Summary of the Proposed National Emissions Standard for Gold Mine Ore Processing and Production

Webinar
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Outline

- Background
- Summary of the proposed regulation for mercury emissions
- Discussion of Non-mercury HAPs
- Schedule/next steps
- Questions?

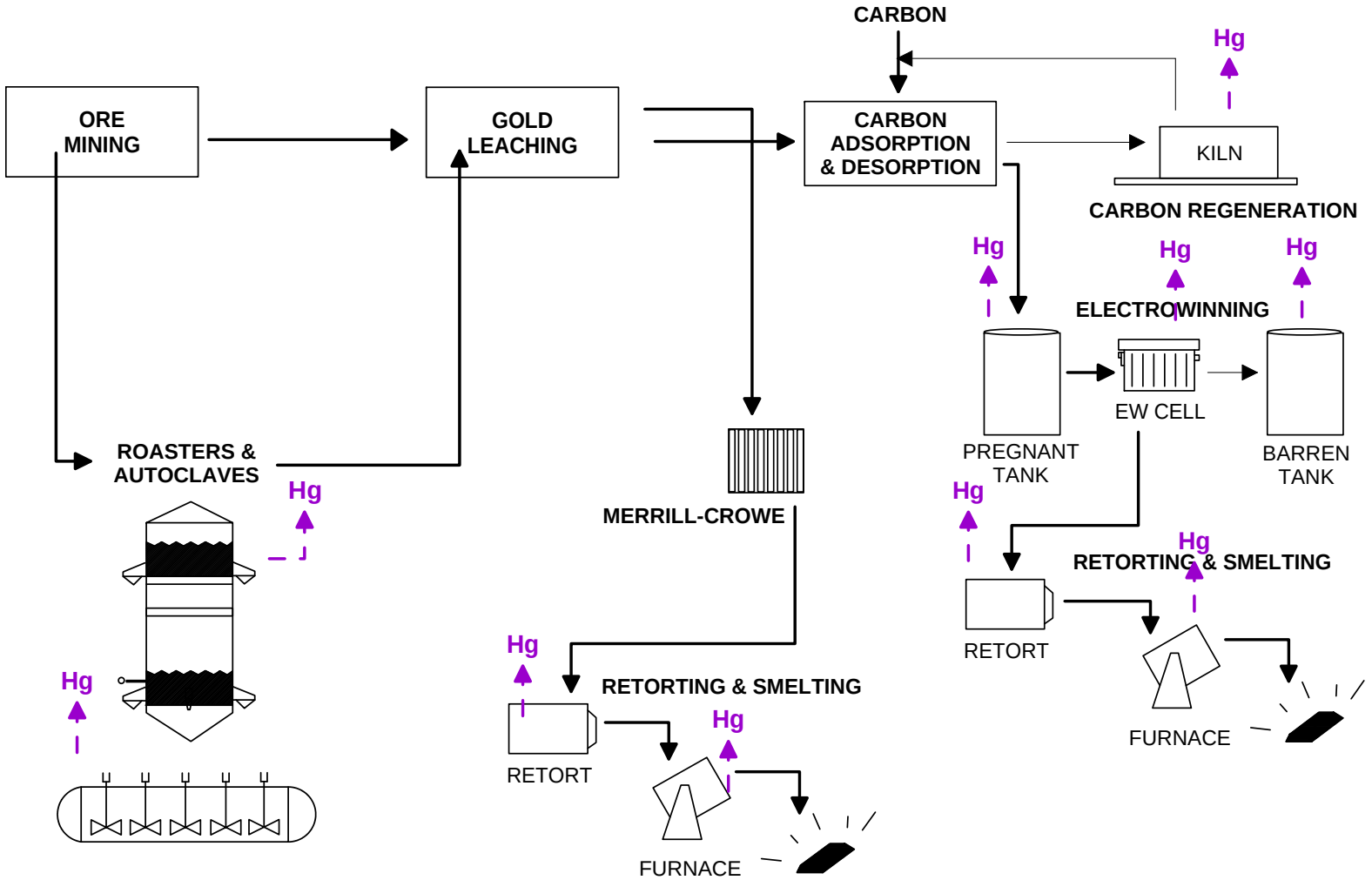
Background

- 23 facilities in U.S. (15 in Nevada and 8 in other Western States)
- Gold Mines were identified in the 1999 National Emissions Inventory as a source of mercury emissions (estimated 11.5 tons per year)
  - Most emissions were from facilities located in Nevada
  - Initial Nevada Voluntary Program (2001-04) achieved some reductions
    - Targeted 5 large facilities
  - In 2006 Nevada DEP established a mandatory Mercury Control Program to achieve further reductions:
    - covers all gold and silver production operations in Nevada
    - requires best available control technology at facilities in Nevada
- In 2007, Gold Mines emitted an estimated 2.5 tons of mercury nationwide
- In 2008, EPA determined that mercury emissions from Gold Mines should be regulated under the National MACT program
  - Pursuant to Section 112(c)(6) of the Clean Air Act

