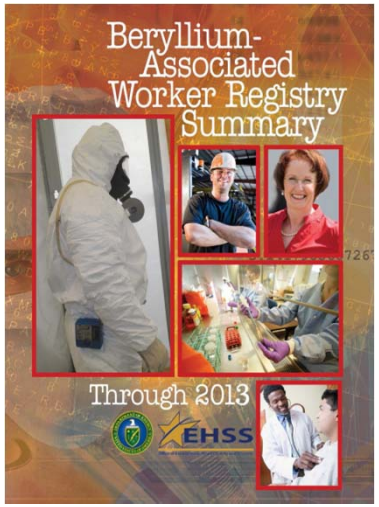
Beryllium-Associated Worker Registry



A Review of the 2013 Annual Summary

Data Coordinator Functions

- Primary interface with sites
- Respond to queries about data
- Address data quality issues
- Need to meet data submission deadlines
- Expected to know requirements
- Communicate issues as they arise
- Affect almost every aspect of program

Number of Sites with Data Coordinator Changes

YEAR	TOTAL DATA COORDINATOR CHANGES	SITES
2013	6	HAN, SNL, AMWTP, PNNL, NSPS/2
2014	15	HAN, AMES/2, NSC(formerly KCP)/2, Y-12 URS/2, PAD LATAKY/2, NSPS, ANL, BNL, SRS, LBNL/2
2015 (to date)	9	HAN/2, AMWTP/2, LANL, LLNL CHES, LBNL, Y-12 Energy Solutions/2

Percentage of 27 Active Sites with Data Coordinator Changes

YEAR	PERCENTAGE OF 27 ACTIVE SITES	SITES
2013	19% (5)	HAN, SNL, AMWTP, PNNL, NSPS/2
2014	37% (10)	HAN, AMES/2, NSC(formerly KCP)/2, Y-12 URS/2, PAD LATAKY/2, NSPS, ANL, BNL, SRS, LBNL/2
2015 (to May)	22% (6)	HAN/2, AMWTP/2, LANL, LLNL CHES, LBNL, Y-12 Energy Solutions/2

Active Sites with 2 Data Coordinator Changes in the Same Year

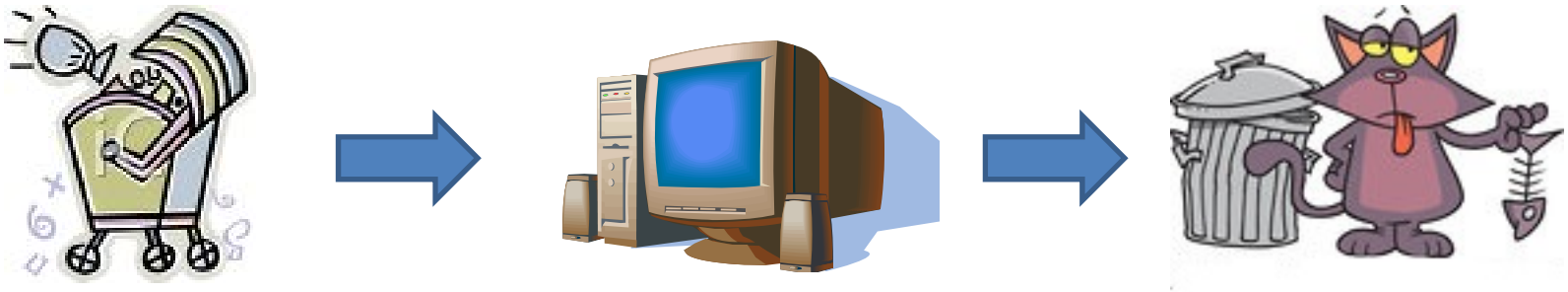
YEAR	NUMBER OF SITES	SITES
2013	1	NSPS
2014	5	AMES, NSC, Y-12 URS, PAD-LATAKY, LBNL
2015 (so far)	3	AMWTP, HAN, Y-12 Energy Solutions

I. Implications of High Data Coordinator Turnover

- Poor understanding of requirements & expectations
- Repeated need for training drains resources, takes time
- Affects those who use data, e.g., establishing limits, rule-making, policy, research
- Data quality can suffer

II. Implications of High Data Coordinator Turnover

- **Results are only as good as what gets reported to us…**



Data Variability and Limitations

- Among active sites, reporting limits typically vary from 0.01 to 0.05 µg/m^3, 1/20th to 1/4th of the action level of 0.2 µg/m^3.
- "Non-detectable" can be somewhere between zero and the site's reporting limit. Not all sites report non-detect values in the same manner.
- Of 553 employees (from 19 sites) who are BeSensitized or have CBD, 372 employees (67%) have no exposure sampling data.
- Almost 14% of workers with BeLPT results have no reported work history.

