

Atmospheric Mercury; Automated System for Monitoring Gaseous and Particulate Mercury

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What we measure

**Gaseous Elemental Mercury (GEM) ng/m³
*5 minute interval***

**Gaseous Oxidized Mercury ((GOM) RGM) pg/m³
*60 or 120 minute interval***

**Particulate Bound Mercury (PBM) pg/m³
*60 or 120 minute interval***

Why we measure atmospheric Mercury

Dry deposition can make up a significant percent of the total Mercury input to the ecosystem

Dry + Wet = Total Hg Deposition

Mercury speciation and scale of impact



Global - Regional - Local

**GEM has long residence times in the atmosphere
low water solubility**

**GOM and PBM have short residence times
high water solubility**

GOM and PBM have larger input to Mercury in rainfall

**If we can reduce GOM and PBM, we should see
reductions in wet deposition concentrations**

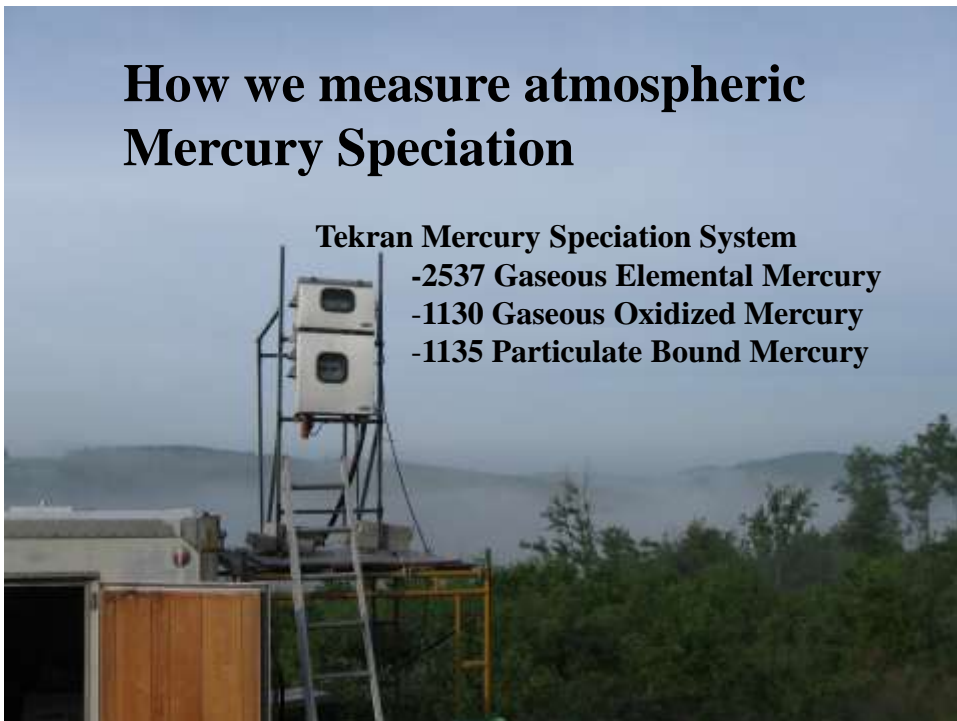
How we measure atmospheric Mercury Speciation

