

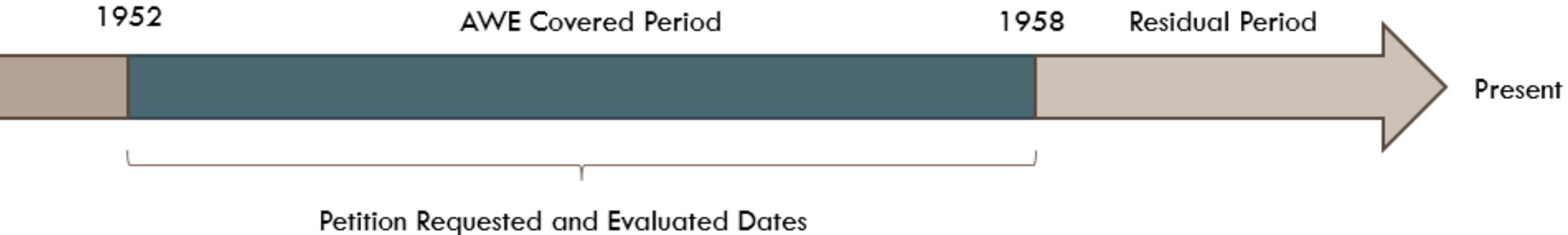


SUPERIOR STEEL CO.
SEC PETITION SEC-00247
PRELIMINARY REVIEW

Site Information

2

- Located in Carnegie, PA (outside of Pittsburgh)
- Metal processing facility hired by AEC because it was one of only a few companies identified with the technical expertise to roll and clad metal strip plate
- Cost-plus-fixed fee contract for intermittent, on-demand rolling
- Covered years:



Petition-Related Dates

3

- Petition received on May 1, 2018

Requested class:

All workers who worked in any area at the Superior Steel Co. facility in Carnegie, PA, during the period from January 1, 1952 through December 31, 1957.

Basis:

- “Individual uranium urinalysis data are unavailable for Superior Steel workers and none are known to exist.”
- “No external dosimetry results are available for Superior Steel employees.”

- Petition qualified for evaluation July 19, 2018

- Qualified class:

All atomic weapons employees who worked in any area at Superior Steel Co. in Carnegie, Pennsylvania, during the period from January 1, 1952 through December 31, 1957.

- NIOSH Petition Evaluation Report issued November 16, 2018
- Board discussed at December 12–13, 2018, meeting

Data Reviewed By SC&A

4

- Site Research Database
 - ▣ Health and Safety Laboratory (HASL) monitoring studies
 - ▣ United States Army Corps of Engineers Preliminary Assessment study
 - ▣ Thorium licensing communication
- CATI reports
- Superior Steel TBD (ORAUT-TKBS-0034, Rev. 00 PC-1)
- TBD-6000

Radiological Exposure Sources at Superior Steel Co.

