistent with emergency responses outlined in the contingency plan (Appendix 7A).

The PUREX Facility training program includes a solid waste training course that covers training requirements for shift operations managers and nuclear operators associated with PUREX Storage Tunnels activities. Chemical Processing Management (including the PUREX Facility), in cooperation with Technical Training, PUREX Health Physics, Industrial Safety and Fire Protection, and other Westinghouse Hanford organizations, is responsible for the development and administration of the comprehensive training program for personnel involved with the PUREX Facility (Figure 8-1). The PUREX Facility management is responsible for identifying training requirements for PUREX Facility personnel and for ensuring that personnel complete appropriate training. The responsibilities of the various organizations are outlined in Section 8.1.3.

An initial job analysis process was completed on the PUREX Facility, which resulted in identifying the required training to transfer equipment from the PUREX Plant to the designated PUREX Storage Tunnel in a safe and efficient manner.

A job analysis process, currently used by Westinghouse Hanford, will be used to guide reevaluations of the PUREX Facility training program to ensure that operational and dangerous waste training requirements continue to be met. These reevaluations may result in modifying or adding new material to the current training program.

8.1.1 Job Positions and Descriptions [H-1a]

Within Westinghouse Hanford, each employee is assigned a job position. Job positions for employees associated with the PUREX Facility and the transfer of dangerous waste to the PUREX Storage Tunnels are listed in the following sections with a description of associated responsibilities.

8.1.1.1 The PUREX Manager and Deputy Manager. Responsibilities of the PUREX manager and deputy manager include the following:

- Operating and maintaining the PUREX Plant in compliance with U.S. Department of Energy directives, Westinghouse Hanford policies and procedures, and approved safety documentation
- Complying with all effluent and hazardous waste policies, procedures, and regulations
- Recruiting and developing a trained cadre of managers, professionals, nonexempt, and bargaining unit employees.
- Ensuring safe and disciplined operations by trained personnel who implement policies and procedures
- Ensuring that documents related to the safe operations and maintenance of the PUREX Facility are accurate and up-to-date
- Ensuring the proper allocation of resources required to support the operation, maintenance and plant modification, and the installation of new equipment required for safety and to meet production schedules
- Providing operational requirements to support organizations
- Approving the PUREX storage tunnel checklist
- Performing the duties of the Building Emergency Director during emergencies.

8.1.1.2 PUREX Processing Manager. Responsibilities of the PUREX Processing manager include the following:

- Supervising, coordinating, and directing the activities of PUREX Shift Operations managers

- Promoting safe operations of the PUREX Facility, including the PUREX Storage Tunnels
- Enforcing safety, housekeeping, and general plant rules
- Conducting operations according to established procedures
- Meeting quality assurance requirements
- Statusing and resolving action items arising from audits, inspections, and unusual occurrences
- Supervising emergency response and recovery actions
- Maintaining administrative controls
- Supervising procedure compliance
- Ensuring compliance to operating limits and specifications
- Assuming charge during emergencies until properly relieved by Building Emergency Director.

8.1.1.3 The PUREX Shift Operations Manager. Responsibilities of the PUREX shift operations manager include the following:

- Supervising, coordinating, and directing the activities of nuclear operators
- Maintaining control over the PUREX Facility (including the PUREX Storage Tunnels) in accordance with established operating procedures, Westinghouse Hanford policies, U.S. Department of Energy Orders, and federal and state regulations
- Recognizing abnormal conditions and taking appropriate action
- Training and/or arranging training for personnel
- Maintaining essential records
- Supervising emergency response and recovery actions
- Maintaining administrative controls
- Supervising procedure compliance
- Conducting pre-job safety and planning meetings with personnel involved with the PUREX Facility, including the PUREX Storage Tunnels
- Ensuring that nuclear operators and process crane operators are trained

- Ensuring compliance to operating limits and specifications

- Ensuring radiation exposure and dangerous waste exposure are maintained ALARA

- Assuming charge during emergencies until properly relieved by upper management or the Building Emergency Director.

8.1.1.4 Nuclear Operator. Responsibilities of nuclear operators include the following:

- Performing PUREX Storage Tunnels work activities in accordance with current operating procedures

- Attending PUREX Storage Tunnels work plan and pre-job safety meetings

- Preparing the PUREX railroad tunnels for storage operations

- Operating the doors of the PUREX railroad tunnels

- Operating the remotely controlled locomotive during equipment storage

- Operating the water-fillable doors of the PUREX Storage Tunnels

- Inspecting railcar(s) before loading

- Staging railcar(s) for loading equipment.

8.1.1.5 PUREX Dispatcher. Responsibilities of the PUREX dispatchers include the following:

- Controlling personnel entrance and time spent in the PUREX tunnel areas

- Controlling the operation of the PUREX railroad tunnel doors

- Controlling the operation of the PUREX Storage Tunnel doors

- Notifying the Hanford Patrol when PUREX railroad tunnel doors are to be opened/closed

- Notifying the Hanford Patrol when PUREX Storage Tunnel doors are to be opened/closed

- Contacting the power operators when PUREX railroad tunnel doors are to be opened/closed for ventilation balance control

- Contacting PUREX power operators when PUREX Storage Tunnel doors are to be opened/closed for ventilation balance control

- Responding to all panel alarms.

8.1.1.6 Planner. Responsibilities of the planners include the following:

- Reviewing all work packages for proper documentation
- Preparing work plans for the transfer of equipment to the PUREX Storage Tunnels
- Assembling necessary work and job permits and documentation
- Arranging for railcars
- Participating in work plan and pre-job safety meetings.

8.1.1.7 Health Physics Supervisor. Responsibilities of the health physics supervisors include the following:

- Providing health physics support for PUREX Storage Tunnels operations
- Providing current radiation work permits for all personnel working in the PUREX Facility
- Overseeing on-the-job training for health physics technicians
- Providing direction and guidance to PUREX Facility management concerning radiological conditions
- Providing immediate health physics support in an emergency.

8.1.1.8 Health Physics Technician. Health physics technicians include health physics technician-trainees, health physics technicians, and senior health physics technicians. Responsibilities of the health physics technicians include the following:

- Operating radiation and contamination sampling systems
- Issuing supplemental dosimeters
- Providing dose rate monitoring support
- Surveying personnel out of radiation areas
- Maintaining all radiation equipment records
- Prescribing protective clothing necessary to perform work in radiation and contamination areas
- Collecting air samples
- Locating radiation and contamination boundary perimeters for nuclear operators when fences and barriers are erected
- Responding to all radiation alarms

- Performing routine surveillance

- Documenting all support provided for personnel at the PUREX Facility, including the PUREX Storage Tunnels

- Overseeing work activities to ensure exposure of personnel to radiation is ALARA.

8.1.1.9 PUREX Facility Engineering Manager and PUREX Facility Cognizant Engineer. Responsibilities of the PUREX Facility engineering managers and PUREX Facility cognizant engineers include the following:

- Preparing and approving engineering design documents and drawings that are in compliance with applicable policies, procedures, and instructions and are in accordance with recognized national standards and codes

- Preparing all engineering change notices

- Maintaining and updating design engineering drawing files

- Preparing and approving equipment and material specifications for new design and equipment purchase requisitions, including quality statements and impacts

- Performing bid reviews on new designs, equipment, and materials and approving vendor bids and/or qualifications

- Acting as the 'point of contact' for resolution and disposition of nonconformance material and equipment

- Preparing design criteria, performing and approving design analysis, and assigning impact levels on designs

- Preparing and/or approving excavation permits and tie-in permits

- Analyzing and/or approving, with concurrence of cognizant, maintenance, and process engineers, the spare capital equipment requirements based on anticipated failures for PUREX Plant canyon jumpers, pumps, agitators, and major pieces of PUREX Plant equipment

- Acting as the 'point of contact' for design review and review comment record disposition

- Assisting in resolving plant equipment problems, when required.

8.1.1.10 PUREX Nuclear Facility Safety Manager. Responsibilities of the PUREX Nuclear Facility safety manager include the following:

- Reviewing work packages to ensure nuclear safety

- Reviewing and approving quality level documents

- Providing oversight of work activities.

8.1.1.11 **PUREX Quality Assurance Manager.** Responsibilities of the PUREX Quality Assurance manager include the following:

- Reviewing and approving quality level documents

- Reviewing and approving work packages to ensure adequacy of quality provisions

- Reviewing work permits

- Providing quality planning to ensure that requisite quality is attained

- Ensuring compliance with technical requirements, including all U.S. Department of Energy-approved requirements and applicable codes and standards

- Investigating, analyzing, and evaluating all reported nonconformances from approved technical requirements

- Approving disposition actions defined by nonconformance reports for all nonconforming items

- Reviewing status reports, audit reports, inspection reports, nonconformance reports, and unusual occurrence reports to determine existing or potential problems

- Establishing inspection procedures and controls that provide data necessary to resolve disposition of nonconformance or other quality problems

- Obtaining commitments to take corrective action to solve root causes of problems and providing follow up to ensure the effectiveness of actions taken

- Reviewing and approving engineering drawings, specifications, and other technical documents specifying design and fabrication requirements, and changes thereto, to ensure adequacy of definition of quality provisions

- Planning and performing quality assurance surveillance of individual organizations to assess compliance with quality requirements

- Issuing reports of findings and providing follow up as required to effect timely implementation of necessary corrective actions.

8.1.1.12 PUREX Quality Control Manager. Responsibilities of the PUREX Quality Control manager include the following:

- Determining quality control inspection requirements and procedures
- Preparing audit reports, inspection reports, and noncompliance reports for existing or potential problems
- Planning and performing surveillance of PUREX Facility activities
- Providing monitoring and oversight of PUREX Facility work activities
- Reviewing and approving work packages and checklists.

8.1.1.13 Industrial Safety Manager. Responsibilities of the Industrial Safety manager include the following:

- Reviewing and approving entry into the PUREX Storage Tunnels
- Reviewing and approving work plans and packages
- Approving the PUREX storage tunnels checklist.

8.1.1.14 Hanford Fire Department. Responsibilities of the Hanford Fire Department include the following:

- Responding to emergencies
- Providing fire suppression for fires and/or explosions
- Providing control and containment of nonradioactive and mixed material accidents and/or incidents
- Providing emergency medical attention for injured personnel.

8.1.2 Training Content, Frequency, and Techniques [H-1b]

This section provides an overview of job-specific training provided to personnel in job positions discussed in the previous sections. In addition to normal plant conditions, personnel with these job positions are instructed on communication and alarm systems and the proper response to abnormal conditions and emergencies such as fire, radiological incidents, dangerous waste incidents, and shutdown of operations.

8.1.2.1 Overview of Training for Specific Positions. All PUREX Facility personnel receive applicable company-general, plant-specific, and job-specific training. The courses are provided in classroom settings, on-the-job training, self-study units, and computer-based training. Tables 8-1 through 8-6 relate job position to the individual training courses. The sections that follow provide an overview of job-specific training.

8.1.2.1.1 PUREX Manager and Deputy Manager Training. The PUREX manager and deputy manager complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. These courses include the implementation of the PUREX Facility contingency plan, and the use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.2 PUREX Processing Manager Training. The PUREX Processing managers complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures (including implementation of the contingency plan) and the use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.3 The PUREX Shift Operations Manager Training. The PUREX shift operations managers must complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures (including implementation of the contingency plan) and use of PUREX Facility emergency and monitoring equipment.

Shift operations managers are required to be certified for assigned jobs (e.g., solid waste handling). Those who are certified have completed appropriate dangerous waste training. Shift operations managers must recertify for their assigned jobs at least biennially. In addition to the requalification test, they must complete emergency procedures and abnormal plant conditions tests annually. The combination of requalification tests and the emergency procedures and abnormal plant conditions tests ensures that shift operations managers continue to comply with annual emergency training requirements.

8.1.2.1.4 Nuclear Operator Training. Nuclear operators must complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures (including implementation of the contingency plan) and inspection and use of PUREX Facility emergency and monitoring equipment.

Nuclear operators are required to be certified for assigned jobs (e.g., solid waste handling). Those who are certified have completed appropriate dangerous waste training. Operators must recertify for their assigned jobs at least biennially. They must complete their progression tests (general radio-chemical operator and plant-specific courses) at least annually. Once a nuclear operator reaches the nuclear process operator level, the progression tests are referred to as requalification tests and are a biennial requirement supplemented by an intervening biennial emergency procedure and abnormal plant conditions test. The combination of requalification tests and the emergency procedures and abnormal plant conditions tests ensures that nuclear process operators continue to comply with the annual emergency training requirements.

8.1.2.1.5 PUREX Dispatcher Training. PUREX dispatchers must complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures (including

implementation of the contingency plan) and inspection and use of PUREX Facility emergency and monitoring equipment.

PUREX dispatchers are nuclear operators who are required to be certified for assigned job (e.g., dispatcher). Those who are certified have completed appropriate dangerous waste training. Dispatchers must recertify for their assigned jobs at least biennially. They must complete their progression tests (general radio-chemical operator and plant-specific courses) at least annually. Once a nuclear operator (dispatcher) reaches the nuclear process operator level, the progression tests are referred to as requalification tests and are a biennial requirement supplemented by an intervening biennial emergency procedure and abnormal plant conditions test. The combination of requalification tests and the emergency procedures and abnormal plant conditions tests ensures that nuclear process operators continue to comply with the annual emergency training requirements.

8.1.2.1.6 Planner Training. Planners complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures (including the implementation of the contingency plan) and use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.7 Health Physics Supervisor Training. Health physics supervisors must complete specific courses that prepare them for work assignments. These courses address PUREX Facility management procedures (including implementation of the contingency plan) and use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.8 Health Physics Technician Training. The health physics technicians must complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures (including implementation of the contingency plan) and use of PUREX Facility emergency and monitoring equipment.

The health physics technicians are required to be certified for their work assignments. The health physics technicians must certify for the level of assigned work (i.e., health physics technician-trainee, health physics technician, and senior health physics technician must complete the next-level certification tests between 15 and 18 months of arrival at the current level). Once a health physics technician reaches the senior health physics technician level, recertification is required at least biennially thereafter. The health physics technician also must complete corresponding general and specific on-the-job training for each level. The health physics technician must complete the appropriate on-the-job training at least every 4 years thereafter. All health physic technicians must comply with the emergency procedures and abnormal plant conditions training requirements and at least annually complete the hazardous worker training refresher course. Health physics technicians complete the training requirement with a written test or an on-the-job training checklist in alternating years.

8.1.2.1.9 PUREX Facility Engineering Manager and PUREX Facility Cognizant Engineer Training. The PUREX Plant engineering manager and

cognizant engineer complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. These courses include the implementation of the PUREX Facility contingency plan, and the use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.10 PUREX Nuclear Facility Safety Manager Training. The PUREX Nuclear Facility safety managers complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. These courses include the implementation of the PUREX Facility contingency plan, and the use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.11 PUREX Quality Assurance Manager Training. The PUREX Quality Assurance managers complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. These courses include the implementation of the PUREX Facility contingency plan, and the use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.12 PUREX Quality Control Manager Training. The PUREX Quality Control managers complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. These courses include the implementation of the PUREX Facility contingency plan, and the use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.13 Industrial Safety Manager Training. The Industrial Safety managers complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. These courses include the implementation of the PUREX Facility contingency plan, and the use of PUREX Facility emergency and monitoring equipment.

8.1.2.1.14 Hanford Fire Department Training. The Hanford Fire Department personnel complete specific courses that prepare them for their work assignments. These courses address PUREX Facility management procedures, U.S. Department of Energy directives, Westinghouse Hanford policies, and federal and state regulations. These courses include the implementation of the PUREX Facility contingency plan, and the use of PUREX Facility emergency and monitoring equipment.

The Hanford Fire Department firefighters training meets the requirements of the National Firefighters Protection Association [NFPA Paragraph Q of 472 and NFPA 1001 (NFPA 1989)], 29 CFR 1910.1200, 1910.120, and the Washington State requirements for emergency medical personnel response.

8.1.2.2 Training Matrix: Job Positions and Training. The PUREX Facility training program encompasses company-general, plant-specific, and job-specific training courses. Tables 8-1 through 8-6 relate job position to individual training courses.

Some courses are introductory and must be completed one time only (often referred to as orientation); other introductory courses are the first course in a program. Continuing courses are those that must be repeated according to a specified frequency.

8.1.2.3 Training Course Descriptions. Appendix 8A contains brief descriptions of selected courses, including descriptions of the target audience, instructional technique, evaluation method, length of course, and frequency of retraining.

8.1.3 Training Director [H-1c]

There is no one individual designated as training director at Westinghouse Hanford. This responsibility is shared among Chemical Processing Management, Technical Training, PUREX Health Physics, and Industrial Safety and Fire Protection. The responsibilities of the various organizations are outlined in the following sections. Using the system noted in Figure 8-1, PUREX Facility management can access training resources and experts in many different areas of dangerous waste and industrial safety rather than relying on the knowledge of one person or a small number of individuals.

8.1.3.1 The PUREX Facility Management Responsibilities. Management training responsibilities of the PUREX Facility include the following:

- Setting training requirements for each position
- Requesting and/or conducting training
- Keeping field training records and certifications
- Tracking retraining.

8.1.3.2 Technical Training Responsibilities. Technical Training, in cooperation with Industrial Safety and Fire Protection, is responsible for development and administration of the comprehensive safety training program for persons involved with the PUREX Facility. Chemical Processing technical training, in cooperation with PUREX Facility management, develops and administers the nuclear operator training program. The responsibilities for training, as applicable to the PUREX Facility, are outlined in the following.

<u>Technical Training Support</u>

- Conducting job analysis
- Operating and maintaining central training files

- Providing consultation to other training organizations regarding training development.

Safety Training

- Developing and implementing company-general training courses to comply with federal and state regulations
- Conducting hazardous material and waste handling classes
- Conducting respiratory protection classes.

Chemical Processing Technical Training

- Developing and providing study material and examinations
- Preparing and administering examinations
- Coordinating classes and other training requirements with facility management to complete and maintain certifications
- Developing and maintaining on-the-job training requirements.

Maintenance Training

- Developing training materials and providing instruction for facility maintenance personnel and process crane operators.

8.1.3.3 Health Physics Responsibilities. Training responsibilities for the health physics organization include the following:

- Establishing health physics personnel training requirements
- Developing and conducting operational health physics on-the-job training
- Maintaining health physics technician field training records and certifications
- Tracking health physics technician retraining.

8.1.3.4 Industrial Safety and Fire Protection Responsibilities. Training responsibilities for this organization include the following:

- Maintaining current knowledge of Occupational Safety and Health Administration regulations
- Ensuring facility compliance with Occupational Safety and Health Administration regulations through audits, design and procedure reviews, and surveillances

- Providing instructors for selected safety classes

- Consulting with Technical Training and facility management in the development and reevaluation of current training programs.

8.1.4 Relevance of Training to Job Position [H-1d]

The training program for the PUREX Facility was developed after completing an initial job analysis. Tasks performed by PUREX Facility personnel were identified and evaluated to determine training requirements. In addition, training needs are assessed in relation to current federal and state regulations on a continual basis. These evaluations could result in modifying or adding new material to the current training program.

Certification is required for PUREX shift operations managers and nuclear operators who work at the facility. To become certified at the PUREX Facility, an employee must successfully complete classroom training and on-the-job training. Classroom instruction is designed to provide employees with fundamental knowledge required to perform work safely at the PUREX Facility.

On-the-job training requires operations personnel to gain experience with the operating procedures. All work that is performed involving dangerous waste is done according to approved operating procedures; therefore, an understanding of procedures is crucial to ensure the proper and safe operation of the PUREX Facility. Understanding is accomplished by having individuals perform, simulate, and/or describe a particular task as directed by the appropriate operating procedure after receiving on-the-job training. The individual demonstrating required skills and knowledge is observed by another certified nuclear operator and the PUREX shift operations manager before being certified. Additionally, management must complete their certification requirements, which include self-study and on-the-job training.

8.1.5 Training to Emergency Response [H-1e]

Effective response to emergencies and familiarity with emergency equipment and emergency systems are covered under the classroom and on-the-job training requirements as outlined in Tables 8-1, 8-2, and 8-3, and in Appendix 8A.

Ecology regulations require that facility personnel be able to respond effectively to emergencies and that personnel be familiar with emergency procedures, emergency equipment, and emergency systems. Specific topics addressed include the following:

- PUREX Facility orientation

- PUREX Facility-specific training

- PUREX nuclear operator emergency procedures and abnormal plant conditions training

- PUREX shift operations manager emergency procedures and abnormal plant conditions training

- PUREX health physics technicians emergency procedures and abnormal plant conditions training.

Instruction on shutdown of the PUREX Facility is included in current operating procedures and is presented during on-the-job training.

8.2 IMPLEMENTATION OF TRAINING PROGRAM [H-2]

The PUREX Facility training program is in place and has been fully implemented. Certification for the PUREX Facility is required before employees may work unsupervised. Certification requires personnel to successfully complete identified classroom and on-the-job training requirements. Certification requires management to successfully complete self-study, classroom, and on-the-job training requirements. Training content is reviewed and updated as appropriate.

Training of new employees is to be completed within the first 6 months. After the initial training, employees are required to recertify annually. Uncertified employees are not permitted to work in the PUREX Facility without the supervision of a certified employee. The PUREX shift operations manager is responsible for ensuring new employees are trained and certifications are maintained.

