# Richland, WA LLRW Disposal Site Update

## 2025 Northwest Interstate Compact Meeting

Doug Frenette
General Manager, Richland LLRW Disposal Facility
September 10, 2025

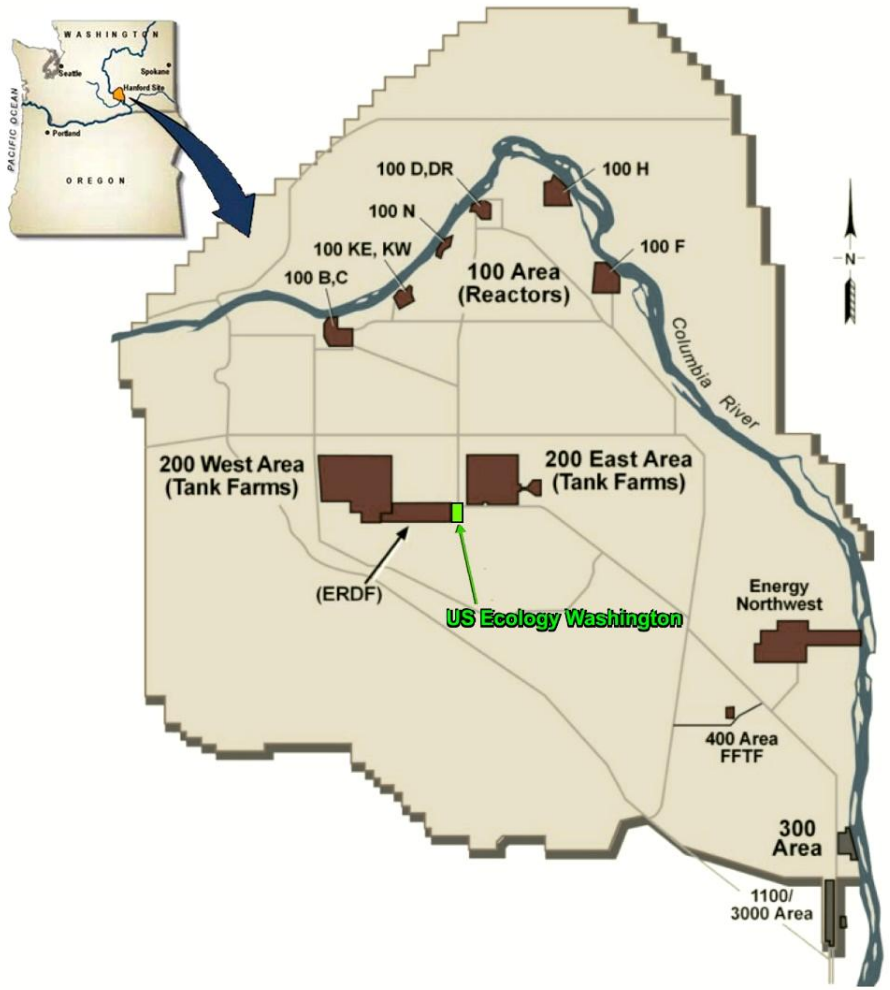
# Richland, WA Facility

## Northwest Interstate Compact Host Disposal Facility



REPUBLIC SERVICES

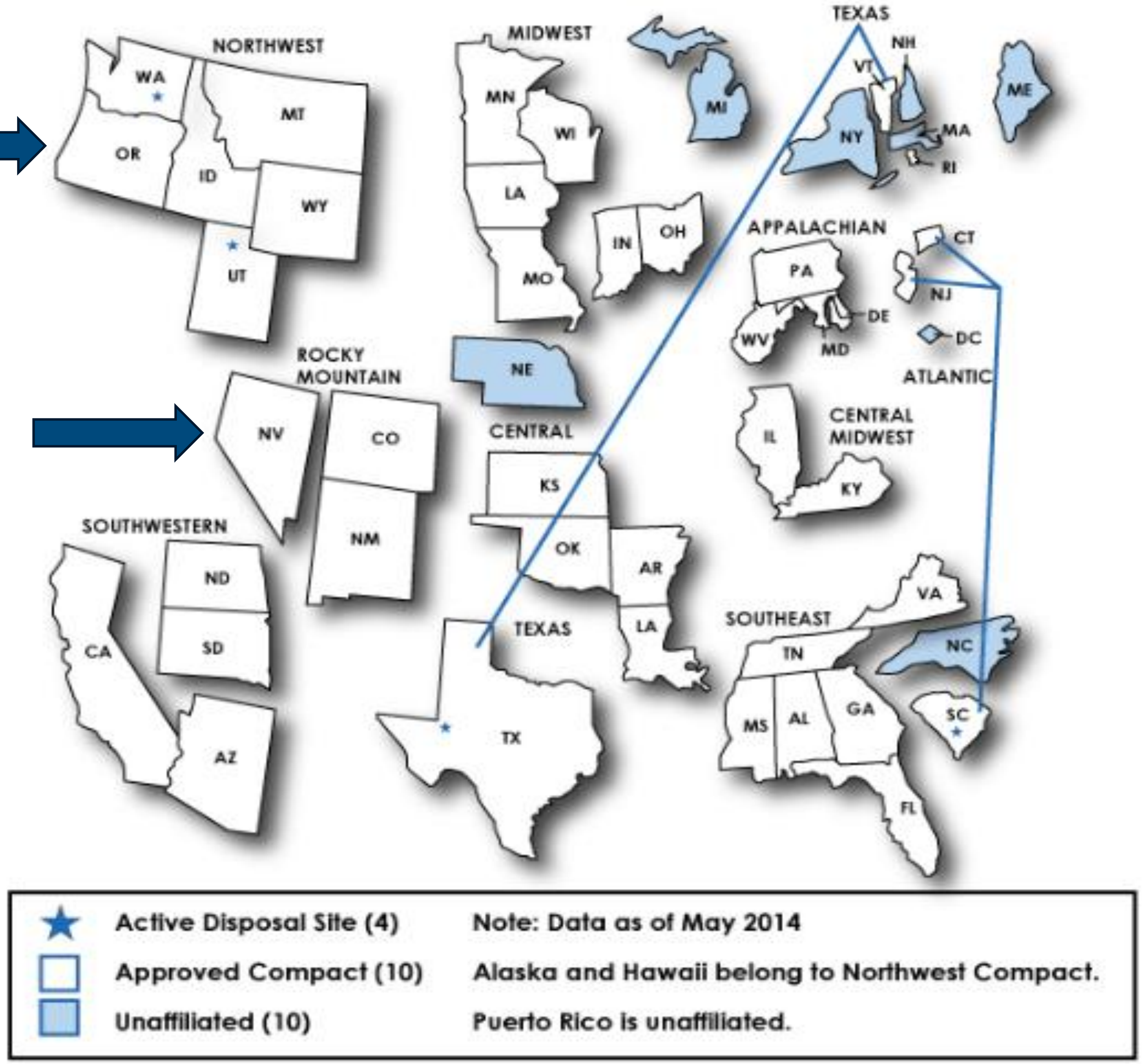
# Republic Services Richland




- Part 61 LLRW Facility – 1 of 4 in United States
- Located on 100 acres within the DOE Hanford Reservation in Richland, WA
- Originally Licensed in 1965
- Designated NWIC Host Disposal Facility (Accessible to 11 states in NW & RM Compacts - January 1, 1993)
- Operates through sublease agreement with State of WA
- Rate-regulated by WA Utility & Transportation Commission

# Northwest and Rocky Mountain Compacts

- Richland is the designated host LLRW Disposal Facility for the Northwest Compact (8 States)
- Richland also serves the Rocky Mountain Compact through agreement (3 States)



# Richland Historical – Timeline & Key Dates

1965 – Site Licensed by the Atomic Energy Commission to California Nuclear, Inc. (CNI) begins accepting LLRW

