Navajo Abandoned Uranium Mines

U.S. EPA R9 Superfund Program

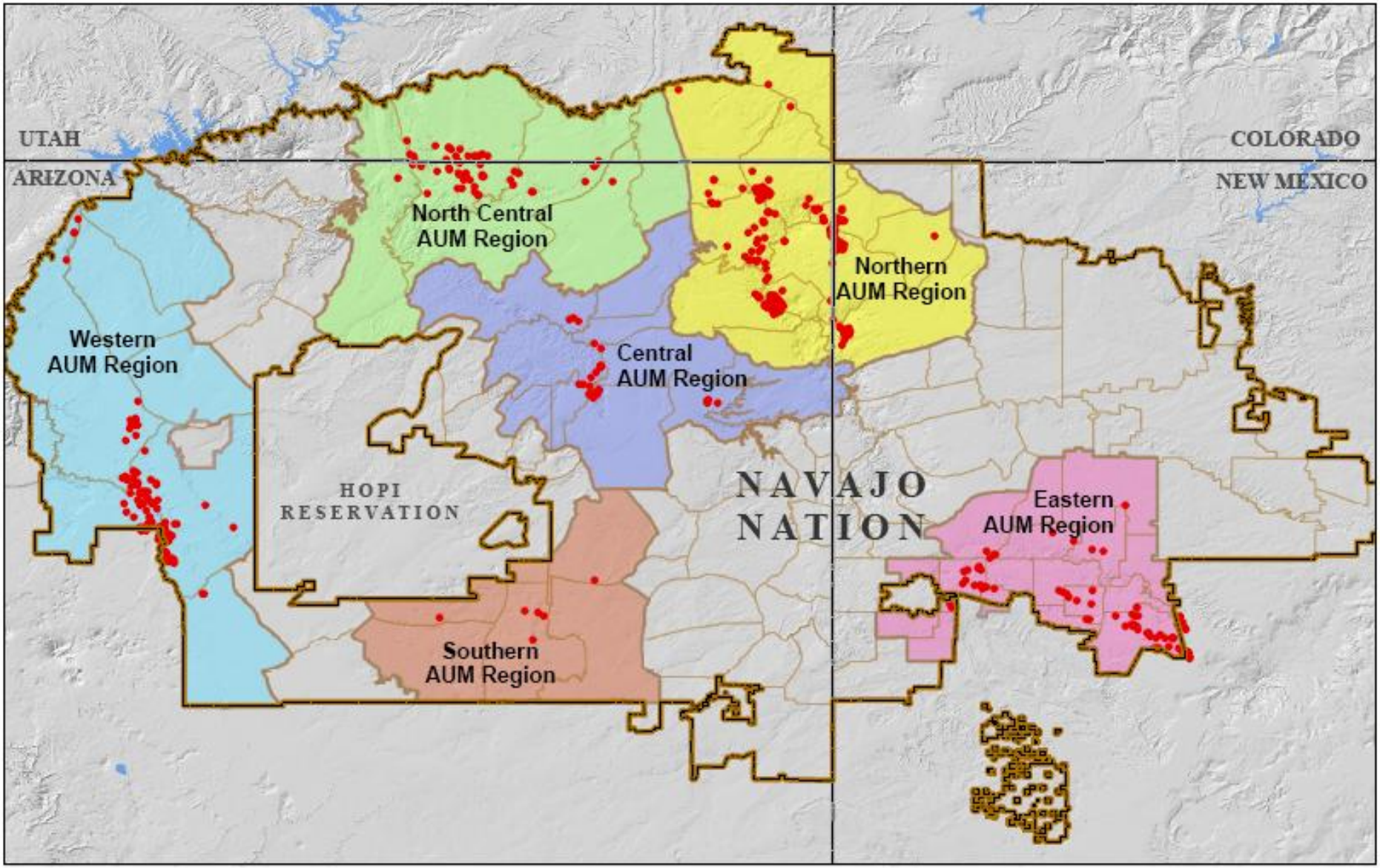
Southwest Uranium Stakeholders Conference

September 15, 2010 Tuba City, Arizona

Abandoned Uranium Mines - Background

- 2000 to 2007: EPA compiled all available data on AUMs into Atlas and GIS database.
- Plan: On-site screening of all 520 mines by 2012. Clean up the highest risk mines.

