



# Richland LLRW Site Update

## LLW Forum Fall 2024 Meeting

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Douglas Frenette  
General Manager Republic Services Richland  
October 9, 2024

# Republic Services, Inc.

## Company Overview

# Republic Services

## About

- Republic Services, Inc. is now the nation's leading environmental services provider. Through our subsidiaries (US Ecology, ACV & ACT Enviro, Ecoflo), we provide superior service offerings to ensure compliance while partnering with customers to create a more sustainable world.

## Company Overview

- 42K employees
- 14M customers
- 1,000+ worldwide locations
- \$15B in revenue in 2023
- 95% customer retention
- 17K Trucks | 5<sup>th</sup> largest vocational fleet in the nation

## Business Solutions

- Solid waste collection and disposal
- Recycling
- Dumpster rental
- Construction and demo
- Compactor solutions
- Environmental solutions

## Awards and Recognition



# Environmental Solutions

*Vision:* To be the Premier Provider of Comprehensive Environmental Services



# Environmental Solutions

Republic Services' extensive Environmental Solutions nationwide footprint allows us to support your recycling and waste needs safely and sustainably. Our team of professionals stand ready to handle your most complex jobs.



**15**

Environmental  
Solutions Landfills



**7**

Injection Wells



**8**

Environmental  
Solutions  
Recycling Sites



**20**

Treatment,  
Storage and  
Disposal Facilities



**100+**

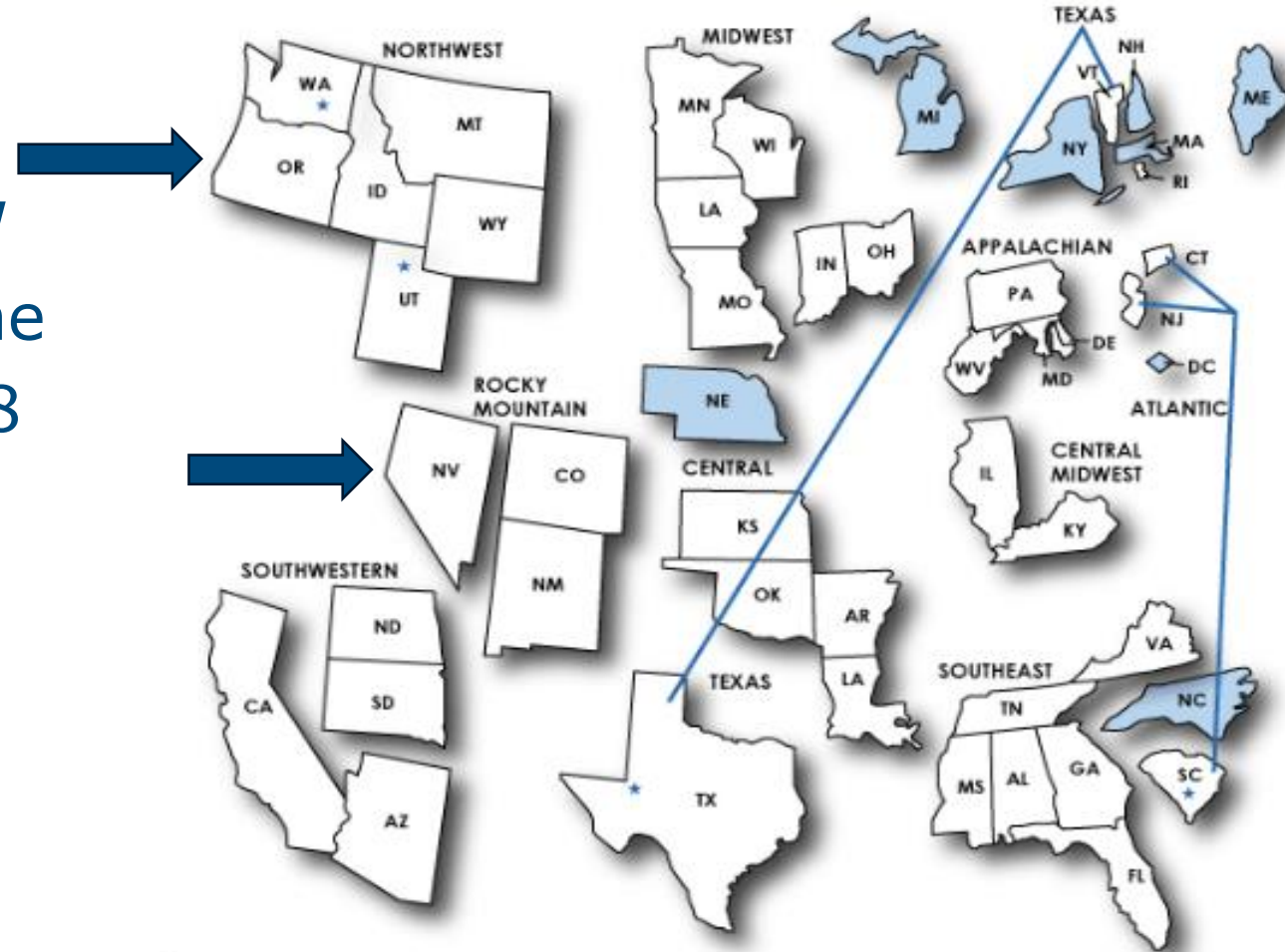
Service Centers

# **Richland, WA Facility**

# **Low-Level Waste Compacts**

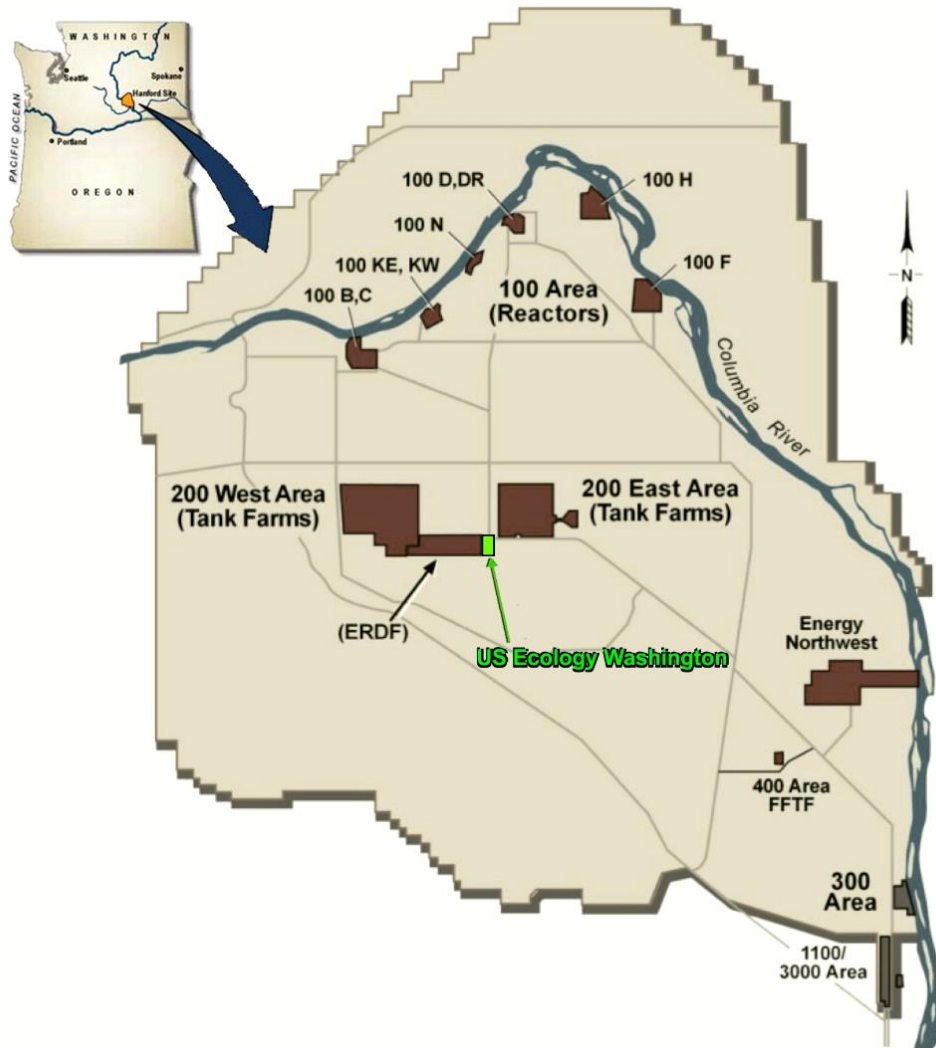
# Northwest and Rocky Mountain Compacts

- 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)



★	Active Disposal Site (4)	Note: Data as of May 2014
□	Approved Compact (10)	Alaska and Hawaii belong to Northwest Compact.
■	Unaffiliated (10)	Puerto Rico is unaffiliated.

# 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 by AEC
- Serves the NW and Rocky Mountain Compacts
- Operates through sublease agreement with State of WA
- Rate-regulated by WA Utility & Transportation Commission



# 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. Trojan NPP Shutdown (1 of 2 Compact NPPs)
- 1993 – Northwest Compact restricts disposal of LLRW to NWIC (8 states) and Rocky Mountain Compact (3 states)
- 1999 – Disposal of Trojan Reactor Vessel.
- 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

# 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



# Washington License & Accepted Waste

- WDOH License # WN-I019-2, Amendment 43
- Expires July 31, 2027

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

State of Washington  
**Radioactive Materials License**

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License Number: WN-1019-2

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. License Name: US ECOLOGY WASHINGTON, INC.	3. License Number: WN-1019-2 <b>Administrative Amendment Amendment 43</b>
2. Address: 1777 TERMINAL DRIVE RICHLAND, WASHINGTON 99354 Attn: <b>Douglas Frenette</b> , Facility Manager	4. Expiration Date: July 31, 2027 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 x 10 <sup>13</sup> 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 <sup>235</sup> or 200 grams of U <sup>233</sup> 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 x 10 <sup>9</sup> Becquerels).