1968 – Nuclear Engineering Company (NECO) acquires CNI, takes over as site operator

1976 – Congress passes RCRA

1980 – Congress passes LLRW Policy Act

1981 – NECO changes name to US Ecology, Inc. US Ecology Washington, Inc (USEW) is a subsidiary.

1981 – USEW disposes of 1,440,000 Cubic Feet of LLRW in a single year, taking almost half of the national volume

1983 – NRC adoption of 10 CFR Part 61 for regulating LLRW sites

1985 – Congress passes LLRW Amendments Act

1986 – WDOH adopts first regulation for NARM disposal

1992 – Started tracking NARM separately from LLRW

1993 – Northwest Compact restricts disposal of LLRW to NWIC (8 states) and Rocky Mountain Compact (3 states)

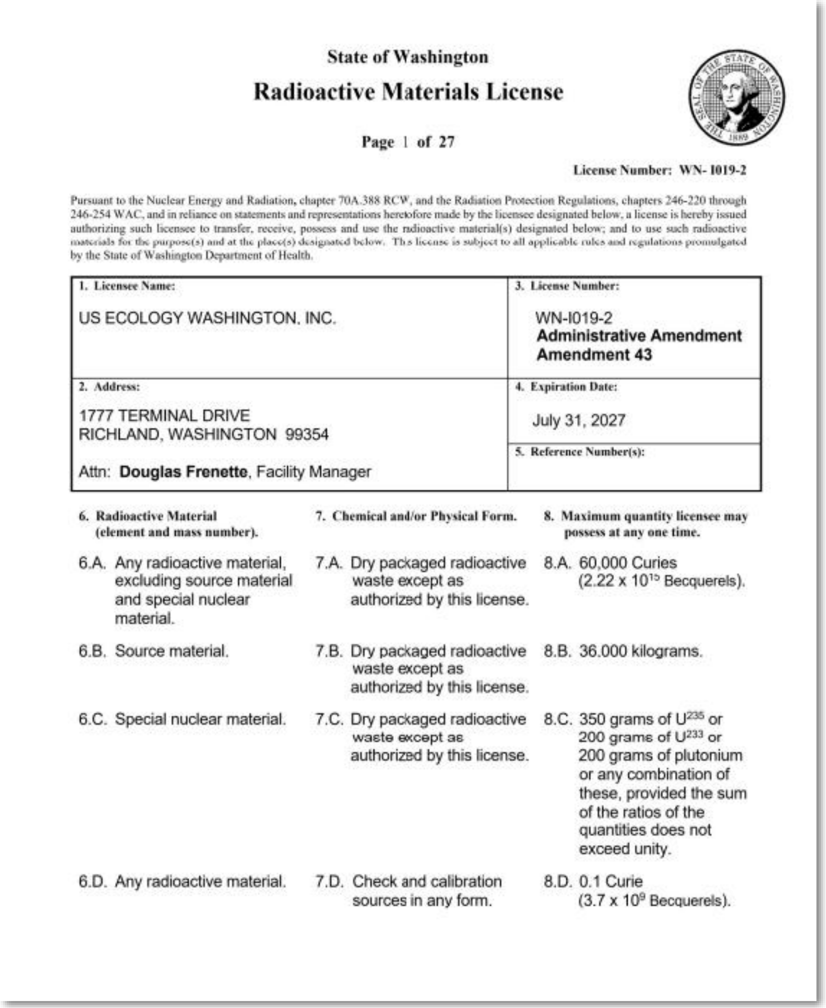
1999 – Disposal of Trojan Reactor Vessel. Closed Trenches 12A & 16 (last trenches closed)

2019 – Trench 12 opened for disposal of Class A Unstable (Newest trench – build as we go)

2022 – Republic Services, Inc. acquires US Ecology, Inc. and its subsidiaries. Rebrands USEW site as “Republic Services Richland” but keeps USEW as legal name.