Skyline Mine



Abandoned Uranium Mine Locations and AUM Regions on the Navajo Nation

• Abandoned Uranium Mines

50 25 0 50 Miles

EPA
Region 9 GIS Center
November 6, 2007

Screening Data

- Data Collected:
  - Gamma radiation measured in Counts per minute using 2x2 meters
  - Information gathered includes location of residential structures, wells, and sensitive environments.

- Organizing results by:
  - Close proximity to inhabited structure
  - Highest radiological readings (>100,000 cpm)

Ruby No. 3 Mine

Navajo Abandoned Uranium Mine

Site Screen Report

This form is for use at the site of abandoned uranium mines (AUM) located on Navajo Nation lands. Applicable sites include all mine and mine features that have or have not undergone reclamation by the Navajo Abandoned Mine Lands Reclamation Program, including features, adits, pits and waste piles. Applicable sites also include all AUM sites listed in the USEPA CERCLIS database, all sites listed in the 2008 AUM GIS Report issued by USACOE and USEPA, all AUM sites on allotment lands associated with the Navajo Nation, and any and all AUM sites not listed in any database located on Navajo lands. Reconnaissance of any sites located on lands adjacent to Navajo lands that may be impacting Navajo lands will need to be coordinated with the authorities appropriate to those lands.

The purpose of the form is to ascertain the status and location of the identified AUM site, and to record all immediate site information associated with the mine site. Decisions and recommendations on what additional steps are needed will be provided on a separate document.

Joleo Mine AUM Site

Navajo AUM Northern Region

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Contract: W91238-06-F-0083

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Part II Summary of radiological readings

Highest gamma radiation measurement:

979,487 counts per minute (cpm)

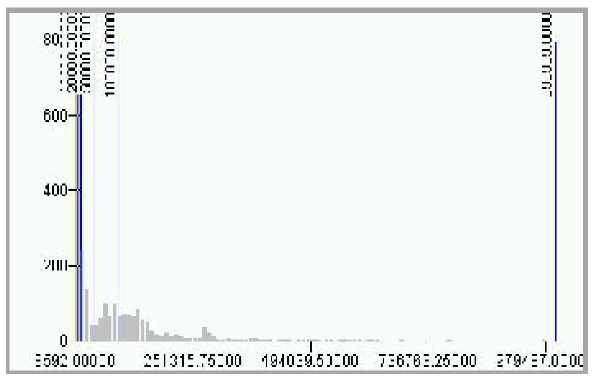
Describe any other radiological measurements:

A total of 2,339 gamma radiation measurements were collected from the mine site, ranging from 8,592 cpm to 979,487 cpm. Measurements in the vicinity of the waste debris piles were found at levels ranging from 120,000 cpm to 360,000 cpm, at the adits ranging from 150,000 to 700,000 cpm, and at the exposed ore at levels of approximately 970,000 cpm. The measurements are represented in Figures 1 and 2.

Background Locations **Average background** = 10,407 cpm
#1 10,407 cpm

Distribution Chart and Statistics:

The following chart and statistics were generated by ESRI ArcGIS 9.3.1, and show the general distribution of the site gamma radiation measurements. The horizontal X axis represents the gamma radiation reading levels in cpm (lowest levels to the left). The vertical Y axis represents the frequency of each gamma radiation level.