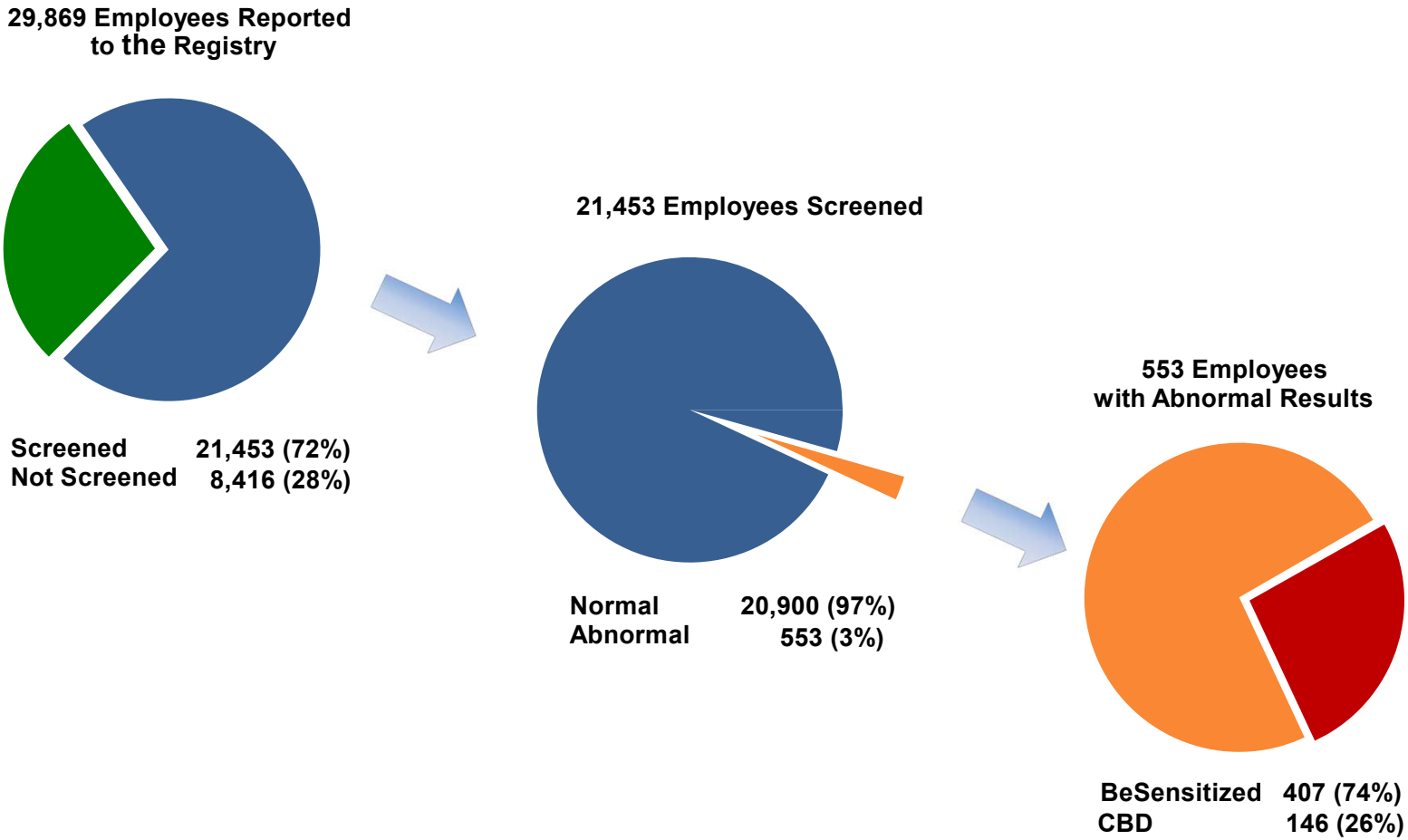
BAWR Technical Standard Revisions

- Race, date of death, cause(s) of death removed from roster table
- Request for smoking data removed
- Organization code & beryllium job start date now required fields
- Guidance inserted on what to do when there's a change in individuals who perform Data Coordinator role

The 2013 Summary

- Contains data submitted or corrected by end of March 2014
- Includes 27 active sites, 5 sites inactive
- Compared with 2012 Summary:
  - 1,440 more workers
  - 5,094 additional exposure sampling results,
  - 4 additional beryllium sensitizations
  - no additional CBD diagnoses

Progression from BeLPT Testing to Sensitized to CBD Through 2013



*Some sites have provided data that predate the 2002 start date of the Registry.

From 2012 to 2013, the 27 sites and subcontractors currently reporting to the Registry identified 8 additional sensitized employees and no additional employees with CBD.