Official training files for PUREX Facility employees are maintained in the Training Records Information System database. This database is managed by the Technical Training Support organization. Technical Training Support inputs the completed training records into a computer file. The computer file is accessible on a local area network to allow remote accessing of employee training records via a computer terminal. A tickler file is available from the database to inform the PUREX shift operations manager when training is within 90 days of expiration. A copy of completed training and certifications for PUREX employees is available at the PUREX Plant. Training records on former employees are kept for 3 years from the date the employee last worked at the PUREX Facility.

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Table 8-1. Company-General Training Matrix.

Course	Type	Target audience													
		OM	NO	PL	HP	HPT	PM	PC	PD	PE	NF	QA	QC	IS	FD
Radiation safety training	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Radiation safety requalification	C	X	X	X	X	1	X	X	X	X	X	X	X	X	X
Hanford Site general employee training	I,C	X	X	X	X	X	X	X	X	X	X	X	X	X	X
New employee safety training	I	2	2	2	2	2	2	2	2	2	2	2	2	2	2
On-the-job training instructor training	I	3	3	-	3	3	-	-	3	-	-	-	-	-	-
Environmental and hazardous material safety training requirements	I,C	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Building emergency director	I,C	X	-	-	-	-	X	X	-	-	-	-	-	-	-

OM = Operations manager and supervisors
NO = Nuclear operators
PL = Planners (remote/canyon)
HP = Health physics supervisor
HPT = Health physics technicians
PM = PUREX manager and deputy manager
PC = PUREX processing manager
PD = PUREX dispatcher
PE = PUREX Facility engineering manager and cognizant engineer
NF = PUREX nuclear facility safety manager
QA = PUREX quality assurance manager
QC = PUREX quality control manager
IS = Industrial safety manager
FD = Hanford Fire Department
I = Introductory course
C = Continuing course
X = Required course
1 = Completed as part of job-specific certification
2 = Required only for new employees
3 = Required as determined by management for designated personnel (Table 8-4).

Table 8-2. Plant-Specific Training Matrix.

Course	Type	Target audience													
		OM	NO	PL	HP	HPT	PM	PC	PD	PE	NF	QA	QC	IS	FD
PUREX Facility orientation	I	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PUREX Building Emergency Plan checklist	C	X	X	X	X	X	X	X	X	X[1]	X[1]	X[1]	X[1]	X[1]	X[1]

OM = Operations manager and supervisors
NO = Nuclear operators
PL = Planners (remote/canyon)
HP = Health physics supervisor
HPT = Health physics technicians
PM = PUREX manager and deputy manager
PC = PUREX processing manager
PD = PUREX dispatcher
PE = PUREX Facility engineering manager and cognizant engineer
NF = PUREX nuclear facility safety manager
QA = PUREX quality assurance manager
QC = PUREX quality control manager
IS = Industrial safety manager
FD = Hanford Fire Department
I = Introductory course
C = Continuing course
X = Required course
X[1] = Required only for personnel assigned to PUREX Facility

Table 8-3. Job-Specific Training Matrix. (sheet 1 of 2)

Course	Type	Target audience													
		OM	NO	PL	HP	HPT	PM	PC	PD	PE	NF	QA	QC	IS	FD
General radio-chemical operator training	I,C	X[a]	X	-	-	-	-	-	X	-	-	-	-	-	-
PUREX Plant-specific training	I,C	X[a]	X	-	-	-	-	-	X	-	-	-	-	-	-
Solid waste handling certification	C	X	X	-	-	-	-	-	-	-	-	-	-	-	-
Dispatcher certification	C	-	-	-	-	-	-	-	X	-	-	-	-	-	-
PUREX nuclear operator certifications	C	-	X	-	-	-	-	-	X	-	-	-	-	-	-
PUREX nuclear operators emergency procedures and abnormal plant conditions training	C	-	X[b]	-	-	-	-	-	X[b]	-	-	-	-	-	-
PUREX shift operations manager certification	C	X	-	-	-	-	-	-	-	-	-	-	-	-	-
PUREX operational safety requirements	C	X	-	-	-	-	-	X	-	-	-	-	-	-	-
PUREX shift operations manager emergency procedures and abnormal plant conditions training	C	X	-	-	-	-	-	-	-	-	-	-	-	-	-
Health physics technician-trainee certification	I	-	-	-	-	X[c]	-	-	-	-	-	-	-	-	-
Health physics technician-trainee general on-the-job training	C	-	-	-	-	X[d]	-	-	-	-	-	-	-	-	-
Health physics technician-trainee PUREX on-the-job training	C	-	-	-	-	X[d]	-	-	-	-	-	-	-	-	-
Health physics technician certification	I	-	-	-	-	X[e]	-	-	-	-	-	-	-	-	-
Health physics technician general on-the-job training	C	-	-	-	-	X[f]	-	-	-	-	-	-	-	-	-
Health physics technician PUREX on-the-job training	C	-	-	-	-	X[f]	-	-	-	-	-	-	-	-	-
Senior health physics technician certification	C	-	-	-	-	X[g]	-	-	-	-	-	-	-	-	-
Senior health physics technician general on-the-job training	C	-	-	-	-	X[g]	-	-	-	-	-	-	-	-	-

Table 8-3. Job-Specific Sample Training Matrix. (sheet 2 of 2)

Course	Type	Target audience													
		OM	NO	PL	HP	HPT	PM	PC	PD	PE	NF	QA	QC	IS	FD
PUREX health physics technicians emergency procedures and abnormal plant conditions training	C	-	-	-	-	X^h	-	-	-	-	-	-	-	-	-

OM = Operations manager and supervisors
NO = Nuclear operators
PL = Planners (remote/canyon)
HP = Health physics supervisor
HPT = Health physics technician
PM = PUREX manager and deputy manager
PC = PUREX processing manager
PD = PUREX dispatcher
PE = PUREX plant engineering manager and cognizant engineer
NF = PUREX nuclear facility safety manager
QA = PUREX quality assurance manager
QC = PUREX quality control manager
IS = Industrial safety manager
FD = Hanford Fire Department
I = Introductory course
C = Continuing course
X = Required course
X^a = Introductory course for shift operations managers
X^b = Only nuclear process operations must complete this course in alternating years in conjunction with the general radio-chemical operator
X^c = Required only for those health physics technicians hired into the company at the junior health physics technician level
X^d = Required for junior health physics technicians, health physics technologists, and senior health physics technologists
X^e = Required only for those health physics technologists hired into the company at the health physics technologist level or who progress from the junior health physics technologist level
X^f = Required for health physics technologists and senior health physics technologists
X^g = Required for senior health physics technologists only
X^h = Required for health physics technician-trainees, health physics technicians, and senior health physics technicians

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9.0 EXPOSURE INFORMATION REPORT 9-1

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9.0 EXPOSURE INFORMATION REPORT

The PUREX Storage Tunnels are being permitted as a miscellaneous unit under the provisions of 40 CFR 264 Subpart X. These regulations require that miscellaneous unit permit terms and provisions address appropriate requirements provided for other treatment, storage, and/or disposal facilities.

Appropriate requirements for a container storage facility are addressed for the PUREX Storage Tunnels because its construction and operation most closely resemble this type of facility. The PUREX Storage Tunnels do not treat, store, or dispose of waste in a surface impoundment or landfill as defined in 40 CFR 270.10 and RCRA, Section 3019; therefore, exposure information is not required.

This Part B is written under the assumption that authority for administering Subpart X will be extended to Ecology by the time the PUREX Storage Tunnels permit is finalized and issued.

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CONTENTS

10.0 WASTE MINIMIZATION PLAN 10-1

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10.0 WASTE MINIMIZATION PLAN

The PUREX Storage Tunnels receive waste for storage from the PUREX Plant. No dangerous waste is generated in the PUREX Storage Tunnels. Waste minimization is performed before transfer of the waste out of the PUREX Plant. A PUREX Plant waste minimization plan [WHC-SD-WM-EV-021, Rev. 0 (WHC 1989c)] is currently in effect. This waste minimization plan, or a variation of it, will be included in the PUREX Plant Dangerous Waste Permit Application.

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900921.0816

11.0 CLOSURE AND POSTCLOSURE REQUIREMENTS [I]

This chapter presents the closure plan for the PUREX Storage Tunnels. This plan is based on the results of an alternatives engineering study included in Appendix 11A. This engineering study considered two categories of disposal alternatives: (1) clean closure of the storage tunnels by retrieving the equipment and (2) in situ disposal. The following alternatives were considered in detail:

- Backfill
- Grout injection
- Gravel backfill with grout injection
- Retrieval with disposal in the PUREX Plant
- Retrieval, process in the PUREX Plant, and disposal at appropriate disposal unit
- Retrieval, process at the Waste Receiving and Processing Facility, and disposal at appropriate disposal unit
- Retrieval, process, and disposal at offsite disposal facility
- Constructing a new unit onsite for treatment and disposal of the waste.

The results of the engineering study indicated that the preferred course of action is clean closure, using the alternative involving 'retrieval, process in the PUREX Plant, and disposal at appropriate disposal unit.' A no action alternative was not considered viable within the regulatory framework governing the disposal of the equipment.

As part of the clean closure of the PUREX Storage Tunnels, it will be demonstrated that dangerous waste or waste residues above acceptable closure performance standards do not remain in the PUREX Storage Tunnels. Closure of the PUREX Storage Tunnels will be performed in conjunction with the operable units that include the tunnels, i.e., 200-PO-1 and 200-PO-2. Because it is planned that the PUREX Storage Tunnels will be clean closed, postclosure activities are not applicable to this closure strategy.

The closure of the PUREX Storage Tunnels will take place after removal of the stored equipment. This removal will be done in conjunction with the final disposition of equipment from the PUREX Plant. A common equipment disposal method will be established as part of the PUREX Facility closure. If it is subsequently determined that clean closure of the PUREX Storage Tunnels is not possible or is not environmentally feasible, the closure plan will be modified to address required closure and postclosure activities as part of the final disposition of operable units (200-PO-1 and 200-PO-2).

Decommissioning activities following certification of clean closure of the PUREX Storage Tunnels are not specifically addressed in this closure plan. Decommissioning activities will be initiated when it has been established that the PUREX Storage Tunnels are no longer needed to support a Hanford Site mission. The certification of closure addressed in Section 11.2 will be submitted when all dangerous waste within Tunnel Number 1 and Tunnel Number 2 has been removed to meet the closure performance standards identified in Section 11.1.1.

11.1 CLOSURE PLAN [I-1]

As currently envisioned, preclosure and closure activities will be conducted in three phases.

- Phase I
  - Retrieval of stored equipment
  - Transfer of equipment to a processing area of PUREX Plant
  - Decontamination of railcars with transfer to a Hanford Site unit for disposal
  - Decontamination and dismantling of stored equipment including dangerous waste removal and disposal

- Phase 2
  - Sampling of tunnels for dangerous waste
  - Evaluation of sample analysis data
  - Determination of remedial action and closure activities
  - Performance of remedial action and closure

- Phase 3
  - Verification of remedial activities
  - Performance of additional remedial activities as necessary
  - Closure certification.

11.1.1 Closure Performance Standard [I-1a]

This section describes the performance standards to be applied to the PUREX Storage Tunnels.

Clean closure of the PUREX Storage Tunnels will eliminate the need for postclosure maintenance. An authoritative sampling program will be conducted following the equipment retrieval operations to verify that no significant contaminant residues remain. The evaluation of significance will be based on considerations of the concentration levels that are deleterious to human health and the ecosystem, and includes exposure models, toxicity, and carcinogenicity thresholds. These considerations also are applicable to the operable unit activities for 200-PO-1 and 200-PO-2. Clean closure will allow the PUREX Storage Tunnels to be used for other nondangerous waste activities in the future as required. Decommissioning of the tunnels after clean closure is not addressed in this chapter as the

determination for ultimate decommissioning should be integrated with the 200-PO-1 and 200-PO-2 operable unit closure activities.

11.1.1.1 **Performance Standard [I-1a(2)].** This plan has been developed to close the PUREX Storage Tunnels in a manner that meets the following closure performance standards of WAC 173-303-610(2)(a).

- Minimize the need for future tunnel site maintenance.
- Control, minimize, or eliminate to the extent necessary to protect human health and the environment, the postclosure escape of dangerous waste, dangerous constituents, leachate, contaminated run-off, or dangerous waste decomposition products to the ground, surface water, groundwater, or atmosphere.
- Return the land to the appearance and use of surrounding land areas to the degree possible given the nature of the dangerous waste activities.

The performance standards can be achieved through identification and evaluation of contamination based on soil baseline levels; health-based environmental standards; type, extent, and significance of contamination; and remedial action standards that provide for achievable cost and benefit protection of the environment and human health.

In general, these standards will be achieved by removing, to below appropriate standards (thresholds), dangerous waste from the PUREX Storage Tunnels and decontaminating or removing all equipment and soils contaminated with dangerous waste.

11.1.1.2 **Removal or Decontamination Standard [I-1a(1)].** Equipment containing dangerous waste will be retrieved for separation, processing, and treatment before disposal in an appropriate unit. Should decontamination be necessary, as determined by authoritative sampling, clean closure of the tunnels will include removal and disposal of all materials contaminated with dangerous waste [WAC 173-303-610(2)(b)].

Samples will be obtained from the gravel and soil materials from the floors of the tunnels to ensure that the environment has not been contaminated by the equipment storage operations. Should contaminants be detected above appropriate threshold values, the gravel and soil will be excavated to a depth where dangerous waste constituents are equal to or below the appropriate threshold values. Soil concentration levels will be established by soil sample analytical methods specified in SW-846 (EPA 1986) or an equivalent method.

Background threshold concentrations and significance levels will be based on information including mean concentrations and variance for each constituent of concern. Specific approaches and the criteria and assumptions implicit in establishing concentration levels that constitute significant deviation from background or other control levels will be consistent with the outcome of background discussions currently underway

with Ecology and the EPA. Background sampling will be done at the time of closure.

11.1.2 Partial Closure Activities [I-1b]

No partial closure is anticipated for the PUREX Storage Tunnels. The closure of the PUREX Storage Tunnels is to take place as part of the closure of the PUREX Plant.

11.1.3 Maximum Waste Inventory [I-1c]

The combined volume of equipment stored on the eight railcars in Tunnel Number 1 is approximately 780 cubic yards. The eight railcar capacity for Tunnel Number 1 was reached in January 1965.

As of January 1, 1990, the combined volume of equipment stored on the 17 railcars in Tunnel Number 2 is approximately 1,780 cubic yards. Tunnel Number 2 has a maximum storage space of 40 railcars. Based on projections for future equipment storage, it is anticipated that another 16 railcars of equipment will be stored in Tunnel Number 2 before PUREX Plant closure.

Because of the limitations in projecting the types of equipment to be stored in the future and the amount to be placed on the railcars, the total volume of equipment at closure is uncertain. The volume of waste within Tunnel Number 2 at closure is estimated to be approximately 3,500 cubic yards. This estimate assumes the average volume of equipment presently stored on the railcars will be representative of the future average volume of equipment on the 16 railcars anticipated to be placed in the tunnels. The quantity of mixed waste stored in the PUREX Storage Tunnels at closure also is uncertain. Assuming the 16 railcars anticipated to be placed into storage contain the same fraction of mixed waste as the railcars presently stored in the PUREX Storage Tunnels, an additional 4,220 pounds of lead, 1,100 pounds of silver, and 200 pounds of mercury will be placed into the tunnels. This will bring the total inventory of mixed waste stored in the PUREX Storage Tunnels at closure to an estimated 14,000 pounds. Changes to this estimate will be submitted as a minor modification of the permit in accordance with WAC 173-303-830(4).

11.1.4 Inventory Removal or Disposal and Decontamination of Equipment, Structures, and Soils [I-1d]

Clean closure activities will involve removal of the railcars and equipment followed by decontamination of the tunnels, as necessary, to remove residual dangerous waste identified during sampling, analysis, and data evaluation. The known dangerous waste present in the tunnels is not expected to have migrated from the railcars to the gravel and soil. The lead and silver could only be expected to migrate through fluid transport and the history of the tunnels does not indicate water infiltration and migration as a known occurrence. The mercury is contained in heavy gauge stainless steel

that would have to fail for migration to occur. Failure of the equipment would lead to the mercury contaminating the railcar, and/or the gravel ballast and soil of the tunnel floor. The evaluation of the railcars and equipment during removal activities will provide guidance for sampling. If visual evaluations indicate that there is no failure of the dangerous waste containment, the detail of the sampling plan will be less rigorous than a sampling plan that considers failed equipment and potential spillage.

The PUREX Storage Tunnels will be closed in a manner that protects public health and the environment and minimizes or eliminates the escape of waste constituents to the groundwater, surface water, or to the atmosphere. The PUREX Storage Tunnels closure plan provides for the following:

- Removal, processing, and treatment of the equipment and disposal of the dangerous waste (Appendix 11A)
- Sampling to determine concentrations of the dangerous waste constituents of concern using an authoritative sampling scheme of biased grab samples
- Soil sampling and dangerous waste decontamination activities
- Excavation and disposal of contaminated gravel and soil
- Repeat excavation and sampling as necessary until contaminated gravel and soil is removed to appropriate levels
- Decontamination of equipment used in the tunnels for performing soil and gravel removal
- Disposal of all contaminated material and rinsate generated during closure activities
- Certification that closure activities have been completed in accordance with the approved plan.

11.1.4.1 **Inventory Removal.** The PUREX Storage Tunnels preparation for closure will provide for the following:

- Remote visual and radiation surveys of the stored equipment
- Equipment retrieval and transfer
- Equipment processing for disposal.

An inventory of tunnel equipment, documented in the PUREX Facility records and briefly described in Appendix 11A, indicates that the majority of the equipment within the tunnels is categorized as remote-handled transuranic or remote-handled low-level waste. A few pieces of failed equipment are designated as containing dangerous waste constituents and are categorized as remote-handled mixed waste. Some of the equipment may be considered as transuranic waste or greater than Class C waste as defined in

10 CFR 61.55. The remote-handled category is assigned because of the size, gross contamination, and/or radiation levels associated with the stored equipment.

The PUREX Storage Tunnels equipment disposal will be performed in conjunction with the closure of the PUREX Facility. To clean close the PUREX Storage Tunnels, the equipment will be retrieved and processed in the PUREX Plant. This method, through mechanical processing and segregation, will reduce the volume of mixed waste. The majority of the processed low-level waste will be disposed of in the Low-Level Burial Grounds. The mixed waste will be processed at the Waste Receiving and Processing Facility. Transuranic waste will be certified and disposed of offsite at the Waste Isolation Pilot Project site. Because of the elevated levels of ionizing radiation contaminating the equipment and the physical size and/or configuration of the equipment, the removal of all stored equipment from the tunnels is expected to require, at a minimum, several years.

11.1.4.1.1 Initial Survey. Before initiating equipment removal from the PUREX Storage Tunnels, remote surveys will be conducted to verify layout, content, stored waste conditions and configuration, and to record the level of radiation at various locations. These surveys will require developing remote techniques not presently available at the PUREX Storage Tunnels. It is anticipated that the implementation of the remote viewing and radiation monitoring equipment will require modification of the existing tunnel configuration, such as opening ceiling ports for probes and/or robotic overhead tram devices. The survey will be initiated well in advance of PUREX Storage Tunnels closure to ensure necessary equipment development, procurement, implementation, and adequate data assimilation.

11.1.4.1.2 Retrieval and Transfer of Equipment. The equipment is stored on railcars on a single, dead-end railroad spur. Thus, removal will be in the reverse order of placement. Railcars will be retrieved one at a time by a remotely operated locomotive or other appropriate means. The locomotive will connect to the railcar to be extracted and will pull the railcar into the railroad tunnel. The southern couplers of the railcars have been disabled to prevent coupling of the railcars and to ensure only one railcar at a time is withdrawn. The northern couplers have been left intact and operational. Tunnel Number 1 railcars, located in Positions 1 and 2, are configured to be retrieved as a single unit because of the length of the equipment.

A loaded railcar will be retrieved from a tunnel and placed beneath the horizontal door of the railroad tunnel at the east end of the PUREX Plant (Figure 2-4, Chapter 2.0). Detailed remote viewing and radiation measurements will be obtained at this time to determine the possibility of containment failure during storage. Equipment will be remotely transferred from the railcar to the upper canyon area by use of the overhead crane in the canyon building. The railcar will be decontaminated and resurveyed to controlled release limits, and transported to other Hanford Site units for further decontamination, decommissioning, and ultimate disposition as part of routine nondangerous waste disposal activities. The rinsate from railcar

decontamination activities will be disposed of through the PUREX Plant permitted dangerous waste management unit.

11.1.4.1.3 Equipment Processed for Disposal. An area of the PUREX Plant (upper canyon or a process cell) will be modified to incorporate the necessary technology to process the equipment retrieved from the PUREX Storage Tunnels. Modification will include installation of remote-handling equipment, shielding, closed-circuit television equipment, and ancillary equipment necessary for radiological decontamination, size reduction, and sampling of the waste. Size reduction will be accomplished through flame cutting, water-jet cutting, plasma-arc cutting, power sawing, or other available technologies. If physical modification of the existing canyon areas is not feasible, design and development of a transportable, shielded size-reduction device, capable of being moved by an overhead crane, will be necessary to allow personnel to perform remote-size reduction. Means to radiologically decontaminate equipment also will be provided.