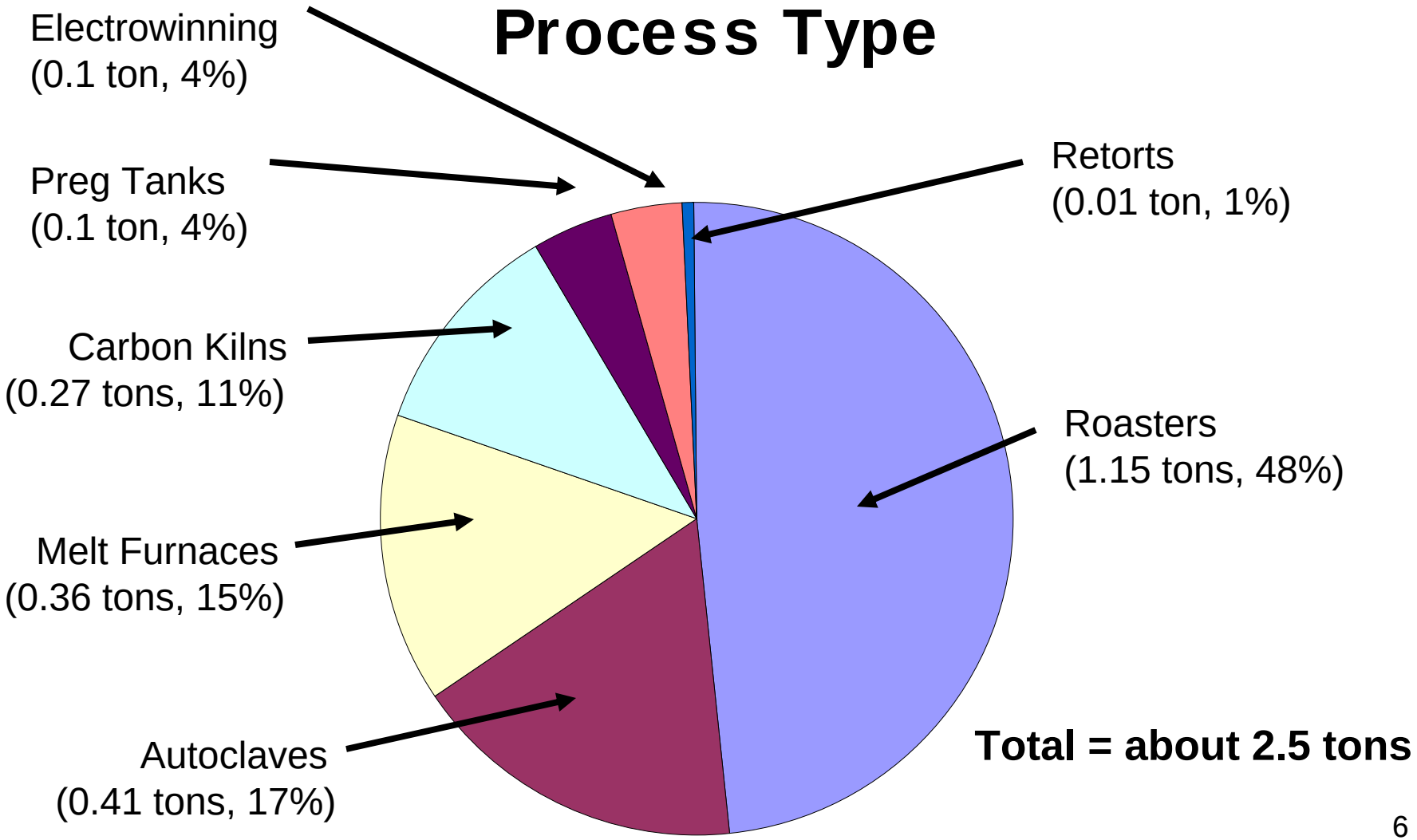
Summary of Gold Mine Production Processes in U.S.A.

- All facilities:
  - mine, crush ores.....
  - conduct various other processes, depending on ore type, etc.
- 5 facilities use high temperature ore pre-treatment (roasters or autoclaves) before cyanide leaching.
- About 18 facilities process ores without pre-treatment (no roaster or autoclave), but have other thermal processes:
  - About 14 facilities add carbon to leaching, therefore have carbon kilns and 2-4 other processes (e.g., electrowinning, retorts, furnaces).
  - About 4 facilities use no carbon (therefore no kiln), but have other processes (e.g., furnaces, retorts).