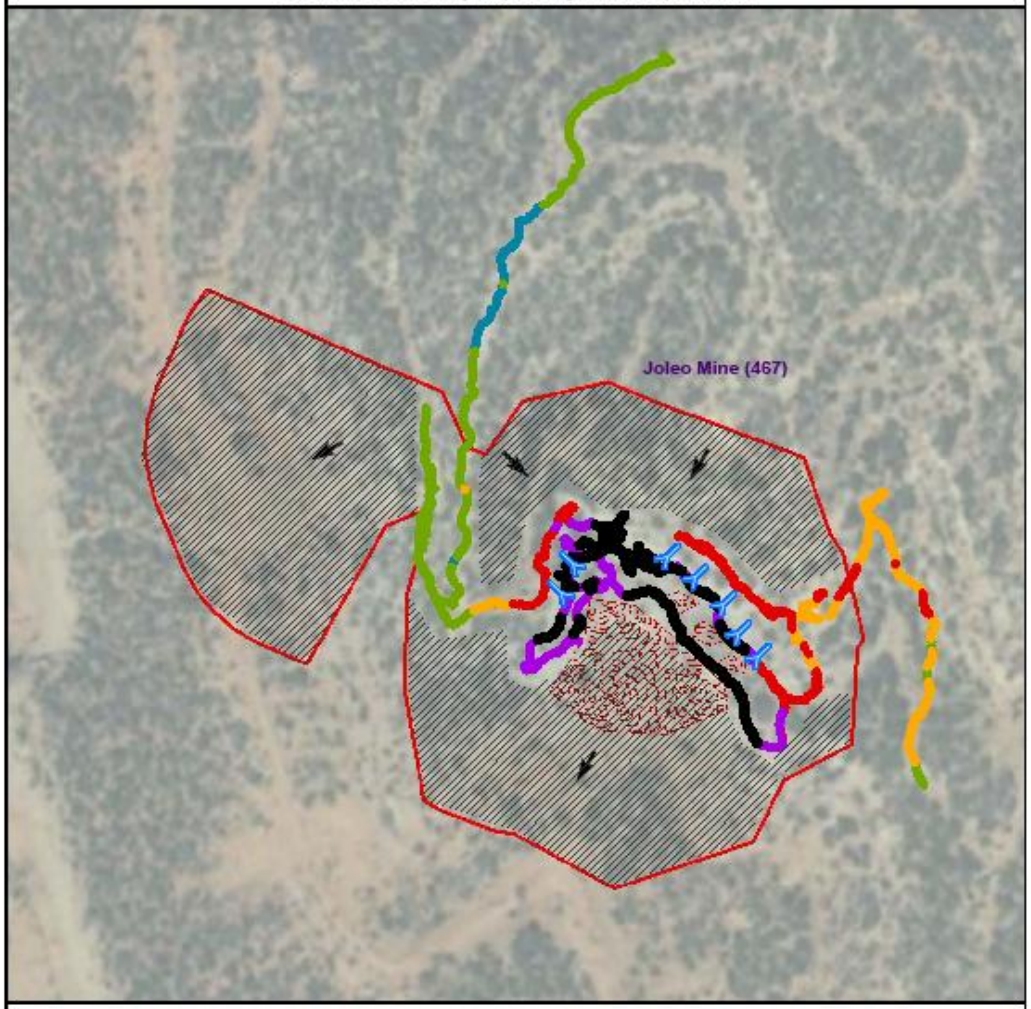


Count:	2339
Minimum:	[illegible]
Maximum:	979487.00000
Sum:	[illegible]
Mean:	[illegible]
Median:	[illegible]
Standard Deviation:	[illegible]

Photo 7. Waste debris sloughing down slope

Photo 8. Mine site

Figure 2 - Gamma Radiation Measurements
Joleo Mine (467)
Round Rock Chapter, Navajo Nation, Arizona