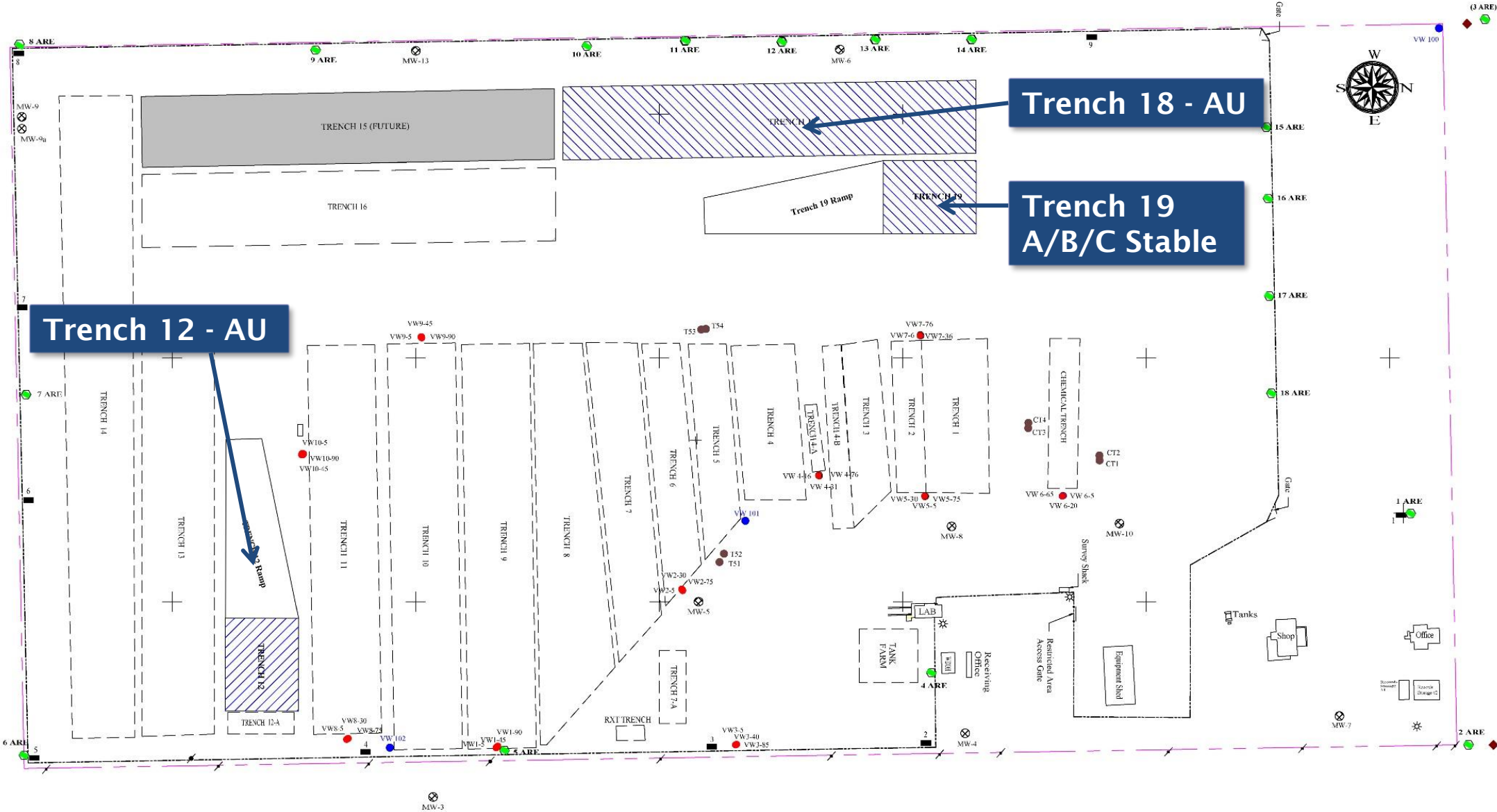


# Richland Facility - Overview



- Currently employs 24 full time workers
- Facility averages  $\sim 20,000$  ft<sup>3</sup> of LLW annually (10-yr average)
- Disposal trenches are designated for Stable or Unstable LLW
- 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

# Site Footprint



# Richland Facility



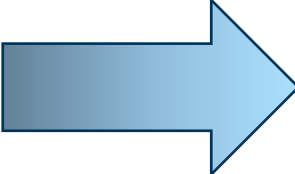
Trench 18 - AU

Trench 19  
A/B/C Stable

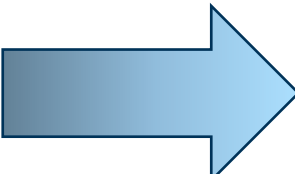
Trench 12 - AU

# Class A Unstable Waste Trenches

Trench 18



Trench 12



# Trench 18 Interim Closure - 2025

- Large Trench
- Constructed in its entirety 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





