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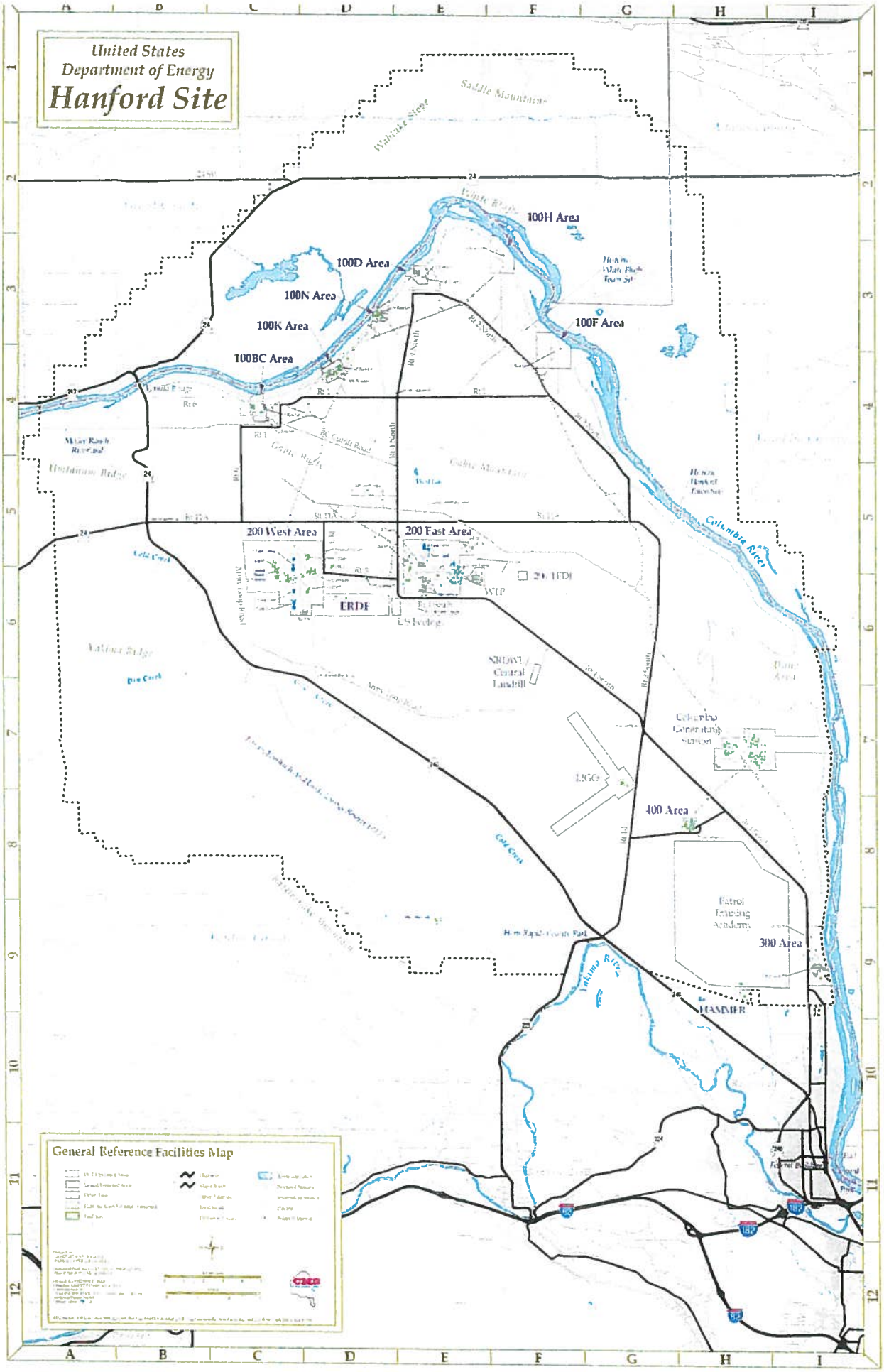
United States
Department of Energy
Hanford Site
100H Area
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100N Area
100K Area
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200 East Area
ERDF
WTP
400 Area
300 Area
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Yakima River
General Reference Facilities Map

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OREGON HANFORD CLEANUP BOARD
MEETING AGENDA

Monday, March 11, 2019

Best Western Plus Hood River Inn
1108 E Marina Drive
Hood River, Oregon

1 p.m. Administrative
- Greetings and introductions
- Approval of November meeting minutes (Tab # 3 of briefing book)

1:15 p.m. Review of activities/events since July meeting (Tabs # 4, 5, 6, 7 & 10)
(Ken Niles, Oregon Department of Energy)
Purpose: To review recent and relevant Hanford and Board-related events/activities.

1:45 p.m. Public comment opportunity

2:00 p.m. One DOE Manager concept at Hanford
(Brian Vance, U.S. Department of Energy)

2:15 p.m. DOE-ORP update (Tab # 6)
(Ben Harp, U.S. Department of Energy Office of River Protection)
Purpose: To provide the Board with an update on Office of River Protection activities, including tank retrieval, Direct-Feed Low Activity Waste, the Test Bed Initiative, and an update on DOE's Waste Incidental to Reprocessing determination for C Area tanks.

3 p.m. Break

3:15 p.m. Update from Ecology on tank-waste related issues
(Alex Smith, Washington Department of Ecology)
Purpose: To provide the Board with the status of Tri-Party Agreement negotiations related to tank waste treatment milestones, Washington's views on DOE's proposed interpretation of high-level waste and other tank-waste related issues.

4 p.m. DOE Richland Office update (Tab # 5)
(Bill Hamel, U.S. Department of Energy, Richland Office)
Purpose: To provide the Board with an update on key cleanup issues, including Plutonium Finishing Plant demolition, K-Basin sludge removal, work to remove highly concentrated soil contamination beneath the 324 Building, the grouting of PUREX tunnel 2 and funding.

5 p.m. Public comment/adjourn for the day

4

Oregon Hanford Cleanup Board

Best Western Plus Columbia River Inn
Cascade Locks, Oregon

Monday, November 5, 2018

Members In Attendance:
Ted Taylor, Chair
Dan Solitz, Vice-Chair
Jürgen Hess
Steve March
John Howieson
Erica Elliott
Tom Roberts
Brian Wolfe
Kristen McNall
Justin Iverson, Oregon Water Resources
Ken Niles, Oregon Dept. of Energy
Representative Tawna Sanchez
Senator Bill Hansell

ODOE Staff:
Mark Reese
Tom Sicilia
Sara Lovtang
Jeff Burright

Tri-Party Agencies:
Jon Peschong, U.S. DOE Office of River Protection
JoLyn Garcia, U.S. DOE Office of River Protection
Dieter Bohrmann, North Winds (ORP support)
John Price, Washington Dept. of Ecology
Theresa Howell, Washington Dept. of Ecology

Public
Sharon Monteiro
Marylou Schnoes

Link to meeting materials:
https://www.oregon.gov/energy/safety-resiliency/Pages/OHCB-Meetings.aspx

Administrative
Chair Ted Taylor opened the meeting at 1 p.m.

After introductions, the minutes from the July 2018 meeting were approved.

Board discussion: Ken Niles, Oregon Department of Energy, asked the Board and members of the public in attendance, whether the current level of detail in the meeting minutes is necessary. Ken proposed instead a meeting summary, with an explanation of Board actions and on-line links to the presentations and the meeting recording. After discussion, the Board gave staff the go-ahead on a trial basis to produce a meeting summary rather than extensive meeting minutes.

Tuesday, November 6, 2018

Members In Attendance:
Ted Taylor, Chair
Dan Solitz, Vice-Chair
Jurgen Hess
Steve March
John Howieson
Erica Elliott
Tom Roberts
Kristen McNall
Brian Wolfe
Justin Iverson, Oregon Water Resources Dept.
Ken Niles, Oregon Dept. of Energy
Senator Bill Hansell

ODOE Staff:
Mark Reese
Tom Sicilia
Sara Lovtang
Jeff Burright

Tri-Party Agencies:
Bill Hamel, U. S. DOE Richland Office
Rich Buel, U.S. DOE Richland Office
Jennifer Copeland, CHPRC John Price,
Washington Dept. of Ecology

Public
Sharon Monteiro
Marylou Schnoes
Molly McGrew

Administrative
Chair Taylor opened the meeting at 9 a.m.

Public Comments / Questions Opportunity
The public was invited to make comments and ask questions.[7]

Sharon Monteiro asked the Board to continue to make Hanford cleanup a priority. It is important to Oregon.

Hanford Public Meetings in Oregon
Ken and Jeff[8] provided the Board with information about recent public meetings held in Portland and Hood River.

[7] Refer to public comment 11/6 audio 00:01.
[8] Refer to Niles presentation 11/ 6 audio 04:08.

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Post Register
LOCAL • PROVEN • ESSENTIAL

DOE: Sending Hanford waste to Idaho would cost more

By NATHAN BROWN nbrown@postregister.com

Dec 10, 2018

A semitruck loaded with radioactive waste leaves the Advanced Mixed Waste Treatment Project with the Experimental Breeder Reactor 1 in the background in this April, 2017 file photograph. The shipment is headed to the Waste Isolation Pilot Project in Carlsbad, N.M. for storage.

- Processing the nuclear waste in Hanford, Wash., at the Advanced Mixed Waste Treatment project would have cost $75 million more than processing it in Hanford, according to a U.S. Department of Energy study analyzing whether to keep the AMWTP open.

The DOE announced recently it would close the AMWTP, which is located in the desert west of Idaho Falls, sometime next year after it finishes its current mission processing the decades-old transuranic waste that is in Idaho now. The roughly 6,100 cubic meters of transuranic waste at Hanford will be processed on-site rather than shipped to Idaho for processing.

"I think it's a very good decision," said Beatrice Brailsford, the Snake River Alliance's nuclear program director. "It certainly responds to the concerns that the people of Idaho have expressed about waste coming in from other places. I know it's a good economic and environmental decision."

About half of the people working at the AMWTP work in waste treatment, and those jobs will go away next year, although it is expected some of them will transition into other jobs either at Idaho National Laboratory or with cleanup contractor Fluor. The other half work in waste characterization and certification, and they will still have work.

"That function is going to remain in operation at the site," the DOE official said.

The closure won't have any direct impact on INL, although some of the people who work at the AMWTP might get jobs at INL, said INL spokeswoman Sarah Neumann.

Some available jobs are for Hanford projects that offer more stability and longevity, as Plutonium Finishing Plant work will ramp down as cleanup there is completed.

DOE contractor CH2M Hill Plateau Remediation Co. had the potential to earn $51 million in incentive pay for tearing the plant down to its foundation by early 2015.

But the possible incentive pay for completing the work was gradually reduced as time passed, until it hit $12 million at the end of this September. CH2M is owned by Jacobs Engineering Group.

"DOE leadership is focused on assuring that demolition activities are performed in a manner that assures the safety of the public and the workers while protecting the environment," DOE said in a statement.

JULY 26, 2018 4:05 PM

The Washington state Department of Ecology, the regulator on the project, agrees.

"We do want to see the work completed," said Ecology spokesman Randy Bradbury. "(But) our primary concern is the work proceed with minimal risk."

Demolition now is expected to restart not this month, but in February or early March.

DOE had projected this past summer that the last of the plant could be torn down and demolition rubble hauled away by the end of May 2019 and Hanford officials still think that could happen by July 2019.

The pace of work is anticipated to pick up as crews on the project gain experience.

In mid-September DOE approved CH2M to restart the load out of contaminated rubble left on the ground and unpackaged, but only for the rubble from tearing down some of the least contaminated areas of the plant.

Hanford regulators, Ecology and the Environmental Protection Agency, also agreed to a limited restart of work after they issued a stop-work order in January.

DOE planned to evaluate progress after the initial rubble load out before approving the restart of demolition, which would begin with a lower risk area of the main plant.

Once workers had shown they could do that work safely, they would move on to higher risk work on areas much more heavily contaminated with plutonium particles.

This editorial page over decades has decried the pace of clean-up at Hanford. It is essential that all of us — certainly including we who live downriver from Hanford — pay attention to what's going on. Oregon's U.S. senators — Ron Wyden and Jeff Merkley — and Washington's senators — Patty Murray and Maria Cantwell — must leave no doubt that this Trump proposal is indefensible and merits a swift burial.

"Burial" was a policy theme for far too long at Hanford, and continues in some senses today. Underground storage tanks which kept toxic sludge out of sight, if not out of mind, have been overly prone to leaks into the ground water and surrounding air. More recently, entire trainloads of diverse poisonous waste from the bomb-building era have been causing problems in tunnels where they were secreted away. In a suspiciously impromptu decision, these nightmarish tunnels are being pumped full of grout. Nearby residents express doubts about whether this stopgap answer will come back to haunt us.