Be Sensitization as Defined by DOE

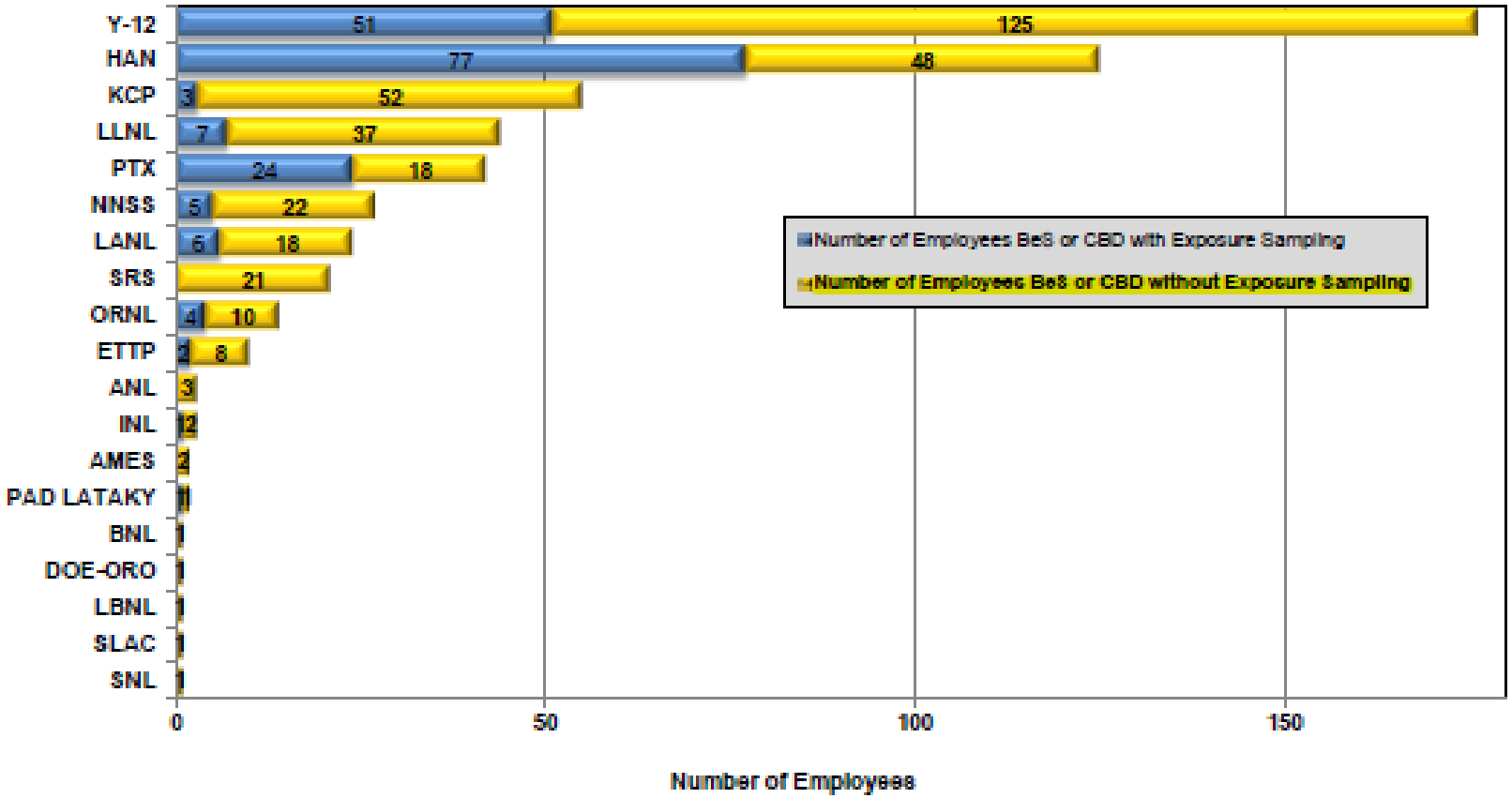
To be considered beryllium sensitized (Be Sensitized), an individual must have:

- **2 abnormal blood tests, or**
- **1 abnormal and 2 borderline blood tests, or**
- **1 abnormal bronchoalveolar lavage BeLPT, or**
- **clinical evaluation with a diagnosis of BeS**

Exposures > Action Level

- In 2012, 38 exceedances above 0.2 µg/m^3 action level
- In 2013, reduced to 6 reported exceedances
- Observed exceedances associated with waste operations at Pantex Plant
- Work planning had identified high risk operations
- Respiratory protection was appropriate

Distribution of Workers Be Sensitized or CBD by Site: Exposure Sampling Status Through 2013*