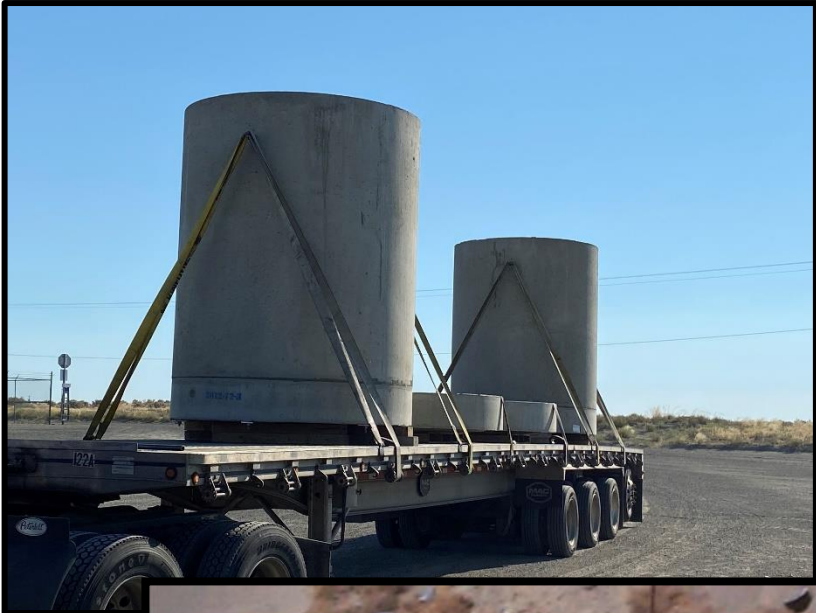
# Trench 19 – Class A/B/C Stable Trench



ECBs

Below Grade  
Caissons

# Engineered Concrete Barriers (ECBs)

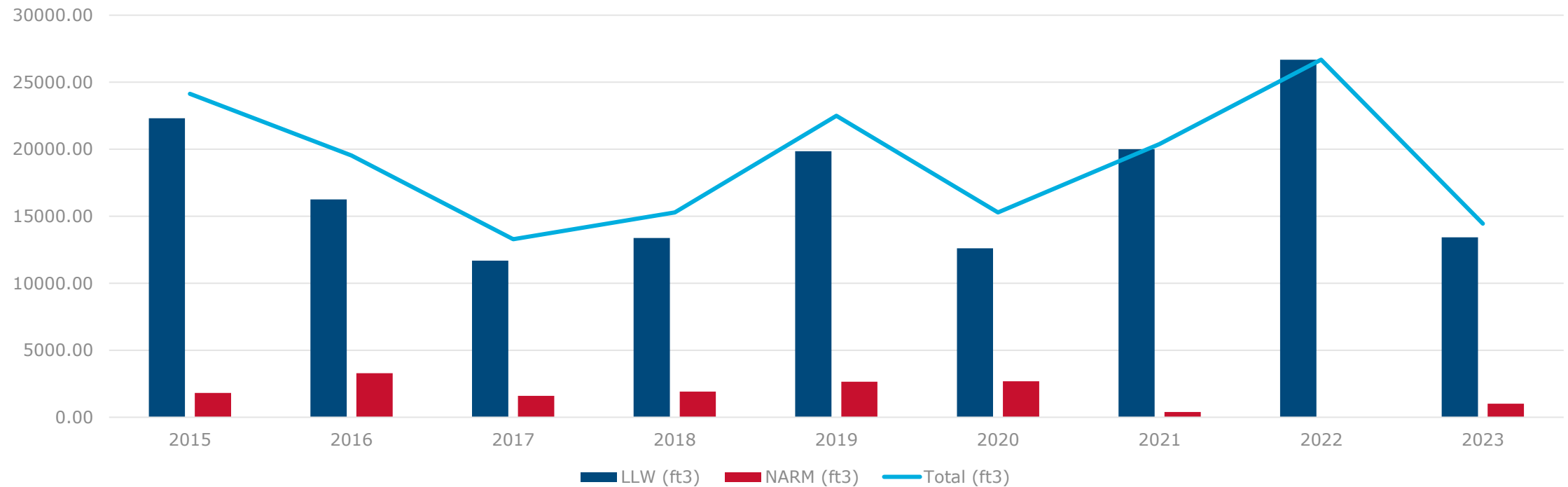


# Disposal Volumes & Rate Regulation

# Richland Historical Volumes

- Washington Facility has received an annual average volume of ~20,200 ft<sup>3</sup> (2013-2023)
- Approximately 50% of volume is generated at Energy Northwest Columbia Generating Station
- Prior to LLRWPA of 1985, annual average volumes were much larger: ex. 1981, 1,440,000 ft<sup>3</sup>
- Ample capacity remains to support generator needs through 2056 (planned closure)

Richland Disposal Volumes by Year



All values in cubic feet (ft<sup>3</sup>)