"Burial" also comes to mind in the context of longstanding national failures in how we internalize the human, environmental and monetary costs of war. For too long, Hanford as a facility was treated with much the same lackadaisical attitude too many of our leaders display toward veterans — burying their suffering and needs in an underfunded and sometimes poorly run bureaucracy. Like the Veterans Administration, Hanford will benefit from continuing close oversight. The cleanup certainly must be financially accountable. But first and foremost, it must achieve its aims of making certain its surroundings and the wider Columbia River region are kept safe for generations to come. The expediencies of war are no excuse for potentially deadly shortcuts in confronting the aftermath of those decisions.

These commitments cannot and must not be hamstrung by political expediency — by this or any future presidential administration.

• Filing suit challenging a Washington state law making it easier for sickened Hanford workers to access compensation benefits — potentially perpetuating public health risks. (Go to http://bit.ly/2CeE2Ux to read our editorial.)

• Deciding to restrict the access of an independent safety board, which the federal government had agreed to form, to information about progress at the Hanford cleanup — potentially putting public health at risk.

• Seeking to reclassify high-level radioactive waste to "lower its threat level," which would save the Energy department billions of dollars and countless logistical headaches by simply leaving considerable toxic material in the ground — potentially putting public health at risk.

Notice the pattern? The federal government, which has dragged its feet for decades in cleaning up the nation's most contaminated nuclear site, now seems to be trying to dispose of the hassle of cleanup through rewriting rules rather than continuing the open and prudent process of cleaning up all the hazardous waste from decades of building nuclear weapons.

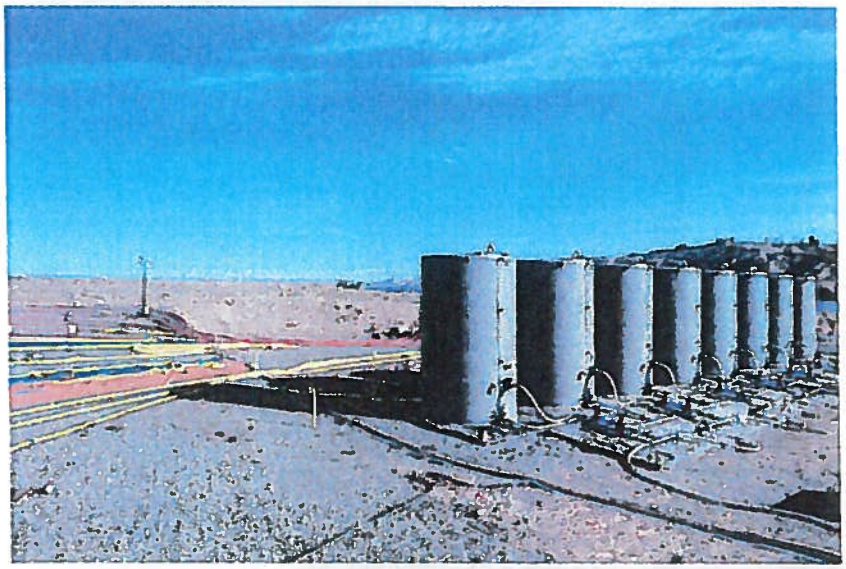
Yes, we know the price tag of the Hanford cleanup is steep — close to $2 billion a year. Likely, there are inefficiencies and wastefulness in Hanford's operating budget, but its mandate to clean up the mess is the price the government must pay for its nuclear weapons policies. Perhaps because the reservation is an hour or so south of us in the Tri-Cities, we tend to forget the almost unfathomable amount of waste wallowing underground – 8,000 cubic yards, including 56 million gallons of radioactive and hazardous chemicals waiting to be treated for permanent disposal while currently stewing in 177 atrophying underground tanks.

The federal government should be hastening the removal, not looking for ways to save a buck by, decades after the fact, attempting to change rules on what constitutes high and low levels of toxicity. Sure, the move will save the government $40 billion dollars under this proposal, but, in return, parts of Hanford would indefinitely remain a dumping ground for toxic sludge.

Environmental groups, such as Hanford Challenge, have balked at the DOE's proposal, saying the government would recklessly expedite the cleanup of Hanford the cheapest way possible.

But we live in the nuclear age, and situations such as Hanford's are part of the fallout. Saving money is a good thing, but not at the expense of a continued poisoned environment.

• Members of the Yakima Herald-Republic editorial board are Bob Crider and Sam McManis.



A view of the tanks and hoses used at the electrical resistivity tomography site at Hanford's 300 Area.

Researchers with DOE's Pacific Northwest National Laboratory (PNNL) worked with CHPRC to successfully implement a state-of-the-art approach for monitoring the delivery of the polyphosphate remediation.

The approach uses PNNL's Real-time Four-Dimensional Subsurface Imaging Software (E4D) to take images of the vertical and lateral movement of the polyphosphate solution. E4D was developed with support from DOE and the U.S. Department of Defense and is freely available to anyone.

E4D uses electrical resistivity tomography (ERT) measurements to reconstruct time-lapse images of the electrical conductivity of the soil. As the polyphosphate solution permeates the soil and the ground's electrical conductivity increases, an array of ERT sensors continuously measure the change in conductivity. E4D uses the measurements to produce images of the polyphosphate remedy distribution over time.

"It's sort of like using infrared goggles to see heat signatures in the dark, except this is underground — there is no direct line of sight," said Tim Johnson, senior geophysicist at PNNL and lead developer of the E4D software. "With E4D, data collected by remote sensors are processed by a computer tomography algorithm to produce an image that reflects the environment."

The polyphosphate remedy, delivered at two depths from a patchwork of 48 total injection wells, spreads through the soil. To help CHPRC employees view the spread of the phosphate solution underground, PNNL placed its ERT sensors in a unique cross-hole pattern within clusters of injection and monitoring wells.

During the phosphate solution injections, the ERT system injected electrical current into the subsurface. Sensors running the length of each well measured the corresponding changes in soil voltage.

Those measurements instantly traveled via wireless internet to Constance, a supercomputer at PNNL's Institutional Computing Center. There, Constance processed the data, combining geology, physics, mathematics, and chemistry with E4D's modeling software to create time-lapse 3-D images of the solution and its location within minutes.

Tri-City Herald

A highly radioactive dumping ground near the Columbia River is clean and returning to nature

RICHLAND, WA

In the '50s large cask trucks, heavily shielded to provide protection against radiation, drove north from near Richland with loads of highly radioactive waste that Hanford officials did not want buried too close to town.

At a site along the main Hanford highway six miles north of the city, they would back into position to dump their loads down pipes deep into the ground.

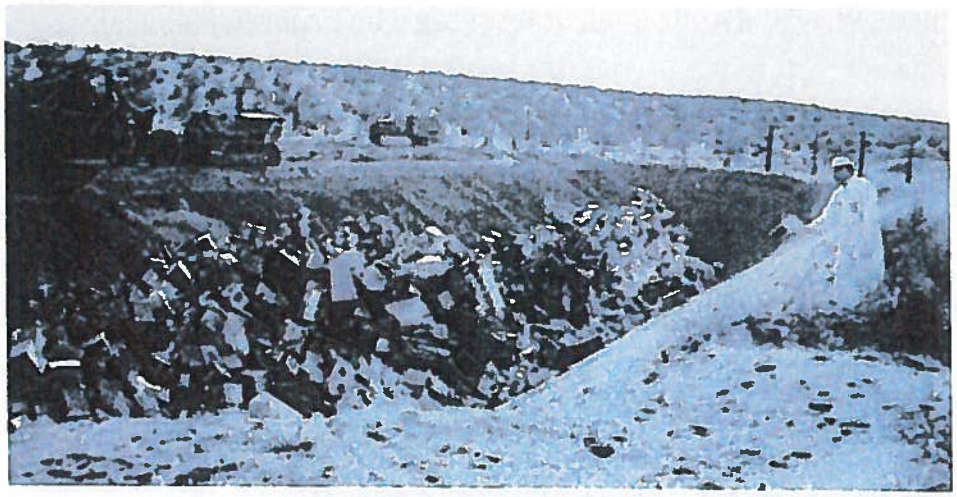
In between loads, each layer of waste would be topped with soil or grout to reduce the radiation emanating from the pipe.

More waste was buried directly in the soil at the 7.5 acre 618-10 Burial Ground.

One of the most hazardous burial ground cleanup projects along the Columbia River at Hanford, it was left as one of the last waste sites to be tackled.

many of the processes used to produce plutonium, creating highly radioactive and chemically contaminated waste.

Much of the worst of the laboratory waste created over nearly a decade was disposed of at the 618-10 Burial Ground.



Cans, ranging from the size of juice cans to paint cans, were dropped down 94 vertically buried pipes. Other waste was buried directly in the ground.

Workers dug down to 30 feet to retrieve about 2,200 drums and other miscellaneous containers of waste, including a 20,000-pound chamber once used to decontaminate equipment in the 300 Area. It had to be lifted out with a crane.

But the most challenging work was removal of the vertically buried pipes in one corner of the burial ground, which were suspected of having some of the most radioactive waste at the site.

Unusual burial method

"There were a number of people who thought this project, the remediation, couldn't be done safely," Kruzic said.

Because the auger was not tough enough to chew through them, workers dug up the soil around each of the pipes until the top four or five feet of the pipe were exposed.

Then an open box with a hole in the bottom was fitted over each steel pipe.

A soupy grout mixture was poured into the box and a hydraulic shear on the end of an excavator was lowered into the grout to munch up the steel pipe and waste contained in the mixture.

Between the time cleanup started in April 2011 and was completed in late 2017, some 528,000 tons of contaminated soil and debris were removed, said Lorna Dittmer, environmental director for CH2M's river risk management project.

Waste was taken to a lined, central Hanford landfill miles from the Columbia River for disposal.

2 more waste sites

The work included two nearby waste sites that were too close to address until 618-10 was completed.

One was a small site where testing was done using a radioactive tracer material to track soil contamination.

But the second was used to dispose of liquid contaminated with uranium and fossil fuels by dumping them into the ground.

CH2M workers excavated the dump site down to groundwater, about 68 feet deep.

Some of the species were requested by the tribes, including coyote tobacco, a wild tobacco that grew in the area of the 618-10 Burial Ground.

Few seeds were available for certain species, like mariposa lilies and yellowbell. They were planted in groupings, from which they are expected to spread.

Native grass seeds, including Sandberg's bluegrass and Indian ricegrass, were purchased from local providers.

Some seed was broadcast onto the ground and then covered with straw, which will help protect young plants from the cold and keep birds from eating the seed.

Planting started in mid-November to take advantage of the rainfall from then until February.

Roots will grow and seeds will start to germinate in the winter, Kruzic said.

The plantings will be evaluated annually to determine how different plant species are faring, said John Neath, the DOE river corridor closure supervisor for field remediation.

Tri-City Herald

Hanford blamed for most of $110 billion bump in federal cleanup costs

RICHLAND, WA

A $110 billion increase in the estimated Department of Energy cleanup costs across the nation is being blamed largely on the Hanford nuclear reservation.

A new DOE estimate increases the cost of remaining environmental cleanup at Hanford by $82 billion, bringing it to $242 billion, according to unaudited information in DOE's fiscal year 2018 financial report.

The issue is Hanford's underground tanks holding 56 million gallons of radioactive waste.

New estimates refine the costs of retrieving waste from the tanks, closing or otherwise disposing of the tanks, completing construction of the $17 billion vitrification plant and then decades of plant operation to turn much of the tank waste into a stable glass form for disposal.

The start of operations for the plant has been repeatedly delayed since Bechtel National began construction on it in 2002. Then the plant was expected to be ready to operate in 2011.

Most recently technical issues in parts of the $17 billion plant that will handle high level radioactive waste at the plant have led to a change in its operating plan.

Tri-City Herald

Potentially cheaper, faster Hanford radioactive waste treatment to be tested

RICHLAND, WA

The Department of Energy has awarded a $4.8 million contract to test a new and potentially less costly way to treat Hanford's radioactive waste held in underground storage tanks.

"We believe this is good news and a positive step forward," said David Reeploeg, Tri-City Development Council vice president for federal programs. "We've been supportive of the Test Bed Initiative."

The contract, awarded to joint-venture company Aerostar Perma-Fix TRU Services, would cover the second phase of the initiative, treating 2,000 gallons of the Hanford nuclear reservation's waste in underground tanks.

The demonstration project would mix it with concrete-like grout and then ship it to Waste Control Specialists in Texas for disposal.

"It is a team effort between DOE and local small businesses to find a solution to some tank waste treatment," said Richard Grondin, general manager of Perma-Fix Northwest just of the Hanford site in north Richland.

It would be a partial alternative for some waste now planned to be glassified at the $17 billion Hanford vitrification plant under construction.