Large equipment will be dismantled. Size reduction will allow equipment segments to accommodate the physical and radiological constraints of approved packaging, will allow a more detailed characterization of the down-sized pieces, and will provide for a better segregation of the mixed-waste fraction of the inventory. The low-level waste will be placed in approved packaging and certified for disposal in the Low-Level Burial Grounds (in accordance with U.S. Department of Energy Order 5820.2A). Low-activity packages will be contact-handled in accordance with operating procedures and waste acceptance criteria for the burial grounds. High-activity, remote-handled low-level waste will be placed in newly designed and approved packaging for transport to the dragoff trenches in the Low-Level Burial Grounds. The dragoff box will be filled with grout at the Low-Level Burial Grounds to reduce internal voids and provide structural stability.

The transuranic waste will be packaged in accordance with the Waste Receiving and Processing Facility and the Waste Isolation Pilot Project waste acceptance criteria. The precertified transuranic packages will be transported to the Waste Receiving and Processing Facility for final certification and packaging in containers for transport to the Waste Isolation Pilot Project site.

Special waste [greater than Class C waste (10 CFR 61)] will be processed and packaged in approved packaging. This waste will be transported to an appropriate Hanford Site storage unit for storage until final disposition.

The mixed waste will be segregated from the other waste categories to reduce the volume of waste requiring processing and disposition as mixed waste. The elemental mercury waste is contained in stainless steel thermowells and is capped to prevent spillage. The EPA currently does not have a 'best available technology' for treatment and/or removal of the mercury from the thermowells. Treatment may involve either the current approach (Stickney 1989) to add zinc powder to create an amalgam, or a proposed process to mineralize the mercury (creating mercury sulfide). The amalgamation process would be easiest to initiate remotely and also would

reduce the potential for inadvertent spreading of mercury during processing and storage. The lead counterweights possibly could be refined to remove radioactive contamination. However, it is doubtful that unrestricted radiological release of the processed lead could be obtained by mechanical and/or chemical decontamination methods. The silver salts, located in the silver reactor, probably could be treated only by encapsulating the material in a cement grout that immobilizes the silver.

Radiological decontamination of mixed waste will be handled in accordance with waste management procedures using the PUREX Plant liquid waste system and solid radioactive and/or dangerous waste acceptance criteria. Waste classified after treatment as mixed waste will be placed in approved transport packaging and stored in an approved Hanford Site unit or transferred to a permitted offsite disposal facility.

11.1.4.2 Tunnel(s) Contaminated Equipment and Components. The PUREX Storage Tunnels contain dangerous waste in solid (lead, silver) and liquid (mercury) form that is mostly contained in heavy gauge stainless or carbon steel. The lead and silver waste, as well as the encapsulated mercury, does not present a credible scenario for contamination of the internal structural components, the rail or rail ballast (gravel), or the soil within the tunnels. If visual evidence of containment failure is observed during equipment removal, a phased approach to identification of contamination will be instituted based on the dangerous waste present in the equipment. Accordingly, the gravel or soil will be sampled through an authoritative, biased scheme at the perimeter of a railcar unless otherwise indicated by the above-mentioned visual evidence. The aboveground structures and equipment directly related to the tunnels also are not expected to be contaminated with the dangerous waste from the storage of equipment in the tunnels.

11.1.4.3 Decommissioning of the Storage Tunnels. Clean closure of the tunnels in accordance with WAC 173-303-610 does not mandate dismantling of the tunnel structures unless the structures are contaminated with dangerous waste. Therefore, the closure plan for the PUREX Storage Tunnels only addresses the need for certification of clean closure for the dangerous waste that was stored in the tunnels. The long-term use for the tunnels has not been specified and there may be another Hanford mission for the tunnels in the future. After a determination has been made that the tunnels are no longer needed, the final decommissioning and dismantling of the structures will be integrated into the overall closure strategy for the operable unit(s) that include the tunnels.

11.1.4.4 Uncontaminated Equipment and Components. No significant cost recovery opportunities through salvage and reuse have been identified for any of the equipment or storage tunnel components. Therefore, the uncontaminated equipment and components will be either left in place, dismantled, or removed for disposal as scrap in a permitted disposal unit.

11.1.4.5 Soil Sampling and Decontamination. The general sampling strategy is based on the model of minimal likelihood for a spill of dangerous waste to occur in the tunnels (Section 11.1.4.2).

The in-place tunnels equipment survey (Section 11.1.4.1.1), the railcar survey (Section 11.1.4.1.2), and equipment process characterization survey (Section 11.1.4.1.3) will identify locations within the tunnels for sampling. Sampling and analyses will be conducted for constituents known to have been stored at each mixed waste railcar location. An authoritative sampling scheme based on biased grab samples will be developed for sampling suspect areas. Soil samples will be analyzed for the contaminants identified in the equipment surveys.

Soil that is determined to be contaminated above appropriate standards will be removed for disposal. Soils will be placed in new U.S. Department of Transportation-approved containers, pending analysis. Soil samples will be taken again at locations in the excavated area; sample analyses will verify that contamination has been removed to the levels described in Section 11.1.1.2. Analyses will be conducted according to protocols outlined in SW-846 or an equivalent. If the soil is determined to be contaminated, soil containers will be disposed of based on the analytical results of the designating sample(s).

11.1.4.6 Decontamination of Equipment Used for Closure. The equipment used during closure activities to remove dangerous waste will be cleaned three times with a steam cleaner or other appropriate technology as required to effectively clean the surfaces. The rinsate from cleaning will be collected in approved containers, sampled, and disposed of in accordance with WAC 173-303.

11.1.4.7 Closure of Containers [I-1d(1)]. At closure, all containers will be removed from the storage tunnels. All dangerous waste residue will be removed from any local containment system components if such components are used. Any contaminated equipment or soil will be decontaminated or removed. All dangerous waste and contained rinsate will be tested and disposed of as dangerous waste or mixed waste. Sampling and testing will be conducted to ensure that no dangerous waste contamination above regulatory threshold values remains in the tunnels.

11.1.4.8 Closure of Tanks [I-1d(2)]. Operation of the PUREX Storage Tunnels does not involve the storage of dangerous waste in tanks. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

11.1.4.9 Closure of Waste Piles [I-1d(3)]. Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in piles. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

11.1.4.10 Closure of Surface Impoundments [I-1d(4)]. Operation of the PUREX Storage Tunnels does not involve the placement of dangerous waste in surface impoundments. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

11.1.4.11 Closure of Incinerators [I-1d(5)]. Operation of the PUREX Storage Tunnels does not involve the incineration of dangerous waste.

Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

11.1.4.12 Closure of Land Treatment Facilities [I-1d(6)]. Operation of the PUREX Storage Tunnels does not involve the land treatment of dangerous waste. Therefore, the requirements of this section are not applicable to the PUREX Storage Tunnels.

11.1.5 Closure of Disposal Units [I-1e]

The PUREX Storage Tunnels do not contain any piles, landfills, or surface impoundments. In addition, the waste or contaminated materials will not remain at the PUREX Storage Tunnels closure site; therefore, this section is not applicable.

11.1.6 Schedule for Closure [I-1f]

A schedule of the closure activities is presented in Figure 11-1. Closure will be completed 180 days after the last shipment of waste from the tunnels. The activities representing the greatest portion of time will be decontamination and verification sampling of the floor area(s) and related components. An estimate of 90 days is given for initial sampling and analysis tasks. This estimate assumes a rapid turnaround time of 10 working days or less for laboratory analyses. However, it is unknown how many iterations of dangerous waste decontamination will be required or if any will be required at all.

11.1.7 Extension of Closure Time [I-1g]

It is expected that the final closure of the PUREX Storage Tunnels will be completed within the 180-day period allowed by regulations, after the last shipment of waste from the tunnels. Factors such as the number of sampling iterations or the extent of radiological contamination may present information affecting the overall closure plan and may necessitate an extension beyond the 180-day period. In that case, an extension will be requested.

11.1.8 Amendments to Closure Plan

Should changes be required to the approved closure plan, an amended plan will be prepared and submitted to Ecology for approval in accordance with 40 CFR 264.112(c) and WAC 173-303-610(3)(a).

11.1.9 Certification of Closure and Survey Plat

Within 60 days of completion of closure of the PUREX Storage Tunnels, the DOE-RL will submit a certification of closure to Ecology in accordance

with WAC 173-303-610(6). This certification will be signed by an authorized representative of the DOE-RL and by an independent professional engineer registered in the state of Washington and will state that the facility has been closed in accordance with the approved closure plan. The certification will be submitted by registered mail or an equivalent delivery service. The independent registered professional engineer, who will be monitoring closure, will visit the site at least at the commencement and at the end of each activity described in the closure plan. The professional engineer will review all records, notes, analyses, files, manifests, etc., relating to the closure activities. Documentation supporting the closure certification will be retained by the DOE-RL and provided to Ecology upon request. This documentation will be maintained by the DOE-RL contact (or his successor) identified in Section 11.9 of this closure plan.

11.1.9.1 Owner/Operator Closure Certification. The DOE-RL will certify the closure of the PUREX Storage Tunnels with the following statement or a statement similar to it:

> "I, (name), an authorized representative of the U.S. Department of Energy-Richland Operations Office located at the Federal Building, 825 Jadwin Avenue, Richland, Washington, hereby state and certify that the PUREX Storage Tunnels, to the best of my knowledge and belief, have been closed in accordance with the attached approved closure plan, and that the closure was completed on (date), (signature and date)."

11.1.9.2 Professional Engineer Closure Certification. The DOE-RL will engage an independent professional engineer registered in the state of Washington to certify that the PUREX Storage Tunnels have been closed in accordance with this approved closure plan. The DOE-RL will require the engineer to sign the following statement or a statement similar to it:

> "I, (name), an independent registered professional engineer in the state of Washington, hereby certify to the best of my knowledge and belief, that I have made visual inspection(s) of the PUREX Storage Tunnels and that closure of the aforementioned unit has been performed in accordance with the attached approved closure plan. (signature, date, state professional engineer license number, business address, and telephone number)."

11.1.9.3 Survey Plat. The PUREX Storage Tunnels are planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for producing a survey plat is not applicable to the PUREX Storage Tunnels.

11.1.10 Notice to Local Land Authority

The PUREX Storage Tunnels are planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for notification to the local land authority is not applicable to the PUREX Storage Tunnels.

11.2 POSTCLOSURE PLAN [I-2]

The PUREX Storage Tunnels are planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for postclosure activities is not applicable to the PUREX Storage Tunnels.

11.3 NOTICE IN DEED [I-3]

The PUREX Storage Tunnels are planned to be clean closed. Because dangerous waste will not be left in place following the operational period, the requirement for a notice in deed is not applicable to the PUREX Storage Tunnels.

11.4 CLOSURE COST ESTIMATE [I-4]

In accordance with 40 CFR 264.140(c) and WAC 173-303, this section is not required for federal facilities. The Hanford Site is a federally owned facility for which the federal government is an operator and this section is therefore not applicable to the PUREX Storage Tunnels.

11.5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE [I-5]

In accordance with 40 CFR 264.140(c) and WAC 173-303, this section is not required for federal facilities. The Hanford Site is a federally owned facility for which the federal government is an operator and this section is therefore not applicable to the PUREX Storage Tunnels.

11.6 POSTCLOSURE COST ESTIMATE [I-6]

In accordance with 40 CFR 264.140(c) and WAC 173-303, this section is not required for federal facilities. The Hanford Site is a federally owned facility for which the federal government is an operator and this section is therefore not applicable to the PUREX Storage Tunnels.

11.7 FINANCIAL ASSURANCE MECHANISM FOR POSTCLOSURE CARE [I-7]

In accordance with 40 CFR 264.140(c) and WAC 173-303, this section is not required for federal facilities. The Hanford Site is a federally owned facility for which the federal government is an operator and this section is therefore not applicable to the PUREX Storage Tunnels.

11.8 LIABILITY REQUIREMENTS [I-8]

In accordance with 40 CFR 264.140(c) and WAC 173-303, this section is not required for federal facilities. The Hanford Site is a federally owned

facility for which the federal government is an operator and this section is therefore not applicable to the PUREX Storage Tunnels.

11.9 CLOSURE CONTACTS

The following offices (or their successors) are the official contacts for the PUREX Storage Tunnels.

U.S. Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

R. D. Izatt, Director
Environmental Restoration Division
(509) 376-5441

Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

R. E. Lerch, Manager
Environmental Division
(509) 376-5556

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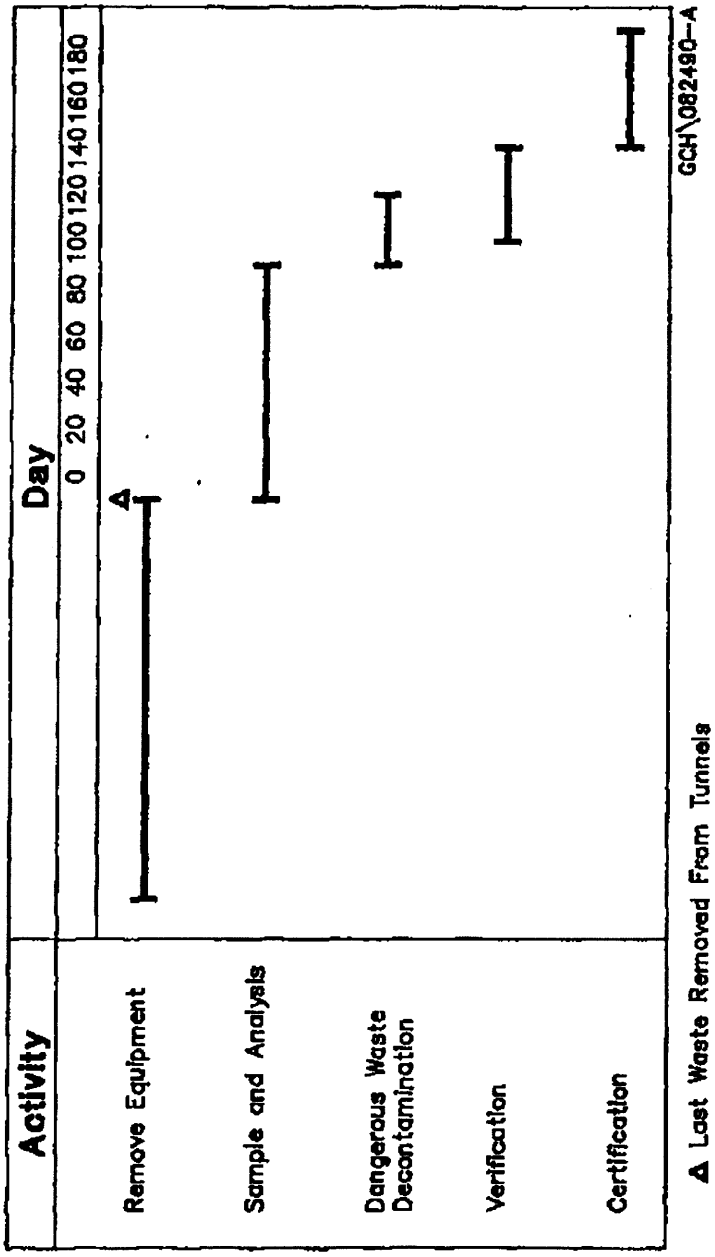

Figure 11-1. Closure Plan Schedule.

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12.0 REPORTING AND RECORDKEEPING

This chapter summarizes the PUREX Storage Tunnels reporting and recordkeeping requirements. The reports are submitted to Ecology and/or the EPA as required by applicable regulations, and required records are maintained by the PUREX Facility or other Hanford Site organizations as appropriate. Because the PUREX Storage Tunnels store only dangerous waste generated at the PUREX Plant, many of the reports and records that would be required for units accepting waste from offsite sources are not applicable. A general reporting requirement applicable to all dangerous waste management units (notification) is described, as well as reporting and recordkeeping requirements for generators, transporters, and treatment, storage, and/or disposal facilities. Reports and records applicable to the PUREX Storage Tunnels are summarized in Table 12-1.

12.1 NOTIFICATION OF HAZARDOUS WASTE ACTIVITIES

Regulations require that facilities involved in the generation or transportation of dangerous waste, or the owner or operator of a treatment, storage, and/or disposal facility, have a current EPA/State Identification Number. The Hanford Site is a single RCRA facility operating under EPA/State Identification Number WA7890008967. The PUREX Storage Tunnels, a waste management unit within the Hanford Site facility, operates under this same EPA/State Identification Number.

12.2 GENERATOR REQUIREMENTS

The Hanford Site facility complies with the generator reporting and recordkeeping regulations. The PUREX Storage Tunnels are not generators of regulated dangerous waste; therefore, generator reporting and recordkeeping requirements are not applicable.

All flushing and rinsing of equipment is conducted in the PUREX Plant before transfer of equipment to the PUREX Storage Tunnels. Reporting and recordkeeping associated with waste generated as a result of flushing and rinsing activities will be addressed in the PUREX Dangerous Waste Permit Application.

12.3 TRANSPORTER REQUIREMENTS

The Hanford Site facility, including the PUREX Storage Tunnels, is not responsible for transporting dangerous waste offsite. Transporters having their own EPA/State Identification Numbers are used to transport dangerous waste from the Hanford Site facility to a permitted offsite treatment, storage, and/or disposal facility. Waste transfers onsite, including waste to the PUREX Storage Tunnels, are recorded and tracked in accordance with Hanford Site procedures (Section 12.4.1.1.). Therefore, transporter records required by 40 CFR 263.22 and WAC 173-303-260 are not maintained by either

the PUREX Facility or by the Hanford Site. Reports such as discharge reports required by 40 CFR 263.30 and WAC 173-303-270 are not applicable.

12.4 TREATMENT, STORAGE, AND/OR DISPOSAL REQUIREMENTS

The treatment, storage, and/or disposal facility reporting and recordkeeping procedures are discussed in this section. The treatment, storage, and/or disposal reports are described, the operating record and miscellaneous support records contents are detailed, and plans submitted with this permit application and maintained at the PUREX Facility are described.

12.4.1 Reports

This section discusses the reporting requirements of WAC 173-303 and several parts of Title 40, Code of Federal Regulations relating to aspects of dangerous waste. The following are included in the reporting requirements:

- Waste manifest reports
- Annual reports
- Biennial reports
- Groundwater monitoring reports
- Contingency plan incident notifications
- Spills, discharges, and leaks reports
- Closure reports
- Postclosure reports.

Additional details of these reports are provided in the following sections. Copies of these reports are maintained by the PUREX Facility or other Hanford Site organizations as appropriate.

12.4.1.1 Waste Manifest Reports. The waste manifest is the source of two possible reports, the manifest discrepancy report and the unmanifested waste report. Because the PUREX Storage Tunnels do not receive offsite waste, waste manifest reports are not required.

Equipment transfers from the PUREX Plant to the PUREX Storage Tunnels are documented on the tunnel storage checklist (Chapter 2.0 and Appendix 2F). The checklist identifies the equipment placed into storage and is prepared for each transfer into the PUREX Storage Tunnels. Information provided in the checklist includes a description of the equipment, equipment identification number (if applicable), radiation level, tunnel position number, and transfer date. Quantities of dangerous waste and dangerous waste code numbers also are included for equipment containing dangerous waste.

Information regarding the dangerous waste is extrapolated from fabrication drawings, specifications, and process knowledge. Finalized checklists are maintained as part of the tunnel storage records located in the PUREX Facility.

All equipment transferred from the PUREX Plant to the PUREX Storage Tunnels subsequent to January 1, 1990 has been documented on the tunnel storage checklist. Equipment placed into the tunnels for storage before January 1, 1990 was documented as required by the controlling procedure in effect at the time of storage. A summary of the equipment stored in the tunnels as of January 1, 1990 is included in the tunnel inventory (Appendix 11A). Chapter 3.0, Table 3.1, includes an estimate of the quantities of dangerous waste stored in the PUREX Storage Tunnels as of January 1, 1990.

12.4.1.2 Annual Reports. The state of Washington, pursuant to WAC 173-303-390, requires an overall annual report for each facility that holds an active EPA/State Identification Number. The report for the Hanford Site facility is due to Ecology on March 1 of each year. The report contents for the PUREX Storage Tunnels include the following:

- The EPA/State Identification Number
- Name and address of the Hanford Site
- Calendar year covered by the report
- Sources of the waste stored at the PUREX Storage Tunnels
- Description and quantity of the waste stored in the PUREX Storage Tunnels
- Treatment, storage, and/or disposal methods
- Certification statement signed by an authorized representative.

The report form and instructions in the "Treatment, Storage, or Disposal Facility Annual Dangerous Waste Report--Forms 4 and 5" are used for this report.

12.4.1.3 Biennial Reports. The EPA requires, pursuant to 40 CFR 264.75, that an overall report describing each dangerous waste facility activity be submitted on March 1 of each even-numbered year. Ecology has been extended administrative responsibilities for biennial reporting as required by 40 CFR 264.75. A specific biennial report is not prepared and submitted as reporting requirements are satisfied by submittal of the annual report to Ecology.

12.4.1.4 Groundwater Monitoring Reports. The PUREX Storage Tunnels are not operated as a dangerous waste surface impoundment, waste pile, land treatment unit, or landfill as defined in WAC 173-303-645(1)(a). Therefore, no groundwater monitoring or reporting is required for this unit.

12.4.1.5 Contingency Plan Incident Notifications. The building emergency director, PUREX Facility line management, and Environmental Protection are responsible for making notifications (Appendix 7A). Notifications of all emergency situations requiring contingency plan implementation are made as required by 40 CFR 264.56 and WAC 173-303-360. Future updates of this section and the PUREX Facility emergency plan contained in Appendix 7A are planned to implement U.S. Department of Energy Order 5000.3A.