5

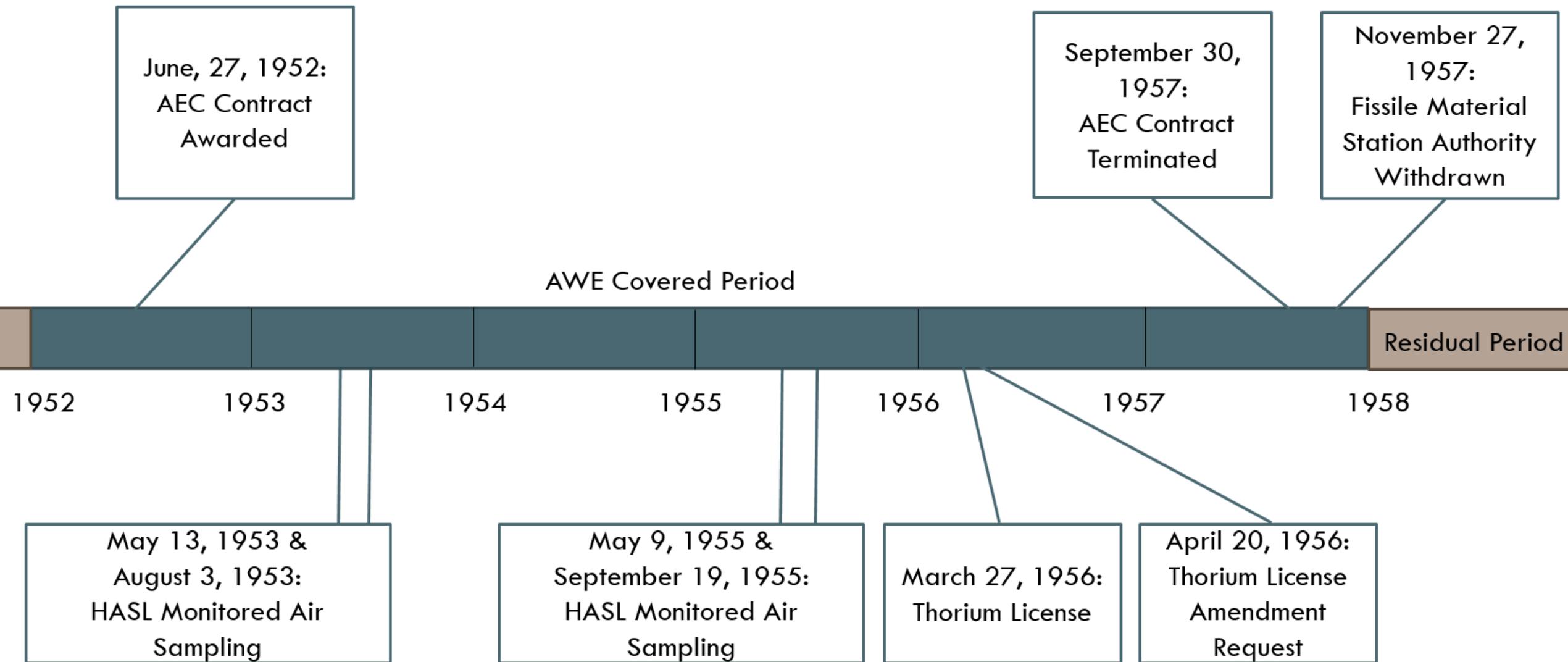
Uranium

- Uranium slabs heated in salt bath, rolled numerous times, finished cut, and allowed to cool
- Majority natural uranium
 - ▣ May have been RU
 - ▣ One known campaign of 1.5% enriched uranium
- 4 HASL air monitoring studies
 - ▣ ~17 BZ results
 - ▣ ~144 process/general air samples

Thorium

- Licensed to possess 700 pounds
 - ▣ Evidence of test rolling
 - ▣ Commercial client (i.e., non-AEC)
- Expanded to unlimited
 - ▣ No evidence of additional rollings, receipt of materials, or work orders
- No evidence of thorium contamination found in cleanup efforts

Important Dates



Challenges

7

- No worker monitoring (both internal and external)
- Air sampling done on limited occasions
- Original contract documentation destroyed
- Minimal information regarding thorium