CONGRESS, STATE HAVE QUESTIONS

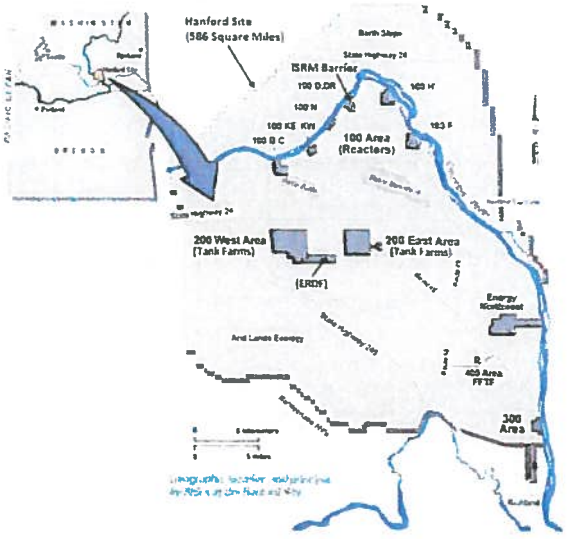
The U.S. Senate included language in a Senate fiscal 2019 DOE spending bill recommending no Hanford budget be spent on the initiative.

However, DOE plans to move forward on the initiative — pending reaching agreement with the Department of Ecology — with technology development funds from its national cleanup budget.

The Department of Ecology, the regulator for Hanford tank waste, said it is open to discussing the Test Bed Initiative as long as the demonstration project does not conflict with or inhibit plans to start treating low activity tank waste at the Hanford vitrification plant by 2023.

Now Ecology officials are waiting to see a report that was due to Congress from DOE in November 2018 to give the full details about the initiative. The report has been delayed, but Ecology expects it to be done soon.

The second phase of the project could be finished in September 2019, according to DOE. The contract announced Monday is for 10 months of work.



The waste in 149 leak-prone, single shell tanks are being emptied into 27 double-shell tanks, which are nearing capacity, until the waste can be treated for disposal.

The initial phase of the initiative treated so little waste that a three-gallon low activity waste stream could be separated from tank waste at the Hanford 222-S Laboratory.

For the second phase, liquid waste will be extracted from a double-shell tank that is running short of storage space.

Within the pipe coming from the tank to the ground's surface, called a riser, a system will be inserted to remove high level waste constituents from the liquid.

Liquid waste is mostly low activity waste but also can include cesium, which must be treated as high level waste. The cesium would be removed from the extracted waste with an ion-exchange system within the riser, according to DOE plans.

The waste would then be double checked to make sure it qualifies as low activity waste before it is grouted and then sent to Texas for disposal.

In addition, the scorecard pointed out that CH2M is no longer eligible for additional pay for completing work to demolish the highly contaminated Plutonium Finishing Plant.

CH2M FORFEITS PAY

The company earned $12 million in incentive pay from fiscal 2009-2012 for its work as it cleaned out and prepared the plant for demolition and tore down ancillary facilities there.

But none of the $39 million in remaining fee it could have earned remains available. The full amount would have been available if CH2M had completed work to tear down the plant by early 2015.

The amount remaining to claim was gradually reduced to zero through September 2018, other than the $12 million already awarded.

This was the second year in a row the annual scorecard from DOE called out CH2M's performance at the Plutonium Finishing Plant.

The low payment resulting from its subjective performance evaluation is linked to the 2017 spread of radioactive contamination during demolition of the plant and a failure to immediately correct the problem, it said.

DOE PRAISES SOME WORK

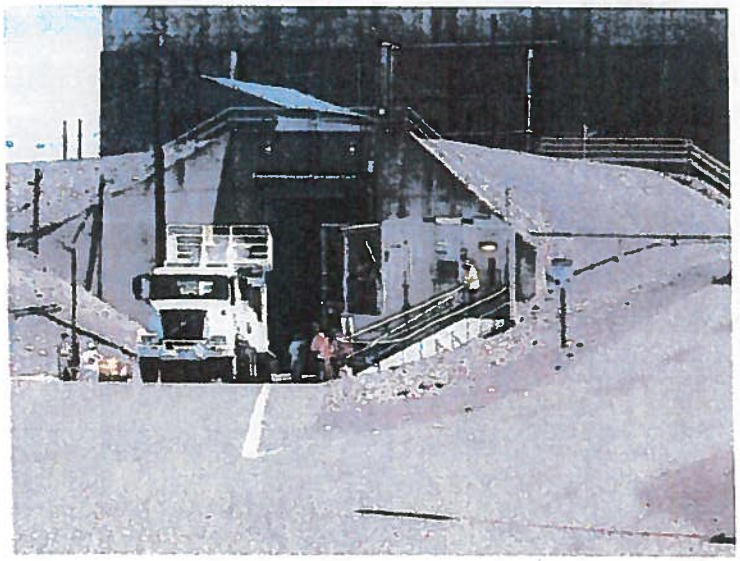
DOE said it has seen steady improvement in CH2M's work at the plant in the areas of radiological controls, work planning and work supervision since the December 2017 spread.

But more improvement is needed in vehicle safety, accounting for depreciation and a backlog of subcontract audits, the scorecard said.

"We will continue to learn and grow," said Ty Blackford, CH2M president at Hanford. "We overcame significant challenges, but also made great progress for the Hanford Site mission."

Both Blackford and the DOE scorecard pointed to CH2M successes in two projects.

The contractor started moving highly radioactive sludge from underwater storage at the K West Reactor near the Columbia River to central Hanford. And it began work to fill a PUREX plant waste storage tunnel at risk of collapse with concrete-like grout.



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U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

EM Update | Vol. 10, Issue 48 | Dec. 11, 2018

Four More WTP Support Facilities Move Into Startup, Testing Phase

A Waste Treatment and Immobilization Plant employee inspects electrical control equipment in the Chiller Compressor Building, which was recently turned over for startup and testing.

RICHLAND, Wash. – EM's Office of River Protection (ORP) recently turned over four more utility buildings that are part of the Waste Treatment and Immobilization Plant's (WTP's) Balance of Facilities (BOF) for startup and testing.

The WTP project continues to transition from construction to startup and commissioning, supporting EM's plan to treat tank waste at the Hanford Site through the Direct Feed Low-Activity Waste (DFLAW) approach by 2023.

Tri-City Herald

Hanford contractor gets $48 million reward for radioactive waste work

RICHLAND, WA

The Hanford tank farm contractor has been awarded nearly $48 million in incentive pay for its work in 2018. That's 93 percent of the fee available.

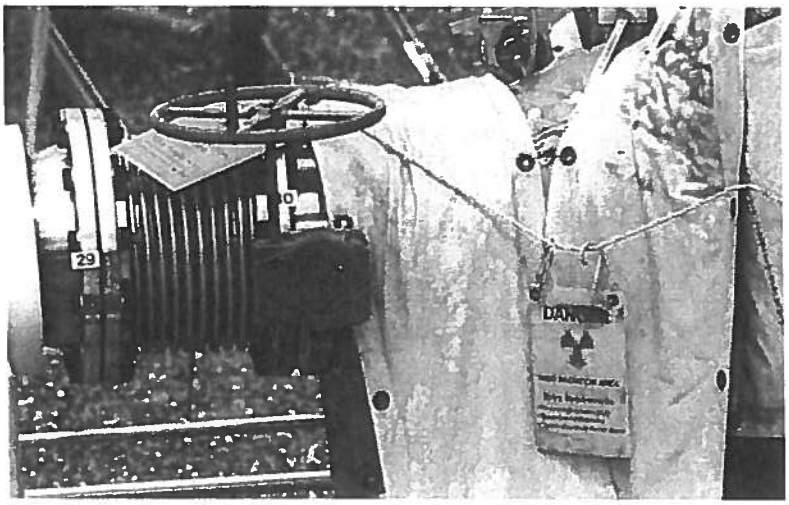
Washington River Protection Solutions, owned by AECOM and Atkins, did particularly well in meeting specific goals set by the Department of Energy, said federal officials.

It earned $35 million, or 98 percent of the pay possible, for meeting performance goals ranging from its work on a comprehensive plan to protect workers from chemical vapors to retrieving or preparing to retrieve radioactive waste from leak-prone single shell tanks.

"I saw very good commitment from the WRPS team toward accomplishing its goals this year," said Brian Vance, manager of the Department of Energy Office of River Protection at Hanford.

DOE also awarded WRPS nearly $13 million, or 83 percent of the fee available, in a subjective evaluation of its performance.

The contractor is responsible for operating the Hanford tank farms, where 56 million gallons of radioactive and hazardous chemical waste are held in underground tanks until the waste can be treated for disposal.



WRPS did a good job of identifying issues without having to be prompted by DOE, the score card said. It also had independent assessments of its work done more often than required and to cover a broad scope of work.

DOE was pleased that WRPS stepped up to quickly ramp down the design and testing being done for a pretreatment system planned to be built at the Hanford site's tank farms to prepare some waste before it is sent to the vitrification plant.

The fixed facility is on hold while DOE tries a smaller system that can be set up beside individual tanks to separate out low activity waste from high level waste to meet a 2023 deadline set in federal court to start vitrifying the least hazardous waste.

DOE also found some room for improvement in its tank farm contractor's performance.

WRPS scored just 65 percent on conduct of operations, earning $1.3 million of $2 million available.

The contractor had five of what DOE termed "adverse events" that did not have serious consequences, but had the potential if not addressed.

Tri-City Herald

Who will operate the $17 billion Hanford plant once it's done?

RICHLAND, WA

The Department of Energy is making plans for a new contract at Hanford — the first to operate the $17 billion vitrification plant under construction at the nuclear reservation.

The toxic waste glassification plant won't be finished for several years but DOE announced this week that the company operating it will be different than the contractor running the nuclear waste tank farm.

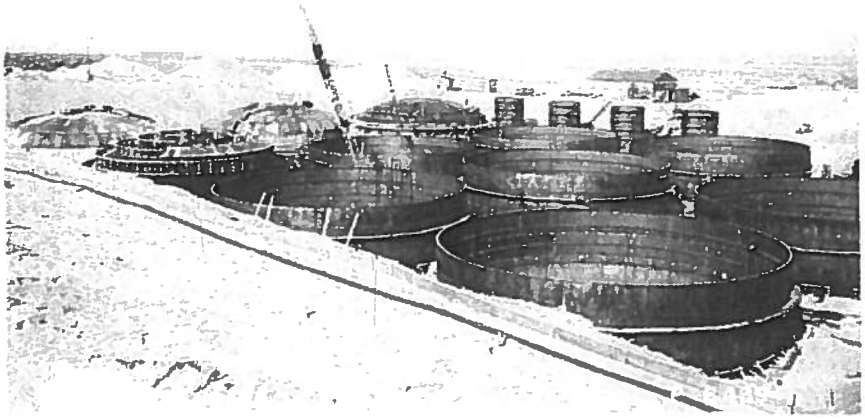
A new contract covering vit plant operations and maintenance will be awarded, likely sometime after DOE finishes deciding five other major contracts this year and next.

Bechtel, with subcontractor AECOM, holds a contract to build and start up the plant to turn up to 56 million gallons of radioactive and hazardous chemical waste into a stable glass form for disposal.

But it is not under contract to operate the plant.

The waste is left from the past processing of uranium fuel irradiated at Hanford reactors to chemically separate plutonium for use in the nation's nuclear weapons program.

DOE is required by the federal court to have the plant ready to treat some waste by 2023. But Bechtel is expected to continue working at the vitrification plant until 2036, the court-set deadline for having the plant fully operational.



DOE has been working in recent years on awarding five new major Hanford contracts.

The first of those contracts, for occupational medicine services at the site, was awarded to HPM Corp. of Kennewick, DOE announced this week. It is valued at up to $152 million for up to seven years of work.

Tri-City company awarded $152 million Hanford contract

DECEMBER 31, 2018 4:33 PM

The other four planned new contracts to be awarded over the next two years are in various stages of progress.

DOE already has released a request for bids for site wide services. Site wide services are now provided by Mission Support Alliance, owned by Leidos and Centerra Group, under a contract that expires May 25.

The proposed new contract, valued at $4 billion to $6 billion over up to a decade, covers services such as utilities, roads, security, land management, information technology and management of the HAMMER training center.

Tri-City Herald

Feds say some Hanford radioactive waste is not so dangerous. Oregon disagrees

RICHLAND, WA

A Department of Energy proposal that could change what is done with some high level radioactive waste at Hanford has Oregon urging its residents to take a stand.

"Waste that is no longer considered high level would be disposed in shallow burial at Hanford," said Oregon in a news release Monday.

The state's position is at odds with Tri-City area groups, which say the DOE proposal could save billions of dollars in environmental cleanup money across the nation, making more money available for some of the most pressing environmental cleanup at the Hanford nuclear reservation.

Now radioactive waste at Hanford and other DOE nuclear cleanup sites across the nation is defined as high level waste based on its origin.

Waste associated with chemically processing irradiated uranium fuel to remove plutonium for the nation's nuclear weapons program is currently classified as high level waste.

It is required to be disposed of in a deep geological repository, such as the one that has been proposed at Yucca Mountain, Nev.