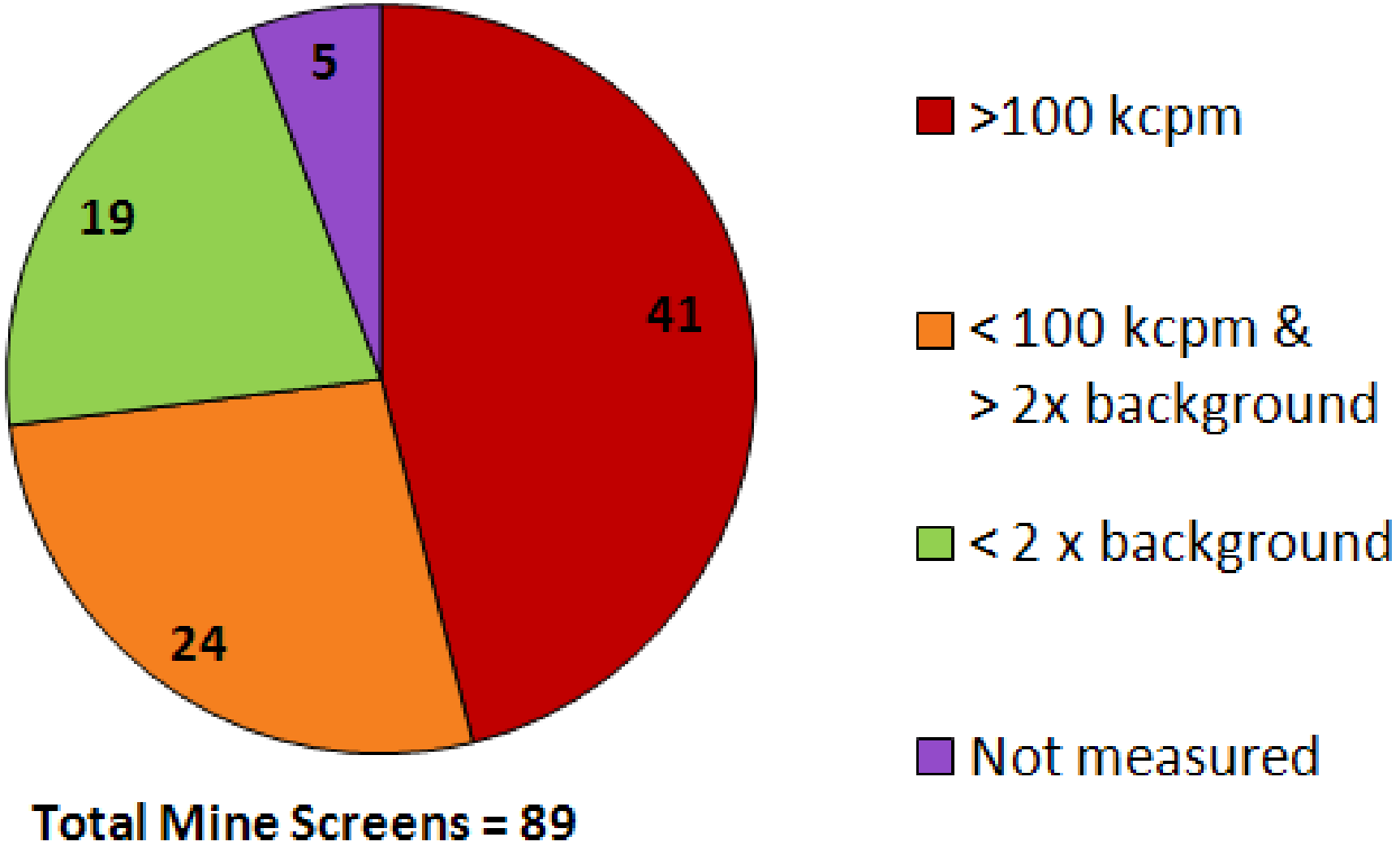
Screening Data (all sites combined):