# Radioactive Materials License & Accepted Waste

- WDOH License # WN-I019-2, Amendment 44
- Expires July 31, 2027



State of Washington

**Radioactive Materials License**

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**License Number: WN- I019-2**

Pursuant to the Nuclear Energy and Radiation, chapter 70A.388 RCW, and the Radiation Protection Regulations, chapters 246-220 through 246-254 WAC, and in reliance on statements and representations heretofore made by the licensee designated below, a license is hereby issued authorizing such licensee to transfer, receive, possess and use the radioactive material(s) designated below; and to use such radioactive materials for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules and regulations promulgated by the State of Washington Department of Health.

| | |
|---|---|
| 1. Licensee Name:<br>US ECOLOGY WASHINGTON, INC. | 3. License Number:<br>WN-I019-2<br>**Administrative Amendment**<br>**Amendment 43** |
| 2. Address:<br>1777 TERMINAL DRIVE<br>RICHLAND, WASHINGTON 99354<br>Attn: **Douglas Frenette**, Facility Manager | 4. Expiration Date:<br>July 31, 2027<br>5. Reference Number(s): |

| 6. Radioactive Material (element and mass number). | 7. Chemical and/or Physical Form. | 8. Maximum quantity licensee may possess at any one time. |
|---|---|---|
| 6.A. Any radioactive material, excluding source material and special nuclear material. | 7.A. Dry packaged radioactive waste except as authorized by this license. | 8.A. 60,000 Curies ($2.22 \times 10^{15}$ Becquerels). |
| 6.B. Source material. | 7.B. Dry packaged radioactive waste except as authorized by this license. | 8.B. 36,000 kilograms. |
| 6.C. Special nuclear material. | 7.C. Dry packaged radioactive waste except as authorized by this license. | 8.C. 350 grams of $U^{235}$ or 200 grams of $U^{233}$ or 200 grams of plutonium or any combination of these, provided the sum of the ratios of the quantities does not exceed unity. |
| 6.D. Any radioactive material. | 7.D. Check and calibration sources in any form. | 8.D. 0.1 Curie ($3.7 \times 10^{9}$ Becquerels). |

- Class A, B, and C LLRW from the Northwest and Rocky Mountain Compacts
- NORM/TENORM/NARM acceptable from generators nationwide
- High-activity sealed source capabilities
- All waste arrives by truck



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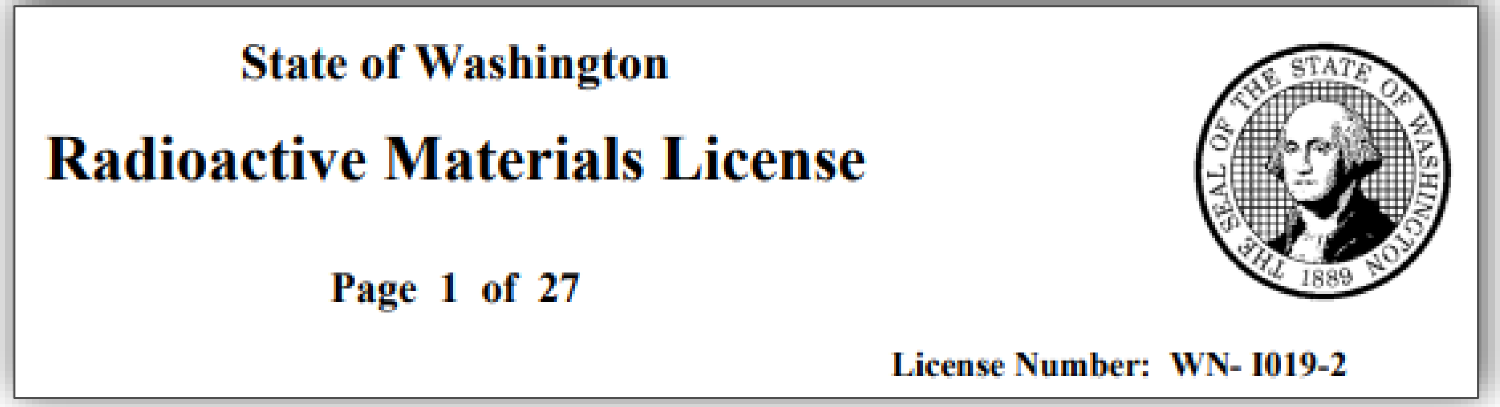
# Radioactive Materials License

- Amendment issued February 20, 2025 (Amendment 44)
- Not issued in entirety, added LC 92.K, revised FSM
- Waste Acceptance Criteria License Conditions 19-52
- Available on our website: https://www.republicservices.com/facilities/washington/richland-facility
- Expires July 29, 2027