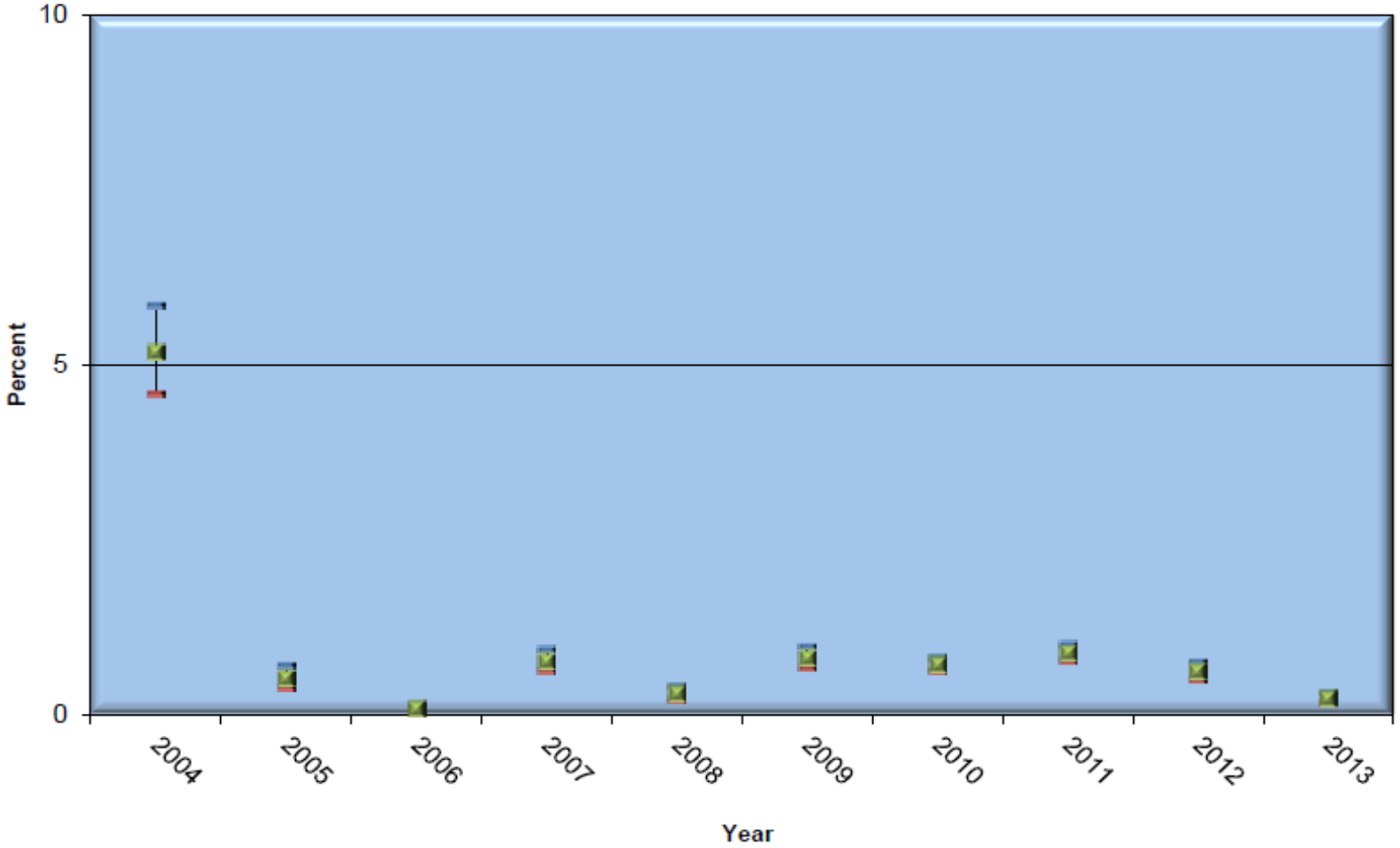


*Some sites have provided data that predate the 2002 start date of the Registry.

Reporting from the Registry shows that for the 553 employees (representing 19 sites) who are BeSensitized or diagnosed with CBD, 372 employees (or 67 percent) have no exposure sampling data.

