

# *Groundwater Cleanup Report Analysis*



# *What This Presentation Covers*

└ Cleanup progress highlights & gaps

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└ Pilot tests & technical results

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└ Tritium and vapor risks

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└ Budget

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└ Oversight concerns

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└ Community recommendations

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# *Decades of Cleanup: Where We Are Now*

- 3,574 kg VOCs removed since 1989
- Only 31.3 kg removed in 2024
- Slowing removal = diminishing returns
- Containment is working — but far from finished

● We're in the hard-to-reach phase — slow, uneven, and still risky.





# *Treatment Systems in 2024*

25 groundwater & 7 soil vapor units in use

Pump-and-treat effectiveness now limited

VOC declines are small & site-dependent

Some reductions may not even be due to cleanup

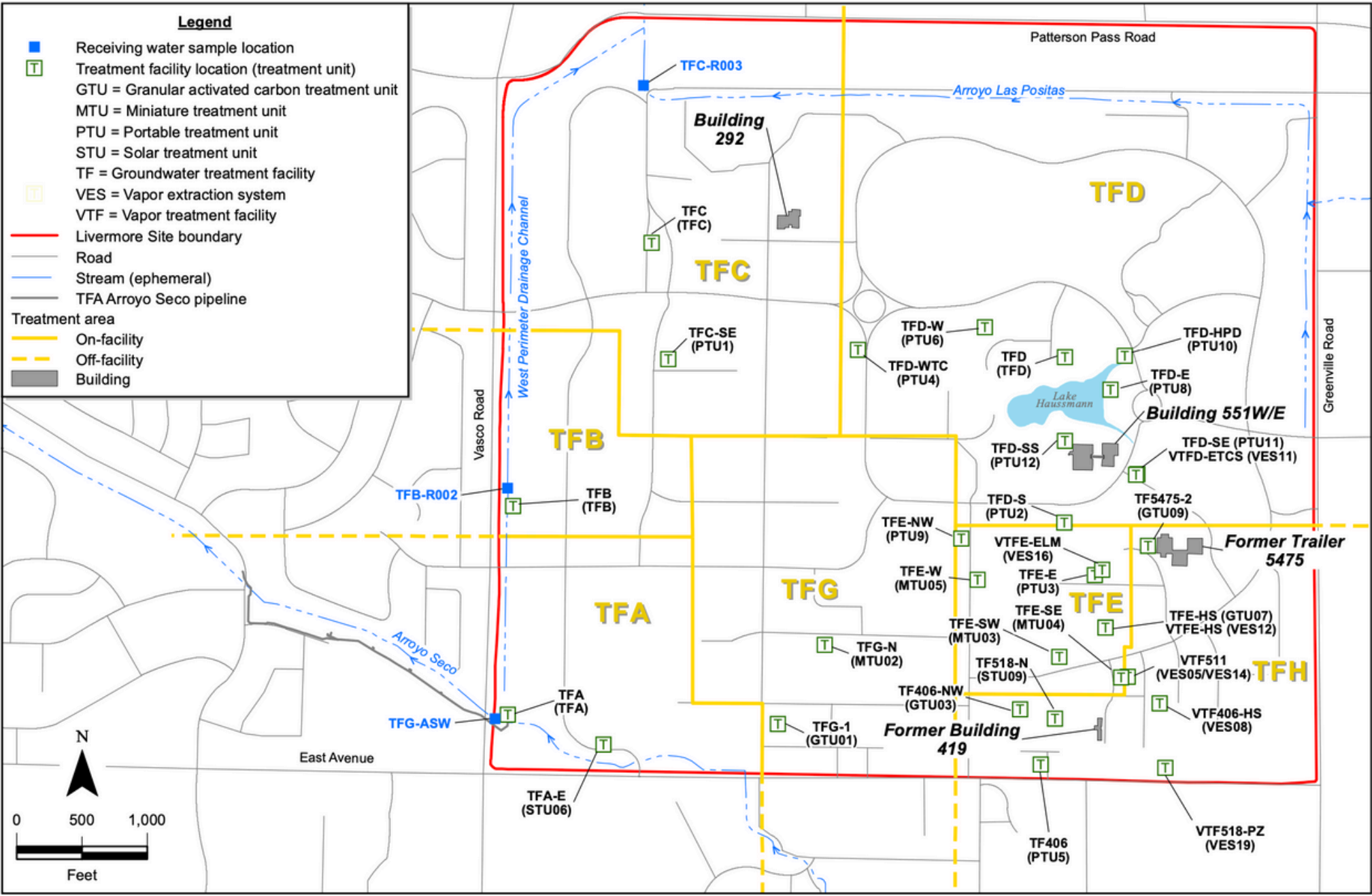
⚠ **LESS THAN 1% OF TOTAL MASS REMOVED IN 2024.**