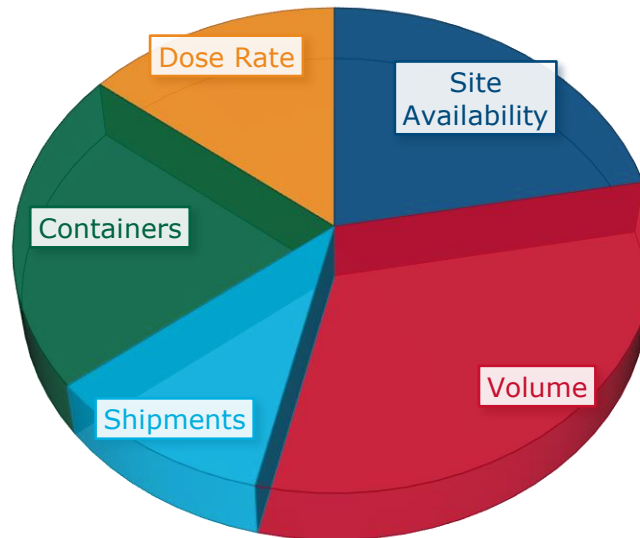
# Richland Revenue Requirement

- Legal Monopoly – Rate Regulated by WUTC
- 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
- Five categories – Site Availability, Volume, Shipment, Container, Exposure
- Uncollected amounts in a category 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 =  $RR / \text{Volume Estimates}$
- Base Rates set in January and adjusted in May of each year
- Revenue Requirement is split into 5 categories
  - Site Availability (22%)
  - Volume (31.6%)
  - Shipments (10.7%)
  - Containers (21.5%)
  - Dose Rate (14.2%)



# Richland May 2024 Rates

**A. SITE AVAILABILITY CHARGE**

**1. Rates**

<u>Block</u>	<u>Block Criteria</u>	<u>Annual Charge per Generator</u>
0	No site use at all.....	\$440
1	Greater than zero but less than or equal to 10 ft <sup>3</sup> and 50 mR/h.....	841
2	Greater than 10 ft <sup>3</sup> or 50 mR/h* but less than or equal to 20 ft <sup>3</sup> and 100 mR/h* .....	1,615
3	Greater than 20 ft <sup>3</sup> or 100 mR/h* but less than or equal to 40 ft <sup>3</sup> and 200 mR/h* .....	3,099
4	Greater than 40 ft <sup>3</sup> or 200 mR/h* but less than or equal to 80 ft <sup>3</sup> and 400 mR/h* .....	5,951
5	Greater than 80 ft <sup>3</sup> or 400 mR/h* but less than or equal to 160 ft <sup>3</sup> and 800 mR/h* .....	11,429
6	Greater than 160 ft <sup>3</sup> or 800 mR/h* but less than or equal to 320 ft <sup>3</sup> and 1,600 mR/h*.....	21,917
7	Greater than 320 ft <sup>3</sup> or 1,600 mR/h* but less than or equal to 640 ft <sup>3</sup> and 3,200 mR/h* .....	42,087
8	Greater than 640 ft <sup>3</sup> or 3,200 mR/h* but less than or equal to 1,280 ft <sup>3</sup> and 6,400 mR/h*.....	80,795
9	Greater than 1,280 ft <sup>3</sup> or 6,400 mR/h* but less than or equal to 2,560 ft <sup>3</sup> and 12,800 mR/h*.....	155,125
10	Greater than 2,560 ft <sup>3</sup> or 12,800 mR/h* but less than or equal to 5,120 ft <sup>3</sup> and 25,600 mR/h* .....	176,701
11	Greater than 5,120 ft <sup>3</sup> or 25,600 mR/h* .....	176,701

\* 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 2024 Rates

## B. DISPOSAL RATES

1. Volume: \$287.30 per cubic foot
2. Shipment: \$28,680 per manifested shipment
3. Container: \$20,430 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 .....	\$119
2	Greater than 200 mR/h but less than or equal to 1,000 mR/h .....	8,460
3	Greater than 1,000 mR/h but less than or equal to 10,000 mR/h .....	33,810
4	Greater than 10,000 mR/h but less than or equal to 100,000 mR/h .....	50,920
5	Greater than 100,000 mR/h .....	855,000



# Sublease

# Sublease Extension 2025



- The State of Washington (Department of Ecology) leases the 100 acres of land from the US Department of Energy (USDOE) on the Hanford Reservation.
- The state subleases the land to USEW to operate.
- The USEW 2005 sublease had an original period of 10 years. Options to extend for 10-year increments.
- The first option was already exercised in 2015.
- USEW and Department of Ecology are preparing to work through the second option period (2025 – 2035.)