U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

EM Update | Vol. 11, Issue 1 | Jan. 8, 2019

Hanford Team Successfully Installs Tank Farm Barriers

At center are the new interim surface barriers at the SX Tank Farm.

RICHLAND, Wash. – EM's Office of River Protection (ORP) and tank farms contractor Washington River Protection Solutions (WRPS) recently finished installing two interim surface barriers in Hanford's SX Tank Farm.

The two barriers cover nine tanks and portions of three more in the tank farm. The barriers consist of a layer of gravel covered with four inches of compacted high-density asphalt. Crews used about 4,500 tons of gravel and 3,300 tons of asphalt covering about 170,000 square feet.

About 300 people worked on the project, including engineers, project management professionals, construction crews, health physics technicians, industrial hygiene personnel, nuclear chemical operators, and employees from several support organizations.

"We could not have done it without so many people working together," said Jeff Jansen, WRPS project manager. "Their efforts to complete the job safely and efficiently while dealing with changing conditions and

Tri-City Herald

Feds are downplaying the dangers of Hanford radioactive waste, says Gov. Inslee

RICHLAND, WA

The state of Washington says a new Department of Energy plan would not protect the Columbia River from radioactive waste at Hanford.

Washington state's stand, which was announced by the office of Gov. Jay Inslee on Tuesday, is in opposition to the support by two key Tri-City-area groups for DOE's proposal. It follows a similar announcement by the state of Oregon on Monday opposing it.

DOE wants to change the way it classifies waste now labeled high level radioactive waste, which requires it to be disposed of in a deep geological repository, such as the one considered at Yucca Mountain, Nev.

The federal agency would assess the characteristics and risks of what's now classified as high level to see if it instead could be treated and disposed of under less restrictive requirements for low level radioactive waste.

Now waste is classified as high level if it came from chemically reprocessing irradiated nuclear fuel.

The Hanford nuclear reservation has 56 million gallons of such waste after plutonium was removed from irradiated fuel to be used in the nation's nuclear weapons program.

"This is an attempt by the federal government to grant themselves the unilateral authority to leave high level radioactive waste in the ground at Hanford," Inslee said.

DOE has previously said that waste in several of the Hanford site's 149 older waste storage tanks could meet criteria for disposal in New Mexico if tank waste were allowed there.

Texas is home to a commercial disposal facility for low level waste from DOE sites, including three gallons of Hanford tank waste mixed with concrete-like grout as part of the start of a pilot project under special regulatory approval.

"The term 'high-level radioactive waste' should be reserved for waste that truly requires disposal in a deep geologic repository in order to ensure public and environmental safety," said Richland Mayor Bob Thompson, in a comment sent to DOE on behalf of Hanford Communities.

But the state of Washington argued in its comments that there are already ways to reclassify high level waste based on their risk and characteristics, which allow input or oversight from the Nuclear Regulatory Commission and the state of Washington.

That includes provisional plans to vitrify, or incorporate in glass, about 90 percent of Hanford's tank waste as if it were low level waste and then dispose of it in a Hanford landfill.

A new interpretation of high level waste could allow DOE to grout waste in Hanford's tanks and leave the tanks in place, increasing the risk to human health and the environment, according to the state's comments.

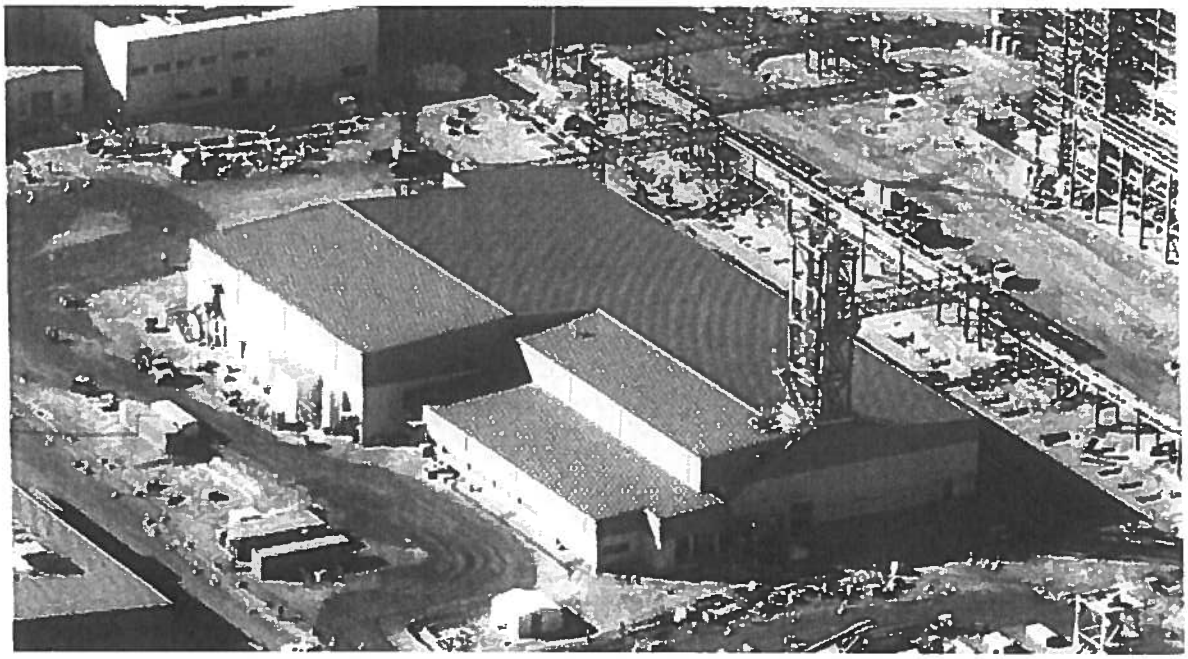
A 2012 DOE environmental study concluded that the only way to protect the Columbia River and communities near Hanford is to empty at least 99 percent of the waste in the tanks and then incorporate it into a stable glass form, rather than grouting it, for disposal, according to the state.

DOE has said that science is driving the proposal to allow it to reclassify some waste, according to the state.

U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

EM Update | Vol. 11, Issue 4 | Jan. 29, 2019

Hanford WTP Turns Over Analytical Laboratory to Startup Phase

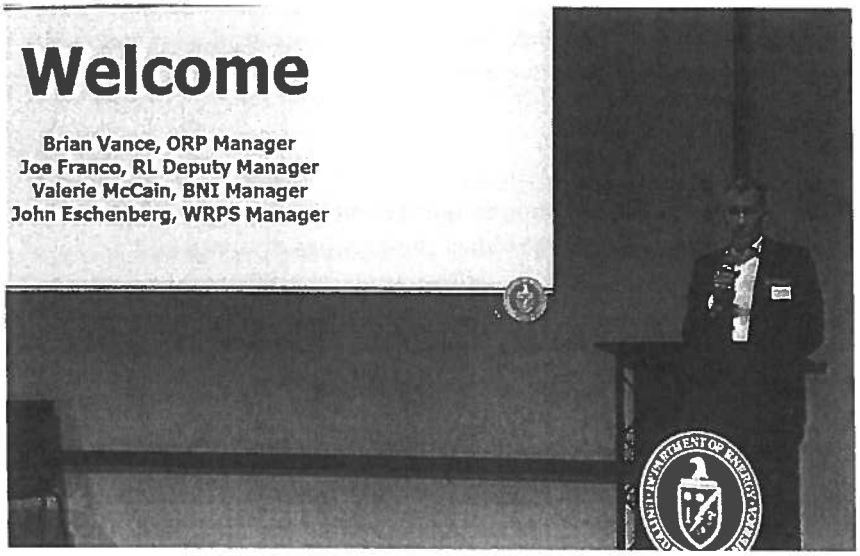


Workers at Hanford's Waste Treatment and Immobilization Plant recently completed turnover of the Analytical Laboratory to the full startup and testing phase. During direct feed low-activity waste vitrification operations, the laboratory will analyze approximately 3,000 samples each year to confirm the correct "recipe" needed to produce a consistent glass form.

RICHLAND, Wash. – Hanford's Waste Treatment and Immobilization Plant (WTP) team achieved a significant accomplishment recently as construction crews completed turnover of the Analytical Laboratory systems to the full startup phase.

"The laboratory is the first major WTP facility to complete systems turnover work," said Tom Fletcher, WTP project director for EM's Office of River Protection. "Finishing major construction and turning the laboratory systems over to the startup phase moves us closer to treating radioactive tank waste."

Hanford Leadership Energized for DFLAW Operations, Other Transitions



EM Office of River Protection Manager Brian Vance speaks to more than 80 senior leaders from more than 14 Hanford Site organizations during a recent operations leadership workshop.

RICHLAND, Wash. – More than 80 senior federal and contractor leaders met recently to discuss direct feed low-activity waste (DFLAW) operations and other advancements as part of the Hanford Site moves from a long-term construction site to an operational nuclear cleanup facility.

"We have to think differently about our future, not just for the Waste Treatment and Immobilization Plant (WTP), but also the tank farms and the rest of the site," EM Office of River Protection (ORP) Manager Brian Vance said. "In less than two years, we'll actually be transitioning to an operational mode at the site for waste treatment. We're here today to communicate our perspective about what that transition means."

Virtually every organization at the site will be impacted by the increase in operations, and they need to work together to meet those challenges, Vance said.

"This is not just an ORP deliverable or a WRPS deliverable or a BNI deliverable," Vance said, referring to ORP tank farms contractor Washington River Protection Solutions and WTP contractor Bechtel National Inc. "It's a DOE-Hanford community deliverable."

Valerie McCain, BNI principal vice president and WTP project director, echoed Vance's comments.

"It's a great time to be a part of this mission and I can tell you the tempo and pace of the project has really picked up," she said. "There is a sense of urgency. We're not talking years, we're talking months and days on the project."

The DFLAW approach is expected to allow treatment of low-activity radioactive waste, which makes up the bulk of waste in the tank farms, to begin by 2023.

WASHINGTON STATE UNIVERSITY

WSU INSIDER

High-performance grout aims to encapsulate Hanford secondary waste

February 20, 2019

WSU Tri-Cities engineering professor Srinivas Allena (r-l) and civil engineering students pour an ultra-high-performance grout mixture into a rectangle mold. (Photo by Maegan Murray, WSU Tri-Cities)

By Maegan Murray, WSU Tri-Cities

After seeing initial success in developing an ultra-high-performance grout to potentially encapsulate solid secondary waste at the Hanford Site, Washington River Protection Solutions is providing a Washington State University Tri-Cities professor and his research team with more than $300,000 to further the research.

7

COST ESTIMATE ALTERNATIVE ANALYSES FOR SELECTED CLEANUP ACTIONS

The Tri-Party agencies considered the remaining cleanup actions to be analyzed (Appendix B, Table B-6) and agreed that the 2019 LCR would not include an alternatives analysis.

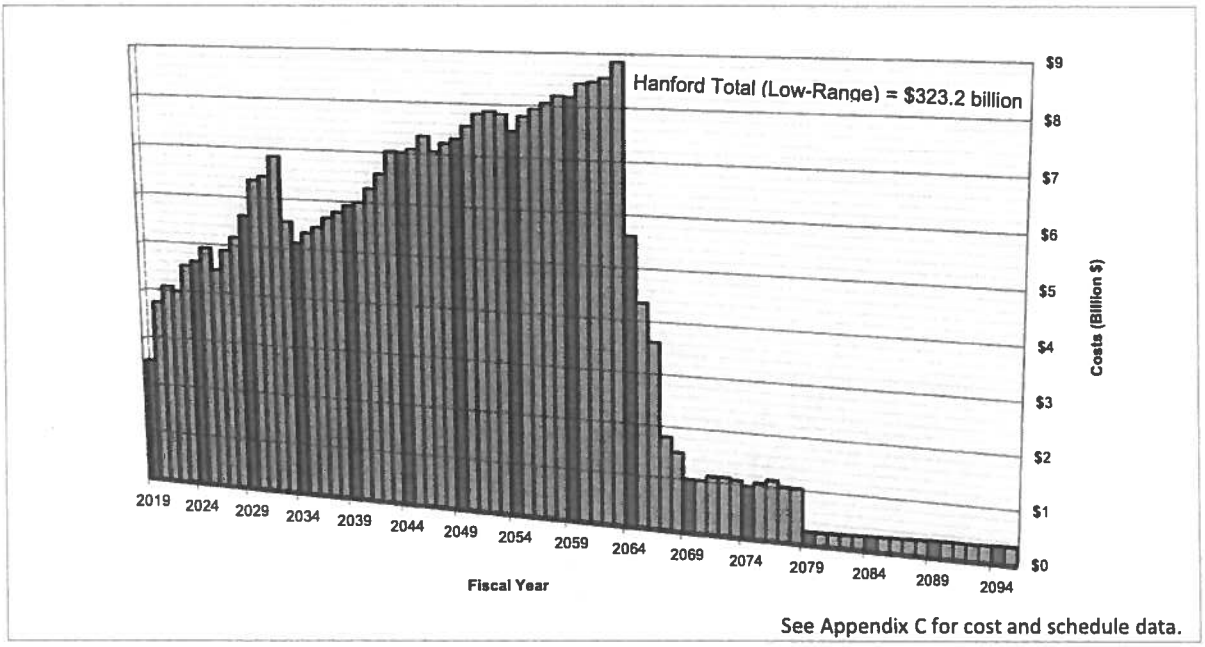


Figure ES-1. Hanford Site Remaining Estimated Cleanup Costs (Low-Range) by Fiscal Year (includes both RL and ORP).