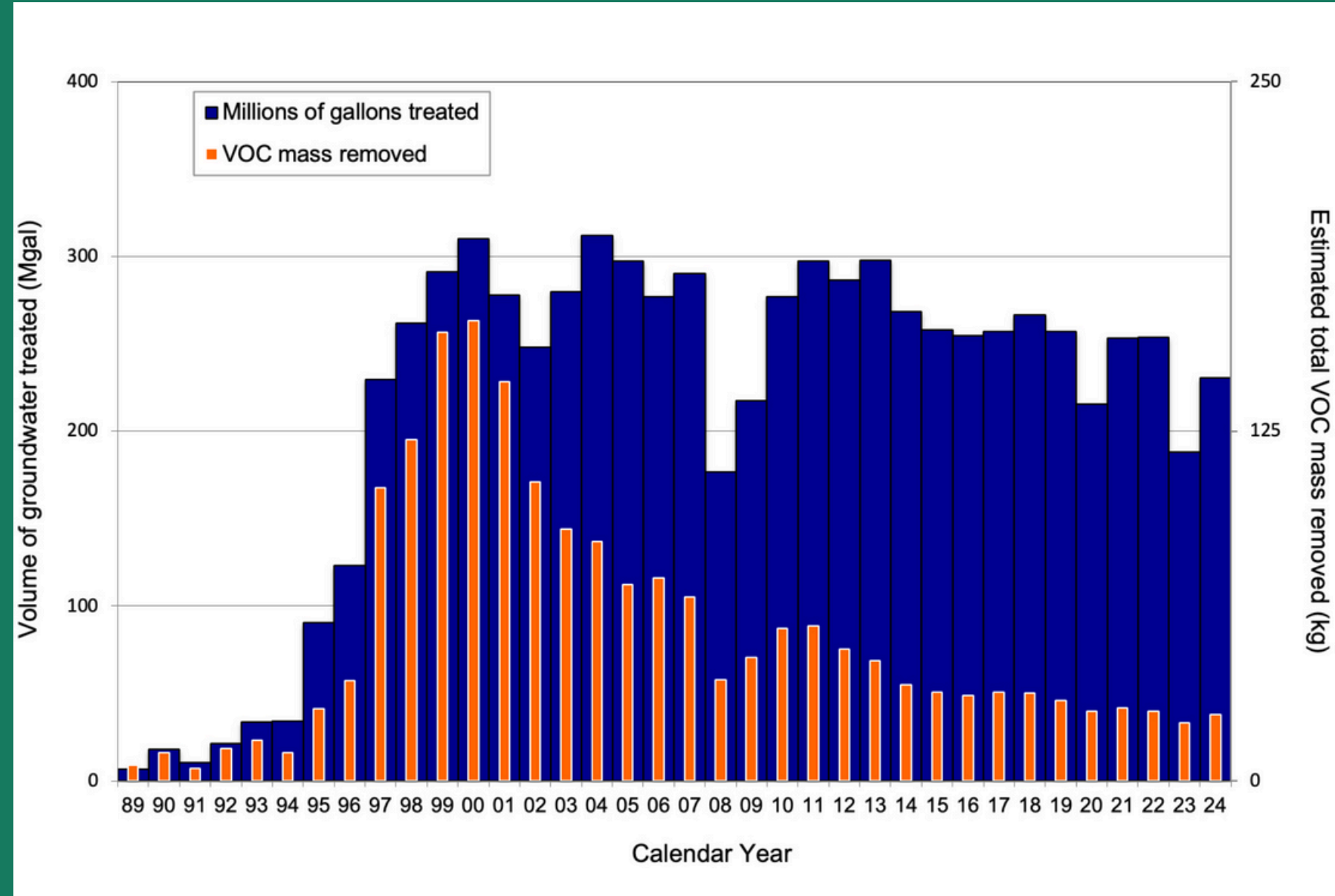
*Time for Better Tools: Why  
ESAR Matters*