State of Washington

Radioactive Materials License

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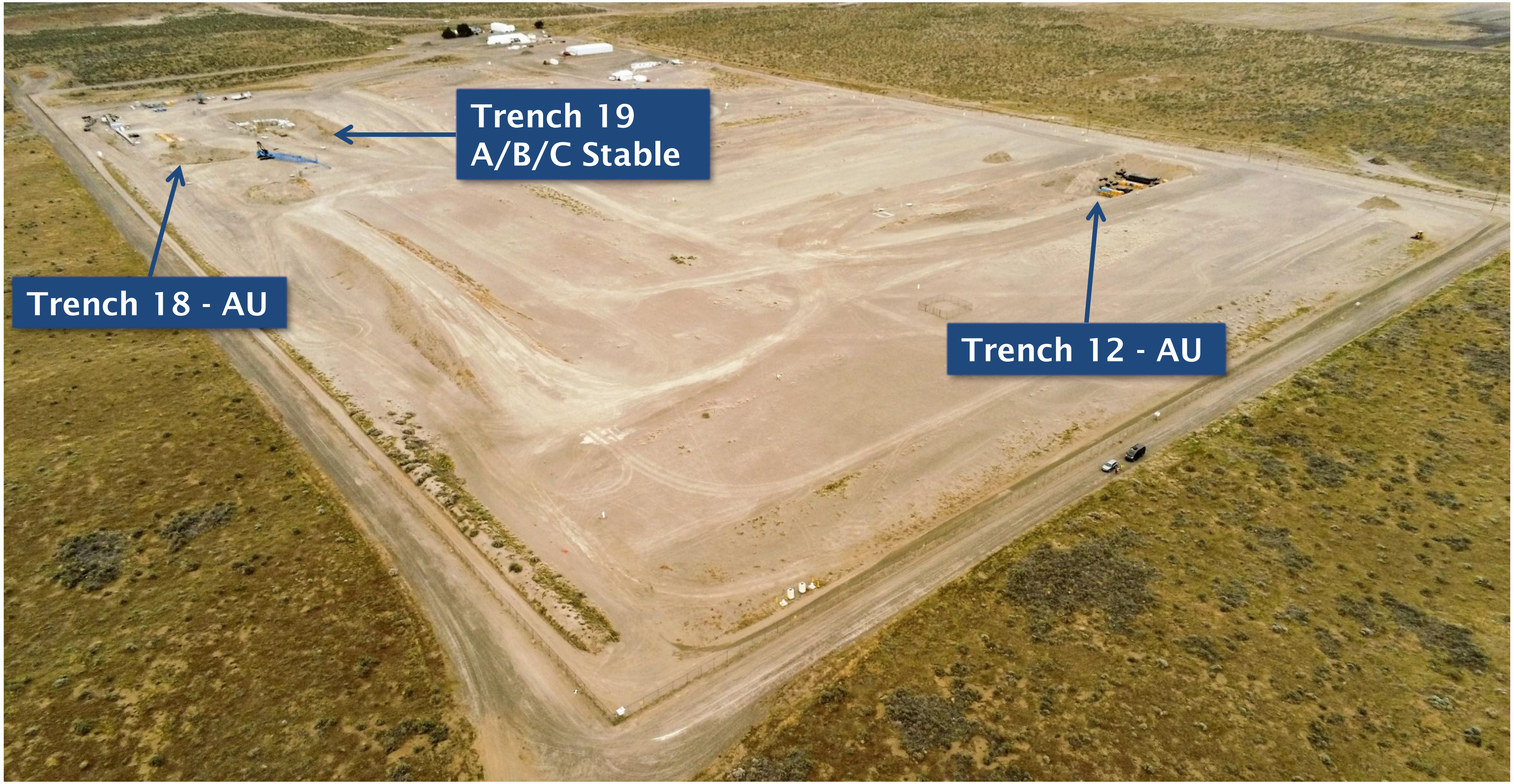
License Number: WN- I019-2

# Richland Facility - Overview

- Currently employs 24 full time workers
- Facility averages ~18,600 ft$^3$ of LLRW annually (10-yr average)
- Disposal trenches are designated for Stable or Unstable LLRW
- Disposal trenches are built of various sizes can be up to 50 feet deep, 150 feet wide and 1,000 feet long
- Construct trenches on "build-as-you-go" method (150' sections)
- Provides enough disposal capacity for Compact Waste Generators through 2056

# Richland Facility



# Class A Unstable Waste Trenches

Trench 18

2012

2025

Trench 12

2018

2025



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# Trench 19 –Class A/B/C Stable Trench

# Engineered Concrete Barriers (ECBs)

# Annual & Historical Disposal Volumes & Source Term

# Historical – Volumes and Source Term Update

## Total Site Volume Disposed

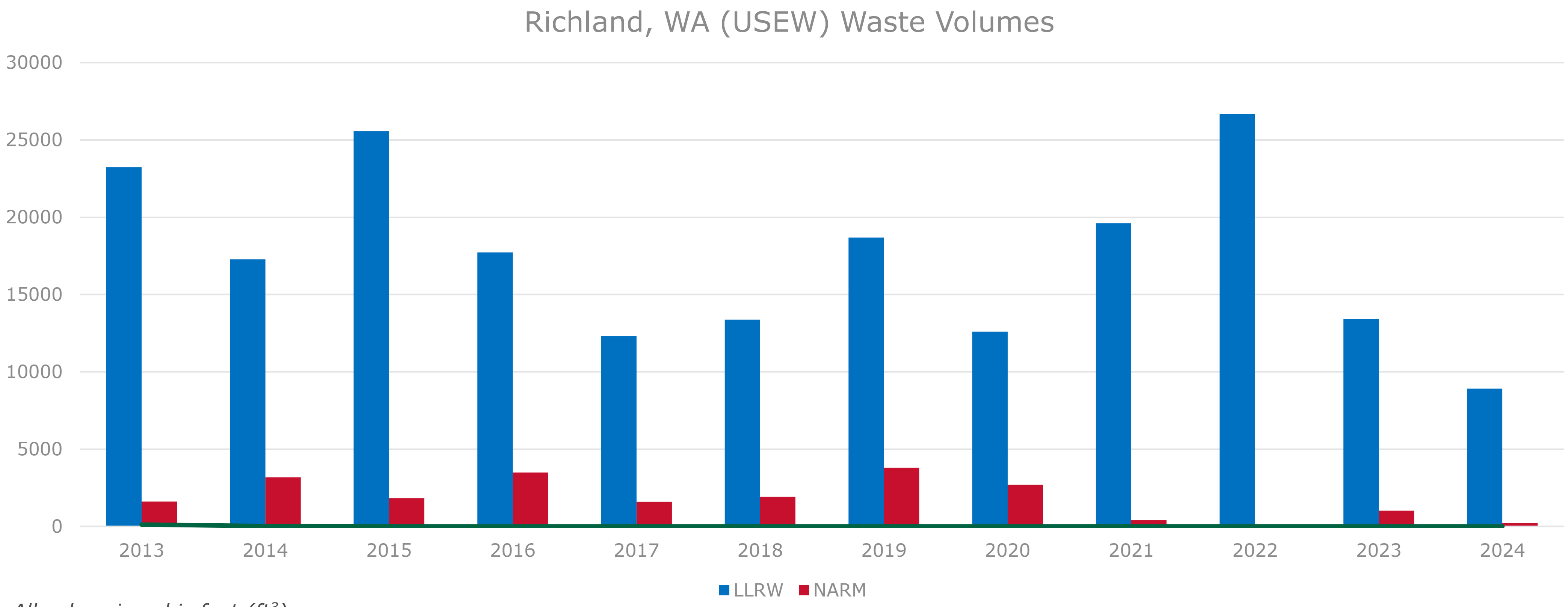
- ~14.5M cubic feet
- Includes LLRW & NARM