In the event of a fire or explosion, the building emergency director or PUREX Facility line management immediately must notify the Patrol Operations Center by telephone at 811. In the event of an unplanned release of hazardous or dangerous waste or materials, the building emergency director immediately will notify Environmental Protection who will notify the DOE-RL. The DOE-RL must be notified by telephone as soon as possible on the day of the event. The building emergency director or PUREX Facility line management must document the emergency on an Event Fact Sheet (Figure 12-1), which must be completed and submitted to the DOE-RL within 24 hours of discovery of the event. A copy of the Event Fact Sheet is retained at the PUREX Facility as part of the operating record.

If the PUREX Facility stops operations in response to a fire, an explosion, or a release that may present a hazard to human health or the environment, the building emergency director notifies the DOE-RL, via line management, that the PUREX Facility is operational and the emergency cleanup is complete.

The DOE-RL is responsible for three types of notifications: an immediate notification, the incident assessment report, and the facility restart notification. Details of these notifications are provided in the following sections.

12.4.1.5.1 Immediate Notification. The DOE-RL immediately will notify Ecology and the individual designated as the on-scene coordinator for the southeastern Washington area of the National Response Center (800-424-8802) if the PUREX Facility has had a fire, explosion, or release that could threaten human health or the environment outside the PUREX Storage Tunnels.

The DOE-RL report will contain the following information:

- Name and telephone number of reporter
- Name and address of the waste management unit
- Time and type of incident
- Name and quantity of material(s) involved to the extent known
- Extent of injuries if any

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- Possible hazards to human health or the environment outside the waste management unit

- Actions already taken to mitigate the situation.

12.4.1.5.2 **Incident Assessment Report.** The DOE-RL will provide a written report to Ecology within 15 days of any incident that requires implementation of the contingency plan. This report will include the following:

- Name, address, and telephone number of the owner or operator

- Name, address, and telephone number of the waste management unit

- Date, time, and type of incident

- Name and quantity of material(s) involved

- Extent of injuries if any

- Assessment of actual or potential hazards to human health or the environment where this is applicable

- Estimated quantity and disposition of recovered material that resulted from the incident

- Cause of incident

- Description of corrective action taken to prevent recurrence of the incident.

12.4.1.5.3 **Facility Restart Notification.** If the PUREX Storage Tunnels stop operations in response to a fire, an explosion, or a release that may present a hazard to human health or the environment, the DOE-RL will notify Ecology and the appropriate local authorities before operations are resumed in the affected area(s). The notification will indicate that cleanup procedures are completed and that emergency equipment is cleaned and fit for its intended use.

12.4.1.6 **Spills, Discharges, and Leaks Reports.** Because of the nature of the stored waste and the design and operation of the PUREX Storage Tunnels, the possibility of spills, discharges, and leaks of dangerous waste to the environment are considered negligible. Therefore, requirements for reporting spills, discharges, and leaks will be addressed only at closure when safe access to the tunnels is possible (Chapter 11.0, Section 11.1).

12.4.1.7 **Closure Reports.** Reports regarding the closure of the PUREX Storage Tunnels will be made in accordance with the requirements of 40 CFR 264.115 and .116 and WAC 173-303-610(6) and (9). These reports include notification of beginning of closure and certification of closure.

12.4.1.7.1 **Notification of Closure.** Ecology will be notified in writing at least 60 days before the date on which closure of the PUREX Storage Tunnels is expected to begin.

12.4.1.7.2 **Certification of Closure.** Within 60 days of completion of closure of the PUREX Storage Tunnels, a certification signed by the DOE-RL and an independent registered professional engineer will be submitted to the regulatory authority. The certification will be sent by registered mail or an equivalent delivery service. The certification will state that the PUREX Storage Tunnels were closed in accordance with the approved closure plan. Documentation supporting the independent registered engineer's certification will be supplied upon request of the regulatory authority.

12.4.1.7.3 **Survey Plat.** The PUREX Storage Tunnels are not a disposal facility. This determination eliminates the requirement for producing a survey plat.

12.4.1.8 **Postclosure Reports.** Postclosure reports required by 40 CFR 264.119 and .120, and WAC 173-303-610(9), (10), and (11) are not required because the PUREX Storage Tunnels are not a disposal facility.

12.4.2 Recordkeeping Requirements

Records retained at the PUREX Facility for the PUREX Storage Tunnels include plans described in other portions of this permit application, operating records, miscellaneous support records, and records of reports made to the regulatory authority. These records are described in the following sections.

12.4.2.1 **Permit Application Plans.** Plans described in other portions of this permit application and retained at the PUREX Facility for the PUREX Storage Tunnels include the following:

- Waste analysis data
- Contingency plan and amendments
- Training plans
- Closure plans
- Inspection plans.

These plans are maintained at the PUREX Facility for the life of the PUREX Storage Tunnels. Modifications or amendments required as a result of changing regulatory or operational requirements will be submitted to the regulatory authority and added to the plans maintained at the PUREX Facility as required.

12.4.2.2 **Operating Records.** Operating records maintained at the PUREX Facility for the PUREX Storage Tunnels include the following:

- Description and quantity of the dangerous waste placed into the PUREX Storage Tunnels for storage and the method(s) and date(s) of storage as required by 40 CFR 264, Appendix I and WAC 173-303-380

- Location of dangerous waste stored within the PUREX Storage Tunnels and the quantity at each location

- Waste analysis results

- Contingency plan incident notifications

- Inspection records.

12.4.2.2.1 **Waste Description and Quantity.** The description and quantity of dangerous waste placed into the PUREX Storage Tunnels will be maintained in the PUREX Facility records. Records describing the types and quantities of waste are maintained as part of the operating record.

12.4.2.2.2 **Waste Location.** The contents of each railcar and the specific position of the railcar within the PUREX Storage Tunnels are documented on the tunnel storage checklist. This checklist is maintained as part of the operating record.

12.4.2.2.3 **Waste Analysis Data.** Records of the information necessary for storing waste in the PUREX Storage Tunnels are maintained as part of the operating record.

12.4.2.2.4 **Contingency Plan Incident Report.** Records documenting the details of any incidents requiring the implementation of the contingency plan are maintained as part of the PUREX Storage Tunnels operating record as required by 40 CFR 264.73 and WAC 173-303-380. In addition to these records, Event Fact Sheets are generated to document incidents. The Event Fact Sheets describe all incidents, including those that are judged too minor to require the implementation of the contingency plan.

12.4.2.2.5 **Inspection Records.** Records of the PUREX Storage Tunnels general inspections are maintained at the PUREX Facility for a period of at least 3 years from the inspection date. The records include the following:

- Date and time of inspection

- Inspector's printed name and handwritten signature

- Notations of observations

- Date and nature of any repairs or other remedial actions.

12.4.2.2.6 **Waste Minimization Certification.** Annual certification by the DOE-RL that the Hanford Site is in compliance with the waste minimization requirements is inserted into the Site operating record as required by 40 CFR 264.73(b)(9).

12.4.2.2.7 **Land Disposal Restriction Records.** All of the dangerous waste stored within the PUREX Storage Tunnels is subject to land disposal restrictions. Because the PUREX Storage Tunnels receive onsite waste only from the PUREX Plant and because records associated with the operation of the PUREX Storage Tunnels are maintained at the PUREX Facility, land disposal restriction records required by 40 CFR 264.73(b)(10) and (16) are not addressed in this permit application. Procedures for preparation and maintenance of land disposal restriction records will be addressed in the PUREX Dangerous Waste Permit Application.

12.4.2.3 **Miscellaneous Support Records.** Miscellaneous support records include the following:

- Training documentation
- Liability coverage documentation
- Closure and postclosure cost estimates
- Report Records.

12.4.2.3.1 **Training Documentation.** The name of each employee and the waste management position held are maintained at the PUREX Facility. Training records document that employees have received the training or job experience required for that position. Training records on current employees are retained until closure of the PUREX Facility. Training records on former employees are retained for 3 years from the date the employee last worked at the PUREX Facility. Auditable copies of these records are maintained by the Westinghouse Hanford Technical Training organization.

12.4.2.3.2 **Liability Coverage Documentation.** In accordance with 40 CFR 264.140(c) and WAC 173-303, this documentation is not required for federal facilities. The Hanford Site is a federally owned facility for which the federal government is an operator and this documentation is therefore not applicable to the PUREX Storage Tunnels.

12.4.2.3.3 **Closure and Postclosure Cost Estimates.** In accordance with 40 CFR 264.140(c) and WAC 173-303, these estimates are not required for federal facilities. The Hanford Site is a federally owned facility for which the federal government is an operator and these estimates are therefore not applicable to the PUREX Storage Tunnels.

12.4.2.3.4 **Report Records.** The reports described in Section 12.1 and 12.4.1 are contained in records maintained either at the PUREX Facility or by other Hanford Site organizations as noted in Table 12-1. Copies of the reports will be made available upon the request of Ecology or the EPA.

Table 12-1. Reports and Records. (sheet 1 of 3)

Item	Storage	
	Retention time	Location
Notification of dangerous waste activities	Life of PUREX Facility	Hanford Site
GENERATOR REPORTS AND RECORDS:		
None required	NA[a]	NA
TRANSPORTER REPORTS AND RECORDS:		
None required	NA	NA
TREATMENT, STORAGE, AND/OR DISPOSAL REPORTS AND RECORDS:		
Permit Application Plans:		
Waste analysis plan	Life of PUREX Facility	PUREX Facility
Contingency plan and amendments	Life of PUREX Facility	PUREX Facility
Training plan	Life of PUREX Facility	PUREX Facility
Closure plan	Life of PUREX Facility	PUREX Facility
Postclosure plan	NA	NA
Inspection plans	Life of PUREX Facility	PUREX Facility
Operating Reports and Records:		
Waste description and quantity	Life of PUREX Facility	PUREX Facility
Waste location	Until closure	PUREX Facility
Waste analysis data	Life of PUREX Facility	PUREX Facility
Inspection records	Varies from 3 years from inspection date to life of PUREX Facility	PUREX Facility
Certification of waste minimization efforts	NA	NA

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Table 12-1. Reports and Records. (sheet 2 of 3)

Item	Storage	
	Retention time	Location
Land Disposal Restriction Records:		
None required	NA	NA
Waste Manifest Reports and Records:		
None required	NA	NA
Groundwater Monitoring Reports and Records:		
None required	NA	NA
Contingency Plan Incident Reports and Records:		
Immediate notification-- Event Fact Sheets	Life of PUREX Facility	PUREX Facility
Assessment report	Life of PUREX Facility	PUREX Facility
Plant restart notification	Life of PUREX Facility	PUREX Facility
Spills, Discharges, and Leaks Reports and Records:		
None required	NA	NA
Closure Reports and Records:		
Certification of closure	Life of PUREX Facility	PUREX Facility
Survey plat	NA	NA
Closure cost estimates	NA	NA
Postclosure Reports and Records:		
None required	NA	NA

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Table 12-1. Reports and Records. (sheet 3 of 3)

Item	Storage	
	Retention time	Location
Miscellaneous Support Records:		
Annual report	3 years from due date	PUREX Facility
Biennial report	NA	NA
Training documentation	Life of PUREX Facility	PUREX Facility
Liability coverage documentation	NA	NA

[a] NA = not applicable.

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13.0 OTHER RELEVANT LAWS [J]

The PUREX Storage Tunnels are operated in compliance with applicable laws and regulations. Relevant environmental laws and regulations have been reviewed, necessary notifications have been made, and necessary approvals or permits have been obtained. No additional approvals or permits for the PUREX Storage Tunnels that would require action by either Ecology or the EPA have been identified.

This chapter provides a summary of the regulatory review performed to assist Ecology in determining that the PUREX Storage Tunnels have met its obligations with respect to other federal or state laws. The major environmental laws evaluated include the following:

- *Atomic Energy Act of 1954*, as amended
- *Clean Air Act of 1977*, as amended
- *Clean Water Act of 1977*, as amended
- *Coastal Zone Management Act of 1972*, as amended
- *Endangered Species Act of 1973*, as amended
- *Fish and Wildlife Coordination Act of 1934*, as amended
- *National Historic Preservation Act of 1966*, as amended
- *Wild and Scenic Rivers Act of 1968*, as amended.

In addition, a summary of other requirements that may apply is provided. Full references for each of these acts are included in Chapter 15.0.

13.1 ATOMIC ENERGY ACT OF 1954

The Atomic Energy Act provides that the U.S. Atomic Energy Commission (succeeded by the U.S. Department of Energy for conduct of nuclear defense and research and development activities at the Hanford Site) is authorized to develop and implement regulations to govern activities related to the design, location, and operation of the U.S. Department of Energy facilities, to protect health, and to minimize danger to life or property. Mixed waste (waste containing both dangerous chemicals and radioactive materials) has been interpreted (10 CFR 962) to be regulated by both the *Atomic Energy Act* and RCRA. The nonradioactive, chemically hazardous portion of a nuclear waste is subject to regulation under RCRA; the radioactive component of the waste is regulated under the authority of the *Atomic Energy Act*.

The U.S. Department of Energy has issued several orders to govern the activities of its sites and to manage the health protection aspects of mixed wastes. These orders provide for a consistent approach to managing waste

that results from U.S. Department of Energy activities. The orders set radiation exposure limits and concentration guidelines to minimize exposure to radiation and detail standards and procedures for managing mixed wastes. The PUREX Storage Tunnels waste storage operations are carried out in accordance with these orders.

13.2 CLEAN AIR ACT OF 1977

The *Clean Air Act* protects the public health by establishing national ambient air-quality standards, setting standards for abating existing air pollution, and preventing further deterioration of air quality. These standards are implemented and enforced primarily by state and local authorities. The PUREX Storage Tunnels comply with applicable federal, state, and local requirements to control and abate air pollution. The applicable regulations include the following:

- *National Emission Standards for Hazardous Air Pollutants* (40 CFR 61) and National Emission Standards for Radionuclide Emissions From Department of Energy Facilities (40 CFR 61, Subpart H)
- Air pollution control regulations (WAC 173-400 through 495) issued under the authority of the *Washington Clean Air Act of 1967*
- *Monitoring and Enforcement of Air Quality and Emission Standards for Radionuclides* (WAC 402-80) issued under the authority of the Washington State Department of Health (RCW 70.98.080, dated December 11, 1986)
- Benton-Franklin-Walla Walla Counties Air Pollution Control Authority regulation (1980).

The PUREX Storage Tunnels comply with pollution control standards established by General Regulation 80-7 of the Benton-Franklin-Walla Walla Counties Air Pollution Control Authority (1980).

Tunnel Number 1 does not have a stack in operation; therefore, it is not a registered stack under the *Washington Clean Air Act*. Tunnel Number 2 has an operating stack (296-A-10), and the stack is registered with the state of Washington. The only potentially hazardous pollutants identified for this stack are radionuclides. All exhaust from the tunnel stack is filtered through a single-stage, high-efficiency particulate air filter before release. This ensures that the emissions generated from this stack are maintained at levels that will not adversely impact the environment.

13.3 CLEAN WATER ACT OF 1977

Operation of the PUREX Storage Tunnels will not result in the discharge of any liquid effluents that would require a National Pollutant Discharge Elimination System permit; therefore, no permits or reviews pursuant to the *Clean Water Act* are applicable.

13.4 COASTAL ZONE MANAGEMENT ACT OF 1972

The PUREX Storage Tunnels are not located in a coastal zone or shoreline area as defined by this statute. Therefore, no permits or reviews pursuant to this statute are applicable.

13.5 ENDANGERED SPECIES ACT OF 1973

The PUREX Storage Tunnels are located in the 200 East Area of the Hanford Site (see Chapter 2.0 for location information). These areas have been extensively developed during past construction activities and during reactor fuel and chemical processing activities. The location of the PUREX Storage Tunnels cannot be considered an undisturbed area or a major habitat for native plant and animal species. Also, this area is a very small fraction of the Hanford Site and hence would not play a significant role in the ecology of the Hanford Site. No listed or proposed endangered or threatened species or their habitats have been observed at the PUREX Facility; therefore, none are expected to be affected by the PUREX Storage Tunnels activities.

13.6 FISH AND WILDLIFE COORDINATION ACT OF 1934

The PUREX Storage Tunnels will not involve the impoundment, diversion, or other control or modification of any body of water. Therefore, no permits or reviews pursuant to this statute are applicable.

13.7 NATIONAL HISTORIC PRESERVATION ACT OF 1966

The PUREX Storage Tunnels affect no areas that are eligible for nomination to the National Register of Historic Places. Construction of the PUREX Storage Tunnels occurred before the passage of the *National Historic Preservation Act* (construction completed in 1956 and 1964 for Tunnel Number 1 and Number 2, respectively). Any historical information present at the location during the time of construction of the PUREX Storage Tunnels already has been altered or removed.

Any future excavations associated with the PUREX Storage Tunnels will be reviewed for the presence of archaeological resources in accordance with regulations issued pursuant to, or other requirements of, the *American Antiquities Preservation Act of 1906*; the *American Indian Religious Freedom Act of 1978*; the *Historic Sites, Buildings and Antiquities Act of 1935*; the *Archaeological and Historic Preservation Act of 1960*; and the *Archaeological Resources Protection Act of 1979*. No known cultural resource impacts have occurred from PUREX Storage Tunnels activities.

13.8 WILD AND SCENIC RIVERS ACT OF 1968

The PUREX Storage Tunnels do not affect any rivers presently designated under the *Wild and Scenic Rivers Act*.

13.9 OTHER REQUIREMENTS

The application of insecticides and herbicides on or in the immediate vicinity of the PUREX Storage Tunnels is conducted in compliance with the *Federal Insecticide, Fungicide, and Rodenticide Act of 1975*, the *Toxic Substances Control Act of 1976*, and the applicable provisions of the Washington State Water Quality Standards, WAC 173-201.

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14.0 CERTIFICATION [K]

The following certification, required by Washington Administrative Code 173-303-810(13), for all applications and reports submitted to Ecology is hereby included:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Edward D. Hollen — 8/18/90

Owner/Operator
John D. Wagoner, Manager
U.S. Department of Energy
Richland Operations Office

Date

Roger Nichols — 8/31/90

Co-operator
Roger C. Nichols, President
Westinghouse Hanford Company

Date

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Stickney, R. G., 1989, *Hanford Site Radioactive Solid Waste Acceptance Criteria*, WHC-EP-0063-1, Westinghouse Hanford Company, Richland, Washington.

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15.2 CODE OF FEDERAL REGULATIONS AND FEDERAL REGISTER

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10 CFR 962, "Radioactive Waste: Byproduct Material," Title 10, Code of Federal Regulations, Part 962, as amended, *Federal Register*, Vol. 52, p. 15937 et seq., May 1, 1987, U.S. Nuclear Regulatory Commission, Washington, D.C.

40 CFR 52, *Approval and Promulgation of Implementation Plans*, Title 40, Code of Federal Regulations, Part 52, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 61, *National Emission Standards for Hazardous Air Pollutants*, Title 40, Code of Federal Regulations, Part 61, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 260, *Hazardous Waste Management System: General*, Title 40, Code of Federal Regulations, Part 260, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 263, *Standards Applicable to Transporters of Hazardous Waste*, Title 40, Code of Federal Regulations, Part 263, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 264, *Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, Part 264, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 265, *Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities*, Title 40, Code of Federal Regulations, Part 265, as amended, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 270, *EPA-Administered Permit Programs: The Hazardous Waste Permit Program*, Title 40, Code of Federal Regulations, Part 270, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 302, *Designation, Reportable Quantities, and Notification*, Title 40, Code of Federal Regulations, Part 302, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 372, *Toxic Chemical Release Reporting: Community Right-to-Know*, Title 40, Code of Federal Regulations, Part 372, U.S. Environmental Protection Agency, Washington, D.C.

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15.3 FEDERAL AND STATE ACTS

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15.4 WASHINGTON ADMINISTRATIVE CODE

WAC 173-201, *Water Quality Standards for Water of the State of Washington*, 1987, Washington State Department of Ecology, Olympia, Washington.

WAC 173-303, *Dangerous Waste Regulations*, 1989, Washington State Department of Ecology, Olympia, Washington.

WAC 173-400 through 495, *General Regulations for Air Pollution Sources*, 1987, Washington State Department of Ecology, Olympia, Washington.

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15.5 THE U.S. DEPARTMENT OF ENERGY ORDERS

5000.3A, *Occurrence Reporting and Processing of Operations Information*, U.S. Department of Energy, Washington, D.C.

5820.2A, *Radioactive Waste Management*, U.S. Department of Energy, Washington, D.C.

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APPENDICES

2A	Hanford Site Maps	APP 2A-i
2B	Construction Photographs	APP 2B-i
2C	Construction Drawings	APP 2C-i
2D	Tunnel 1 Specifications	APP 2D-i
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3A	Classification of Residual Tank Heels in the PUREX Storage Tunnels	APP 3A-i
7A	Westinghouse Hanford Company Emergency Plan for PUREX Facility	APP 7A-i
8A	Training Course Descriptions	APP 8A-i
11A	The PUREX Storage Tunnels Engineering Study	APP 11A-i

APPENDIX 2A

HANFORD SITE MAPS

Plate 2-1. Hanford Site Map.

Plate 2-2. Topographic Map--PUREX Storage Tunnels.

Plate 2-3. Legal Description--PUREX Storage Tunnels.

9 1 1 1 3 3 7 1 9 9 0

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PLATE 2-1. HANFORD SITE MAP.