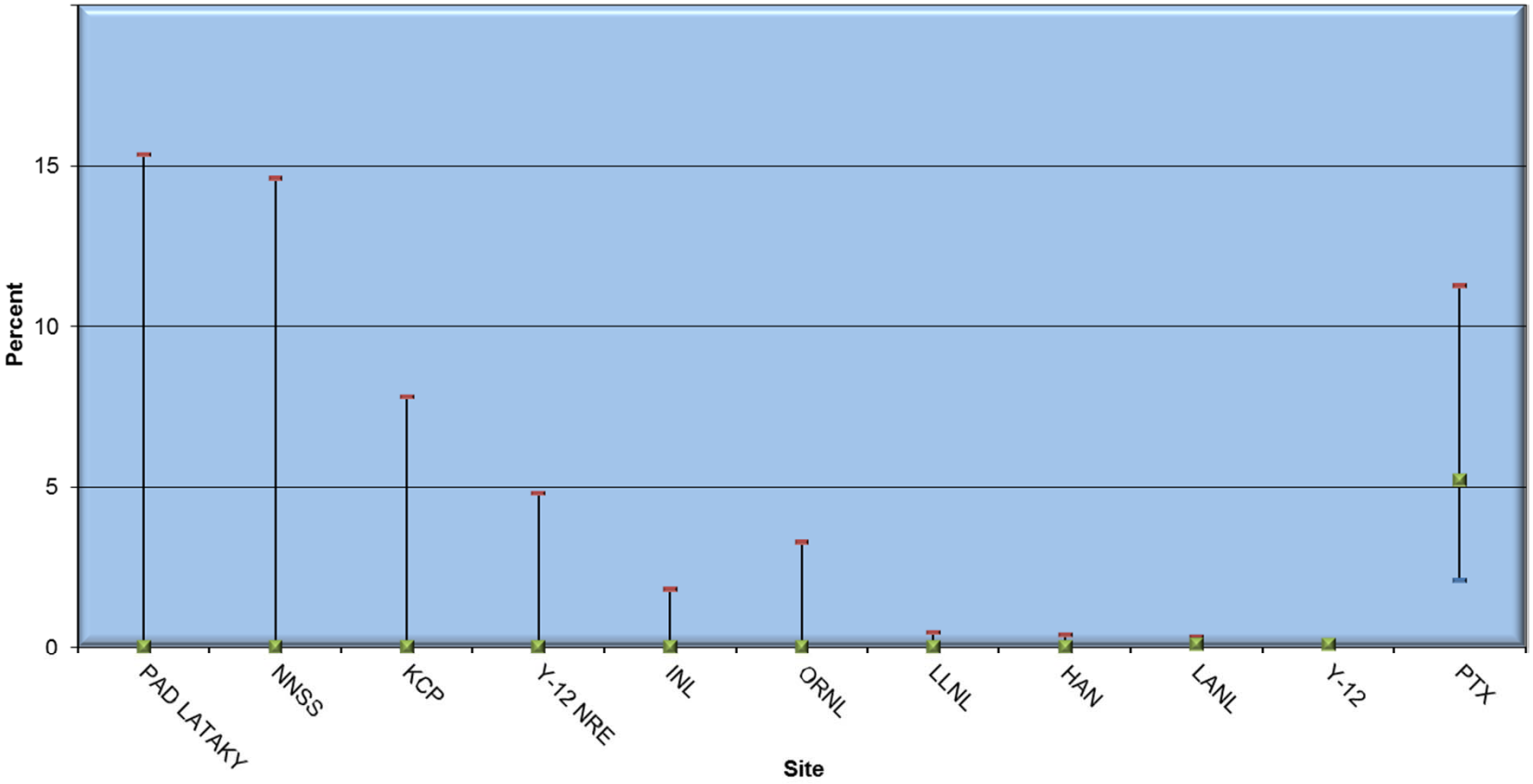
DOE-wide Exposure Trend for 2004 – 2013

Percent Exceeding 0.2 µg/m^3 Based on 95 Percent Confidence Limits



This DOE-wide rollup of 8-hour time weighted average personal exposure monitoring results indicates that the CBD prevention programs operated at DOE sites have achieved a high level of compliance with the 10 CFR 850 action level of 0.2 µg/m3 since 2004.

Percent of Exposure Monitoring Results Exceeding Action Level by Site, Calendar Year 2013 (Ranked by % Exceeding)*