## Total Site Source Term

- ~3.7M Curies
- ~1.6M Curies from Co-60 alone (~43%)
- 600+ manifested radionuclides
- Not decay corrected

# Richland Historical Volumes

- Richland Facility has received an annual average volume of ~18,600 $ft^3$ (2015-2024)
- Over 50% of volume is from Energy Northwest Nuclear Power Plant
- Prior to LLRWPA of 1985, annual average volumes were much larger: ex. 1981 ~ 1,440,000 $ft^3$
- 2024 was first year where volumes were <10,000 $ft^3$




*All values in cubic feet ($ft^3$)*

# 2024 Disposal Volumes

| | |
|---|---|
| LLRW | 8,918.57 $ft^3$ |
| NARM | 204.04 $ft^3$ |
| Exempt | 0.00 $ft^3$ |
| Total | 9,122.61 $ft^3$ |

# 2025 Disposal Volumes
## (Through August)

| | |
|---|---|
| LLRW | 3,355.40 $ft^3$ |
| NARM | 0.00 $ft^3$ |
| Exempt | 0.00 $ft^3$ |
| Total | 3,355.40 $ft^3$ |

# Remaining Source Term

| Radionuclide | RML Limit (mCi) | Received (mCi) | Remaining (mCi) | Percentage Remaining |
|---|---|---|---|---|
| C-14 | 5,090,000.00 | 4,042,151.65 | 1,047,848.35 | 20.6% |
| I-129 | 5,980.00 | 5,716.80 | 263.20 | 4.4% |
| Pu-239 | 4,510,000.00 | 4,500,041.68 | 9,958.32 | 0.22% |
| Ra-226 | 464,600.00 | 250,000.11 | 214,588.89 | 46.2% |
| Tc-99 | 55,100.00 | 51,083.36 | 4,016.64 | 7.3% |
| U-234 | 335,400.00 | 283,400.43 | 51,999.57 | 15.5% |
| U-238 | 1,547,700.00 | 1,512,713.69 | 34,986.31 | 2.3% |
| H-3 | 100,000/year | Unstable Waste Form – Stable no limit | | |

# Remaining Disposal Volumes

| Trench | Remaining Capacity ($ft^3$) |
|---|---|
| 12 | 1,437,853 |
| 15 | 1,824,974 |
| 18 | 6,805 |
| 19 | 2,192,461 |
| *Total | 5,462,093 |

*Data is based on existing facility plans. Additional disposal capacity above what is listed in this table is available should the need arise.



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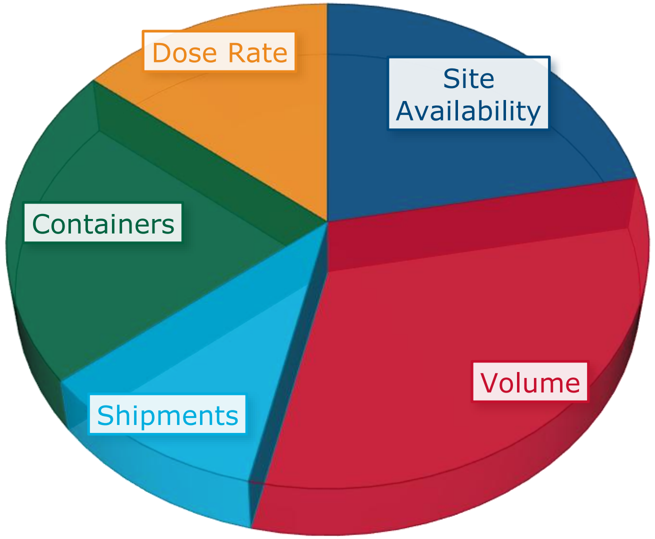
# Richland Revenue

# Richland Revenue Requirement

- USEW operates under a base Revenue Requirement (RR)
- Submitted for approval by WUTC every 6 years
- Facility Cost of Operation @ 71% operating ratio
- Annual adjustments to RR base allowed on core inflation metrics
- Uncollected amounts in a category (volume, shipments, containers, etc.) may be rolled over into next year's RR
- Overcollection results in refunds to all generators that shipped waste that calendar year

# Richland Revenue Requirement

- Rates are set using generator supplied volume estimates
  - Total Rate = RR / Volume Estimates
- Base Rates set in January and adjusted in May of each year
- Revenue Requirement is split into 5 categories
  - Volume (31.6%)
  - Site Availability (22%)
  - Containers (21.5%)
  - Dose Rate (14.2%)
  - Shipments (10.7%)



# Richland Revenue Requirement

| Year | Base RR Adjusted by Inflation | Total Prior Year Carryover | Final RR |
|---|---|---|---|
| 2018 | $5,976,482 | $1,895,058 | $7,871,540 |
| 2019 | $6,151,681 | $1,727,783 | $7,879,464 |
| 2020 | $6,255,450 | $166,477 | $6,421,927 |
| 2021 | $6,329,230 | $182,964 | $6,512,194 |
| 2022 | $6,584,107 | $92,239 | $6,676,346 |
| 2023 | $7,031,600 | $110,404 | $7,142,004 |
| 2024 | $7,280,743 | $336,326 | $7,617,069 |
| 2025 | $7,452,304 | $405,997 | $7,858,301 |