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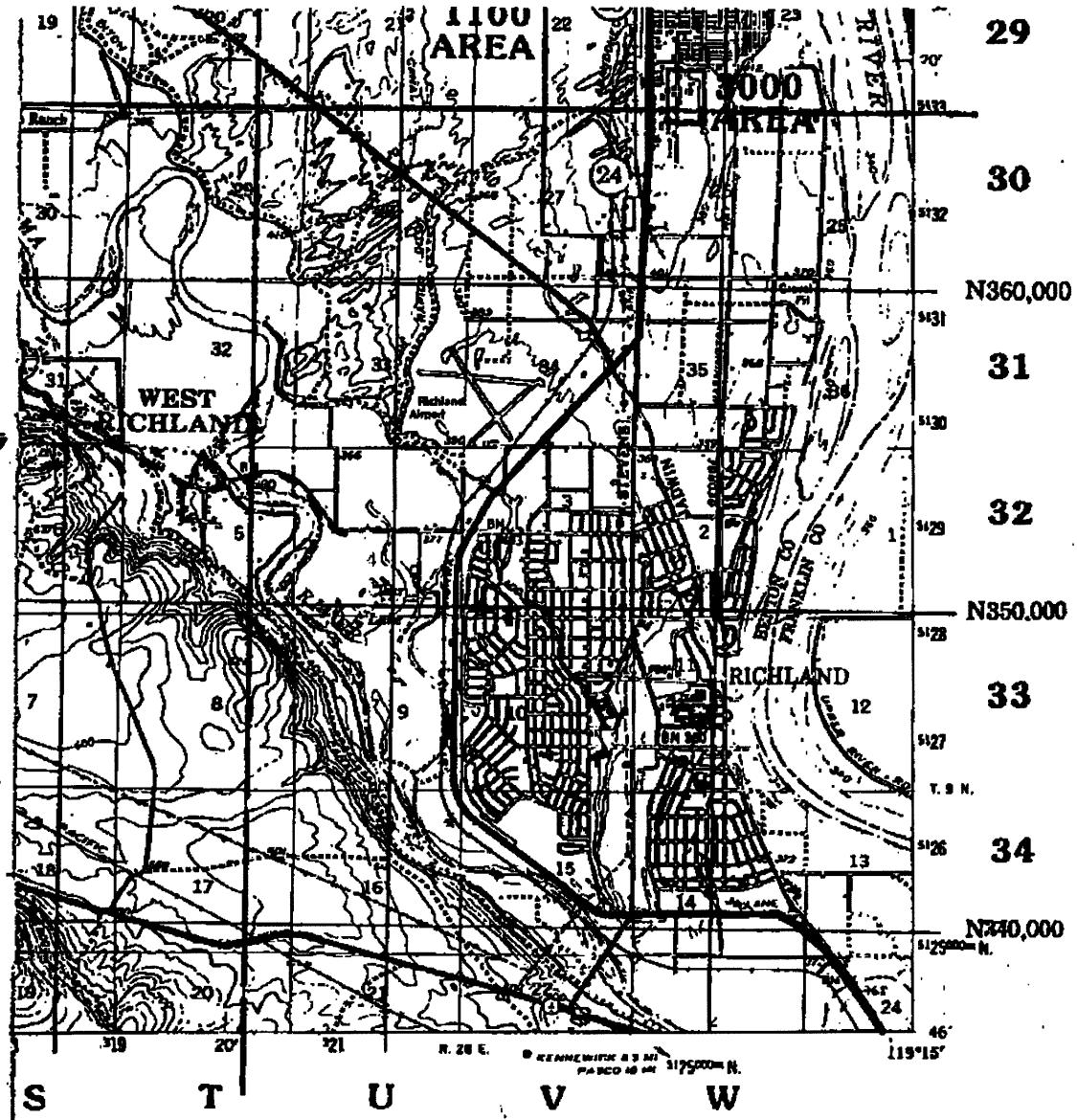

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APPD FOR QUALITY ASSURANCE	
APPD	3/89
APPD	
APPD	
RESPONSIBLE ENGINEER R.L. MARTELL	3/89
DRAFTING APPD	
CHECKED	3/3/89
DRAWN K.D. JUNT	3/87

U. S. Department of Energy
Richland Operations Office

Westinghouse Hanford Company

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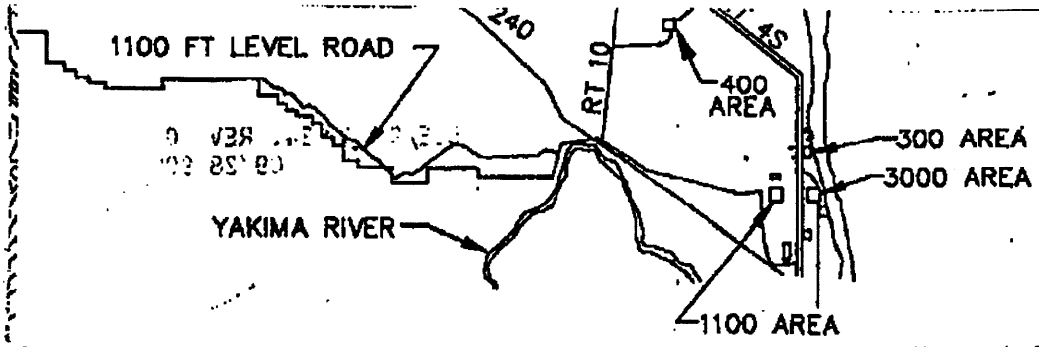
PLATE 2-2. TOPOGRAPHIC MAP--PUREX Storage Tunnels.



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WN C. ROBINSON	DATE 5-2-90	U.S. DEPARTMENT OF ENERGY Richland Operations Office Westinghouse Hanford Company
CKED Larry J. Robinson	7-26-90	
G APVD L. D. Coleman	7-26-90	TOPOGRAPHIC MAP
ENGR J. E. Salmony	7-26-90	PUREX STORAGE TUNNELS
ER S. Stanley for J. M. Peila	7/26/90	
ER		
ER		
D FOR IMPLEMENTATION		
DATE		

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PLATE 2-3. LEGAL DESCRIPTION--PUREX Storage Tunnels.

Note: In preparation. This map will define the legal boundaries of the PUREX Storage Tunnels and be certified by a professional land surveyor registered in the state of Washington.

1991

APPENDIX 2B

CONSTRUCTION PHOTOGRAPHS

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CONSTRUCTION PHOTOGRAPHS

Tunnel No. 1 Construction Photograph Showing Placement of Structural Timbers . . . . . APP 2B-1

Tunnel No. 1 Construction Photograph Showing Excavation, Track, and Concrete Structure . . . . . APP 2B-2

Tunnel No. 1 Photograph Showing Construction of Vent Shaft and Railcar Bumper . . . . . APP 2B-3

Tunnel No. 1 Photograph Showing Final Placement of Structural Timbers and Completed Vent Shaft . . . . . APP 2B-4

Tunnel No. 1 Photograph Showing Water-Fillable Door, Typical to Both Tunnels . . . . . APP 2B-5

Tunnel No. 1 Photograph Taken Following Completion of Earth Barrier . . . . . APP 2B-6

Tunnel No. 2 Photograph Showing Southern Portion of PUREX Plant Railroad Tunnel, and Interior of Tunnel No. 2 (under construction) . . . . . APP 2B-7

Tunnel No. 2 Construction Photograph Showing Water-Fillable Door Housing, Future Tunnel Entrance, and Metal Structure of the Tunnel . . . . . APP 2B-8

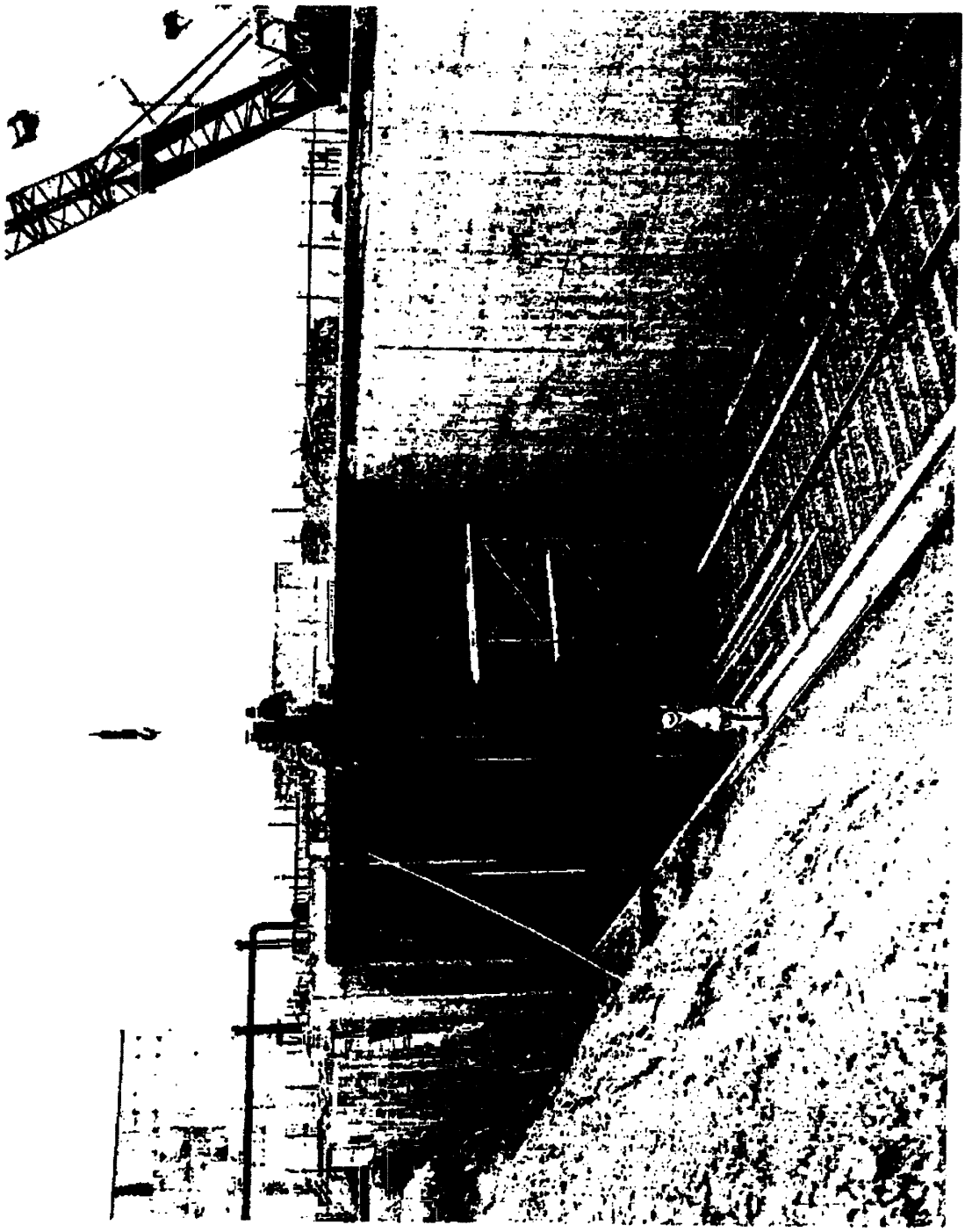
Tunnel No. 2 Photograph Showing Tunnel Side Slopes and Water-Fillable Door in Partially Closed Position . . . . . APP 2B-9

Tunnel No. 2 Construction Photograph Showing Interior of Tunnel Looking South . . . . . APP 2B-10

Tunnel No. 2 Photograph Showing Construction of Concrete Arches. Tunnel No. 1 Vent Stack in Foreground . . . . . APP 2B-11

Tunnel No. 2 Placement of Earth Barrier . . . . . APP 2B-12

Tunnel No. 2 Photograph Taken Following Final Completion of Earth Barrier. . . . . APP 2B-13

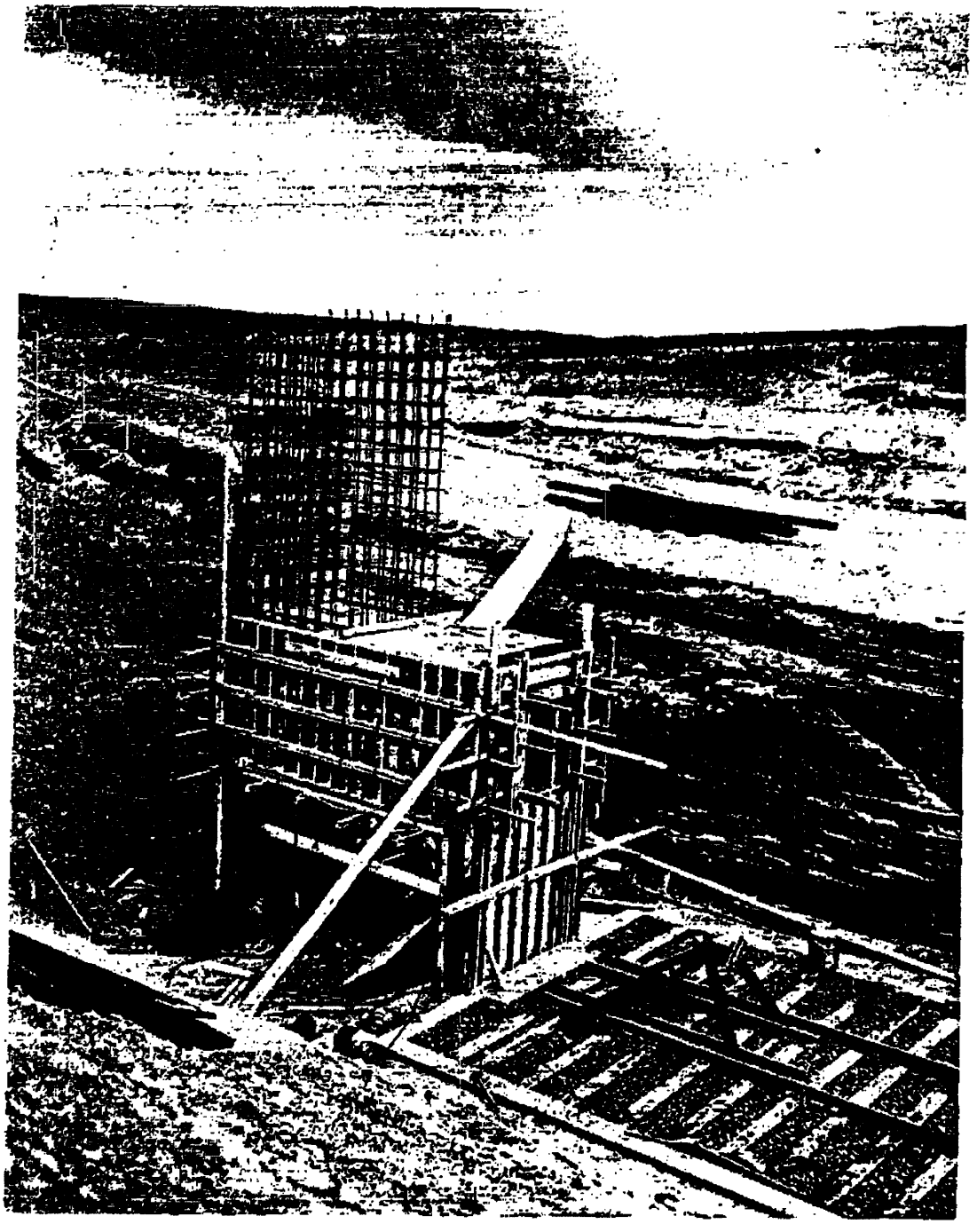


Tunnel No. 1, Photo 1

Tunnel No. 1 Construction Photograph Showing Placement of Structural Timbers.

Tunnel No. 1, Photo 2

Tunnel No. 1 Construction Photograph Showing Excavation, Track, and Concrete Structure.



Tunnel No. 1, Photo 3

Tunnel No. 1 Photograph Showing Construction of Vent Shaft and Railcar Bumper.

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Tunnel No. 1, Photo 4

Tunnel No. 1 Photograph Showing Final Placement of Structural Timbers and Completed Vent Shaft.

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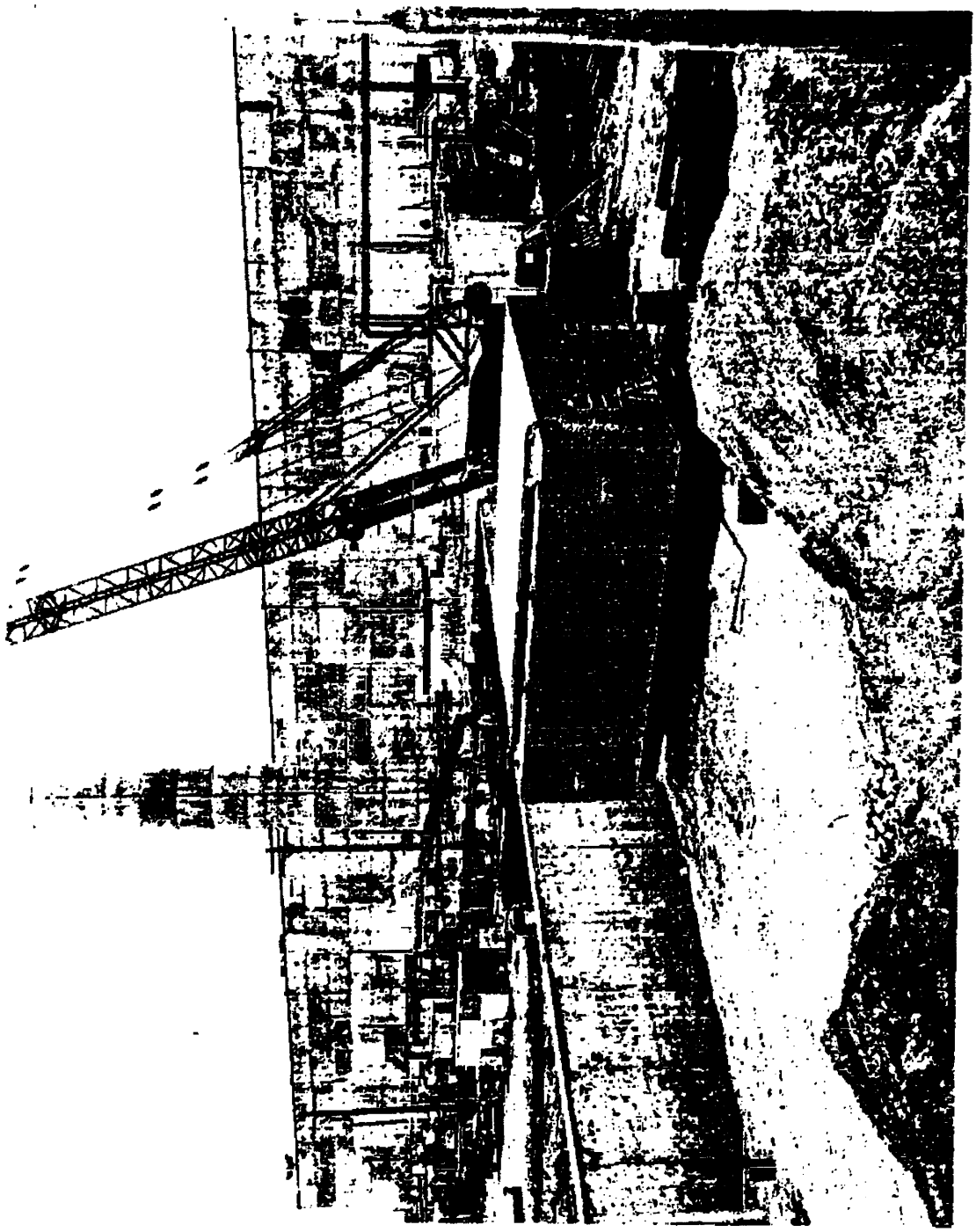


Tunnel No. 1, Photo 5

Tunnel No. 1 Photograph Showing Water-Fillable Door, Typical to Both Tunnels.