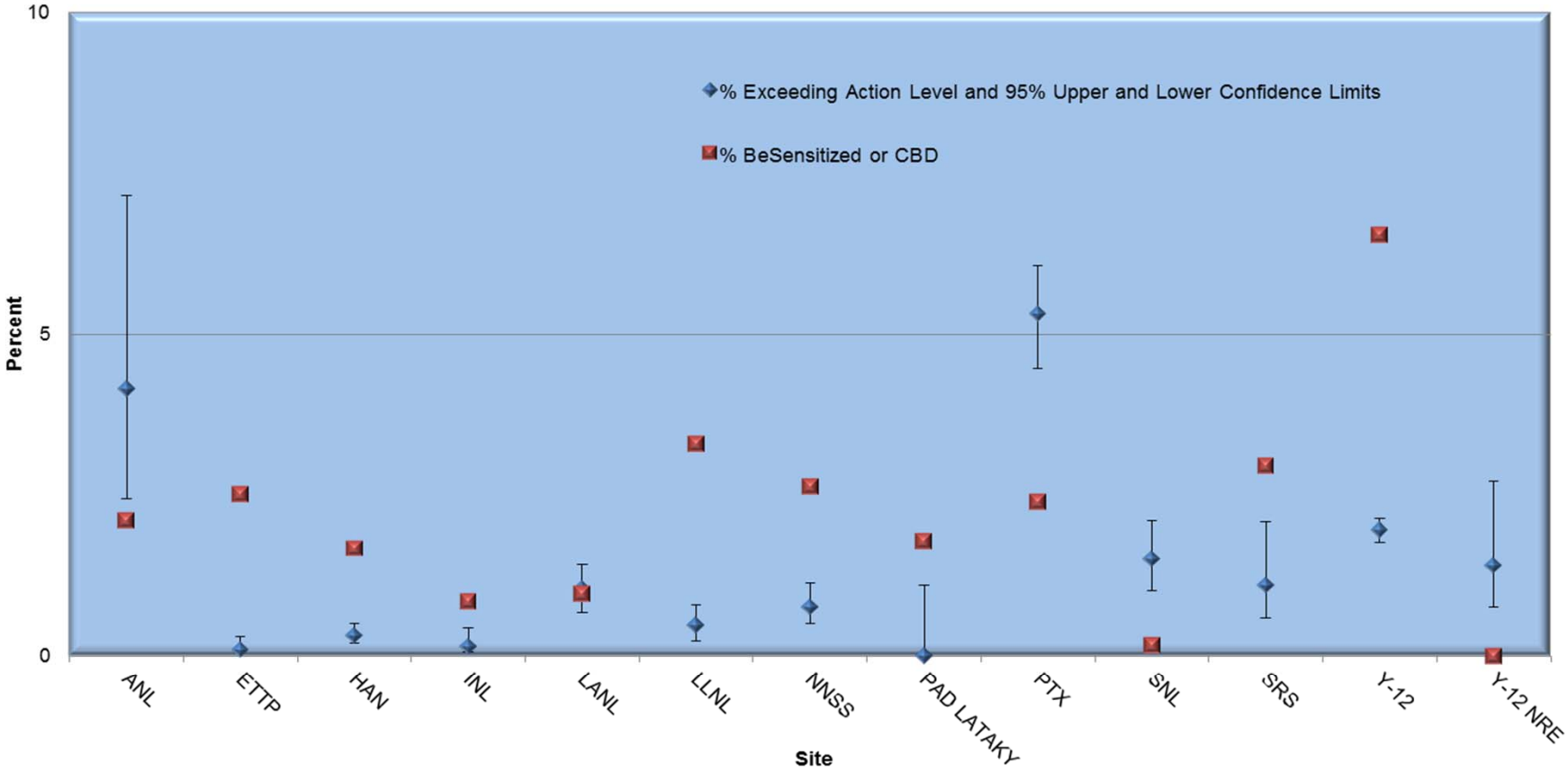


***Percent Exceeding 0.2 µg/m^3 Based on 95 Percent Confidence Limits**

PTX reported the majority of results above the action level in 2013. Detailed data are presented on the following page. The upper confidence limit is above 5 percent at sites that reported fewer than 60 sampling results in 2013.

Results from AMWTP, ETTP, LBNL, PNNL, SNL, and SRS were not included in this figure because of the small number of total samples.

Cumulative Rates of Beryllium Sensitization or CBD versus Exposure Levels Through 2013



*Some sites have provided data that predate the 2002 start date of the Registry.