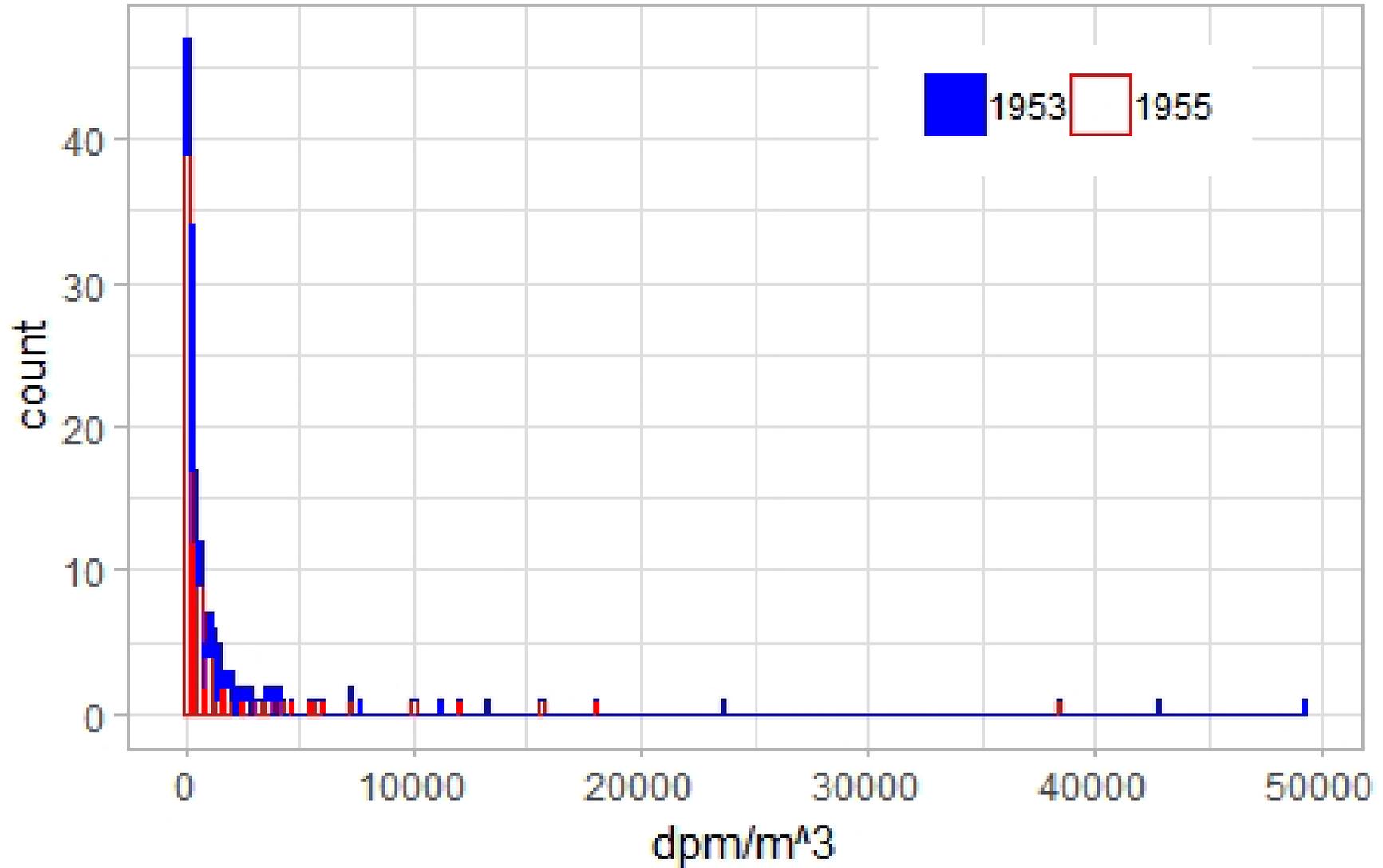
NIOSH Approach to Internal Dose from Uranium

8

- 500 hours rolling mill time per year
 - ▣ Established via contract annual billings
 - ▣ Use Vulcan Crucible Steel billing rate per hour
- Air concentrations established from 4 HASL studies
 - ▣ U-234 including RU contaminates
 - ▣ Split into a pre- and post-May 9, 1955, rolling
 - Man-cooling fans installed at unknown date between August 1953 and May 1955 rollings