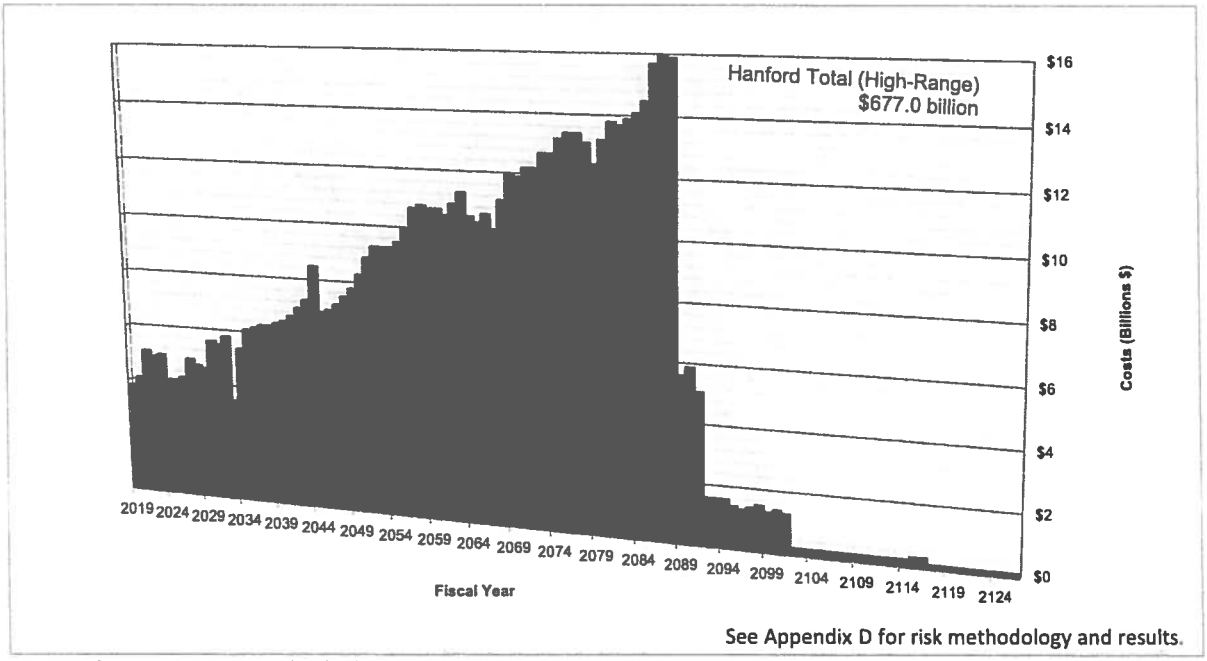


Figure ES-2. Hanford Site Remaining Estimated Cleanup Costs (High-Range) by Fiscal Year (includes both RL and ORP).

Tri-City Herald

Hanford cleanup costs triple. And that's the 'best case scenario' in a new report

RICHLAND, WA

The expected cost to finish cleaning up the Hanford nuclear reservation has tripled in three years, and that's under the best case scenario, according to a Department of Energy report released Friday.

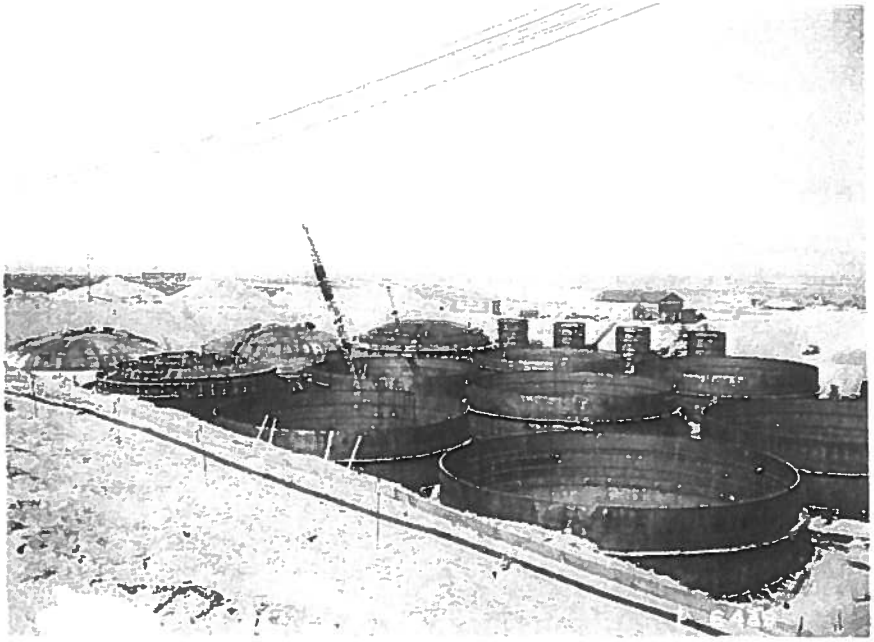
The report put remaining cleanup costs at $323.2 billion at best. At worst it could be $677 billion.

The cost estimates were included in the first Hanford Lifecycle Scope, Schedule and Cost Report to be released in three years. In the last report in 2016 the estimate was $107.7 billion.

"The findings of this report, and the developments on which it is based, show that a new approach is needed for the mission at Hanford," DOE said in a statement.

"These increases have been years in the making and, while not unexpected, the implications are clear," DOE said.

Estimates also have been extended on how long cleanup will need to continue at the 580-square-mile site in Eastern Washington state.



The cost of groundwater and contaminated soil cleanup increases from around $6 billion in 2016 to about $10 billion in the latest report.

DOE will use information in the new report "as it continues to work in a collaborative manner with the state of Washington, members of Congress, and local stakeholders to get waste out of Hanford's tanks and disposed of sooner and safer," DOE said.

ECOLOGY OFFICIALS NOT SURPRISED

The report released Friday followed both a Government Accountability Office report released this week on increasing costs across the DOE cleanup complex and a DOE financial report that showed rising costs to complete cleanup. The GAO report described an $82 billion single-year cost increase.

The Department of Ecology had just received the lifecycle report Thursday, the legal deadline for DOE to finish its 2019 report, and expects to study the 240-page document this month.

8

DOE/RL-2017-58
Draft A

TECHNOLOGY EVALUATION AND TREATABILITY STUDIES ASSESSMENT FOR THE HANFORD CENTRAL PLATEAU DEEP VADOSE ZONE

Date Published
January 2019

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

U.S. DEPARTMENT OF ENERGY Richland Operations Office
P.O. Box 550
Richland, Washington 99352

APPROVED
By Janis D. Aardal at 8:53 am, Jan 17, 2019

Release Approval Date

treatability tests were included in this technology evaluation and treatability study assessment.

Conclusions

Comprehensive evaluation of vadose zone technologies identified a list of technologies to consider when assembling remedial alternatives for the 200-DV-1 OU and other Hanford Site Central Plateau vadose zone OU feasibility studies. A preliminary assessment of the effectiveness, implementability, and applicability of these technologies to Central Plateau DVZ treatment areas and contaminants of interest (COIs) was conducted to identify data needs to support technology screening and alternative evaluation in future feasibility studies. This document provides recommendations for technologies where additional information on treatment effectiveness is needed to supplement existing technology information to evaluate effectiveness, implementability, and cost (EIC) in a feasibility study.

The technology evaluation and associated treatability study recommendations are based on the current general understanding of the nature and extent, fate and transport, and risk to groundwater of the vadose zone contamination. The 200-DV-1 OU Remedial Investigation (RI)/Feasibility Study (FS) and Resource Conservation and Recovery Act Facility Investigation/Corrective Measures Study (RFI/CMS) will determine which waste sites and contaminants pose a risk to groundwater.

The information from the recommended treatability studies needs to be obtained so these technologies can be appropriately evaluated in the feasibility study to expand on the limited number of viable DVZ remediation technologies. The treatability study assessment concluded the need for the following field and laboratory scale information:

- Laboratory studies to determine the effectiveness and scale-up potential for particulate-phase and liquid-phase in situ technologies are needed to support evaluation of contaminant sequestration approaches for perched water.
- Laboratory studies of the same technologies selected for the perched water, but using the geochemical conditions relevant for the water table, are needed to support evaluation of injecting a permeable reactive barrier at the water table interface with the vadose zone. This information will enable evaluation of this approach as a potential option for locations where contaminants in the vadose zone are at or near the water table.

This document also summarizes the results and recommendations from the treatability studies performed under the DVZ Treatability Test Plan (DOE/RL-2007-56) and fulfills the requirement of the test plan for a final evaluation of the treatability effort. One follow-on study was identified to provide refined surface barrier information that will enable this technology to be effectively evaluated in a feasibility study. All other technologies studied in the DVZ Treatability Test Plan have suitable information for direct consideration in a feasibility study evaluation.

Recommendations

The following modeling and laboratory studies are recommended from this evaluation to provide enough information to perform remedial alternative evaluations in the feasibility study:

- Initiate a modeling study based on existing field data to assess surface barrier design to correlate surface barrier size and placement to depth of barrier effectiveness.
- Initiate laboratory studies to assess effectiveness of in situ gas-phase technologies for contaminants in the unsaturated DVZ.
- Initiate laboratory studies of in situ technologies to sequester contaminants in the perched water to expand remedial alternatives beyond the current response action.
- Initiate laboratory studies of in situ technologies to sequester contaminants at the water table to enable evaluation of this approach for locations where contaminants in the vadose zone are at or near the water table.

Table ES-1 summarizes the recommended treatability studies and provides examples of waste sites in 200-DV-1 and other Hanford Site Central Plateau OUs that these technologies could be applied to if the studies show they are effective and implementable. The 200-DV-1 OU perched water and BY Cribs are likely continuing sources of technetium-99 and uranium to groundwater, but these waste sites and the other listed waste sites need to be evaluated in the RI process to assess potential impacts to groundwater.

Table ES-1. Recommended Studies and Potential Site Applications

Technology Process Option	COI to Study	Examples of Potentially Applicable 200-DV-1 Waste Sites	Examples of Other Potentially Applicable Waste Sites
Field Studies are not needed for any DVZ technologies to evaluate these technologies in a feasibility study			
None identified	N/A	N/A	N/A

Note: Bolded COIs are primary known contaminant targets. Other COIs are potential co-contaminants to evaluate with primary COIs.

a. These are likely continuing sources of contaminants to groundwater.

b. The remedial investigation evaluation will determine the waste sites that impact groundwater.

COI = contaminant of interest

DVZ = deep vadose zone

N/A = not applicable

The recommended laboratory studies are anticipated to take 2 to 3 years to implement from the time of sediment sample receipt until reporting of results and should be completed to support submission of the 200-DV-1 OU feasibility study to regulatory agencies for their review by 2023. The surface barrier modeling/paper study is anticipated to take less than a year to fully evaluate.

Technology Evaluation and Treatability Study Assessment Approach

To provide a comprehensive evaluation of available DVZ technologies, the DVZ technologies compiled from previous Hanford Site studies and workshops (which culminated in the tables presented in Appendix A of SGW-50339[3]) were used as a starting point. This list was augmented by performing a literature search to identify additional relevant technology development and demonstration activities conducted since 2011 at the Hanford Site, other DOE facilities, and other federal agencies and environmental remediation resources (e.g., U.S. Environmental Protection Agency, U.S. Department of Defense, Federal Remediation Technologies Roundtable's Remediation Technology Screening Matrix) and combined into a list of potentially implementable DVZ technologies.

The DVZ technologies were evaluated to provide a range of viable remediation technologies to develop remedial alternatives for feasibility studies and to identify promising remediation technologies that require further treatability testing.

[3] SGW-50339, 2011, *Remediation Technologies Screening Report for the Deep Vadose Zone, Hanford's Central Plateau*, Rev. 0, CH2M HILL Plateau Remediation Company, Richland, Washington. Available at: https://pdw.hanford.gov/arpir/index.cfm/viewDoc?accession=0064784H.

these contaminants are mobile in the subsurface environment compared to other DVZ contaminants and have been detected at high concentrations deep in the vadose zone, as well as in groundwater. Testing of technologies for remediation of technetium-99 and uranium also provided information relative to remediation of other contaminants in the DVZ.