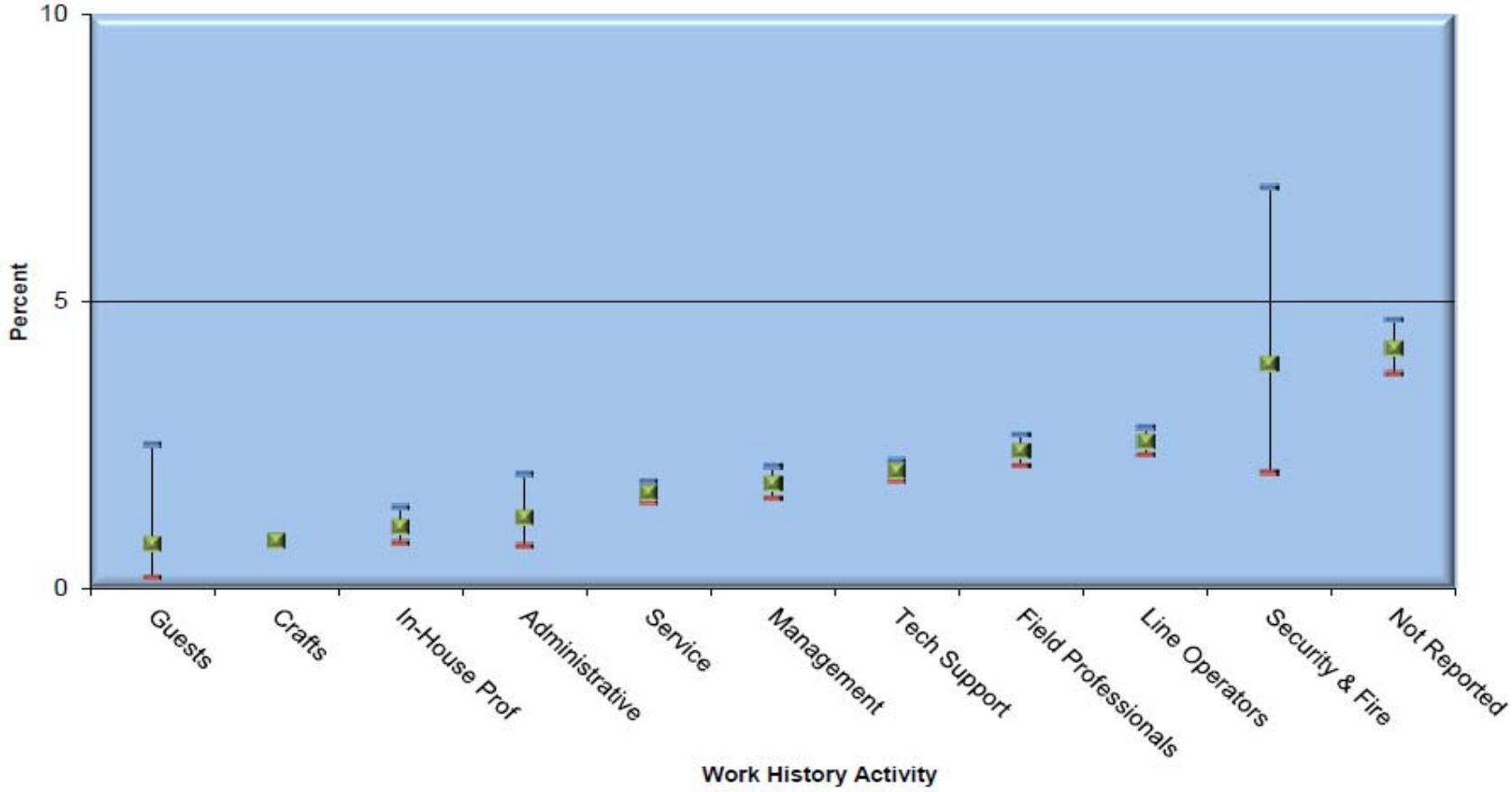
Medical monitoring results for beryllium sensitization or CBD and beryllium exposure monitoring results are very weakly correlated (Pearson product moment correlation coefficient = 0.13). A likely explanation for this is that the sensitization or CBD being detected are due to past working conditions rather than those currently being monitored. However, it is also possible that monitoring programs are missing significant sources of exposure that are ongoing. Sites with low exposure monitoring results and high sensitization or CBD rates can investigate cases to determine if the possibility of ongoing exposure can be ruled out.

Summary Statistics for 8-Hour Time Weighted Average Exposure Monitoring Results by Work History Activity Through 2013

Work History Activity	Admin	Crafts	Field Prof	Guests	In-House Prof	Line Operators	Management	Security & Fire	Service	Tech Support	Not Reported	All Combined
Number of reported monitoring results	608	34,902	5,897	96	2,004	8,157	3,937	154	10,112	12,568	3,215	81,650
Number of detected values	60	1,689	840	28	128	891	693	11	802	1,811	1,218	8,171
Percent non-detects	90.1	95.2	85.8	70.8	93.6	89.1	82.4	92.9	92.1	85.6	62.1	90
Number of individuals monitored	63	1,746	507	7	238	885	230	54	513	959	215	5,417
Observed 95th percentile of data (ug/m^3)	0.025	0.008	0.064	0.028	0.018	0.093	0.058	0.546	0.025	0.060	0.151	0.036
95% upper tolerance limit of the 95th percentile (ug/m^3)	0.030	0.009	0.067	0.061	0.015	0.055	0.067	0.062	0.025	0.061	0.170	0.036
Largest value (ug/m^3)	2.600	51.895	26.678	0.313	7.500	575.930	11.762	11.700	84.933	29.852	7.670	575.930
Percent exceeding 0.2 ug/m^3 (F)	1.2	0.8	2.4	0.8	1.1	2.6	1.8	3.9	1.7	2.1	4.2	1.7
Lower confidence limit for F	0.8	0.8	2.1	0.2	0.8	2.3	1.6	2.0	1.5	1.9	3.8	1.6
Upper confidence limit for F	2.0	0.9	2.7	2.5	1.4	2.8	2.1	7.0	1.9	2.2	4.7	1.7