- Pump-and-treat alone isn't enough
- LLNL piloted 3 Enhanced Source Area Remediation (ESAR) projects in 2024
- Let's assess their progress & transparency



Locations of treatment areas and treatment facilities at the Livermore Site





Estimated total VOC mass removed from groundwater at the Livermore Site since 1989

# *ESAR Pilot 1: Bioremediation at TFD-HPD*

↘ Injected lactate & KB-1® bacteria

↘ Promising early drops:

- W-3702: 3,000 → 1,600 µg/L
- W-3703: 1,300 → 1,000 µg/L

↘ But: one well worsened, others inconsistent

↘ Results buried in Appendix C

● WORKS UNEVENLY, MORE CLARITY  
NEEDED ON SUCCESS CRITERIA



# *ESAR Pilot 2: ZVI at TFC Hotspot*

- ZERO-VALENT IRON WORKING IN SOME SPOTS
- 74%, 51% DROPS: BUT REBOUNDS IN 2024
- DEEPER ZONES LESS IMPROVED
- STILL OPERATING — BUT IS IT ENOUGH?

 ***PATCHY SUCCESS; LIMITED REACH; STABILITY UNCLEAR***



# *ESAR Pilot 3 : Thermal Cleanup at TFE-ELM*

- Full failure in 2024
- System shut down due to clogging from heat-induced scaling
- No cleanup occurred this year

● **UNACCEPTABLE TO LEAVE A TOXIC SOURCE AREA UNTREATED FOR A FULL YEAR**



- STILL EXCEEDING LIMITS NEAR BLDG 419
- W-1414: >37,000 PCI/L (6 YEARS IN A ROW)
- EXCUSE: RAIN MOBILIZED TRITIUM
- RESPONSE: MONITOR & WAIT