# 2025 Revenue Requirement
**(through August)**

| Component | Revenue Requirement | Collected | Remaining | Annual Percent |
|---|---|---|---|---|
| Site Availability | $680,806 | $680,258 | $548 | 99.9% |
| Volume | $2,895,154 | $1,076,842 | $1,818,312 | 37.2% |
| Shipment | $980,321 | $517,730 | $462,591 | 52.8% |
| Container | $2,001,033 | $684,360 | $1,316,673 | 34.2% |
| Exposure | $1,300,987 | $496,720 | $804,267 | 38.2% |
| **Total** | $7,858,301 | $3,455,910 | $4,402,391 | 44.0% |

# Revenue % by Customer – 2020 to 2024

| Customer | 2020 | 2021 | 2022 | 2023 | 2024 | AVG. |
|---|---|---|---|---|---|---|
| ENERGY NORTHWEST | 55% | 37% | 49% | 63% | 74% | **56%** |
| PUGET SOUND NSY | 15% | 25% | 4% | 11% | 7% | **12%** |
| FRAMATOME | 8% | 14% | 5% | 16% | - | **9%** |
| DAWN MINING | - | - | 37% | - | - | **7%** |
| PERMA-FIX NORTHWEST | 14% | 12% | - | - | - | **5%** |
| EMC/THOMAS GRAY | 2% | 1% | - | 4% | - | **1%** |
| PEARL HARBOR NSY | 2% | 6% | 1% | 2% | 6% | **4%** |
| OTHER/BROKERED | 4% | 5% | 4% | 4% | 13% | **6%** |

# Richland May 2025 Rates

**A. SITE AVAILABILITY CHARGE**

**1. Rates**

| Block | Block Criteria | Annual Charge per Generator |
|---|---|---|
| 0 | No site use at all | $461 |
| 1 | Greater than zero but less than or equal to 10 $ft^3$ and 50 mR/h* | 882 |
| 2 | Greater than 10 $ft^3$ or 50 mR/h* but less than or equal to 20 $ft^3$ and 100 mR/h* | 1,693 |
| 3 | Greater than 20 $ft^3$ or 100 mR/h* but less than or equal to 40 $ft^3$ and 200 mR/h* | 3,249 |
| 4 | Greater than 40 $ft^3$ or 200 mR/h* but less than or equal to 80 $ft^3$ and 400 mR/h* | 6,239 |
| 5 | Greater than 80 $ft^3$ or 400 mR/h* but less than or equal to 160 $ft^3$ and 800 mR/h* | 11,983 |
| 6 | Greater than 160 $ft^3$ or 800 mR/h* but less than or equal to 320 $ft^3$ and 1,600 mR/h* | 22,978 |
| 7 | Greater than 320 $ft^3$ or 1,600 mR/h* but less than or equal to 640 $ft^3$ and 3,200 mR/h* | 44,125 |
| 8 | Greater than 640 $ft^3$ or 3,200 mR/h* but less than or equal to 1,280 $ft^3$ and 6,400 mR/h* | 84,708 |
| 9 | Greater than 1,280 $ft^3$ or 6,400 mR/h* but less than or equal to 2,560 $ft^3$ and 12,800 mR/h* | 162,638 |
| 10 | Greater than 2,560 $ft^3$ or 12,800 mR/h* but less than or equal to 5,120 $ft^3$ and 25,600 mR/h* | 180,977 |
| 11 | Greater than 5,120 $ft^3$ or 25,600 mR/h* | 180,977 |

* For purposes of determining the site availability charge, mR/hour is calculated by summing the mR per hour at container surface of all containers received during the year.

# Richland May 2025 Rates

**B. DISPOSAL RATES**

1. Volume: $317.40 per cubic foot
2. Shipment: $30,640 per manifested shipment
3. Container: $22,950 per container on each manifest.
4. Exposure:

| Block No. | Dose Rate at Container Surface | Charge per Container |
|---|---|---|
| 1 | Less than or equal to 200 mR/h | $131 |
| 2 | Greater than 200 mR/h but less than or equal to 1,000 mR/h | 9,310 |
| 3 | Greater than 1,000 mR/h but less than or equal to 10,000 mR/h | 37,450 |
| 4 | Greater than 10,000 mR/h but less than or equal to 100,000 mR/h | 56,100 |
| 5 | Greater than 100,000 mR/h | 942,500 |