# Community Outreach



# Committed to Serve

## Time & Talent Donation:

2<sup>nd</sup> Harvest – local Food Bank

## Upcoming later this year:

- No Shave November which generates site engagement & funds for the local Tri-Cities Cancer Center
- Adopt-a-Senior – Prestige Care



# Beatty, NV Event

# Beatty, Nevada LLRW Disposal Facility

- 1961 – Land acquired
- 1962 – LLRW site opens and is licensed by AEC by Nuclear Engineering Company (NECO)
- 1972 – Nevada becomes an Agreement State
- 1988 – Closure Plan Approved
- 1992 - USEN closes facility per Closure Plan
- 1997 - USEN license transferred to State of Nevada for the custodial period of the Closure Plan
- At closure, facility consisted of 22 Trenches
- ~4.7M ft<sup>3</sup> of waste buried



A worker stands by a radioactive materials sign in this undated photo at the former Nuclear Engineering Co. low-level nuclear waste landfill, 11 miles south of Beatty. Las Vegas Review-Journal file

# 2015 Beatty Incident – What Led Up To It?

- During 1960s & 1970's the facility received and disposed of >100 drums of Metallic Sodium packed in oil-filled steel drums. Oil was used to protect the Sodium from exposure to moisture
- After disposal, drums corroded, and oil leaked out
- Use of wooden (fiberboard) & cardboard containers
- “Hap-hazard” placement of waste containers in trenches coupled with “undisciplined” backfilling practices
- Commingling of Radioactive and Non-Radioactive waste in same trenches
- Design of closure cap in 1992 only required use of earthen materials
- Underground voids developed over the decades and eventually lead to cracks in the Closure Cap, leaving reactive waste vulnerable
- Fortunately, the Nevada desert is an arid climate...



# 2015 Beatty Incident - Event



Resulting Crater formed from the event

- Heavy precipitation event a few days prior and on the day of the event
- Aided by cracks in the cover, and saturated conditions, moisture penetrated to waste disposal zone of trench
- Water eventually contacted Sodium waste resulting in the violent reactions
- Federal, State, Local Multi-Agency response (15 total) lasting weeks

# 2015 Beatty Incident – Contributing Causes

- Funds intended for post closure monitoring & maintenance moved elsewhere to balance State's budget
- Cover maintenance & monitoring
- Past "common-practices"
- Commingling of wastes (Rad & Non Rad)
- Sodium (reactive metal) had not been treated "deactivated." (Prior to RCRA)



Corroded  
steel drums  
ejected from  
trench



# 2015 Beatty Incident – Contributing Causes



Cardboard & Fiberboard Containers Placed in Disposal Trench

Surface Cracks in Cover



- Wooden/carboard containers collapse underground causing voids
- Container placement in trenches along with backfilling process in undisciplined manner
- Small seismic events over many years and natural geological shifting/settling
- Major rain event – days for water to seep in and reach Sodium

# 2015 Beatty Incident – Corrective Actions

- Stabilization efforts:
  - Gather ejected debris, repacked and dispose
  - Repairs to Closure Cap (cracks, erosion, subsidence)
  - Scraped up ~140 tons of Sodium contaminated soil from surrounding area and disposed of in the adjacent hazardous waste landfill
  - Repairs to other nearby trench caps
  - Additional cap cover installed in phases (ongoing)
- Rules/legislation were needed to secure funds earmarked for monitoring and maintaining of closed LLRW facilities
- Reestablishment of funds for increased radiological environmental monitoring & regulatory inspections
- NRC recommended having more than just an earthen cover – i.e. HDPE cover

# Contact Us!



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**Do you  
have any  
questions?**