9 1 1 1 9 3 7 2 0 0 5

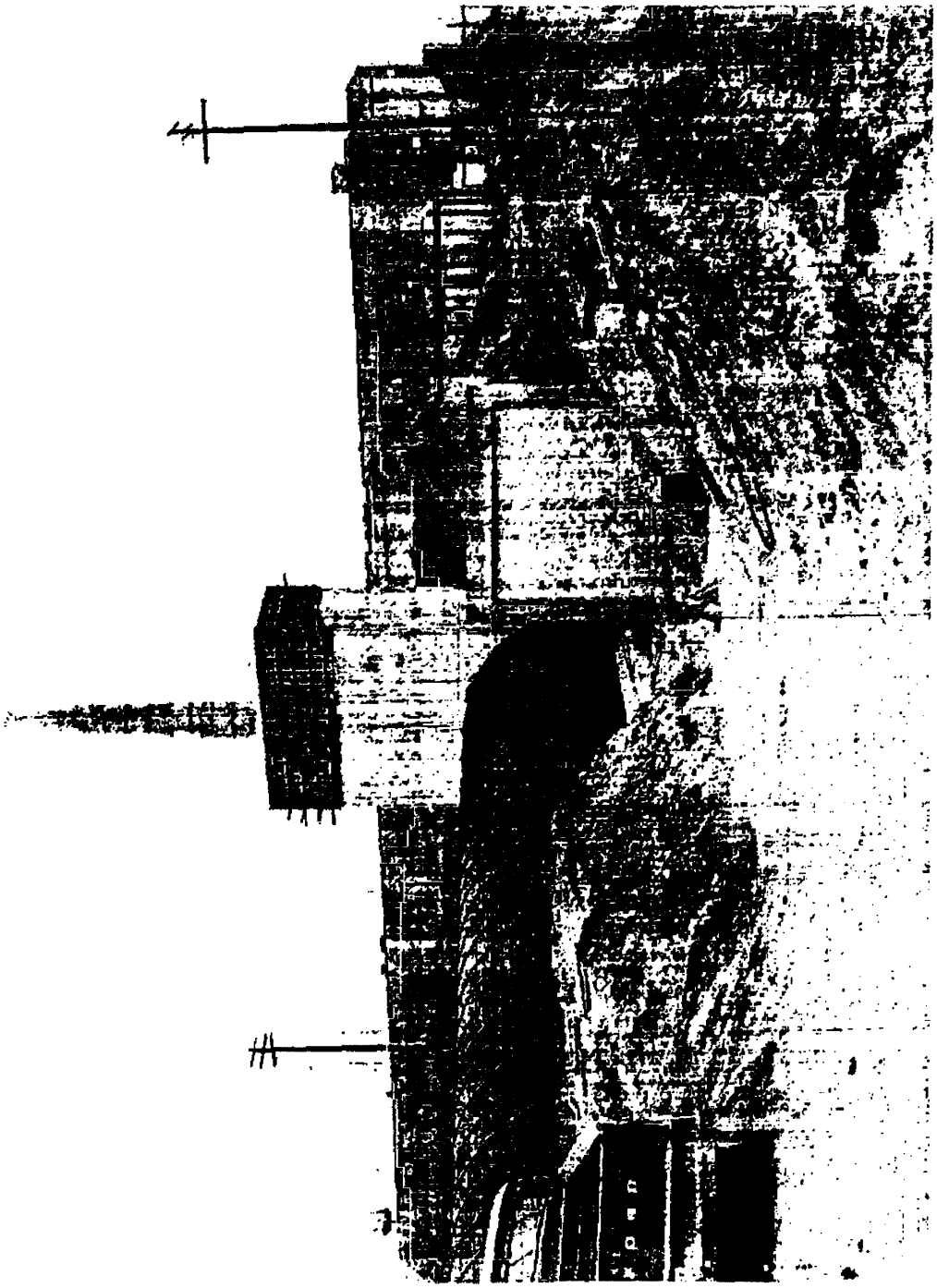
Tunnel No. 1, Photo 6

Tunnel No. 1 Photograph Taken Following Completion of Earth Barrier.

9 1 1 1 3 7 2 0 0

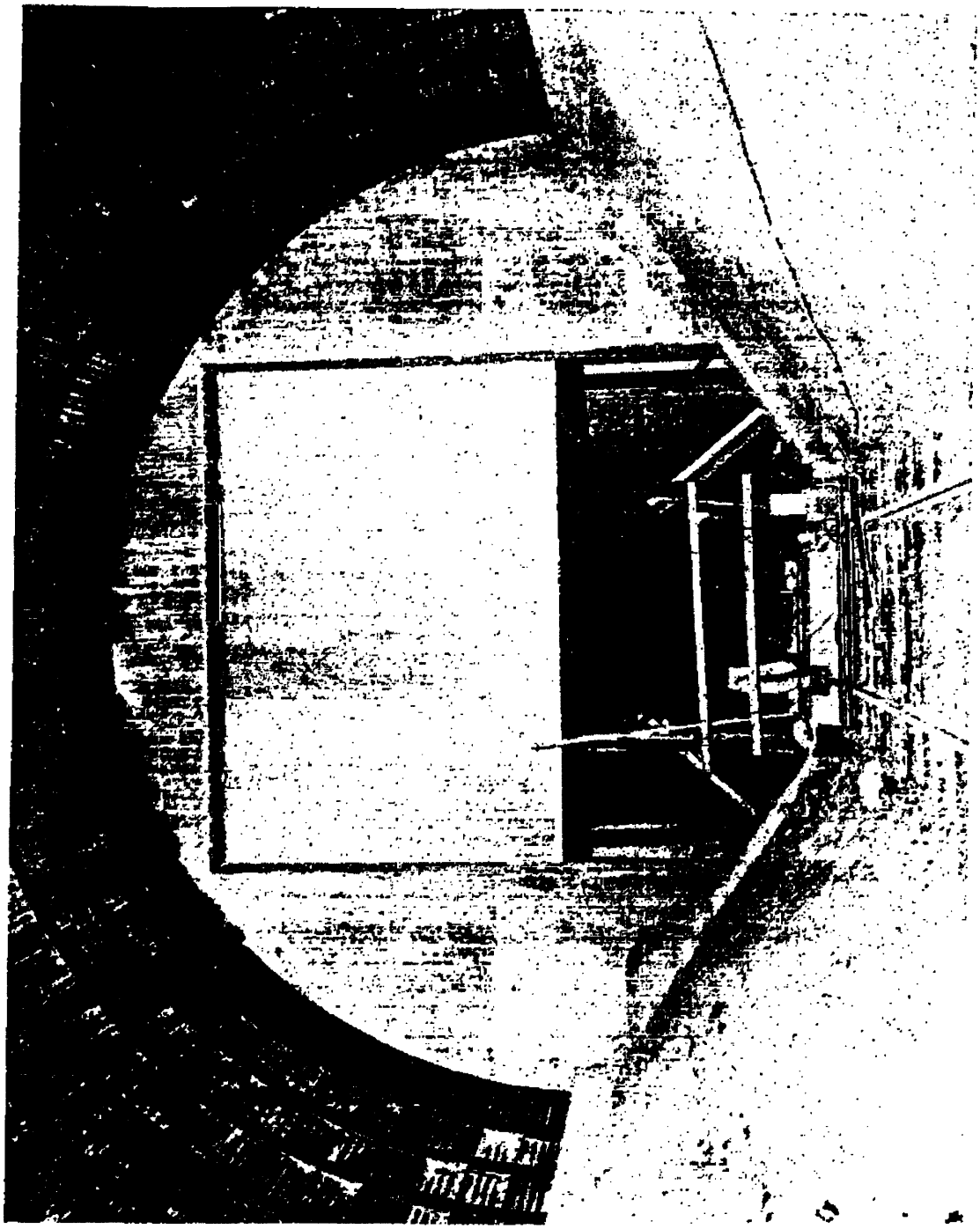
Tunnel No. 2, Photo 1

Tunnel No. 2 Photograph Showing Southern Portion of PUREX Plant Railroad Tunnel, and Interior of Tunnel No. 2 (under construction).



Tunnel No. 2, Photo 2

Tunnel No. 2 Construction Photograph Showing Water-Fillable Door Housing, Future Tunnel Entrance, and Metal Structure of the Tunnel.



Tunnel No. 2, Photo 3

Tunnel No. 2 Photograph Showing Tunnel Side Slopes and Water-Fillable Door in Partially Closed Position.

Tunnel No. 2 Construction Photograph Showing Interior of Tunnel Looking South.

9 1 1 1 3 8 7 2 0 1 0

Tunnel No. 2, Photo 5

Tunnel No. 2 Photograph Showing Construction of Concrete Arches.
Tunnel No. 1 Vent Stack in Foreground.

9 1 1 1 3 3 7 2 0 1 1

Tunnel No. 2, Photo 6

Tunnel No. 2 Placement of Earth Barrier.

9 1 1 1 3 3 7 2 0 1 2

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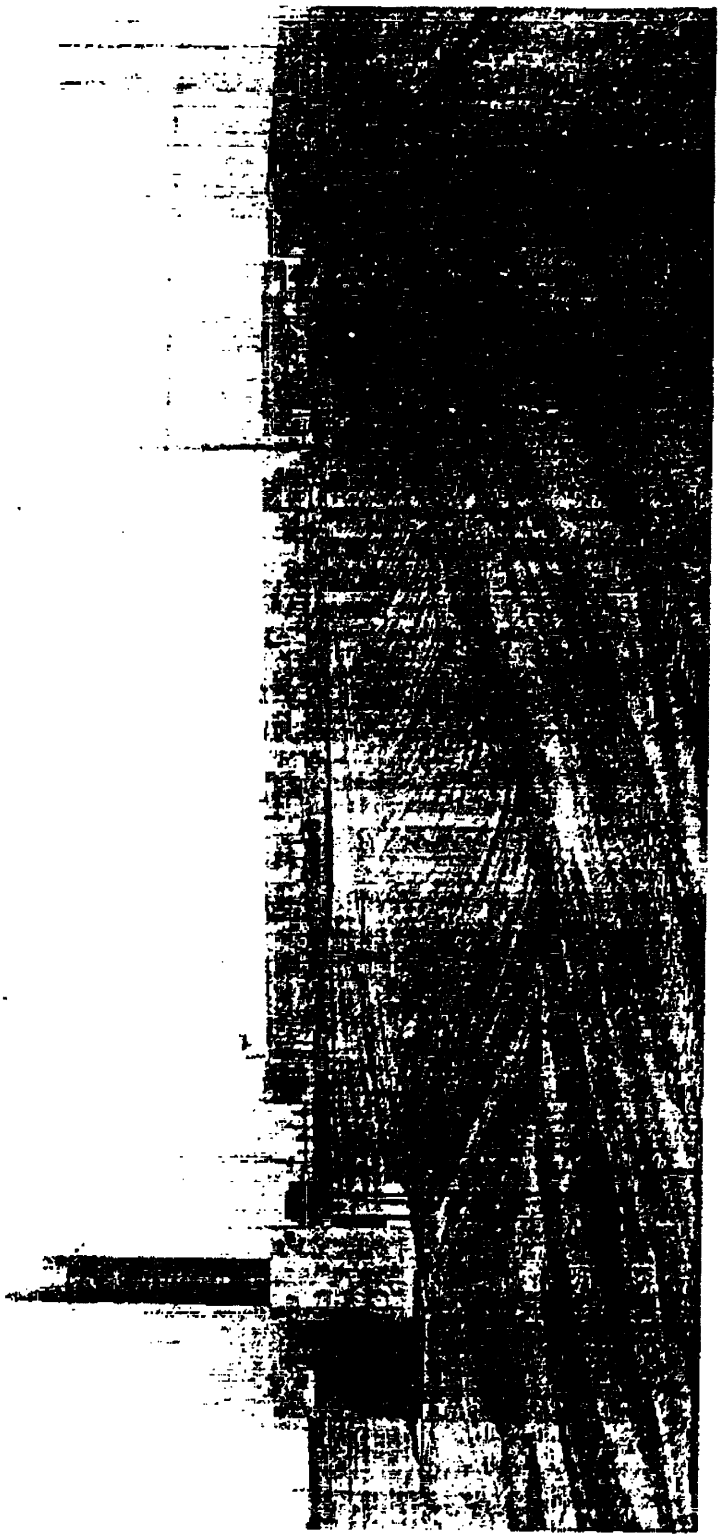

Tunnel No. 2, Photo 7

Tunnel No. 2 Photograph Taken Following Final Completion of Earth Barrier.

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Davisson, Tracy E

From: Levardi, Yvonne M
Sent: Tuesday, May 09, 2017 8:42 AM
To: Tyree, Geoffrey T; Meyer, Carrie C
Subject: Re: Heads up

I'll be there shortly

Sent from my phone, away from desk.

-------- Original message --------
From: "Tyree, Geoffrey T"
Date: 5/9/17 8:39 AM (GMT-08:00)
To: "Meyer, Carrie C" , "Levardi, Yvonne M"
Subject: Fwd: Heads up

I'm headed to EOC for PID duty...

Sent from my iPhone

Begin forwarded message:

> **From:** "Tyree, Geoffrey T" <geoffrey.tyree@rl.doe.gov>
> **Date:** May 9, 2017 at 8:36:30 AM PDT
> **To:** "Nartker, Michael (CONTR)" <Michael.Nartker@EM.doe.gov>, "Holmes, Kristen L" <Kristen.L.Holmes@rl.doe.gov>, "Heeter, Mark A" <Mark.Heeter@rl.doe.gov>
> **Cc:** "Olds, Theodore E (Erik)" <Theodore_E_Erik_Olds@rl.doe.gov>, "Brooks, Renee L" <Renee_L_Brooks@rl.gov>, "Buel, Richard D" <richard.buel@rl.doe.gov>, "Colborn, Jennifer M" <Jennifer_M_Colborn@rl.gov>, "Conrad, Patrick J" <Patrick_J_Conrad@rl.gov>, "Copeland, Jennifer L" <Jennifer_L_Copeland@rl.gov>, "Gribble, Dana C" <Dana_C_Gribble@rl.gov>, "Henderson, Destry J" <Destry_J_Henderson@rl.gov>, "Holmes, Kristen L" <Kristen.L.Holmes@rl.doe.gov>, "Johnson, Sonya E" <Sonya_E_Johnson@rl.gov>, "Millikin, Dee" <Dee_Millikin@rl.gov>, "Moss, Rae S" <Rae_Moss@rl.gov>, "Reyes, Tania" <Tania_Reyes@rl.gov>
> **Subject: Heads up**
>
> I just spoke to our Emergency Preparedness manager in our Emergency Operations Shift Office. Wanted to give you a heads up that Hanford Fire is being dispatched to the PUREX facility area, after report of a possible collapse of part of the tunnel next to PUREX (b)(5) (b)(5) A precautionary take cover of the 200 East Area has been declared (PUREX is located in the 200 East Area), and the site is moving to an emergency status with a probably (b)(5) (b)(5) to be established. I'm heading to the Federal Building to check in and assist with public affairs as needed. I'll be in touch again.
> Geoff
> Geoff Tyree
> Deputy Director, Public Affairs
> Richland Operations Office

Department of Energy
Geoffrey.Tyree@rl.doe.gov
(509) 376-4171
www.hanford.gov
www.facebook.com/hanfordsite

Davisson, Tracy E

From: Levardi, Yvonne M
Sent: Tuesday, May 09, 2017 12:49 PM
To: 'Shannon Vavra'; Heeter, Mark A; Tyree, Geoffrey T
Subject: RE: Axios press inquiry into Hanford tunnel collapse

Hi Shannon,

You can find the most up-to-date info here: http://www.hanford.gov/c.cfm/eoc/?page=290 and if you call 509 376-3322 you'll reach our Emergency Operations Center and they can provide you the information they have.

For information about the White House and the President, I would refer you to www.whitehouse.gov; for information about Secretary Perry, please contact DOE headquarters public affairs staff at 202 586-4940.

Best,
Yvonne

Yvonne Levardi
Deputy Director, Communications and Information Management
Office of River Protection, U.S Department of Energy
Desk: 509.376.8625 Cell: 509.(b)(6)

From: Shannon Vavra [mailto:shannon@axios.com]
Sent: Tuesday, May 9, 2017 12:01 PM
To: Levardi, Yvonne M ; Heeter, Mark A ; Tyree, Geoffrey T
Subject: Axios press inquiry into Hanford tunnel collapse

Hi there,

My name is Shannon Vavra and I'm a reporter at Axios. I'm emailing to inquire about more details on the Hanford site tunnel collapse. Are you able and willing to provide comment or insight on a few details for me?

Could you characterize why the tunnel collapsed and whether there were signs it might collapse?
NBC is reporting that the White House reached out to inquire about the incident. Could you provide details about that call and if Trump will be speaking with any managers and what report was given to the White House?
NBC also reported Secretary Perry has been briefed on the matter: what will his next move be?
Will Hanford be returning to normal operations and if so, when? What are the workers doing now?

I appreciate any information you can offer me! Happy to hop on the phone if that is easier.

Best,
Shannon

--

Shannon Vavra
News Desk Reporter, Axios
shannon@axios.com 773.326.8103
@shanvav

Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 1:38 PM
To: Conrad, Patrick J
Subject: FW: Ready to publish your video?

From: YouTube [mailto:noreply@youtube.com]
Sent: Tuesday, May 9, 2017 12:53 PM
To: Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Subject: Ready to publish your video?

You're almost done!
All you have to do now is publish your video.

PUREX Tunnel

Review draft

We've sent this email to geoffrey.tyree@rl.doe.gov. If you

don't want these notifications for finished uploads anymore, you can **unsubscribe here**.

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 2:31 PM
To: Conrad, Patrick J
Subject: FW: Ready to publish your video?

From: YouTube [mailto:noreply@youtube.com]
Sent: Tuesday, May 9, 2017 2:31 PM
To: Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Subject: Ready to publish your video?

You're almost done!
All you have to do now is publish your video.

Update on partial collapse of PUREX tunnel at Hanford

Review draft

We've sent this email to geoffrey.tyree@rl.doe.gov. If you

don't want these notifications for finished uploads anymore, you can **unsubscribe here**.

©2017 YouTube, LLC 901 Cherry Ave., San Bruno, CA 94066

Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 8:31 AM
To: Johnson, Sonya E
Subject: Canceling PFP meeting at 9 today

Due to emergency at PUREX tunnel

Geoff Tyree
Deputy Director, Public Affairs
Richland Operations Office
Department of Energy
Geoffrey.Tyree@rl.doe.gov
(509) 376-4171
www.hanford.gov
www.facebook.com/hanfordsite

Davisson, Tracy E

From: Buel, Richard D
Sent: Tuesday, May 09, 2017 8:45 AM
To: Tyree, Geoffrey T
Subject: Text from Hanford.gov on PUREX tunnels

The building has been vacant for nearly twenty years, but it remains highly contaminated. Its walls are surrounded by razor wire and barbed wire fences. Several rail cars used to transport the irradiated fuel rods from the Hanford nuclear reactors to the processing canyons are temporarily buried inside a tunnel near PUREX as a result of becoming contaminated.

As with the rest of the Hanford structures, PUREX is slated to be decontaminated, demolished, and some of its debris removed. The rail cars buried next to the facility will also be decontaminated, removed, and permanently buried. Although, the option of grouting the rail cars in-place within the tunnel is being evaluated since removal of the cars would entail extreme worker safety hazards and would be more costly than grouting in-place.

Davisson, Tracy E

From: Morgan Ashley <morgan.ashley@nbcrightnow.com>
Sent: Tuesday, May 09, 2017 8:52 AM
To: Tyree, Geoffrey T
Subject: PUREX Info

Hey Geoff-

Wondering if you could provide some information or maybe steer me in the right direction here. We are trying to get more info about a possible tunnel collapse at PUREX.

Feel free to give me a call 509(b)(6)

Morgan Ashley
Wake Up Northwest Anchor
morgan.ashley@nbcrightnow.com
Office: 509.737.6741
Cell: 509.(b)(6)
Facebook: www.facebook.com/MorganAshleyTV
Twitter: @KNDUMorganAsh

NBC Right Now KNDO 23 KNDU 25
Download our News App: Apple | Android | Kindle

Davisson, Tracy E

From: Wright, Allison K
Sent: Tuesday, May 09, 2017 9:18 AM
To: Tyree, Geoffrey T
Cc: Yearsley, Larry K; Ferns, Thomas W; Faust, Eric T; Farabee, Oliver A (Al); Clark, Clifford E (Cliff); Hoffman, Douglas A; Teynor, Thomas K
Subject: Washington Post - purex tunnel

FYI. A reporter from the Washington Post just called Larry Yearsley. He told them to contact you and provided him your number.

Davisson, Tracy E

From: Javier TOVAR <Javier.TOVAR@afp.com>
Sent: Tuesday, May 09, 2017 9:35 AM
To: Heeter, Mark A; Tyree, Geoffrey T
Subject: From AFP - URGENT - Hanford Challenge

Good morning. My name is Javier Tovar, I work for the international news agency AFP.
We are trying to confirm an incident reported by local media at Hanford Challenge, where hundreds of workers were in "take cover" position after a tunnel in a plutonium finishing plant collapsed early this morning.
What's the situation?
Thank you.

Javier TOVAR
West Coast Correspondent
6430 Sunset Blvd. Suite 702. Los Angeles, CA 90028 - Twitter: @tovarguedez
Tel: +1 (323) 463-0973 - Mob: +1 (213) (b)(6)

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More information regarding AFP is available online at: www.afp.com/en
To see our YouTube channel, with some of the videos we send out to TV and news clients: www.youtube.com/afp

Davisson, Tracy E

From: Daniel Oberhaus <daniel.oberhaus@vice.com>
Sent: Tuesday, May 09, 2017 9:41 AM
To: Heeter, Mark A; Tyree, Geoffrey T
Subject: Request for Comment re: tunnel collapse

Hello,

I am a reporter for VICE's Motherboard. I have tried repeatedly calling the Hanford emergency line for media with no luck. Will someone from Hanford who is able to speak to the tunnel collapse please give me a shout asap?

--
Daniel Oberhaus
480 (b)(6) (Cell)

Davisson, Tracy E

From: Katharina Stefanie <Katharina.Stefanie@bbc.co.uk>
Sent: Tuesday, May 09, 2017 9:45 AM
To: Shoop, Doug S; Smith, Kevin W (ORP); Tyree, Geoffrey T; 'Jonathan_A_Dowell@orp.doe.gov'; Conrad, Jill A; Levardi, Yvonne M; Holmes, Kristen L; 'Jason_R_Chudy@orp.doe.gov'; Riehle, Dorothy C; Meyer, Carrie C
Subject: URGENT - media question

Good Afternoon,

Katharina Werner here with BBBC. Could I please get a quick statement about this nuclear tunnel collapse?

I'm trying to understand how important this is...