- Number of Points = 412,479

- Background Mean = 11,436 cpm
- 2 x Background Mean = 22,874 cpm

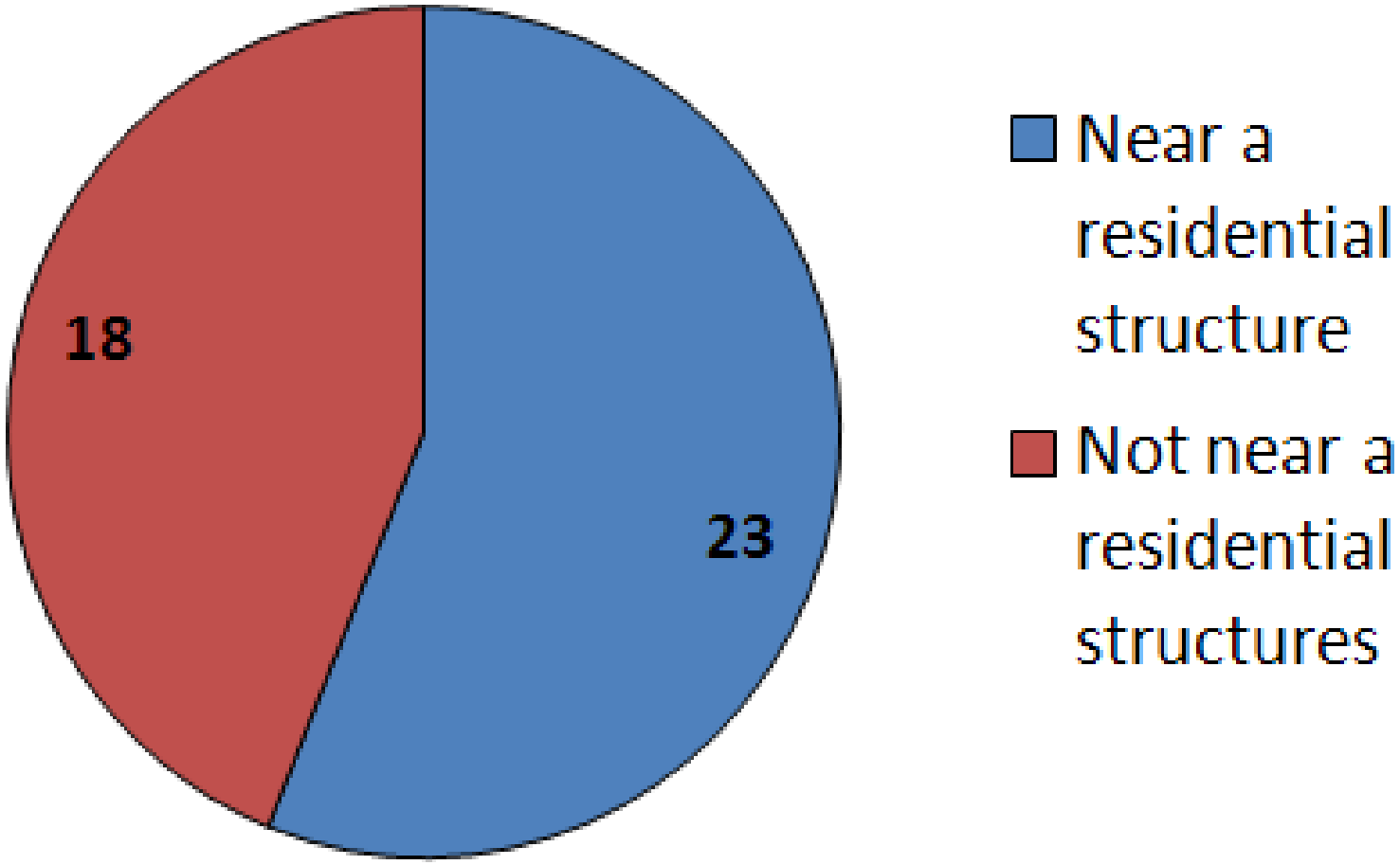
- 75 th percentile = 23,649 cpm
- 95 th percentile = 92,846 cpm