# Operations

# Waste Receipt & Disposal
## (Various Incoming Conveyances)


# Waste Receipt & Disposal
## (Incoming Receipt Surveys)





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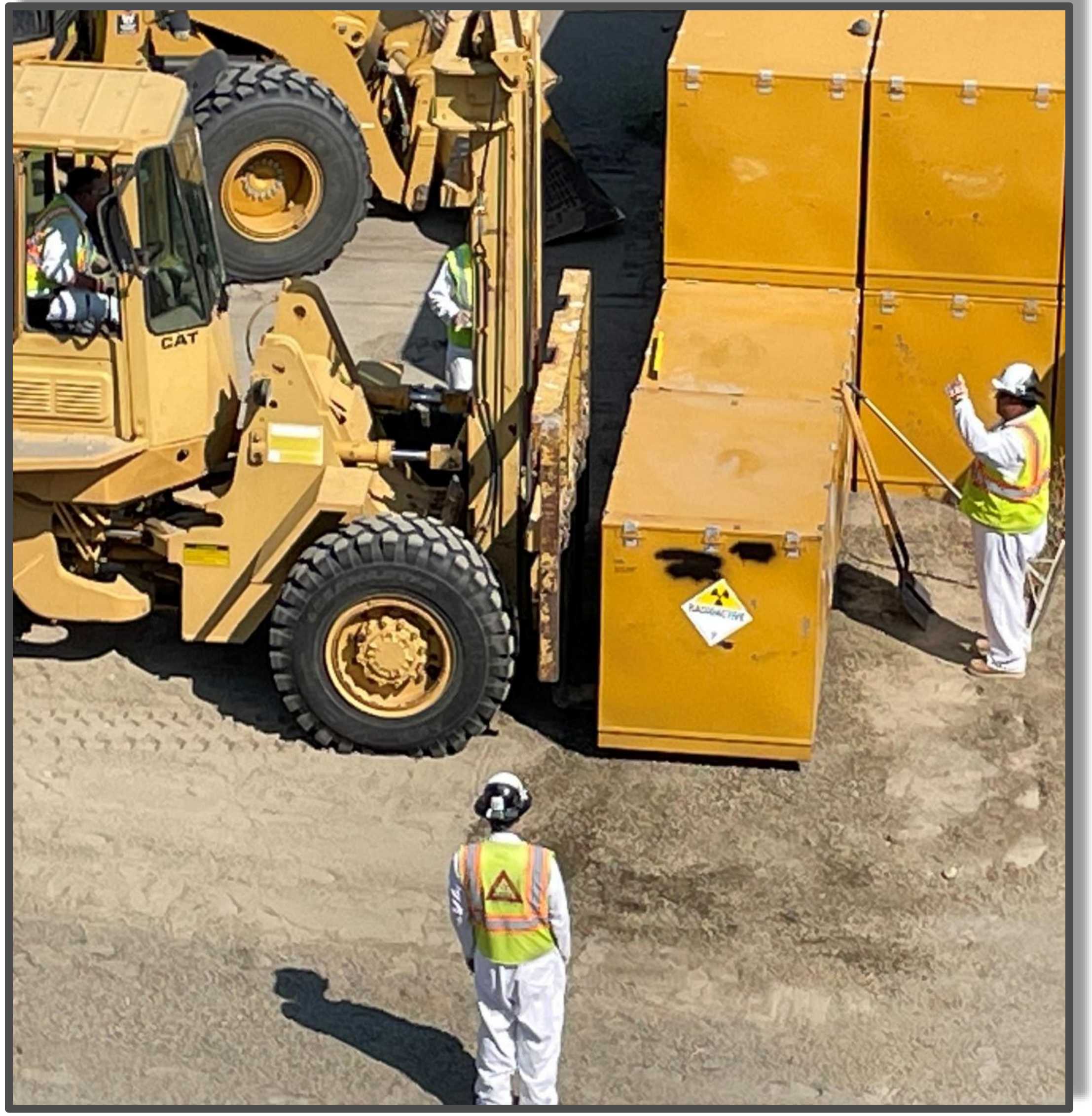
# Waste Receipt & Disposal
## (Package Inspections / Waste Verification)

# Waste Receipt & Disposal
## (Offloading)


# Waste Receipt & Disposal
## (Secondary Containment - HDPE)


# Waste Receipt & Disposal
## (Disposal)





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# Trench 18

# Trench 18 Interim Closure - 2025

- Constructed in 1995
- Opened Nov. 21, 1995
- 850’ X 45’ X 150’
- Class A Unstable Waste
- Disposed of:
  - >1M cubic feet
  - >4.7M mCi
- Installation of Interim Cover

# Sublease

# Sublease

- The 100 acres the USEW facility is located on is own by the US Department of Energy. (Hanford Reservation)
- The State of Washington leases the land from DOE for the purposes of commercial LLRW disposal
- USEW operates the facility through a sublease agreement with the State of Washington's, Department of Ecology (ECY)
- In 2005, the existing sublease agreement was established and included 4 options to extend for additional 10-year periods
- On July 29th of this year, USEW, DOE, and ECY mutually agreed to exercise the second option and extend operation of the facility for another 10 years (July 2025 – July 2035)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Richland Field Office
3100 Port of Benton Blvd., Richland, WA 99354 • 509-372-7950

July 29, 2025 25-NWP-118

Douglas Frenette, General Manager
Republic Services Richland
1777 Terminal Dr. Ste A
Richland, Washington 99354

James Gagnon, Real Estate Contracting Officer
Hanford Field Office
United States Department of Energy
PO Box 550
Richland, Washington 99352

Re: Extension of Sublease dated July 27, 2005, between the State of Washington, acting through the Department of Ecology (Ecology) and US Ecology Washington, Inc. (US Ecology) for land on the Hanford Site, located in Benton County, Washington

# NW Compact Industry Growth

(The calm before the storm)

# Advance Act of 2024


- Passed with bipartisan support and signed into law in July 2024. Requires the NRC to take a number of actions, particularly in the areas of licensing new reactors and fuels, while maintaining the NRC's core safety and security mission
- The Act affects a wide range of NRC activities, including supporting the recruitment and retention of the NRC workforce, adding flexibility in the NRC's budgeting process, enhancing the regulatory framework for advanced reactors and fusion technology, and requiring initiatives to support the NRC's reviews of license applications



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# Advance Act of 2024

The NRC will address the Act's requirements by:

- Implementing initiatives for efficient, timely, and predictable license application reviews
- Establishing an expedited procedure for reviewing and qualifying new reactor license applications
- Developing a regulatory framework for fusion technology
- Implementing changes to how the agency recovers fees from licensees, including establishing a lower hourly rate for advanced reactor applicants and pre-applicants
- Assessing the licensing review process for new nuclear facilities at former fossil-fuel power plant sites and brownfield sites
- Developing strategies and guidance for microreactors
- Removing certain limitations on foreign ownership of some types of licensed facilities
- Continuing to support international coordination on nuclear technologies and licensing activities
- Complementing new requirements relating to nuclear fuel

# NW Compact Industry Growth – “The Nuclear Renaissance”

Overwhelming increase in energy demand. The existing grid can’t handle.