Thank you,

Kat

Katharina Werner
Cell: 301(b)(6)
Office: 202.355.1768
BBC Washington
2000 M St. NW
Washington, DC 20036

Davisson, Tracy E

From: Rosenthal, Jessica <jessica.rosenthal@FOXNEWS.COM>
Sent: Tuesday, May 09, 2017 9:48 AM
To: Heeter, Mark A; Tyree, Geoffrey T; Levardi, Yvonne M
Subject: MEDIA INQUIRY

Hi there. I am writing to ask for a brief over the phone interview about the tunnel collapse at the Hanford site. I understand information may just be coming out, and details may be unclear, but I'm hoping for someone who can educate listeners regarding the site and speak more generally. Let me know if you can accommodate?

Jessica Rosenthal
Fox News Network LLC
West Coast Radio Correspondent
(310)571-2047 (office)
(310)(b)(6) (cell)

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Davisson, Tracy E

From: Katharina Stefanie <Katharina.Stefanie@bbc.co.uk>
Sent: Tuesday, May 09, 2017 9:48 AM
To: Heeter, Mark A
Cc: Tyree, Geoffrey T; Levardi, Yvonne M
Subject: URGENT - media question

Good Afternoon,

Katharina Werner here with BBBC. Could I please get a quick statement about this nuclear tunnel collapse?

I'm trying to understand how important this is...

Thank you,

Kat

Katharina Werner
Cell: 301 (b)(6)
Office: 202.355.1768
BBC Washington
2000 M St. NW
Washington, DC 20036

Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 9:52 AM
To: Tyree, Geoffrey T
Subject: New activity on your video: Hanford Live 2017

New comment on your video

Hanford Live 2017

(b)(6)

Tunnel collapse :/

Reply

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Davisson, Tracy E

From: Levardi, Yvonne M
Sent: Tuesday, May 09, 2017 10:18 AM
To: Jennifer Willen; Tyree, Geoffrey T; Digital Writers; Digital News desk
Subject: Re: Tunnel collapse

Hi Jennifer,
Please visit www.hanford.gov or call 509 376 3322 for information
Thanks,
Yvonne

Sent from my phone, away from desk.

-------- Original message --------
From: Jennifer Willen
Date: 5/9/17 10:14 AM (GMT-08:00)
To: "Tyree, Geoffrey T" , "Levardi, Yvonne M" , Digital Writers , Digital News desk
Subject: Tunnel collapse

Good afternoon,
Wondering if you can confirm any details about the Tunnel Collapse?

Also, do you happen to have any video, photos?

Thanks for your time. Please reply to all.

Jennifer Willen |Assignment Editor
w: (770) 226-2010 e: jennifer.willen@weather.com **Twitter:** @JenniferWillen

Davisson, Tracy E

From: Steve Aagaard <Steve.Aagaard@rsd.edu>
Sent: Tuesday, May 09, 2017 11:39 AM
To: Tyree, Geoffrey T
Cc: Nancy Mayer; Rick Schulte
Subject: list ?

Hello Geoff,

If I send you a list of RSD names and email addresses, could they be included in any alert notification system you have for incidents such as the one this morning with the collapsed tunnel.

Steve

Steve Aagaard
Communications Director
Richland School District
(509) 967-6008

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Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 12:53 PM
To: Tyree, Geoffrey T
Subject: Ready to publish your video?

You're almost done!
All you have to do now is publish your video.

PUREX Tunnel

Review draft

We've sent this email to geoffrey.tyree@ll.doe.gov. If you don't want these notifications for finished uploads anymore, you can unsubscribe here.

©2017 YouTube, LLC 901 Cherry Ave. San Bruno, CA 94066

Davisson, Tracy E

From: Grygiel, Chris <CGrygiel@ap.org>
Sent: Tuesday, May 09, 2017 1:04 PM
To: Tyree, Geoffrey T
Subject: Associated Press photo permission for media image

Hello Geoff

Can you confirm that DOE owns the copyright to the photo you put on the website showing the tunnel collapse? We'd like to move it on the AP wire. Thanks

http://www.hanford.gov/c.cfm/eoc/?page=290

Dear Geoff Tyree
On May 9, 2017 you provided photo(s) to AP for distribution by AP to its subscribers and customers for world-wide editorial publication.
In response to this email, please identify both the photographer and copyright owner of the photo(s) furnished to AP.
If you or your organization is the copyright holder, please confirm that you have furnished the photo(s) to AP for world-wide editorial publication by AP and its subscribers and customers in all media now known or hereafter created.
If you or your organization is not the copyright owner, please confirm that you have written authorization from the copyright owner or the owner's authorized agent to furnish the photo(s) to AP for world-wide editorial publication by AP and its subscribers and customers in all media now known or hereafter created.
Please also confirm that the photo content is an accurate rendering of what it depicts and that it has not been modified or augmented except for standard cropping and toning.
Sincerely,

Chris Grygiel
Northwest News Editor
206-682-1812
1000 Denny Way, #501
Seattle, WA 98109

AP ASSOCIATED PRESS

Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 1:11 PM
To: Tyree, Geoffrey T
Subject: New activity on your video: PUREX Tunnel Collapse Update

New comment on your video

PUREX Tunnel Collapse Update

(b)(6)

URGENT! You have already been exposed and contaminated with accumulative TOXIC Fukushima And Hanford cell mutating radiation & heavy metals from the air, water, sea and from the contaminated food you

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Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 1:20 PM
To: Tyree, Geoffrey T
Subject: Google Alert - Hanford site

Hanford site

NEWS

Tunnel appears to collapse at **Hanford** nuclear waste **site** in Washington state
Washington Post
Hundreds of workers at the Hanford nuclear waste site in Washington state have been ordered to "take cover" after a portion of a tunnel contaminated ...
Tunnel containing nuke waste collapses at **Hanford site** - USA TODAY
Evacuations, lockdown at **Hanford Site** over fears of collapse in PUREX tunnel - Yakima Herald-Republic
Tunnel collapse at **Hanford** Nuclear **site**, emergency declared - CBS News
Full Coverage

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Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 1:24 PM
To: Tyree, Geoffrey T
Subject: Google Alert - hanford

hanford

NEWS

Feds evacuate workers at Hanford nuclear site after soil shifts over contaminated tunnel

CNN

(CNN) The federal government evacuated some workers Tuesday at the **Hanford** Site, a former nuclear weapons production site in Washington state, ...

Latest: **Hanford** employees outside 200 East area allowed to go home: Yakima County monitoring ... - Yakima Herald-Republic

Workers at a massive US nuclear waste facility are taking shelter after a tunnel collapsed - Quartz

Full Coverage

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Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 1:32 PM
To: Tyree, Geoffrey T
Subject: New activity on your video: PUREX Tunnel Collapse Update

New comment on your video

PUREX Tunnel Collapse Update

(b)(6)

Amazing

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 1:38 PM
To: Conrad, Patrick J
Subject: FW: New activity on your video: PUREX Tunnel Collapse Update

From: YouTube [mailto:noreply@youtube.com]
Sent: Tuesday, May 9, 2017 1:32 PM
To: Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Subject: New activity on your video: PUREX Tunnel Collapse Update

New comment on your video

PUREX Tunnel Collapse Update

(b)(6)
Amazing

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 1:38 PM
To: Conrad, Patrick J
Subject: FW: New activity on your video: PUREX Tunnel Collapse Update

From: YouTube [mailto:noreply@youtube.com]
Sent: Tuesday, May 9, 2017 1:11 PM
To: Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Subject: New activity on your video: PUREX Tunnel Collapse Update

New comment on your video

PUREX Tunnel Collapse Update

(b)(6)

URGENT! You have already been exposed and contaminated with accumulative TOXIC Fukushima And Hanford cell mutating radiation & heavy metals from the air, water, sea and from the contaminated food you

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 1:38 PM
To: Conrad, Patrick J
Subject: FW: New activity on your video: Hanford Live 2017

From: YouTube [mailto:noreply@youtube.com]
Sent: Tuesday, May 9, 2017 9:52 AM
To: Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Subject: New activity on your video: Hanford Live 2017

New comment on your video

Hanford Live 2017

(b)(6)
Tunnel collapse :/

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 1:40 PM
To: Millikin, Dee
Subject: Tunnel description

The tunnel is one of two tunnels constructed during the Cold War near the site's Plutonium Uranium Extraction Plant, or PUREX Plant, to store contaminated equipment from plutonium production operations at the site in southeastern Washington state. The tunnels were constructed of wood and concrete with a soil covering approximately 8 feet deep. One tunnel is approximately 360 feet long, and the other tunnel is approximately 1,670 feet long. The 20-foot wide by 20-foot long cave-in is in an area near where the two tunnels join together.

Geoff Tyree
Deputy Director, Public Affairs
Richland Operations Office
Department of Energy
Geoffrey.Tyree@rl.doe.gov
(509) 376-4171
www.hanford.gov
www.facebook.com/hanfordsite

Davisson, Tracy E

From: Liz Mattson <lizm@hanfordchallenge.org>
Sent: Tuesday, May 09, 2017 1:42 PM
To: Tyree, Geoffrey T
Subject: PUREX

Hi Geoff,

Do you know if it is tunnel #1? We have heard that from a few people but haven't seen it confirmed anywhere.

Thanks!
Liz

--
Liz Mattson, Deputy Director
Hanford Challenge
2719 E. Madison St, Ste 304
Seattle, WA 98112
office: 206-292-2850 x21
cell: 828-(b)(6)
www.hanfordchallenge.org
www.inheritinghanfordblog.com

Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 2:08 PM
To: Heeter, Mark A; Henderson, Destry J; Millikin, Dee; Cruz, Noah S
Subject: Updated info for live shot

Workers on swing shift at the Hanford Site who are not needed for essential site operations this evening are being told to not come into work tonight, as officials determine how to address a partial cave-in of a tunnel near a facility in the center of the site that was discovered this morning. Workers considered essential for site operations are being told to report to work while avoiding the area of the emergency.

The tunnel is one of two constructed during the Cold War near the site's Plutonium Uranium Extraction Plant, or PUREX Plant, to store contaminated equipment from plutonium production operations at the site in southeastern Washington state. The tunnels were constructed of wood and concrete with a soil covering approximately 8 feet deep. The tunnels are located east of the PUREX Plant and extend to the south. The plant and tunnels are located near the center of the Hanford Site, in an area known as the 200 East Area.

During a routine surveillance of the area, a hole in the roof of one of the tunnels was discovered. Personnel in the immediate vicinity were evacuated as a precaution out of concern for the potential for the release of contamination. No contamination has been detected as a result of the partial cave-in of a section of the tunnel's roof. Workers continue to monitor the area for contamination.

Officials declared an emergency for Hanford Site personnel and advised employees in the vicinity of the PUREX Plant to shelter indoors. The take cover was later expanded to Hanford Site employees within the security boundary of the government site north of Richland, Wash. At around noon, most of those employees were told to leave work early as a precaution. At around 1:35 the last of the employees in the vicinity of the tunnels were released from work early.

Officials continue to monitor the air and are working on how they will fix the hole in the tunnel roof. They are looking at options that would provide a barrier between the contaminated equipment in the tunnel and the outside air that would not cause the hole in the tunnel's roof to widen.

Geoff Tyree
Deputy Director, Public Affairs
Richland Operations Office
Department of Energy
Geoffrey.Tyree@rl.doe.gov
(509) 376-4171
www.hanford.gov
www.facebook.com/hanfordsite

Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 2:21 PM
To: Tyree, Geoffrey T
Subject: New activity on your video: PUREX Tunnel Collapse Update

New comment on your video

PUREX Tunnel Collapse Update

(b)(6)

he's either like my safety manager and doesn't know his arse from his elbow and is a complete fraud but is a good fall guy for a job nobody wants 😄 or..... he's shitting himself now I don't

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 2:22 PM
To: Conrad, Patrick J
Subject: FW: New activity on your video: PUREX Tunnel Collapse Update

From: YouTube [mailto:noreply@youtube.com]
Sent: Tuesday, May 9, 2017 2:21 PM
To: Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Subject: New activity on your video: PUREX Tunnel Collapse Update

New comment on your video
PUREX Tunnel Collapse Update

(b)(6)
he's either like my safety manager and doesn't know his arse from his elbow and is a complete fraud but is a good fall guy for a job nobody wants 😂 or.....□ he's shitting himself □ now I don't

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Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 2:31 PM
To: Tyree, Geoffrey T
Subject: Ready to publish your video?

You're almost done!
All you have to do now is publish your video.

Update on partial collapse of PUREX tunnel at Hanford

Review draft

We've sent this email to geoffrey.tyree@ntdoe.gov. If you don't want these notifications for finished uploads anymore, you can unsubscribe here

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Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 2:49 PM
To: Tyree, Geoffrey T
Subject: Google Alert - hanford

hanford

NEWS

What is **Hanford**?
KOMO News
The 500-square mile **Hanford** reservation was established by the Manhattan Project during World War II to make plutonium, a key ingredient in nuclear ...

Emergency declared at **Hanford** as portion of tunnel containing nuke waste collapses - KOMO News

A tunnel collapsed at the **Hanford** nuclear waste site on Tuesday. Here's what you need to know. - Popular Science

'Take cover' emergency declared at **Hanford** Nuclear Reservation in Washington state - CBC.ca
Full Coverage

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Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 3:29 PM
To: Tyree, Geoffrey T
Subject: Google Alert - hanford

hanford

NEWS

No radiation reports after tunnel collapse at **Hanford** nuclear site

KETV Omaha

Federal authorities on Tuesday evacuated some workers and instructed others to shelter in place after a tunnel cave-in at the Hanford nuclear waste ...

Emergency declared at the **Hanford** Nuclear Reservation in central Washington - Q13 FOX

Portion of Tunnel Containing Nuke Waste Collapses at **Hanford** - U.S. News & World Report

Hanford tunnel breaches, workers take cover - Crosscut

Full Coverage

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Hanford Nuclear Site Declares Emergency After Tunnel Collapse

Wall Street Journal (subscription)

There was no indication of radioactive contamination in the area of the Hanford nuclear-weapons site, according to federal officials, but the incident is ...

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Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 3:41 PM
To: Tyree, Geoffrey T
Subject: Google Alert - Hanford site

Hanford site

NEWS

Latest: All non-essential **Hanford site** personnel sent home; officials assessing how to fix cave-in

Yakima Herald-Republic

From the **Hanford**.gov emergency information **website**: This picture shows a 20 foot by 20 foot hole in the roof of a tunnel that is hundreds of feet long

A tunnel collapsed at the **Hanford** nuclear waste **site** on Tuesday. Here's what you need to know. - Popular Science

Tunnel containing nuclear waste collapses at **Hanford site** in eastern Washington - The Register-Guard

Hanford Nuclear Reservation Declares Emergency After Tunnel Full Of Radioactive Waste Collapses - Huffington Post Canada

Full Coverage

Hanford Plutonium Plant Tunnel Reportedly Collapses

Patch.com

HANFORD, WA -- The U.S. Department of Energy emergency responders are on the scene at its **Hanford site**, saying there are concerns "about ...

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 4:14 PM
To: Millikin, Dee; Heeter, Mark A; Henderson, Destry J; Olds, Theodore E (Erik); Cruz, Noah S
Subject: Draft Hanford news release May 9
Attachments: Draft Hanford news release May 9.docx

Please review and send me any feedback within the hour you have on this draft release that we are going to be coordinating with HQ (b)(5)
Thank you,
Geoff

Workers used an excavator and sand this evening to fill a 20-foot-wide hole that had opened up in the roof of a tunnel used to store contaminated equipment since the Cold War at the Hanford Site in southeast Washington State. (b)(5) an emergency that was declared at the site at 8:30 this morning, after the hole was discovered during routine checks of the area.

(b)(5) employees in the vicinity of the tunnel were initially told to take shelter as a precaution and the shelter in place order was expanded to cover most of the government site later in the morning. After crews sent to survey the area detected no contamination had been released, the shelter in place order was lifted and workers were sent home from work early. Workers on swing shift not needed for essential site operations were told to (b)(5) worked to fill the hole (b)(5)

The tunnel is one of two constructed in the 1950s and 1960s to hold rail cars that were loaded with contaminated equipment (b)(5) and moved into the tunnels. The tunnels were built next to a former chemical processing plant, the Plutonium Uranium Extraction Plant, or PUREX, located in an industrial area near the center of the Hanford Site called the 200 East Area.

The tunnels were constructed of wood and concrete a covered with approximately 8 feet of soil. The 360-foot tunnel where the partial collapse occurred was used until 1965 to store 8 rail cars loaded with contaminated equipment. That tunnel feeds into a longer tunnel that extends hundreds more feet and contains 28 rail cars loaded with contaminated equipment. The hole opened up in the shorter tunnel near where it joins the longer tunnel. The tunnels were sealed in the mid-1990s and are checked periodically.

During a routine surveillance of the area this morning, a hole in the roof of one of the tunnels was observed, leading to the precautionary sheltering of employees and notifications to area counties and states. Workers continue to monitor the area for contamination (b)(5)

Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 4:17 PM
To: Tyree, Geoffrey T
Subject: New activity on your video: Update on partial collapse of PUREX tunnel at Hanford

New comment on your video

Update on partial collapse of PUREX tunnel at Hanford

(b)(6)

God bless all of you. We completely understand you are limited in what you can disclose, as usual. The 90% Rule: Deny radioactivity causes harm and under report the negative effects of radioactivity

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 4:17 PM
To: Conrad, Patrick J
Subject: FW: New activity on your video: Update on partial collapse of PUREX tunnel at Hanford

From: YouTube [mailto:noreply@youtube.com]
Sent: Tuesday, May 9, 2017 4:17 PM
To: Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Subject: New activity on your video: Update on partial collapse of PUREX tunnel at Hanford

New comment on your video

Update on partial collapse of PUREX tunnel at Hanford

(b)(6)

God bless all of you. We completely understand you are limited in what you can disclose, as usual. The 90% Rule: Deny radioactivity causes harm and under report the negative effects of radioactivity

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Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 4:29 PM
To: Tyree, Geoffrey T
Subject: Google Alert - hanford

hanford

NEWS

Latest: All non-essential **Hanford** site personnel sent home; officials assessing how to fix cave-in
Yakima Herald-Republic
From the **Hanford**.gov emergency information website: This picture shows a 20 foot by 20 foot hole in the roof of a tunnel that is hundreds of feet long.
Hanford Plutonium Plant Tunnel Reportedly Collapses - Patch.com
Emergency Declared After Tunnel Collapse at Toxic **Hanford** Nuke Site - Common Dreams
History of **Hanford** nuclear waste site in Washington state - Minneapolis Star Tribune
Full Coverage

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Davisson, Tracy E

From: Destry Henderson (b)(6)
Sent: Tuesday, May 09, 2017 4:40 PM
To: Tyree, Geoffrey T
Subject: Draft Hanford news release May 9
Attachments: Draft Hanford news release May 9.docx; ATT00001.txt

This includes Dee's feedback as well.

Workers used an excavator and sand this evening to fill a 20-foot-wide hole that had opened up in the roof of a tunnel used to store contaminated equipment since the Cold War at the Hanford Site in southeast Washington State. (b)(5) an emergency that was declared at the site at 8:30 this morning, after the hole was discovered during routine checks of the area.

(b)(5) employees in the vicinity of the tunnel were initially told to take shelter as a precaution and the shelter in place order was (b)(5) in the morning. (b)(5) no contamination (b)(5) the shelter in place was lifted and workers were sent home from work early. Workers on swing shift not needed for essential site operations were told to (b)(5) (b)(5) worked to fill the hole (b)(5)

Commented [1]:

The tunnel is one of two constructed in the 1950s and 1960s to hold rail cars that were loaded with contaminated equipment (b)(5) and moved into the tunnels. The tunnels were built next to a former chemical processing plant, the Plutonium Uranium Extraction Plant, or PUREX, located in an industrial area near the center of the Hanford Site called the 200 East Area.

(b)(5) The tunnels were constructed of wood and concrete [redacted] covered with approximately 8 feet of soil. The 360 foot tunnel where the partial collapse occurred was used until 1965 to store 8 rail cars loaded with contaminated equipment. That tunnel feeds into a longer tunnel that extends hundreds more feet and contains 28 rail cars loaded with contaminated equipment. The hole opened up in the shorter tunnel near where it joins the longer tunnel. The tunnels were sealed in the mid-1990s and are checked periodically.

Commented [2]:

During a routine surveillance of the area this morning, a hole in the roof of one of the tunnels was observed, leading to the precautionary sheltering of employees and notifications to area counties and states. Workers continue to monitor the area for contamination (b)(5)

Commented [3]: (b)(5)

Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 4:47 PM
To: Olds, Theodore E (Erik)
Subject: Draft Hanford news release May 9
Attachments: Draft Hanford news release May 9.docx

Erik
This news release about (b)(5) is ready to coordinate, either now or (b)(5) (b)(5)
Geoff

Workers used an excavator and sand this evening to fill a 20-foot-wide hole that had opened up in the roof of a tunnel used to store contaminated equipment since the Cold War at the Hanford Site in southeast Washington State. (b)(5) an emergency that was declared at the site at 8:30 this morning, after the hole was discovered during routine checks of the area (b)(5)

(b)(5) employees in the vicinity of the tunnel were initially told to take shelter as a precaution, and (b)(5) (b)(5) in the morning. After crews sent to survey the area detected no contamination, the shelter in place order was lifted and site employees were sent home from work early. Workers on swing shift not needed for essential site operations were told to (b)(5) worked to fill the hole (b)(5)

The tunnel is one of two constructed in the 1950s and 1960s to hold rail cars that were loaded with contaminated equipment (b)(5) and moved into the tunnels. The tunnels were built next to a former chemical processing plant, the Plutonium Uranium Extraction Plant, or PUREX, located in an industrial area near the center of the Hanford Site called the 200 East Area.