The treatability studies performed under the DVZ Treatability Test Plan (DOE/RL-2007-56) were conducted to obtain technical performance data for full-scale use of a technology at the Hanford Site and provide a technical basis to evaluate the technology as part of a remedy when developing and screening remedial alternatives in feasibility studies. The strategy focused on testing the most promising in situ treatment and surface barrier technologies as determined based on several technology evaluation efforts at the Hanford Site as a first step in considering technologies for the DVZ. The technologies selected for inclusion in the test plan and the results and conclusions of those treatability studies are summarized in Table ES-2. The results, conclusions, and recommendations of the treatability evaluations performed in the DVZ Treatability Test Plan (DOE/RL-2007-56) are provided in Table ES-2.

Table ES-2. Treatability Test Plan Results, Conclusions, and Recommendations

Treatability Study	Technology Description	Treatability Results, Conclusions, and Recommendations
Desiccation	Desiccation involves injecting dry air to evaporate soil moisture from the contaminated zone to augment the impact of a surface barrier to impede water movement and the transport of contaminants into groundwater. Desiccation has a limited impact on contaminant concentrations, so long-term effectiveness relies on limiting moisture recharge.	Desiccation is considered a viable technology for remediation of most COIs except organics in the DVZ. It is ready for FS evaluations, and no further treatability studies are recommended. Desiccation is potentially applicable for all unsaturated zone sites.
In Situ Gaseous Reduction	A reducing gas (e.g., hydrogen sulfide) is used to directly reduce some contaminants and render them less soluble while they remain reduced or can reduce sediment-associated iron, which can subsequently reduce contaminants.	In situ gaseous reduction was evaluated as an option for field testing, but was not tested in favor of testing desiccation and URGS. This decision was informed by a modeling and experimental study indicating poor longevity of the reducing conditions on which this technology relies in the vadose zone.

Table ES-2. Treatability Test Plan Results, Conclusions, and Recommendations

Treatability Study	Technology Description	Treatability Results, Conclusions, and Recommendations
Surface Barriers	Surface barriers reduce water infiltration, which diminishes the hydraulic driving force for contaminant migration downward through the vadose zone to the groundwater.	The treatability study provided baseline information for surface barrier evaluation. However, as noted in the study, an additional modeling assessment is needed and is recommended to better define the effective depth and areal extent of the barrier in support of FS evaluations. Surface barriers are recommended for consideration in an FS as a stand-alone technology or in conjunction with desiccation to address most COIs.

COI = contaminant of interest
DVZ = deep vadose zone
FS = feasibility study
URGS = uranium reactive gas sequestration

9

Primer on Modeling

Tom Sicilia, PG
Hanford Hydrogeologist

Oregon Hanford Cleanup Board March 2019 Meeting



OREGON DEPARTMENT OF ENERGY

Roadmap

- What a model is
- How a model gets built
- What makes a good model
- Can models be abused
- Hanford

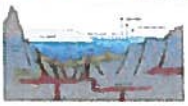
OREGON DEPARTMENT OF ENERGY

WHAT IS A MODEL?

- A simplified description of an existing physical system
- A description or analogy used to help visualize something that can not be directly observed



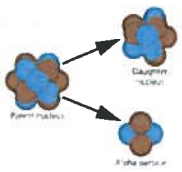


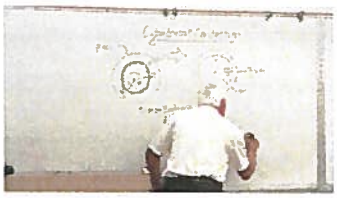


OREGON DEPARTMENT OF ENERGY

ANALYTICAL MODEL

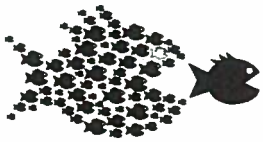
- Use "perfect" equation to know





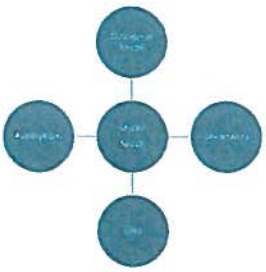
NUMERICAL MODEL

- Use brute computations to estimate



HOW WRONG IS YOUR MODEL?

- Numerical Models are never "true" All models are wrong, but some are useful
- The model is one representation of a potential outcome, given the assumptions, data, and the underlying conceptual model



STEP ONE – COLLECT SOIL/ROCK DATA

Split Spoon every 5'

STEP ONE – COLLECT SOIL/ROCK DATA

Continuous logging

STEP TWO – LUMP OR SPLIT

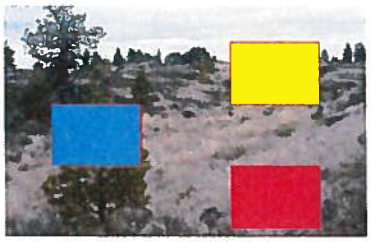
Use data and site knowledge to refine conceptual model

Drill cuttings

Split Spoon every 5'

Continuous logging

ASSUMPTIONS



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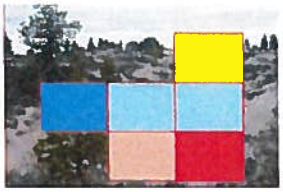
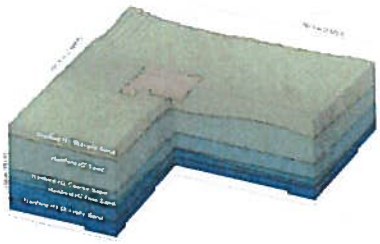


REPEAT AS NEEDED



Running the Model

STEP ONE- INITIALIZATION

Fill up the grids and allow background flow to be established

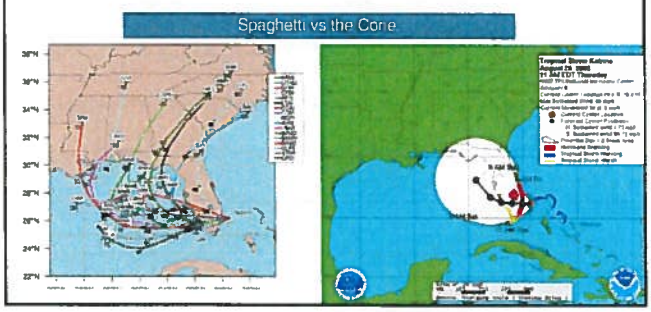
ONE (A) – FIRST CHECK

If there are wells within the space represented by the model, you can check your boundary condition assumptions by comparing the measured water levels to modeled levels (after initialization)

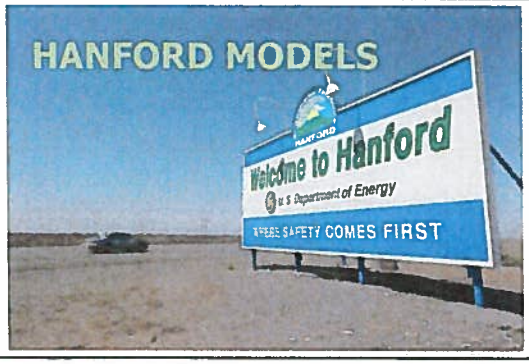
- Revise boundary conditions, re-initialize, and recheck
- Proceed to calibration

DETERMINISTIC VS PROBABILISTIC

Spaghetti vs the Cone

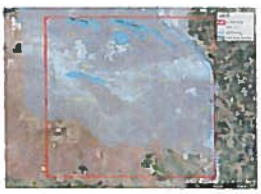


HANFORD MODELS

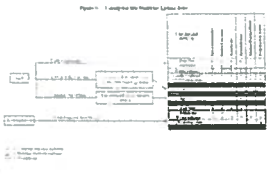


CONCEPTUAL SITE MODELS

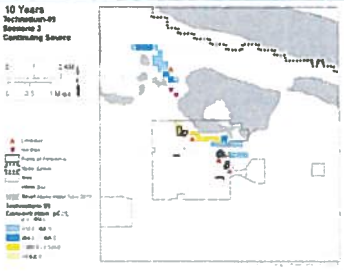
Hanford South Geologic Framework Model



Exposure Pathway Assessment



200-BP-5 AND 200-PO-1 P&T FS



ATMOSPHERIC CALIBRATION

QUESTIONS

10

Tri-City Herald

Critics say DOE is limiting safety oversight at Hanford and at other nuclear sites

BY ANNETTE CARY
acary@tricityherald.com
December 01, 2018

RICHLAND, WA

The Hanford nuclear reservation and other sites will be less safe under a new order issued by the Department of Energy that appears to limit a federal safety board's access, critics say.

The Department of Energy issued a new order in May outlining how it plans to interact with the Defense Nuclear Facilities Safety Board. The board was created by Congress to make recommendations to the energy secretary on safety issues at Hanford and elsewhere.

The board, along with nuclear facility watchdog groups across the nation and the Energy Communities Alliance, have raised concerns that the order appears to reduce the board's access to nuclear facilities and information.

"Within just the past several years, the safety board identified numerous concerns about the build-up of explosive and flammable hydrogen gases in the Hanford waste tanks," said Tom Carpenter, Hanford Challenge executive director, in a statement.

The board has also raised safety issues at the $17 billion vitrification plant under construction at Hanford, including controlling unplanned nuclear reactions and flaws in the design and construction of electrical systems, he said.

"These were issues the board raised because DOE and its contractor had failed to self-identify or correct them," he said.

- Allows DOE to deny board requests for draft documents and access to deliberative meetings, such as those held after emergencies.

- Allows the board to exclude many facilities at Hanford and other sites from board oversight because the board does not think they present a significant radiological hazard.

The safety board told the energy secretary that federal law gives the board the authority to determine its access and the extent of its oversight.

Limiting oversight to the safety of the public off Hanford goes against historical precedence and federal law, it said.

It argued that its expert advice is often dependent on draft documents and meetings.

"Congress has asked the board to express its view early in the process of design and construction, for instance, so that the board's opinion can be considered prior to DOE decision being made," the board told the energy secretary.

White, the assistant secretary for the DOE Office of Environmental Management, said Wednesday that DOE appreciates the advice the board provides, but ultimately DOE is the owner of Hanford and other sites and is responsible for managing the risk associated with their facilities and operations.

"Our work is critical to lowering the environmental risk posed by the legacy of the Cold War," she said. Hanford is contaminated from the past production of plutonium for the nation's nuclear weapons program.

The new DOE order does not hinder cooperation with the board, she said.

DOE has continued to work with the board staff as it did before the order was issued, she said. Since May DOE has responded to about 1,000 requests for information from the board and its staff.

DOE reserves the right to control access to information "in the predecisional phase." On a case-by-case basis, it will consider sharing information when it is mature enough to be helpful, she said.

DOE will welcome board comments on lower hazard radiological facilities, labeled Hazard Category 3, but the main focus should remain on the most serious risks, she said.

The Energy Communities Alliance has told the energy secretary that DOE should have consulted with the alliance, local communities, state regulators, the board, the tribes and the public rather than unilaterally implementing the new order.

The flow of information to the safety board that could impact local communities will be slowed by the order, it said. Among its concerns is that the DOE contractors who do most of the work at Hanford are required under the order to refer all requests for information or access to a DOE liaison for a decision on a response.

Many of the requirements of the order appear either comprehensively or arbitrarily to limit safety board access to DOE activities or DOE employees who make key decisions, it said.

The safety board has areas in which it needs improvement, such as incorporating concerns of cost and technical feasibility into its recommendations to DOE, the alliance said.

"Nevertheless, DOE must not impeded (safety board) operations by restricting access to critical information necessary to fulfill the board's mandate," it said.

The next safety board hearing on the DOE order is expected to be held in New Mexico.

- Chairman Nathan Small of Shoshone-Bannock Tribes
- Governor Perry Martinez of the San Ildefonso Pueblo
- Lieutenant Governor James Naranjo of the Santa Clara Pueblo, and
- First Lieutenant Governor Bryon Yeppa of the Jemez Pueblo

I'd also like to thank the other Tribal leadership and staff from the Tribal Nations. Finally, I'd like to acknowledge all of our elected state and local leaders and administrators, and our regulators. Thank you for traveling great distances to attend this meeting.

I'm glad I was able to meet with you yesterday to learn more about your issues. I recognize that each of your organizations plays a role on a wide range of priorities. With nuclear waste cleanup being only part of your portfolio, I appreciate the time you put into ensuring the success of EM's mission. My goal here is to focus in on ways we can work together to improve the trajectory of cleanup as we wrap our arms around some uncomfortable facts and face some important decisions. Decisions that will have long-lasting impacts. Decisions that will require your input.

Over the next two days the EM team and I will provide updates on the great work being accomplished by the men and women in the field and lay out our initiatives to achieve meaningful reductions in risks and environmental liabilities. It is my hope that we all come away from this meeting with an awareness of the impacts of EM's mounting backlog of work, and a renewed sense of urgency to begin to work off the third biggest liability to the U.S. taxpayer — environmental liabilities.