Radiological Readings for Eastern Agency Mine Screens

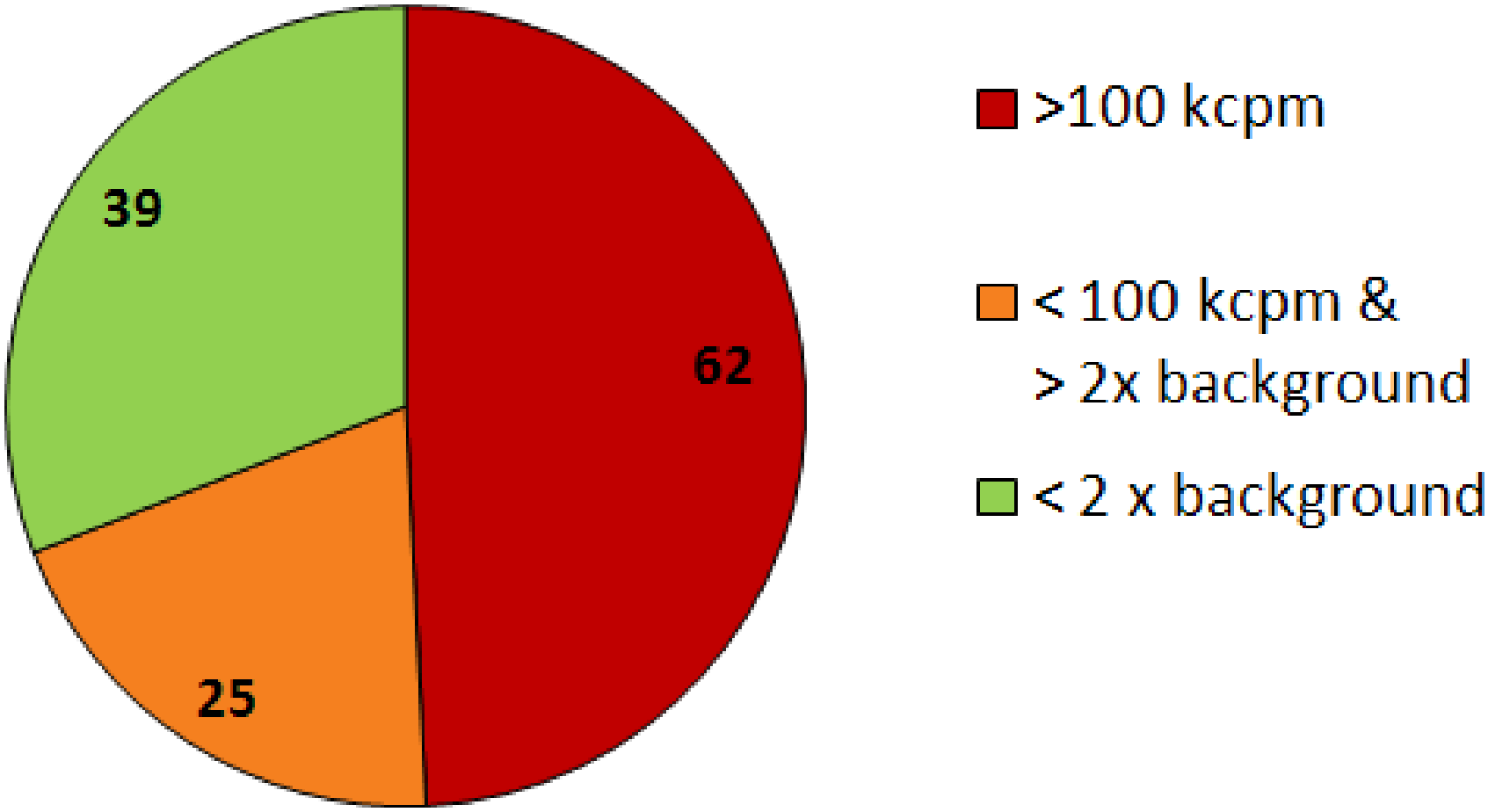


Total Mine Screens = 89

Eastern Agency Mine Screens
> 100,000 cpm



Radiological Readings for Northern Agency Mine Screens



Total Mine Screens = 126

PRP Searches

- Enforcement first policy (mine by mine) extends resources beyond the 5-year plan
- 104e letters to companies associated with highest priority mines (sent to nine companies in 2007)
- Now identifying PRPs for highest risk mines

Regrading NECR Wastepile

Navajo AUM Site Screen 5-Year Plan Schedule

Time Period on Calendar Year Basis	AUM Region - Projected Number of Mine Site Screens	Screens Completed	Screens to be done	Total AUMs for Screening
Fall 2008	Eastern Region	84 sites		84 sites
Fall 2009	Start of Northern Region	105 sites		189 sites 223 sites
Spring 2010	Finish Northern Region	122 sites		311 sites
Fall 2010	Start on Western Region	72 sites	72 sites	383 sites
Spring 2011	Complete Western Region Southern and Central Regions	39 sites 34 sites	39 sites 34 sites	422 sites 456 sites
Fall 2011	North Central Region	63 sites	63 sites	519 sites
	Total Projected by the end of calendar year 2011			520-530 sites

Next Steps

- Continue screens in remaining mining regions.
- Refer high-risk structures to Navajo EPA for screening.
- Develop method to prioritize additional work at mines, including more detailed assessments, enforcement, and cleanup.

Questions?