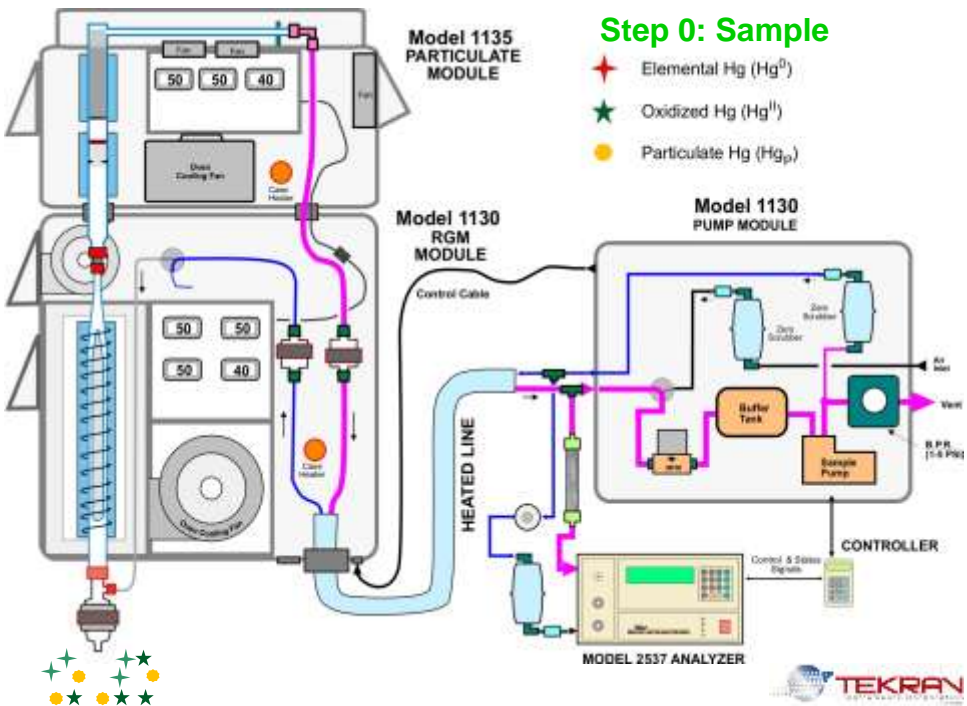
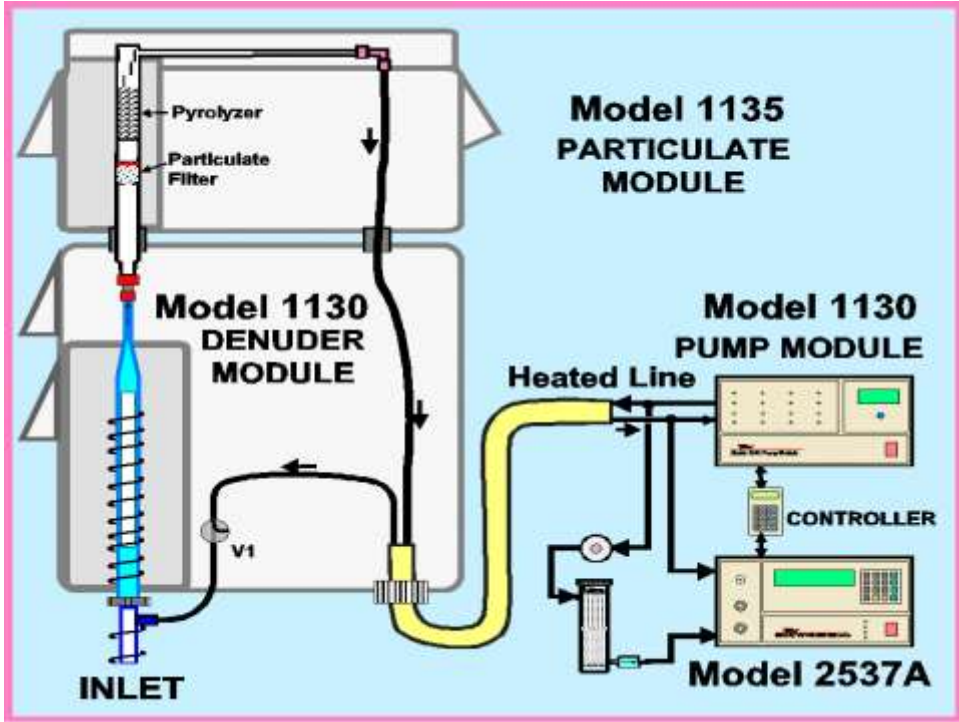
Tekran Mercury Speciation System