While it doesn't always make headline news, progress through action is being made at each of our EM sites. From my time in industry, I understand where work gets done. It is not east of the Potomac, it is out in the field. Our Field Managers, staff and contractors are doing a great job progressing the baseline work scope — but we must do more.

I've been fortunate to visit most of our sites, some more than once, during my time as EM-1. When I go to the sites, I see that people want to get the work done. That's a natural tendency. I see it in the field all the time. It's enthusiasm. That enthusiasm translates into progress across the board.

Even with all this great work being done, and progress being made, EM still faces significant challenges. Cleanup progress is being significantly outpaced by ever-extending site closure dates, leading to increased environmental liabilities. Time equals money! As most of you heard me say yesterday, environmental liabilities represent the third largest liability for the U.S. taxpayer. EM makes up 84 percent of that total. Even with significant budgets, EM is swimming upstream. Rather than fight the current of environmental liabilities, risks, M&O hotel costs, lifecycle schedules, and to-go costs that we have all seen grow each year despite progress on the ground, it's time to change the course of the river. The fact is, cleanup progress cannot outpace this current if EM stays on the same course it has been on for nearly 30 years.

During the early years, EM was rightfully focused on figuring out what kinds of waste it had, how much it had and where it was. That evolved into cleanup plans and agreements with states and regulators based on the best available information and science at the time. At one point in our history, we were stemming the tide as we completed work at Fernald, Rocky Flats and Mound.

This program, that we used to call a project, started in 1989. But we're not here to discuss the EM of the past. At this point, we've all been at this a long time — this is the 17th (!) annual Intergovernmental Meeting. It's time to modernize EM. Our knowledge and technology have matured significantly over the years. It's time

Last month the Department issued for public comment its interpretation of the statutory term high-level radioactive waste. An interpretation that would bring the U.S. more in line with definitions used by the rest of the world — having the option to classify waste based on its actual contents and associated risks vs. solely on the source of the waste. Yesterday, I heard a lot of concern from you about the public comment process. Some said, all we'll get is more questions. Let's turn that around — please turn your questions into comments and statements. This is but the first step in a process that must comply with existing regulatory requirements and law. In no case will the interpretation abrogate the Department's responsibilities under existing regulatory agreements.

I'm encouraged that you have a session on this topic tomorrow with Mark Senderling. I look forward to hearing more from all of you on this both here, and as part of your participation in the public comment period.

EM is also taking steps to get the best value out of every cleanup dollar with which we are entrusted. Consistent with the Deputy Secretary's initiative on Regulatory Reform, I have directed staff and the field to look at opportunities for change. Based on my experience in the field, this will lead to an enhanced safety culture because many of the reforms are common sense approaches that can streamline our work. I want to see EM drive down the operating and maintenance costs for our facilities, which takes up a significant portion of our annual cleanup budget, and instead plow those resources into actual cleanup work. As project lifecycle schedules drag out, aging facilities, components and equipment are stretching resources. It's simple math — we can either put money towards cleanup or we can maintain aging facilities and build new, but we can't do it all.

Of course no cleanup work would happen if not for EM's contract partners. One of our most transformative initiatives that I've undertaken is in the area of contracting. EM has billions of dollars in procurements coming up at some of our largest sites over the next few years, representing a significant opportunity to improve our procurement processes, contract management and oversight performance.

Angela Watmore will talk more about contracting later today, but I'd like to briefly address the topic. End state contracting is not a contract type, but an approach to creating meaningful and visible progress through defined end states, even at sites with completion dates far into the future. This is intended to drive a culture of completion. With this new approach, EM will adhere to a "manage the contract, not the contractor" model. However, this means we must ensure we have the right contracts in place to allow Field Managers to drive contractor performance with a right-sized federal oversight model. I am hopeful that contract approach combined with the discussions we are having on the regulatory front will yield impactful results.

Based on the experience and lessons learned in the last three decades of cleanup and advances in technology and approaches, there are opportunities to streamline and accelerate cleanup by pursuing strategies that are faster, more cost effective, and more technically sound, and would reduce risk to human health and the environment. We have opportunities to utilize tools available to work together on removing barriers to efficient cleanup. These could include CERCLA and RCRA integration at the end, aligning end-use to cleanup standards and recognizing that some areas will need to remain under government control in perpetuity, and streamlining our internal decision processes.

In closing, I'm looking forward to a productive day of discussions. I'm going to be dropping in on all of the site breakout sessions. In addition to the field managers we will have senior DOE people sitting in on all of the sessions. I'm looking forward to a wrap-up on the breakout sessions and on how we continue this dialogue in a way that institutionalizes a completion mentality and moves us towards our many shared goals.

But lawyers for Nevada said that their bid for an emergency injunction is more critical than ever after the energy department misled them about the shipments. They say the government has created the "palpable suspicion" that more shipments are coming to Nevada.

U.S. District Court Judge Miranda Du in Reno is considering the state's request to block plans announced in August to ship a full metric ton of plutonium to Nevada from South Carolina, where a federal judge previously issued an order that the plutonium be removed from a Savannah River site by January 2020.

Nevada argues the DOE has failed to adequately study the potential dangers of moving the material to an area that is subject to flash floods and earthquakes, and that the state's lands and groundwater may already be contaminated with radioactive materials.

The Energy Department defended its decision in court on Jan. 17. Its lawyers argued at the time it doesn't have to disclose top-secret details of the shipment plans because of national security.

Du expressed sympathy at times for the state's argument during the evidentiary hearing, but declined to immediately grant the state's request and indicated she wouldn't rule until February.

"I hope the government doesn't ship plutonium pending a ruling by this court," she said at the time.

Sisolak said Wednesday the energy department led the state to believe it was engaged in good-faith negotiations over the plutonium "only to reveal that those negotiations were a sham all along."

"They lied to the state of Nevada, misled a federal court and jeopardized the safety of Nevada's families and environment," he said.

Experts testifying on behalf of Nevada said the material likely would have to pass directly through Las Vegas on the way to the Nevada National Security Site. They fear an accident could permanently harm an area that boasts 2.2 million residents and more than 40 million tourists a year.

The Energy Department says it has safely shipped the toxic material between states before. Federal officials say the plutonium would only be "staged" in Nevada before moving on to Los Alamos National Laboratory in New Mexico. They say shipments to Nevada would avoid heavily populated areas of Las Vegas.

Nevada's congressional delegation swiftly condemned the newly disclosed shipment.

Tri-City Herald

Hard to understand documents may be costing sick Hanford workers

KENNEWICK, WA

More than 4,000 previously denied claims in a federal compensation program for ill workers at nuclear sites like Hanford were approved in recent years.

But the number might have been higher if those filing claims had information about refiling claims that was easier to understand, according to a Government Accountability Office report recently released.

The report, requested by Congress, found that the Department of Labor should communicate more clearly with people filing claims.

The program compensates workers or their survivors for illnesses that likely were caused by exposures to radiation or toxic chemicals at Department of Energy nuclear sites, including the Hanford nuclear reservation.

To date the program has paid compensation and medical benefits totaling almost $1.6 billion for Hanford workers who became ill, plus $274 million for workers at Pacific Northwest National Laboratory.

Benefits can include a $150,000 payment for radiation-caused cancers or lung disease caused by the metal beryllium and $250,000 for wage loss, impairment and survivor benefits for exposure to toxic chemicals.

Most often claims were denied because a link between a toxic exposure and an illness could not be established, not enough medical information had been supplied or the survivor applying was not eligible to claim benefits.

Some people filing claims may have been denied approval because they did not understand what evidence would be required to reopen a claim, the GAO report said, citing information in 2015 from the federal program's Office of the Ombudsman for the Energy Employees Occupational Illness Compensation Program.

"In particular, the ombudsman found that DOL's written communication with claimants did not clearly explain what specific evidence was needed or why previously submitted evidence was deemed insufficient," the GAO report said.

Department of Labor officials told the GAO in July that they have taken steps to help people filing claims and improve communication. They included visiting district offices to provide training on writing letters using reader-friendly language.

The Department of Labor also has hired a training analyst to develop additional training for claims examiners and to develop a method for assessing the effectiveness of training.

Hanford workers or their families who want to file or refile a compensation claim through the Department of Labor and other programs may get help or information at no cost at the DOE's Hanford Workforce Engagement Center at 309 Bradley Blvd. Suite 120, in Richland.

High Country News

FOR PEOPLE WHO CARE ABOUT THE WEST

There's no easy fix for our nuclear past

At Washington's Hanford nuclear site, failing infrastructure and make-do plans as the West prepares for a new round of radioactivity.

Heather Hansman | **Dec. 10, 2018** | *From the print edition*

The Hanford nuclear complex in eastern Washington lies in a green-gold sagebrush steppe, so big you can't see the edges of it and shimmery in the summer heat. The only landmarks are low-slung buildings on the horizon and ancient sand dunes scrubbed bare when the glaciers melted. There's almost no trace that this is the biggest nuclear waste dump in the country. The scale of nuclear waste is like that: sprawling out into the metaphysical distance, too big for the human mind to hold.

That's what John Price tells me. He's the tri-party agreement section manager for the Washington Department of Ecology, which regulates Hanford, the site of the country's first plutonium production plant. (The other two parties are the U.S. Department of Energy and the Environmental Protection Agency.) On a sweltering June evening, we stand on the edge of the site's central plateau, wind buffeting our faces as we stare at the bony frame of the future vitrification plant. If you were to pull a shot glass full of liquid out of one of the tanks buried near us, it would kill everyone within 100 yards instantly. And the danger would not disappear: Plutonium, one of the components of that poisonous soup, has a half-life of 24,100 years. The plant is supposed to start processing the most toxic waste in 2036. But construction has stalled out and most of the waste sits in underground tanks, some of which have begun to fail.

The B Reactor sits in the sagebrush steppe of the Hanford Site, Washington, along the banks of the Columbia River, where a massive cleanup continues.

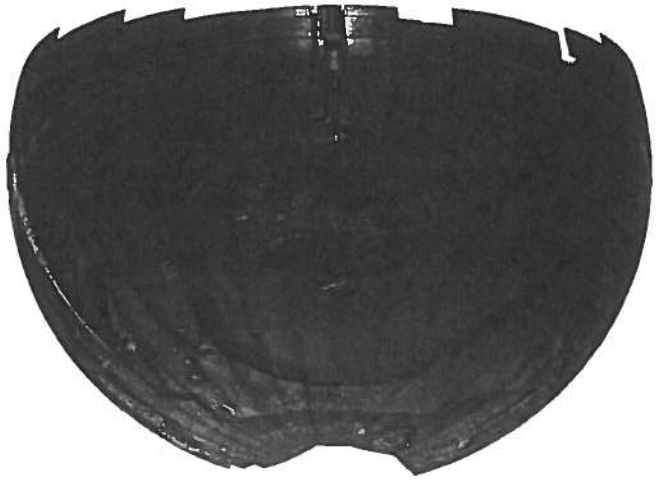
Stuart Isett

IN FEBRUARY 1945, Col. Franklin Matthias, the eager young civil engineer who directed construction of Hanford, took a train to Los Angeles to hand-deliver the first 100-gram plutonium plug fabricated at the site to a courier from Los Alamos, New Mexico. It would become the core of bombs like the Fat Man, dropped on Nagasaki that August. As he handed off the hockey puck-sized object, he told the courier it cost $300 million to make.

The production of those pucks would prove to cost far more than even Matthias could have calculated, mostly due to the radioactive detritus they left behind. The Government Accountability Office estimates cleaning up Hanford could total more than $100 billion. Since 1989, when Hanford was first designated as a Superfund site, 889 buildings have been demolished, 18.5 million tons of debris have been put in controlled landfills, and 20 billion gallons of groundwater have been treated. With three decades of work, the scope of the problem has been greatly reduced, but the really toxic stuff is still on site. The groundwater beneath Hanford is never going to be clean enough to drink, thanks to a cocktail of chemicals: strontium-90, which deteriorates marrow in the bones of humans and animals and takes 300 years to break down; hexavalent chromium, which mutates salmon eggs; and technetium-99, which dissolves like salt in water and has a half-life of 211,000 years.

The 586 square miles of sage still hold the 324 Building, home to highly radioactive nuclear containment chambers called hot cells, less than 1,000 feet from the Columbia and right across from the town of Richland, where many of the Hanford workers live. In

At the current rate of funding and cleanup, the DOE's Richland Office, which manages most of the site, falls another year behind schedule every two years, and the Office of River Protection, which oversees the tank waste, slips back a year every three. This year, President Donald Trump proposed slashing the budget for Hanford cleanup by $230 million.



Inside one of the tanks at Hanford, where the cleanup operation continues.