Exposure by Work History Activity Through 2013*

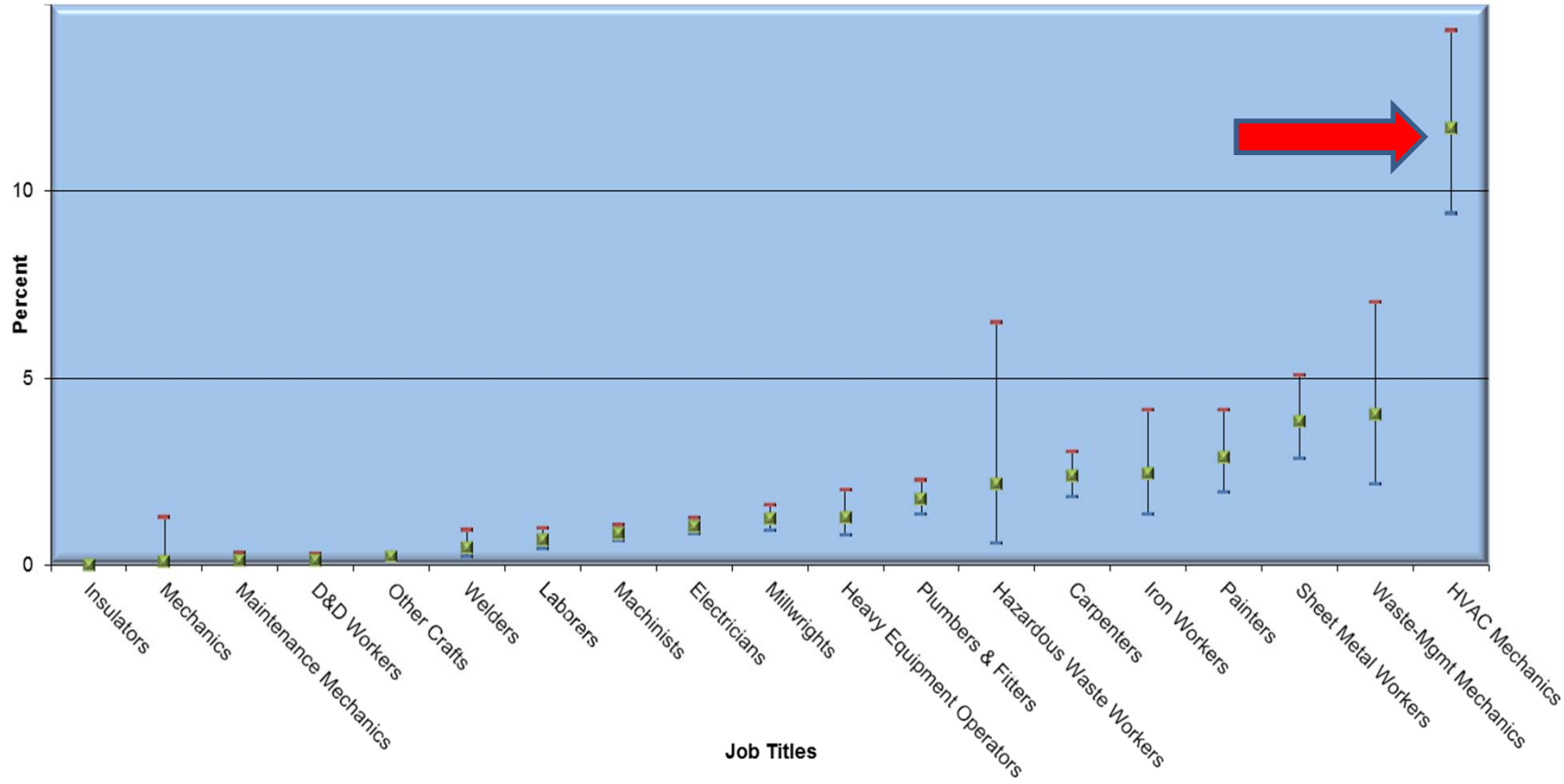
Percent Exceeding 0.2 µg/m3 Based on 95 Percent Confidence Limits



***Some sites have provided data that predate the 2002 start date of the Registry.**
Shown above are exposure data grouped by work activity. The data are through calendar year 2013. The work activities are a high level rollup of job functions Direct comparison with prior years' reports may be problematic due to late reporting and/or corrections.

Exposure by Job Title for Craft Workers Through 2013*
Ranked by Percent Exceeding 0.2 µg/m^3 Action Level

(Percent Exceeding Based on 95 Percent Confidence Limits)



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The figure above provides an indication of differences in exposure level for individuals with job titles that were grouped together in the Craft work activity category. Detailed data are presented on the following page. Electricians, Millwrights, Heavy Equipment Operators, Plumbers & Fitters, Hazardous Waste Workers, Carpenters, Iron Workers, Painters, Sheet Metal Workers, Waste-Management Mechanics, and HVAC Mechanics have exceedance rates significantly higher than all Crafts combined (0.8 µg/m^3, as shown in the table on page 25). Direct comparison with prior years' reports may be problematic due to late reporting and/or corrections.

I. To Summarize the Summary

- **Significant data concerns:**
  - Incomplete exposure monitoring data
  - Incomplete tracking of workers
  - No work history
  - Variations in reporting thresholds affect data comparability
  - Late, incomplete, or no reporting
  - Limited ability to draw conclusions
- **Data coordinator turnover adds variability**

II. To Summarize the Summary

- Despite limitations, data at hand suggest that compliance in general is good
- Significant progress has been made in reducing exposures exceeding the action limit
- We're still dealing with a legacy issue—both in the data and in measuring long term effects of historical exposures