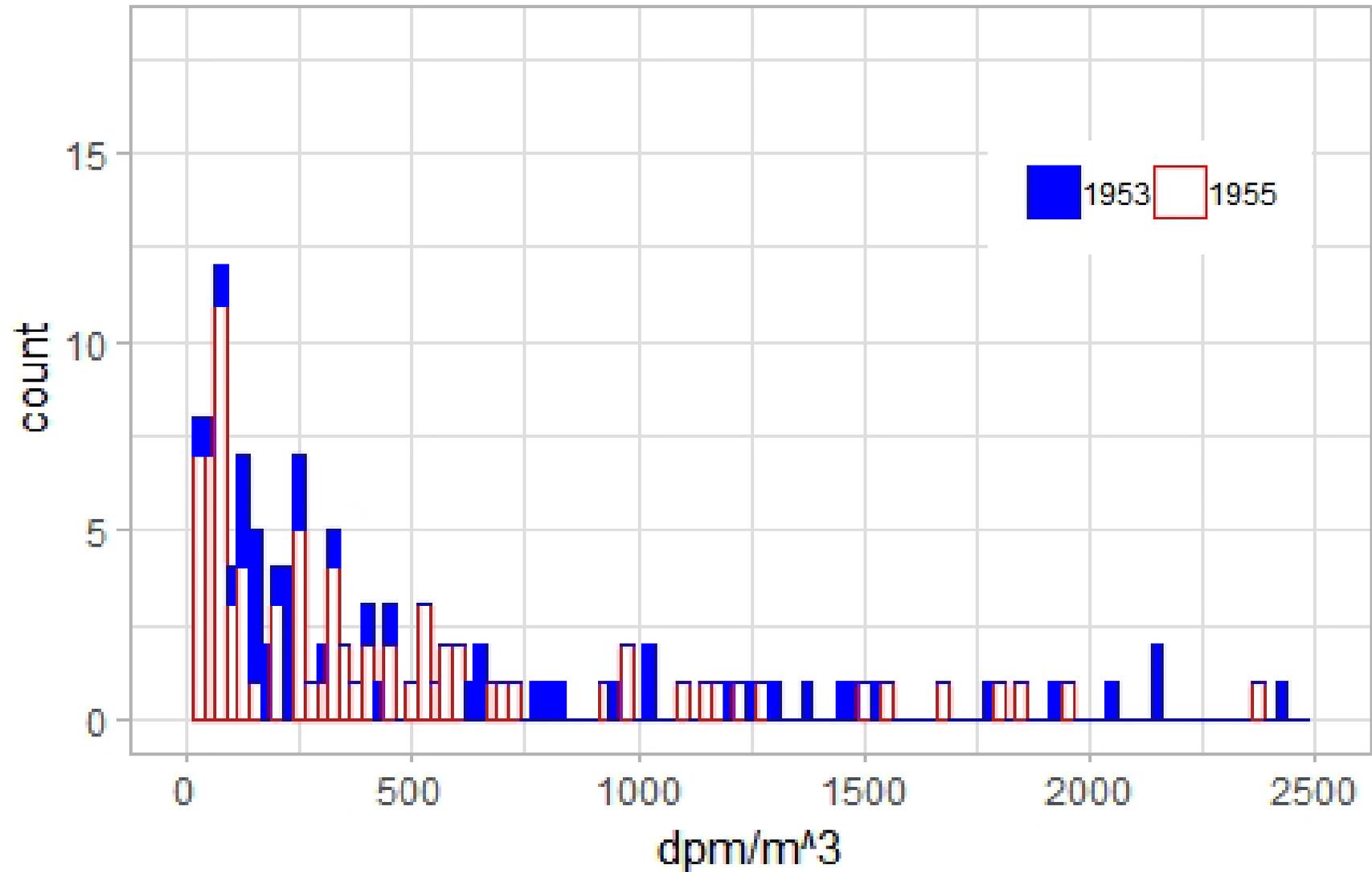
HASL Air Sampling Data (bin width of 200)