# *Tritium Trouble*

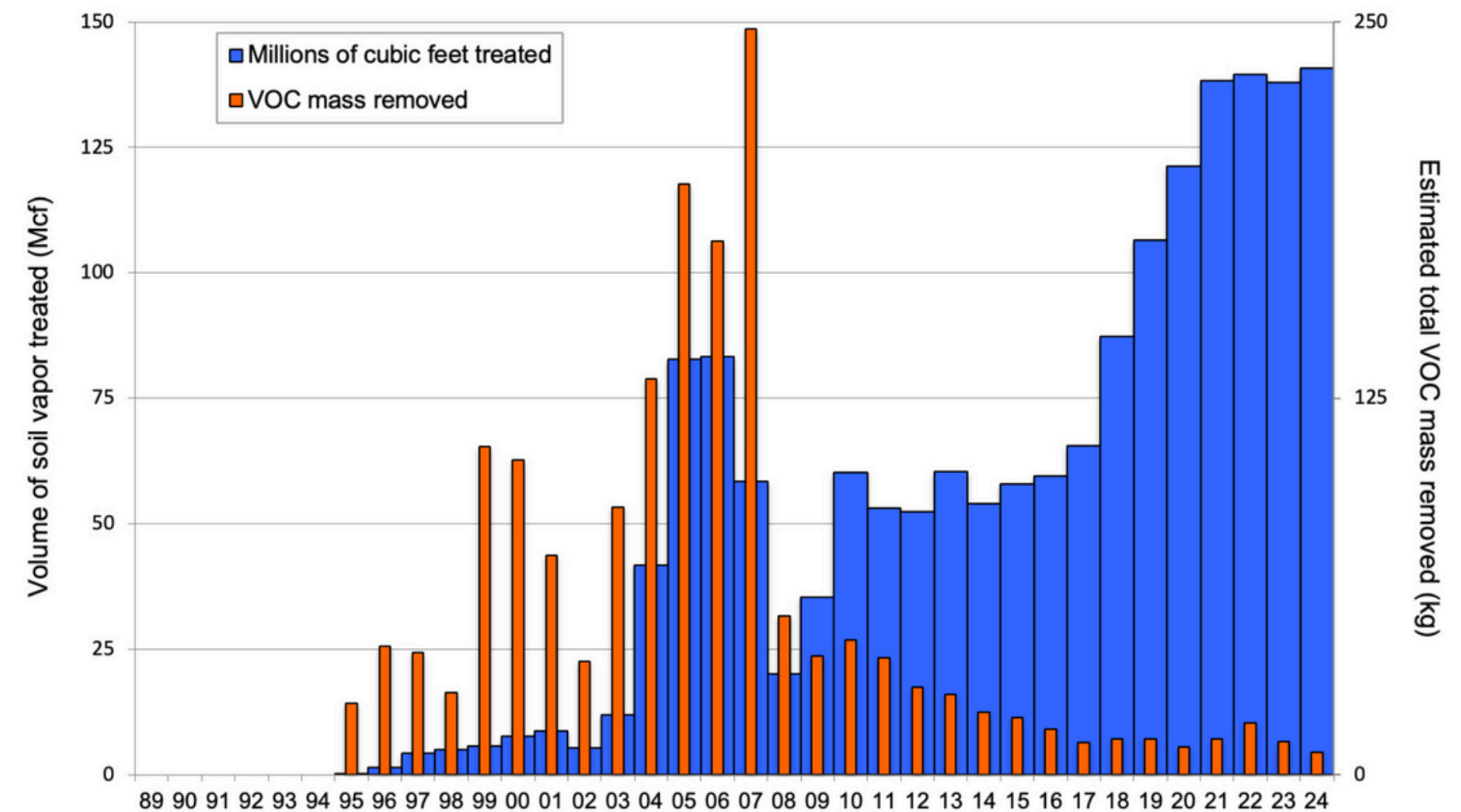
 “NATURAL ATTENUATION” =  
DECADES OF PASSIVE EXPOSURE