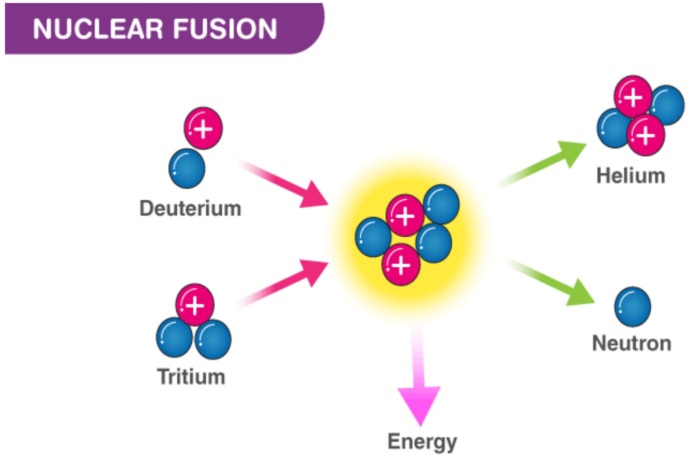
**Artificial Intelligence (AI)** – Massive Data Centers with large power demands. “Grid” is incapable of supporting.

Example: A simple request on ChatGPT requires 2.9 watt-hours per request. That’s 10 times more power than a typical Google Search.

What will get us there:

- Increasing existing NPP License durations, 60-80 years & beyond
- Increasing NPP 18- month to 24-month fuel cycles
- NPP improved plant efficiencies (tune-up)
- New NPP – Vogtle units 3&4 coming online
- Restart of S/D NPPs like Three Mile Island Unit 1 & others
- Micro Reactors and Small Modular Reactors (SMRs)

# NW Compact Industry Growth – "The Nuclear Renaissance"




**Fusion**. Commonwealth Fusion Systems (CFS) Energy.

**Cancer Treatment.** Nusano's "Radiance Lab" – West Valley City, Utah.

**Rare Earth Element Separation and Processing Demonstration Project.** Rare Element Resources, Inc. Upton, Wyoming.

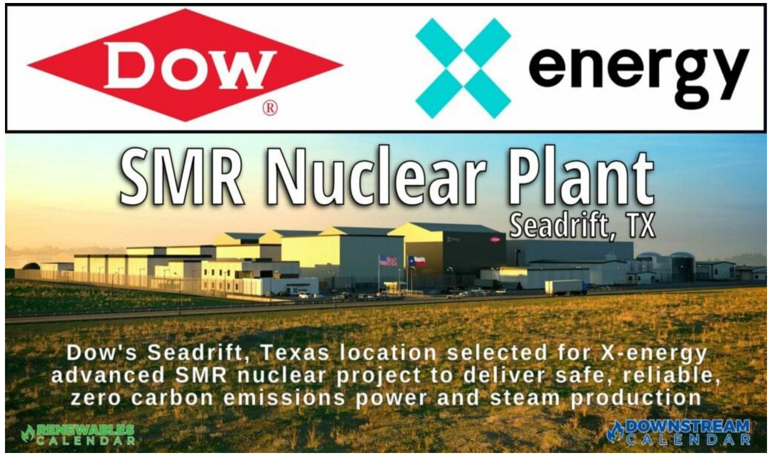
**Other**:

- Space Nuclear Propulsion
- Military – "Micro Grids"
- Transportation – Merchant Shipping
- Heavy Industry – Dow Chemical in Calhoun County, TX. Four SMRs to provide 800-MW of power off the grid.

**Chesterfield planners approve $2.5B+ nuclear fusion plant**

Power plant permit heads before county supervisors in September

**Josh Janney** // August 22, 2025 // **3 Minute Read**



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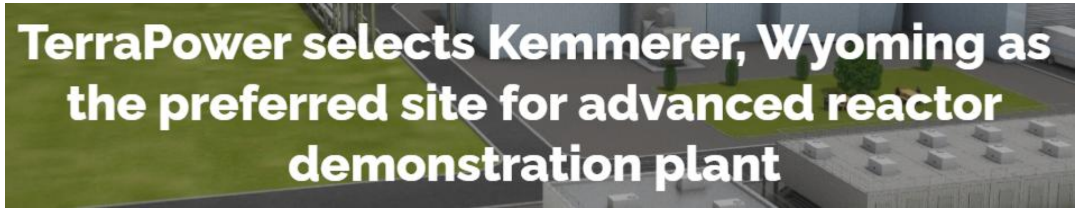
# NW Compact Industry Growth – "The Nuclear Renaissance"

Within our current purview:

Micro Reactors and Small Modular Reactors (SMRs)

- TerraPower 345-MW Sodium Cooled in Kremmerer, Wyoming. Power Ops est. Q3 2031. Licensed by NRC and within NWIC
- Micro Reactor Pilot, Department of Airforce (DAF), Eielson, Alaska (near Fairbanks). 2027 Project Timeline. (Radiant, Oklo, UltraSafe Nuclear Corp, Westinghouse)
- Energy Northwest pursuing siting and construction of up to (12) X-Energy 200-MW units in and around PNW

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# NW Compact Industry Growth – "The Nuclear Renaissance"

## Where will the waste go?

- Under current regulations radioactive wastes meeting the definition of LLRW would have to come to USEW (generated at a licensed facility, regulated by NRC or Agreement State, within a member state & not Hazardous/Dangerous)
- USEW's current life expectancy is 2056. Largely based on 99-year lease with DOE
- USEW has more than enough disposal capacity based on ***current projections.*** What will happen in the next 10 years???
- As one of only four commercial LLRW disposal facilities to take this type of radioactive waste, USEW is and will continue to be a key regional asset

# Organization


**Office Phone**
**(509) 377-2411**

## Contacts

**General Manager:**

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**Assistant General Manager:**

Noah Huston

**Radiation Protection Manager (RPM):**

Matt McClellan

**Assistant RPM:**

Terry Heiman

**Quality Assurance & Regulatory Compliance:**

At Large

**Radiological Services (NARM/Rad Services):**

Laura Lee Barry

# Do you have any questions?