Distribution of air monitoring data similar for 1953 and 1955



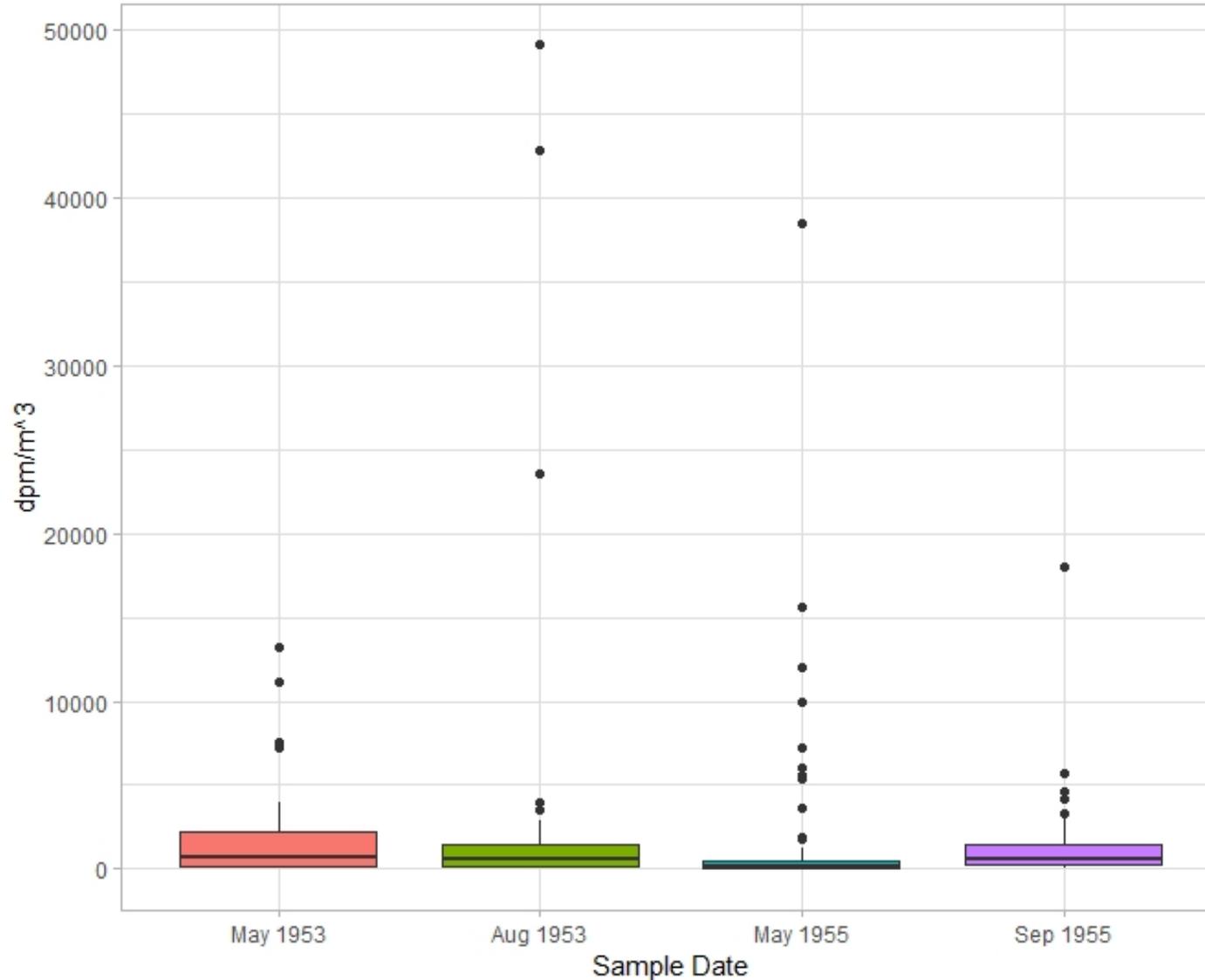
HASL Air Sampling Data (zoomed in with bin width of 25)