Courtesy of Washington River Protection Solutions

IF YOU'RE A CIVILIAN, one of the only ways to get a close look at the hyperobject that is the complex cleanup process is to score a seat on one of the Department of Energy's annual cleanup tours. On a sun-beaten summer day, I boarded an overly air-conditioned short bus packed with retirement-aged folks. Joe Guyette, the volunteer tour guide, has worked at Hanford since 1973; before that, he was in the Army, where he says he got the better part of a lifetime's dose of radiation. He does these tours to try allay negative perceptions of Hanford and show the public just how complicated the cleanup is.

"It's clear that sometimes they haven't been careful," Guyette says. "They get criticized about it, but they're doing the best they can."

Guyette took us on a tour of the water treatment plant, where we talked about those groundwater plumes. We drove by the cocooned reactors and the dark, hulking plutonium finishing plant, hoping to get a sense what is actually worth being scared of, what constitutes cleanup, and how nuclear waste changes over time. He took us to a

safely contain waste for up to 40 years on the assumption that we'd have figured out a long-term plan by then. But we haven't, at Hanford or anywhere else.

High-level waste was never supposed to stay on site permanently. The waste from the tanks is intended to be vitrified, turned into glass rods, then sent to a federal repository, where it would sit, isolated, forever.

But that repository doesn't exist yet, and it's possible that it never will. The Nuclear Waste Policy Act of 1987 designated Yucca Mountain, Nevada, as the spot to store the waste. Despite $15 billion spent studying the site, and a growing cost to hold the waste at other sites, plans for Yucca have been in limbo for decades, in large part because of opposition from Nevadans, including former Senate Majority Leader Harry Reid, D-Nev., who don't want the waste transported through or stored in their state. A bill to reopen Yucca passed the U.S. House of Representatives as recently as May, but failed in the Senate.

"We've made stuff that will be dangerous for millennia and we deal with it in two-year congressional cycles," said William Kinsella, a North Carolina State University professor whose research includes nuclear weapons cleanup. "We don't want to make hasty decisions, but it's a chokepoint for nuclear constipation."

That has created expensive and dangerous blockages throughout the nuclear waste management system. Without a place to send waste, the cleanup at Hanford has no real endgame. Because of the long-term impossibility, the Hanford Advisory Board — a coalition of tribal members, community volunteers and government workers who advise the agencies that manage the site — is constantly worried that the funds might dry up while the tanks are still full. The fear of slashed funding, and the cleanup's long delay, is part of what drove the Department of Energy to consider grouting.

But the proposal worries watchdog groups, who are concerned about short-sighted cost-saving measures that could put surrounding communities at lasting risk by keeping 700,00 gallons of waste that's currently classified as high-level, and that might ultimately leak to the river on site. "What the DOE is proposing is to make the Hanford site a high-level waste repository in all but name," said Tom Carpenter, executive director of the Hanford Challenge, an environmental advocacy group. "That does not belong in an agriculture zone in a major river system in an earthquake zone."

"When I hear people say things like, 'This will never happen,' I really want to caution them," Rod Skeen of the Confederated Tribes of the Umatilla Indian Reservation told the Hanford Advisory Board. He says that traditional water uses, like fishing and sweat lodges, mean the tribe's exposure is different than what the Energy Department might assume exposure looks like. Tribes have historic treaty rights to hunting and fishing grounds within the site, and they've asked the DOE not to reclassify waste in the past, because of concerns about how that waste would trickle down into the ecosystem, and their food system.

Those kinds of low-probability but high-risk odds have created an environment that University of Washington professor Shannon Cram calls "the politics of impossibility." How do you navigate a situation where safety is impossible to promise? The people in charge of caring for Hanford are trying to prevent unknown future problems, and fix past generations' mistakes. But in the face of a budget crunch and an overwhelming cleanup, it's nearly impossible to know what's right.

Cram, who has studied the long-term public health effects of Hanford, says it's likely that Hanford will never be completely clean, and that, if some waste is always going to remain in the ground, the real challenge is deciding what an acceptable level of exposure is.

"I think it's really misleading to call it cleanup," Cram says. "It's not clean, it's contained and monitored." Cram remains concerned about the possibility of disaster being passed on to future generations. "The brewing threat doesn't get enough attention, because a lot of it is looming in the future," she says. "We basically as a country have to learn how to have the appropriate amount of fear."

smell the charred sage. But Price's second fear is about the equally insidious threat people pose to themselves: A lack of long-term protection and the erosion of care. He says the paradox of Hanford is trying to convince people that the site is safe now, but that in 500 — or 1,000 — years, it might not be, and that we have to make decisions with those unknown risks in mind.

"I'm not really worried about today, broad-scale, but I'm worried about the future," he says, when we stop on the north side of the river and look back toward the hulking shells of the former reactors. "I don't want to sensationalize the groundwater plumes or the collapses, but the no-Yucca solution is a real threat."

As Price thinks about the cleanup's future, he's concerned that we can't see the limit of what might happen here, in a worst-case scenario. And he worries that the fear of nuclear waste's slippery threat will fade, even if the threat itself doesn't, or that controls will loosen as people become overwhelmed by the scale of the problem.

To fix our past mistakes, we need to have more foresight than the people who came before us. But that's nearly impossible. In the 1940s, Hanford scientists faced an immediate fear by creating weapons that ended a war but left an unplanned toxic legacy. Today, as we struggle to disentangle ourselves from energy sources that leave us with multigenerational problems like climate change, there's little evidence for further-reaching imagination in our decision-making. It's still impossible to know what we can't see coming. And if we fail, this waste pile and more like it will remain our legacy, sitting in overlooked corners like the empty eastern Washington plains, for longer than humanity can comprehend — or even remember.

Note: This story has been updated to clarify that the toxicity of the waste at Hanford stems only it part from plutonium.

Heather Hansman lives in Seattle, where she writes about water and the West. Downriver, *her first book, will be out in April.* Follow @hhansman (https://twitter.com/hhansman?ref_src=twsrc%5Etfw)

11

Upcoming Tri-Party Agreement (TPA) and Consent Decree Milestones for Hanford Cleanup

Note: This is NOT a complete list of upcoming milestones – it focuses on major issues of concern to Oregon. This summary also does not include the exact language from the TPA.

Note: **Reports/assessments/negotiations/decisions are in black text.**

Cleanup/monitoring actions are in red text.

Milestones at risk or that will be missed are in purple text.

2017

Sept 30, 2017 **DOE will complete Plutonium Finishing Plant to "slab on grade" (M-83-00A). MISSED.**

2018

Apr 30, 2018 **DOE will start construction of supplemental vitrification treatment facility and/or WTP enhancements (M-062-32-T01). This is a TARGET, not an enforceable milestone. IN ABEYANCE (from December 1-31, 2018 ORP TPA Monthly Summary Report). Will be addressed with negotiations supporting M-062-45 which System Plan 8 will help inform.**

Sept 30, 2018 **DOE will initiate characterization work for the 200-SW-2 unlined landfills (M-015-93C). IN DISPUTE (from DOE budget briefing to Oregon, January 23, 2019). Dispute resolution invoked July 9, 2018.**

Dec 31, 2019 **DOE will initiate deactivation of the K-West Fuel Storage basin (M-016-178). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Dec 31, 2019 **DOE will resolve all current technical issues for the pre-treatment and high-level waste facilities (from the Amended Consent Decree, March 11, 2016 – listed as an assumption by the court, not a milestone).**

2020

Sept 30, 2020 **DOE will submit a change request to establish a schedule for achieving the offsite shipment of all transuranic mixed waste (M-091-44T) (from DOE budget briefing to Oregon, January 23, 2019).**

Sept 30, 2020 **DOE will submit a remedial investigation/feasibility study Work Plan for 200-CP-1 (PUREX canyon and associated waste sites) (M-085-80). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Dec 31, 2020 **LAW Facility construction substantially complete *(Amended Consent Decree, Milestone D-00A-07).* ON SCHEDULE (from Consent Decree Monthly Summary Report, December 1-31, 2018).**

Dec 31, 2020 **DOE will have a remedy in place to contain existing groundwater plumes (except iodine, nitrate, and tritium) in the 200 Area (M-016-119-T01). This is a TARGET, not an enforceable milestone. ON SCHEDULE (from 200 Area Project Manager's Meeting, May 19, 2016).**

Dec 31, 2020 **DOE will have taken such action as necessary to remediate hexavalent chromium groundwater plumes to meet drinking water standards in each of the 100 Areas (M-016-110-T02). This is a TARGET, not an enforceable milestone.**

Oct 31, 2021 **DOE will submit a design and monitoring plan to Ecology for interim tank farm barrier 4 in the U Farm. (M-045-92). ON SCHEDULE (from December 1-31, 2018 ORP TPA Monthly Summary Report).**

Dec 31, 2021 **DOE will complete remedial investigation of the 200 West Inner Area and the BC cribs and trenches (M-015-84) AT RISK (from DOE budget briefing to Oregon, January 23, 2019).**

Some selected "key" later deadlines

Jan 31, 2022 **DOE will initiate negotiations to establish interim TPA milestones for closure of the remaining SST waste management areas (M-045-85). ON SCHEDULE (from December 1-31, 2018 ORP TPA Monthly Summary Report).**

Sept 30, 2022 **DOE will select K Basin sludge treatment and packaging technology and propose new interim sludge treatment and packaging milestones (M-016-173). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Nov 30, 2022 **DOE will submit to Ecology a Facility Investigation/Corrective Measures Study and RI/FS for the 200 East Inner Area (M-015-92B). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Dec 30, 2022 **DOE will complete hot commissioning of supplemental vitrification treatment facility and/or WTP enhancements (M-062-34-T01). This is a TARGET, not an enforceable milestone. IN ABEYANCE (from December 1-31, 2018 ORP TPA Monthly Summary Report). Will be addressed with negotiations supporting M-062-45 which System Plan 8 will help inform.**

Dec 31, 2022 **DOE will start LAW Facility cold commissioning. *(Amended Consent Decree, Milestone D-00A-08).* ON SCHEDULE (from Consent Decree Monthly Summary Report, December 1-31, 2018).**

Sept 30, 2024 **DOE will complete K East Reactor and K West Reactor Interim Safe Storage (M-093-27). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Sept 30, 2024 **DOE will complete closure of B Pond and S Pond and Ditch (M-037-11). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Sept 30, 2024 **DOE will complete U Plant demolition (M-016-200A). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Sept 30, 2024 **DOE will complete all response actions in the 100 K Area (M-016-00C). ON SCHEDULE (from 100/300 Area Unit Manager Meeting, September 20, 2018).**

Aug 31, 2025 **DOE will complete the transfer of the cesium and strontium capsules from the Waste Encapsulation and Storage Facilities to a new, permitted interim safe storage facility (M-092-21). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

June 30, 2026 **DOE will complete the remedial investigation/feasibility study process for all non-tank farm operable unit (excluding canyons as well). (M-015-00).**

Sept 30, 2026 **DOE will remove all mixed waste containers from Outside Storage Areas A & B at the Central Waste Complex (M-091-52-T04). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Sept 30, 2026 **DOE will complete retrieval of tank wastes from the A and AX tank farms (excepting A-103). *(Third Amended Consent Decree, Milestone B-02).* UNDER ANAYLSIS (from Consent Decree Monthly Summary Report, December 1-31, 2018).**

Sept 30, 2027 **DOE will complete U Canyon barrier construction (M-016-200B). ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Summary Report, December 1-31, 2018). DOE is considering an option to continue preservation and maintenance of the PT and HLW facilities for a period of 3-5 years while focusing on bringing direct-feed LAW into operation.

Dec 31, 2036 DOE shall achieve initial plant operations of the waste treatment plant ***(Amended Consent Decree, Milestone D-00A-1).*** UNDER ANALYSIS **(from Consent Decree Monthly Summary Report, December 1-31, 2018).** DOE is considering an option to continue preservation and maintenance of the PT and HLW facilities for a period of 3-5 years while focusing on bringing direct-feed LAW into operation.

Dec 31, 2036 DOE will acquire/modify facilities for storage of first two years of immobilized high-level waste (M-090-00). IN ABEYANCE (from December 1-31, 2018 ORP TPA Monthly Summary Report). Will be addressed with negotiations supporting M-062-45 which System Plan 8 will help inform.

Dec 31, 2040 DOE will complete waste retrieval from all remaining single-shell tanks (M-045-70). AT RISK (from December 1-31, 2018 ORP TPA Monthly Summary Report). Will be addressed with negotiations supporting M-062-45.

Sept 30, 2042 DOE shall complete remedial actions for all non-tank farms and non-canyon Operable Units (M-16-00). **ON SCHEDULE (from DOE budget briefing to Oregon, January 23, 2019).**

Jan 31, 2043 DOE will complete closure of all single-shell tank farms (M-045-00). AT RISK (from December 1-31, 2018 ORP TPA Monthly Summary Report). Will be addressed with negotiations supporting M-062-45.

Dec 31, 2047** DOE will complete pretreatment, processing, and vitrification of all high-level and low-activity tank wastes (M-062-00). AT RISK (from December 1-31, 2018 ORP TPA Monthly Summary Report).