Overview of Gold Mine Production Processes



Gold Mine Ore Processing - Mercury Emissions in 2007 by Process Type



Summary of Mercury Controls for Gold Production Facilities

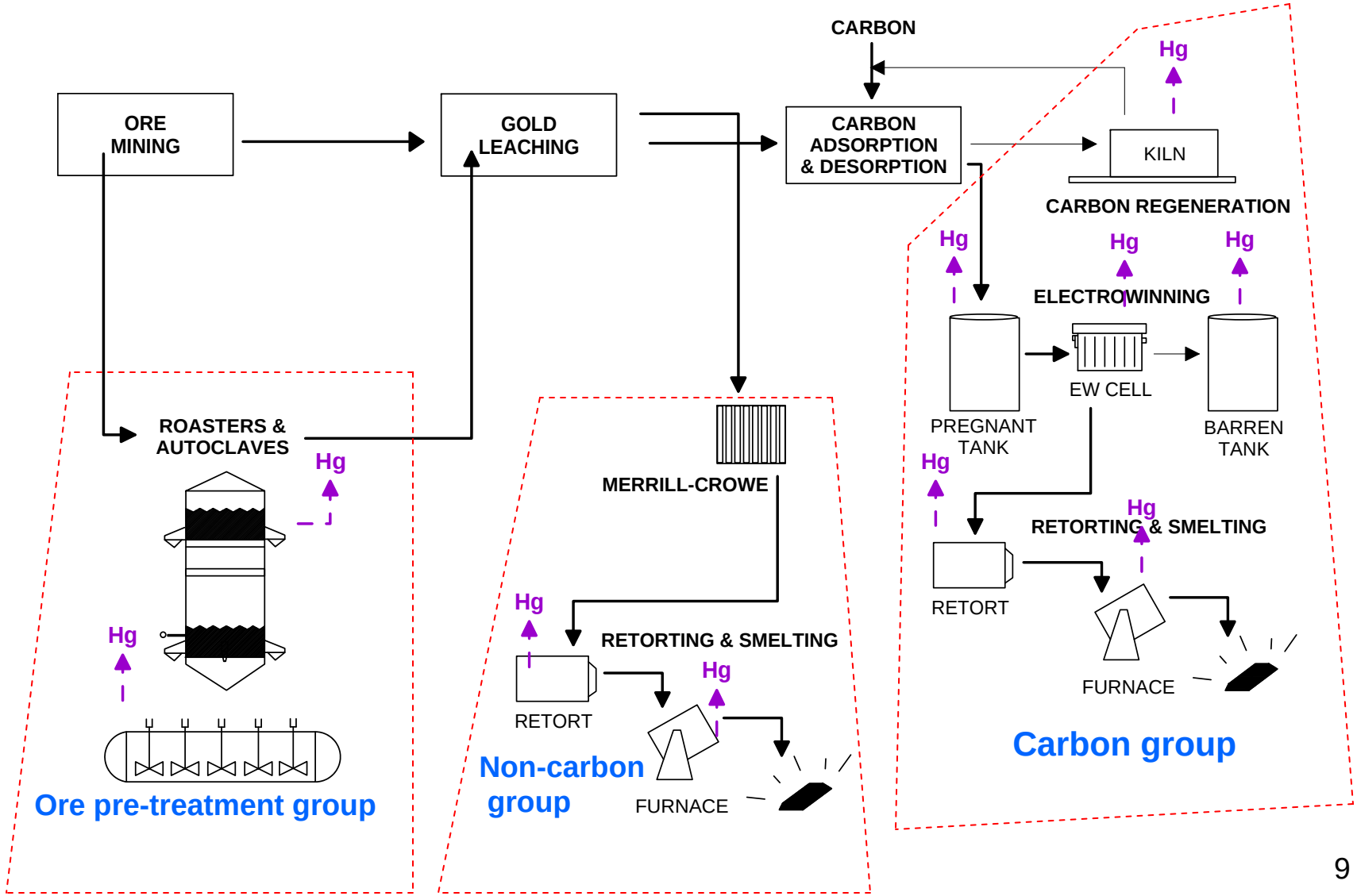
- A number of facilities already have effective mercury controls on many units.
- Facilities apply various control technologies and pollution prevention measures to limit mercury emissions, including:
  - gas condensers
  - carbon adsorption units
  - wet scrubbers
  - fabric filters
  - mercurous chloride scrubbers (calomel scrubbers)
  - wet venturi scrubbers
  - chemical additives to improve mercury capture.