The tunnels were constructed of wood and concrete and covered with approximately 8 feet of soil. The 360-foot tunnel where the partial collapse occurred was used until 1965 to store 8 rail cars loaded with contaminated equipment. That tunnel feeds into a longer tunnel that extends hundreds more feet and contains 28 rail cars loaded with contaminated equipment. The hole opened up in the shorter tunnel near where it joins the longer tunnel. The tunnels were sealed in the mid-1990s and are checked periodically.

During a routine surveillance of the area this morning, a hole in the roof of one of the tunnels was observed, leading to the precautionary sheltering of employees and notifications to area counties and states. Workers continue to monitor the area for contamination (b)(5)

Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 4:55 PM
To: Tyree, Geoffrey T
Subject: Google Alert - Hanford site

Hanford site

As-it-happens updates · May 9, 2017

WEB

Take Cover

MSN.com

Hundreds of workers at the **Hanford** nuclear production complex in Washington state were ordered to "take cover" Tuesday after a tunnel collapsed.

Feds evacuate workers at Hanford nuclear site

RochesterFirst

The federal government evacuated some workers at a former nuclear weapons production **site** in Washington state Tuesday after concerns about ...

hanfordsite

Trendsmap

Hanford Site. Richland, Wash., USA. Followers: 3,211, Following: 325. Joined 2009-08-21. Official site of the Department of Energy's Richland ...

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Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 9, 2017 4:14 PM
To: Gray, Dee; Heeter, Mark A; Henderson, Destry J; Olds, Theodore E (Erik); Cruz, Noah S
Subject: Draft Hanford news release May 9
Attachments: Draft Hanford news release May 9.docx

Please review and send me any feedback within the hour you have on this draft release that we are going to be
(b)(5)
Thank you,
Geoff

Workers used an excavator and sand this evening to fill a 20-foot-wide hole that had opened up in the roof of a tunnel used to store contaminated equipment since the Cold War at the Hanford Site in southeast Washington State. (b)(5) an emergency that was declared at the site at 8:30 this morning, after the hole was discovered during routine checks of the area.

(b)(5) employees in the vicinity of the tunnel were initially told to take shelter as a precaution and the shelter in place order was (b)(5) in the morning. After crews sent to survey the area detected no contamination had been released, the shelter in place order was lifted and workers were sent home from work early. Workers on swing shift not needed for essential site operations were told to (b)(5) worked to fill the hole (b)(5)

The tunnel is one of two constructed in the 1950s and 1960s to hold rail cars that were loaded with contaminated equipment (b)(5) and moved into the tunnels. The tunnels were built next to a former chemical processing plant, the Plutonium Uranium Extraction Plant, or PUREX, located in an industrial area near the center of the Hanford Site called the 200 East Area.

The tunnels were constructed of wood and concrete covered with approximately 8 feet of soil. The (b)(5)
360-foot tunnel where the partial collapse occurred was used until 1965 to store 8 rail cars loaded with contaminated equipment. That tunnel feeds into a longer tunnel that extends hundreds more feet and contains 28 rail cars loaded with contaminated equipment. The hole opened up in the shorter tunnel near where it joins the longer tunnel. The tunnels were sealed in the mid-1990s and are checked periodically.

During a routine surveillance of the area this morning, a hole in the roof of one of the tunnels was observed, leading to the precautionary sheltering of employees and notifications to area counties and states. Workers continue to monitor the area for contamination (b)(5)

Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 4:55 PM
To: Olds, Theodore E (Erik)
Subject: Revised draft Hanford news release May 9
Attachments: Draft Hanford news release May 9.docx

Erik,
I made changes based on your input to this draft news release about (b)(5) tunnel near PUREX. Let me know if you need anything else on this.
Geoff

Workers used an excavator and soil this evening to fill a 20-foot-wide hole that had opened up in the roof of a tunnel used to store contaminated equipment since the Cold War at the Hanford Site in southeast Washington State. (b)(5) of an emergency that was declared at the site at 8:30 this morning, after the hole was discovered during routine checks of the area (b)(5) (b)(5) No contamination outside the tunnel was detected and no workers were injured during the emergency.

(b)(5) employees in the vicinity of the tunnel were initially told to take shelter as a precaution, and (b)(5) (b)(5) in the morning. After crews sent to survey the area detected no contamination, the shelter in place order was lifted and site employees were sent home from work early. Workers on swing shift not needed for essential site operations were told to (b)(5) worked to fill the hole (b)(5)

The tunnel is one of two constructed in the 1950s and 1960s to hold rail cars that were loaded with contaminated equipment (b)(5) and moved into the tunnels. The tunnels were built next to a former chemical processing plant, the Plutonium Uranium Extraction Plant, or PUREX, located in an industrial area near the center of the Hanford Site called the 200 East Area.

The tunnels were constructed of wood and concrete and covered with approximately 8 feet of soil. The 360-foot tunnel where the partial collapse occurred was used until 1965 to store 8 rail cars loaded with contaminated equipment. That tunnel feeds into a longer tunnel that extends hundreds more feet and contains 28 rail cars loaded with contaminated equipment. The hole opened up in the shorter tunnel near where it joins the longer tunnel. The tunnels were sealed in the mid-1990s and are checked periodically.

During a routine surveillance of the area this morning, a hole in the roof of one of the tunnels was observed, leading to the precautionary sheltering of employees and notifications to area counties and states. Workers continue to monitor the area for contamination (b)(5)

Now that the (b)(5)

Davisson, Tracy E

From: Google Alerts <googlealerts-noreply@google.com>
Sent: Tuesday, May 09, 2017 1:24 PM
To: Tyree, Geoffrey T
Subject: Google Alert - hanford

hanford

NEWS

Feds evacuate workers at Hanford nuclear site after soil shifts over contaminated tunnel

CNN

(CNN) The federal government evacuated some workers Tuesday at the **Hanford** Site, a former nuclear weapons production site in Washington state, ...

Latest: **Hanford** employees outside 200 East area allowed to go home: Yakima County monitoring ... - Yakima Herald-Republic

Workers at a massive US nuclear waste facility are taking shelter after a tunnel collapsed - Quartz

Full Coverage

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Davisson, Tracy E

From: YouTube <noreply@youtube.com>
Sent: Tuesday, May 09, 2017 1:32 PM
To: Tyree, Geoffrey T
Subject: New activity on your video: PUREX Tunnel Collapse Update

New comment on your video

PUREX Tunnel Collapse Update

(b)(6)

Amazing

Reply

View all comments

YouTube comments are powered by Google · Learn more

Unsubscribe from these emails

Google Inc., 1600 Amphitheatre Pkwy, Mountain View, CA 94043 USA

Davisson, Tracy E

From: Buel, Richard D
Sent: Tuesday, May 09, 2017 10:23 AM
To: Tyree, Geoffrey T
Subject: FW: PUREX Tunnels-OR Hanford Clean up Board.ppt
Attachments: PUREX Tunnels-OR Hanford Clean up Board.ppt

Additional facts about the tunnels from a previous OHCB presentation. Mike Turner isn't sure of the date, but the slides have additional information about the construction.

From: Turner, Michael J
Sent: Tuesday, May 09, 2017 10:01 AM
To: Buel, Richard D
Subject: PUREX Tunnels-OR Hanford Clean up Board.ppt

ATTACHMENT WAS GENERATED BY THE U.S. DEPARTMENT OF ENERGY (DOE) HEADQUARTERS (HQ).

ATTACHMENT HAS BEEN FORWARDED TO DOE-HQ FOR A RELEASE DETERMINATION.

Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 4:00 PM
To: Cruz, Noah S
Subject: PUREX Tunnels-OR Hanford Clean up Board.ppt
Attachments: PUREX Tunnels-OR Hanford Clean up Board.ppt

ATTACHMENT WAS GENERATED BY THE U.S. DEPARTMENT OF ENERGY (DOE) HEADQUARTERS (HQ).

ATTACHMENT HAS BEEN FORWARDED TO DOE-HQ FOR A RELEASE DETERMINATION.

Davisson, Tracy E

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 4:50 PM
To: ^Hanford EOC
Subject: FW: Incident Recovery Communications Plan
Attachments: Incident Recovery Communications Plan.docx

For Noah

From: Johnson, Sonya E
Sent: Tuesday, May 9, 2017 4:24 PM
To: Heeter, Mark A <Mark.Heeter@rl.doe.gov>; Tyree, Geoffrey T <geoffrey.tyree@rl.doe.gov>
Cc: Millikin, Dee <Dee_Millikin@rl.gov>; Henderson, Destry J <Destry_J_Henderson@rl.gov>; Olds, Theodore E (Erik) <Theodore_E_Erik_Olds@rl.doe.gov>; Geimer, Raymond M <Raymond_M_Geimer@rl.gov>
Subject: Incident Recovery Communications Plan

Please find attached a DRAFT recovery communications plan for review/input. Thanks.

Our Recovery Manager is still tied up at the EOC, so (b)(5) chance to review this. I am especially looking for your input (b)(5)

Thanks.

Sonya

Sonya Johnson
Director of Communications
CH2M HILL Plateau Remediation Company
P.O. Box 1600, MS H8-75
Richland, WA 99352
Sonya_E_Johnson@rl.gov
509.373.5611 (o)
(b)(6)702.[redacted](c)

Incident Recovery Communications Plan

Incident

On May 9, 2017, at approximately 8:30 a.m., the U.S. Department of Energy Richland Operations Office activated the Hanford Emergency Operations Center after workers performing surveillance activities at the Plutonium Uranium Extraction Facility (PUREX) discovered a partial cave-in of a 20 foot section of an adjacent tunnel.

There was no release of contamination and no injuries. Employees located in the vicinity of PUREX (in the center of the site) were sheltered in place and were then released to go home in the afternoon. Other Hanford Site employees in the center of the site were released at noon. Employees were directed not to report to the 200 East Area, where PUREX is located. There was no action required of residents living in communities near Hanford.

Recovery actions are now underway.

Tunnel Background

The PUREX Storage Tunnels are parallel branches of an earth-covered railroad tunnel that extend southward from the east end of the PUREX Facility. Construction of Tunnel #1, completed in the mid-1950s, was first used for storage of radioactively contaminated process equipment in June 1960 and was filled to capacity in 1964. Tunnel #2 was later constructed and (b)(5) with failed equipment typically loaded onto railcars. The cave-in occurred at Tunnel #1.

Tunnel #1 is filled to capacity and contains eight, 42-foot long railcars, positioned end to end along the length of the tunnel. The inside dimensions of Tunnel #1 are 358 feet long, 22 feet high, and 19 feet wide. The external surfaces of the roof and wall timbers of Tunnel #1 are covered with 90-pound roofing material (wooden timbers covered by earth).

Recovery Actions

Heavy equipment was dispatched to the fill the 20 X 20-foot hole created by the caved-in portion of the tunnel. Once filled with clean soil, the hole will be covered by tarp (b)(5) prevent intrusion. DOE and CHPRC are determining long-term actions to (b)(5) (b)(5)

Messages

DOE's priority is the safety of workers and protection of the environment

Recovery actions are underway to safely return the site to normal operations:

- (b)(5)
-
-

Communications

(b)(5)		
Distribute a (b)(5) (b)(5)	(b)(5)	Sonya/(b)(6)
Hold (b)(5) (b)(5)	(b)(5)	Ray
Distribute (b)(5)	As (b)(5)	
(b)(5)		
Provide status via phone call to • (b)(5) • • •	(b)(5)	Erik Olds/ (b)(6)
(b)(5)		
Provide status via phone call to: • (b)(5) • • •	(b)(5)	DOE Public Affairs
(b)(5)		
	(b)(5)	DOE Public Affairs
		DOE Public Affairs
	As (b)(5)	DOE Public Affairs

Contact List		
CONTACT	**PHONE NO.**	**RESPONSIBILITY**
Senator Patty Murray Josephine Eckert Washington Office Raquel Ferrell Crowley Central Washington Director	202-224-2621 509-453-7462 (work) 509 (b)(6) (cell)	DOE Public Affairs
Senator Maria Cantwell Rory Stanley Washington Office Vacant Central Washington Director	202-224-3441 509-946-8106	DOE Public Affairs
Congressman Dan Newhouse Jason Herbert Washington Office Tri Cities Office	202-225-5816 202-225-4466 509-713-7374	DOE Public Affairs
Washington Gov. Inslee D.C. Office Sam Rickets, Director	202-624-3691	DOE Public Affairs
Mayor – Richland Robert Thompson	509-942-7381	DOE Public Affairs
Mayor – Kennewick Steve Young	509-521-5220	DOE Public Affairs
Mayor – Pasco Matt Watkins	509-416-6696	DOE Public Affairs
Mayor – West Richland Brent Gerry	509-967-3431	DOE Public Affairs

Hanford Advisory Board Susan Leckband	509-942-1906 (office) 509-947-2445	DOE Public Affairs
Hanford Union	Hanford Atomic Metal Trades Council Jeff McDaniel, President 509-946-0326	CHPRC
Tri-City Development Council Carl Adrian David Reeploeg	509-735-1000	DOE Public Affairs
Media	Standard Hanford press list	DOE Public Affairs

Riehle, Dorothy C

From: Johnson, Sonya E
Sent: Tuesday, August 29, 2017 3:37 PM
To: Corman, Roger K
Cc: Henderson, Destry J
Subject: FW: Hanford Site Recovery Comm Plan Rev 1
Attachments: Hanford Site Recovery Comm Plan Rev 1.docx

Here is a more recent version of the communications plan (sent back to me four hours after I initially sent it to the client). It includes input by EM. In terms of the (b)(5)

Sonya

Sonya Johnson
Director of Communications
CH2M HILL Plateau Remediation Company
P.O. Box 1600, MS H8-75
Richland, WA 99352
Sonya_E_Johnson@rl.gov
509.373.5611 (o)
702 (b)(6) (c)

From: Tyree, Geoffrey T
Sent: Tuesday, May 09, 2017 8:50 PM
To: Johnson, Sonya E <Sonya_E_Johnson@rl.gov>; Millikin, Dee <Dee_Millikin@rl.gov>; Olds, Theodore E (Erik) <Theodore_E_Erik_Olds@rl.doe.gov>; Heeter, Mark A <Mark.Heeter@rl.doe.gov>
Subject: Hanford Site Recovery Comm Plan Rev 1

Folks, (b)(5) Candice Trummell and Mike Nartker, mostly (b)(5) The (b)(5) and we have more (b)(5) Regarding the (b)(5) I told them we thought this (b)(5) (b)(5) I think that's (b)(5) in the morning. Let's connect in the morning (b)(5) (b)(5)

Thank you,
Geoff

Incident Recovery Communications Plan

Incident

On May 9, 2017, at approximately 8:30 a.m., the U.S. Department of Energy Richland Operations Office declared an Emergency at the Hanford Site after workers performing surveillance activities at the Plutonium Uranium Extraction Facility (PUREX) discovered a partial cave-in of a 20 foot section of tunnel near PUREX that is used to store contaminated equipment.

There was no release of contamination and there were no injuries. Employees located in the vicinity of PUREX (in the center of the site) were sheltered in place as a precaution until crews could complete surveys for a spread of contamination. The shelter in place order was expanded to most of the Hanford Site as a precaution later in the morning. After surveys of the area detected no contamination, employees were released from work early, and only employees essential to Hanford Site operations remained on site. There was no action required of residents living in communities near Hanford.

Initial stabilization actions have been taken, and officials are evaluating long-term actions, including ongoing monitoring, placing a cover over the filled hole, or permanently entombing the tunnel.

Tunnel Background

The PUREX Storage Tunnels are parallel branches of an earth-covered railroad tunnel that extend southward from the east end of the PUREX Facility. Construction of Tunnel #1, completed in the mid-1950s, was first used for storage of radioactively contaminated process equipment in June 1960 and was filled to capacity in 1964. Tunnel #2 was later constructed and (b)(5) with failed equipment typically loaded onto railcars. The cave-in occurred near where Tunnel #1 joins the longer Tunnel #2.

Tunnel #1 is filled to capacity and contains eight, 42-foot long railcars, positioned end to end along the length of the tunnel. The inside dimensions of Tunnel #1 are 358 feet long, 22 feet high, and 19 feet wide. The external surfaces of the roof and wall timbers of Tunnel #1 are covered with wooden timbers and several feet of soil.

Recovery Actions

Heavy equipment was dispatched to the fill the 20 X 20-foot hole created by the caved-in portion of the tunnel. DOE and CHPRC are determining long-term actions (b)(5)

Messages

DOE's priority is the safety of workers and protection of the environment

(b)(5)

Communications

(b)(5)		
Distribute a (b)(5) (b)(5)	(b)(5)	Sonya (b)(6)
Hold (b)(5) (b)(5)	(b)(5)	Ray
Distribute (b)(5)	As (b)(5)	
(b)(5)		
Provide status via phone call to • (b)(5) • •	(b)(5)	CI, Doug Shoop and Erik Olds
Provide status via phone call to • (b)(5) •		Doug Shoop
(b)(5)		
Provide status via phone call to: • (b)(5) • • •	(b)(5)	DOE-RL Public Affairs
(b)(5)		
	(b)(5)	DOE-RL Public Affairs
		DOE-RL Public Affairs
	As (b)(5)	DOE-RL Public Affairs

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Senator Maria Cantwell Rory Stanley Washington Office Vacant Central Washington Director	202-224-3441 509-946-8106	DOE Public Affairs
Congressman Dan Newhouse Jason Herbert Washington Office Tri Cities Office	202-225-5816 202-225-4466 509-713-7374	DOE Public Affairs
Washington Gov. Inslee D.C. Office Sam Rickets, Director	202-624-3691	DOE Public Affairs
Mayor – Richland Robert Thompson	509-942-7381	DOE Public Affairs
Mayor – Kennewick Steve Young	509-521-5220	DOE Public Affairs
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Tri-City Development Council Carl Adrian David Reeploeg	509-735-1000	DOE Public Affairs
Media	Standard Hanford press list	DOE Public Affairs

Davisson, Tracy E

From: Buel, Richard D
Sent: Tuesday, May 09, 2017 9:16 AM
To: Tyree, Geoffrey T
Subject: FW: PUREX (b)(5)

Note that the (b)(5)

From: Turner, Michael J
Sent: Tuesday, May 09, 2017 9:11 AM
To: Buel, Richard D
Subject: PUREX (b)(5)

(b)(5)

Davisson, Tracy E

From: Farabee, Oliver A (AI)
Sent: Tuesday, May 09, 2017 8:51 AM
To: Shoop, Doug S; Fletcher, Thomas W; Franco, Joe R; Hoffman, James C; Blackford, Ty; Corriell, Darin R; Ensign, P G (Patty); Vaughn, Terry L; Geimer, Raymond M
Subject: recent aerial of purex tunnel
Attachments: Purex tunnel aerial taken 4-24-17.jpg

Follow Up Flag: Flag for follow up
Flag Status: Flagged

Withheld pursuant to exemption

(b)(5)

of the Freedom of Information and Privacy Act

Withheld pursuant to exemption

(b)(5)

of the Freedom of Information and Privacy Act

Withheld pursuant to exemption

(b)(5)

of the Freedom of Information and Privacy Act

Withheld pursuant to exemption

(b)(5)

of the Freedom of Information and Privacy Act

Davisson, Tracy E

From: Katharina Stefanie <Katharina.Stefanie@bbc.co.uk>
Sent: Tuesday, May 09, 2017 9:45 AM
To: Shoop, Doug S; Smith, Kevin W (ORP); Tyree, Geoffrey T; 'Jonathan_A_Dowell@orp.doe.gov'; Conrad, Jill A; Levardi, Yvonne M; Holmes, Kristen L; 'Jason_R_Chudy@orp.doe.gov'; Riehle, Dorothy C; Meyer, Carrie C
Subject: URGENT - media question

Good Afternoon,

Katharina Werner here with BBBC. Could I please get a quick statement about this nuclear tunnel collapse?

I'm trying to understand how important this is...

Thank you,

Kat

Katharina Werner
Cell: 301 (b)(6)
Office: 202.355.1768
BBC Washington
2000 M St. NW
Washington, DC 20036

Davisson, Tracy E

From: Smith, Kevin W (ORP)
Sent: Tuesday, May 09, 2017 4:26 PM
To: Franco, Joe R
Cc: Harp, Benton J (Ben); Shoop, Doug S
Subject: Fwd: support for Hanford

Joe ... see below the offer for help. Just let me know if you need their help via (b)(5) Kevin

Begin forwarded message:

> **From:** "Wright, Todd" <Todd.Wright@aecom.com>
> **Date:** May 9, 2017 at 3:25:01 PM PDT
> **To:** "Smith, Kevin W (ORP) (Kevin_W_Smith@orp.doe.gov)" <Kevin_W_Smith@orp.doe.gov>
> **Subject: support for Hanford**
>
> Kevin,
> Let us know if anything else we can do. I offered to CH2 our Drone group who can deploy for tunnel observation /inspection .
> Thanks
> Todd
>
> Dr. G. Todd Wright
> Executive Vice President and
> General Manager
> Nuclear & Environment
> D 1-803-502-9651 C 1-216-(b)(6)
> Todd.Wright@aecom.com
>
> AECOM
> 106 Newberry Street SW, Aiken, South Carolina 29801 USA
> T 1-803-502-5710
> www.aecom.com