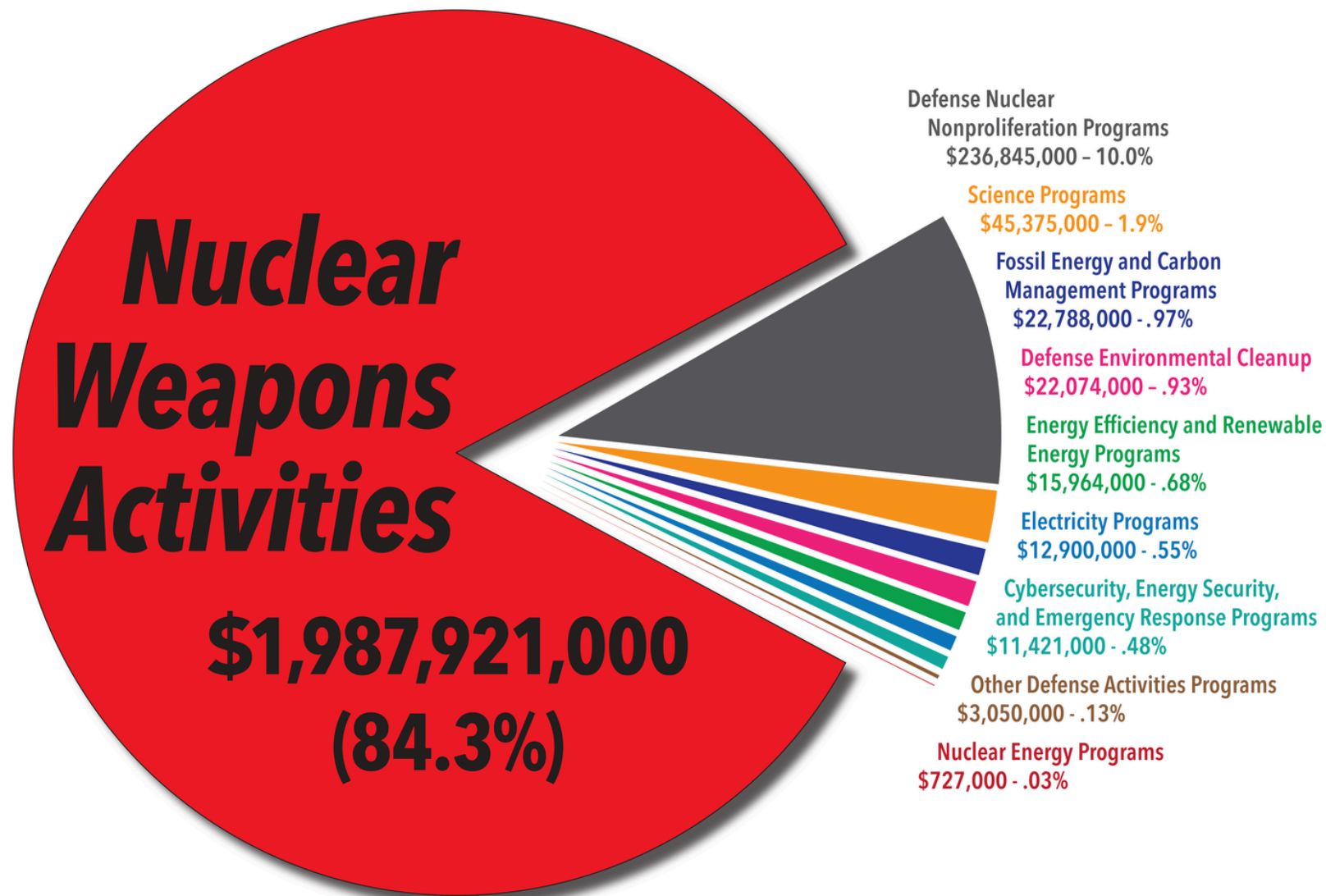
# Vapor Intrusion—Indoor Air Risks

- 6 of 12 tested buildings still show VOCs
- None exceeded limits this year
- 7 vapor systems running
- No off-site testing discussed

● What happens if and when systems turn off? No plan yet.





**FY2024****Budget Request for LLNL****Total \$2,359,047,000**

*Budget Cuts =  
Delayed Cleanup*

No drilling in 2024

Postponed upgrades

Merged systems to save cost

Long-term data gaps & equipment risks

● FUNDING SHORTFALL = REGULATORY AND COMMUNITY RISK



# *Oversight—Is it Enough?*

- LLNL followed reporting timelines, but vague language masks setbacks
- Next Five-Year Review due 2025-26
- No public-facing summary or easily digestible data







## *Key Concerns*

- Stalled ESAR pilot
- Tritium rebound
- No clear cleanup timeline
- Minimal action on thermal failure
- Budget shortfall shows vulnerability



# *Recommendations*

- SECURE CONSISTENT FUNDING
- CLARIFY GOALS & DATA
- SUSTAINED INDOOR AIR TESTING
- ACT ON PERSISTENT VOC & TRITIUM HOTSPOTS
- PUSH FOR HONEST, ACCESSIBLE LANGUAGE
- DEMAND STRONGER STATE/FEDERAL OVERSIGHT





# *Thank You*

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