Distribution of air monitoring data similar for 1953 and 1955



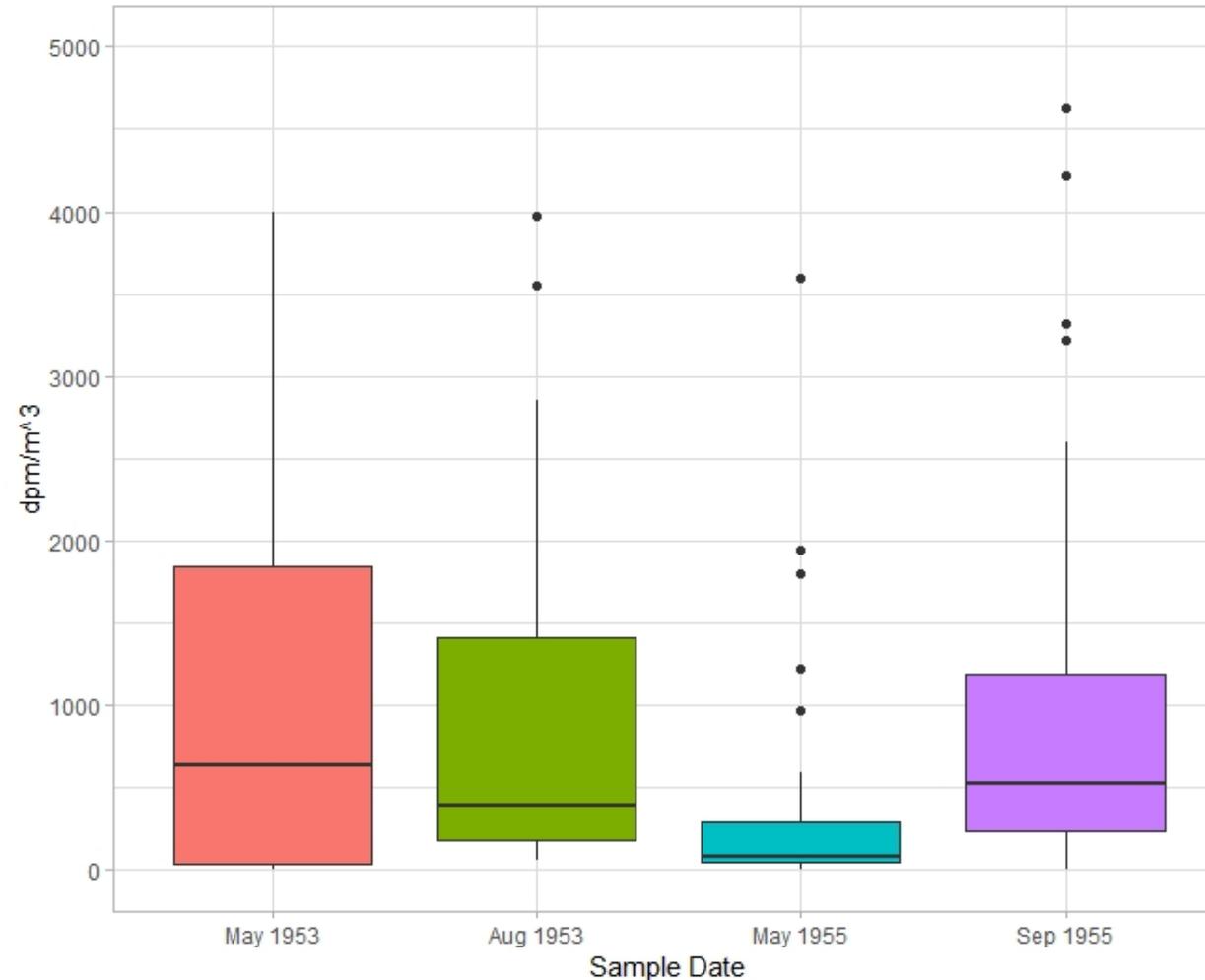
HASL Air Sampling Data by Survey

May 1955
distribution trends
lower; however,
gains are lost in
September 1955
sampling



HASL Air Sampling Data by Survey (zoomed in)

May 1955
distribution trends
lower; however,
gains are lost in
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sampling



NIOSH Approach to Internal Dose from Thorium

13

- Th-232 and daughters in secular equilibrium
- Single 10-hour rolling
- Air concentrations based on mass loading approach
 - ▣ Use U milling air concentration determined from air monitoring results
 - ▣ Similar approach to Bridgeport Brass but assumes Th mass loading equal to U mass loading
- Resuspension remainder of 1956–1957
 - ▣ 1E-5 /m resuspension factor
 - ▣ Source term depletion based on ORAUT-OTIB-0070

NIOSH External Uranium Exposures

14

- 500 hours rolling per year using Battelle-TBD-6000 default worker assumptions
 - ▣ Direct rolling
 - ▣ Submersion
- 500 hours storage
- 2,000 hours post-rolling
 - ▣ Direct exposure
 - ▣ Submersion

NIOSH External Thorium Exposures

15

- 10 hours rolling using Battelle-TBD-6000 guidance
 - ▣ Direct rolling
 - ▣ Submersion
- 190 hours storage
- April 30, 1956, through end of operations post-rolling
 - ▣ Direct exposure
 - ▣ Submersion

Occupational Required X-ray Examinations

16

- No evidence of examinations
- No CATI statements indicating examinations
- NIOSH intends to assign pre-employment, annual, and termination medical X-ray doses for all employees during the AWE operational period
 - ▣ ORAUT-OTIB-0006
 - ▣ Consistency with other AWEs?