Summary of the Proposed National Emissions Standard

- Coordinated with Nevada DEP and other stakeholders in development of the proposal
  - We believe the proposed requirements are compatible with the Nevada Mercury Control Program
- Emissions limits are proposed for mercury, based on Maximum Achievable Control Technology (MACT), for the 3 types of affected processes:

	Ore-pretreatment Processes	**Carbon Processes**	**Non-carbon Processes**
Existing sources	149 lb/million tons of ore	2.6 lb/ton of concentrate	0.25 lb/ton of concentrate
New Sources	149 lb/million tons of ore	0.14 lb/ton of concentrate or 97% reduction	0.20 lb/ton of concentrate

Gold Ore Processing – 3 Process Groups - Proposed Approach for MACT limits



Proposed Compliance Testing and Monitoring Requirements

- For all thermal units, annual stack tests for mercury (using method 29, 30A, 30B, or the Ontario Hydro method).
- For carbon beds, facilities need to monitor temperatures and do one of the following to prevent breakthrough:
  - weekly test with method 30B, and as mercury concentrations approach an “operating limit” established during the performance test, facility must change carbon;
  - periodic sampling of carbon bed at specified depths, and when carbon reaches 90% capacity, carbon must be changed; or
  - replace carbon at specified frequency based on knowledge of bed life demonstrated by one of the above methods.
- Wet Scrubbers:
  - Monitor water flow rate and pressure drop.

Proposed Monitoring Requirements for Roasters

- Continuous emissions monitoring for mercury using either:
  - Hg CEMS (daily average), or
  - Method 30B (sorbent trap) with weekly sampling and analysis
- Concentrations would be compared to an "operating limit" established during the performance test to assure that controls are working, but not used to demonstrate compliance to the MACT emission limit.
- Any deviation must be reported to permitting authority and corrective action taken.
- We also propose that for roasters that are not monitored with a Hg CEMS that facilities must monitor various parameters of the calomel scrubbers including: scrubber liquid flow; pressure drop; inlet temperature; and chloride ion concentration or oxidation reduction potential and pH

Estimated Mercury Emissions Reductions

Affected Processes	Uncontrolled emissions (lb/yr)	2007 emissions (lb/yr)	Reductions due to Federal MACT and Nevada Hg Program (lb/yr)	% Reduction from 2007 emissions	% Reduction from uncontrolled emissions
Ore Pre-treatment processes	18,976	3,383	2,150	64%	94%
Carbon processes	14,465	1,537	1,397	91%	99%
Non-carbon processes	768	139	125	90%	98%
Total	**34,209**	**5,059**	**3,672**	**73%**	**96%**

Estimates of Costs and Cost Effectiveness

Case	Capital cost	Total annualized cost	MACT emission reduction (lb/yr)	Average cost effectiveness
Hg controls only	$4.8 million	$2.3 million/year	1,650	$1,400/lb Hg
With monitoring	$6.0 million	$3.4 million/year	1,650	$2,100/lb Hg

Non-Mercury HAP

- In 2009, we requested that industry conduct emissions tests for non-mercury HAPs, including cyanide and non-mercury metals
  - Cyanide is mainly emitted from large non-point sources (e.g., leach pads, tailings ponds), and non-mercury metals are mainly emitted from stacks
- Testing was completed, and all data submitted to EPA in early 2010
- Results indicate there are no major sources
  - The largest facility emits an estimated 5 to 9 tons of cyanide per year
  - All other HAPs are individually significantly lower than the 10 tons per year (tpy) threshold for a single HAP and the 25 tpy threshold for a combination of HAP.
- The proposed rule text has no requirements for non-mercury HAPs.
  - However, the preamble discusses cyanide and requests comments on possible management practices or other approaches to limit cyanide emissions.

Seeking comments on several specific topics, including:

- Title V:
  - About 6 of the 15 facilities currently have Title V permits
  - We are soliciting comment on whether an exemption is appropriate for any particular sources in this category.
- Hg CEMs:
  - Technology not yet demonstrated on these facilities.
  - We request comments on the viability of using mercury CEMs, specifically for monitoring mercury emissions from roasters.
- Carbon vs concentrate metric for “Carbon Group”
  - The proposed emissions limits for this group are in units of pounds of mercury per ton of concentrate.
  - We seek comment on whether “loaded carbon” might be another option worth further consideration as the denominator (e.g., pounds of mercury per ton of loaded carbon)
- Cyanide Emissions - Management Practices?

Schedule

- April 15, 2010 – Proposed rule was signed by EPA Administrator
- April 28, 2010 – Proposed rule published in Federal Register
- May 20, 2010 – Published Notice of extension of comment period to 6/28/2010
- June 28, 2010 – Public Comment period ends
- December 16, 2010 – Final rule deadline (court-ordered)