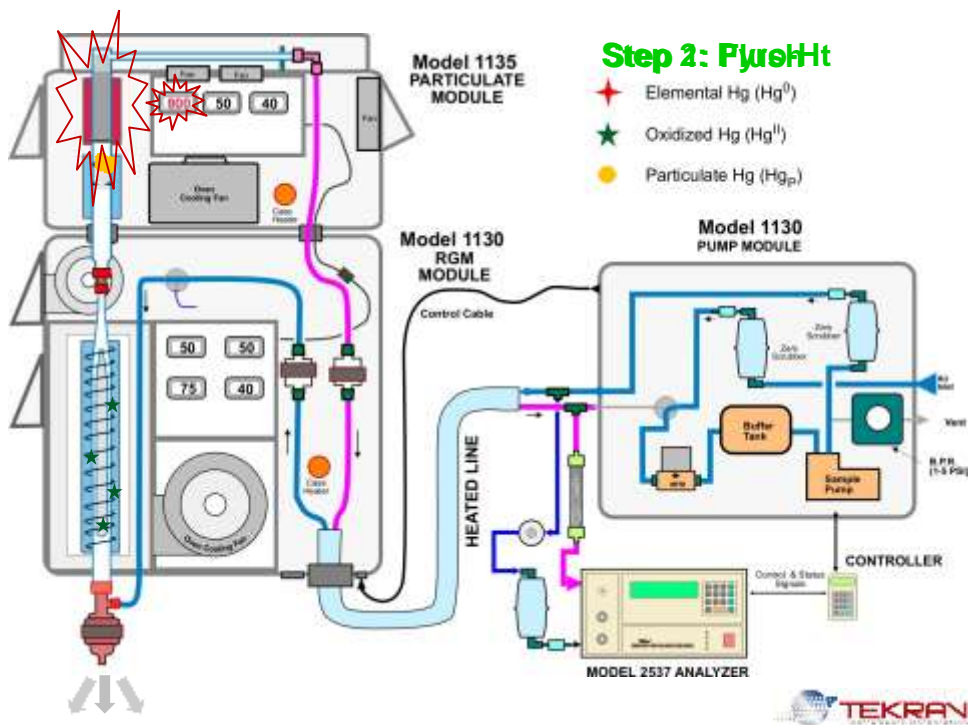
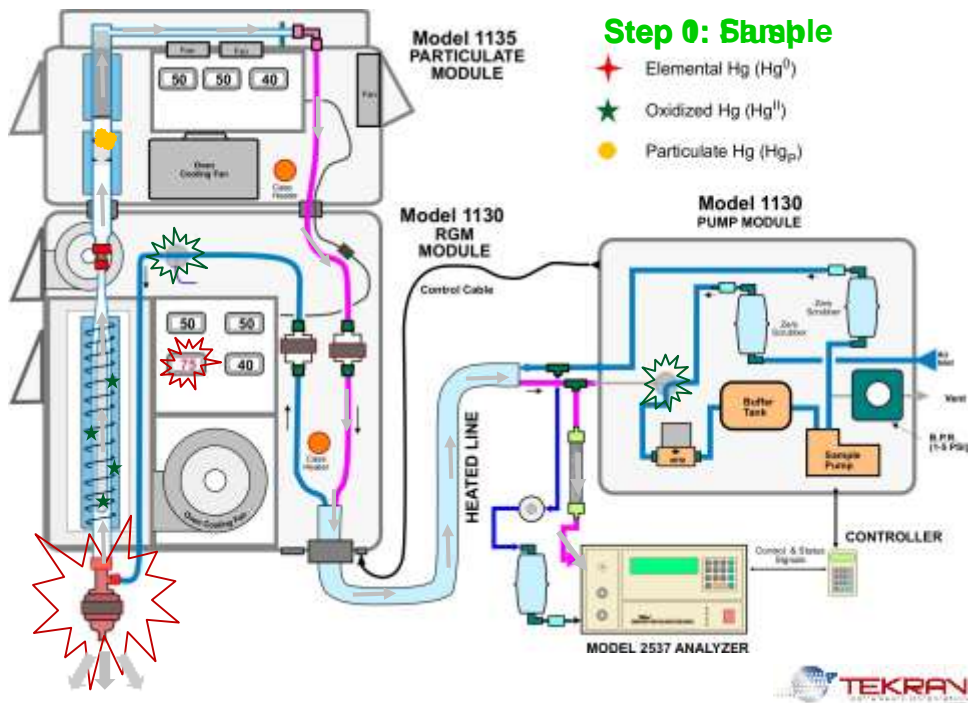
-2537 Gaseous Elemental Mercury

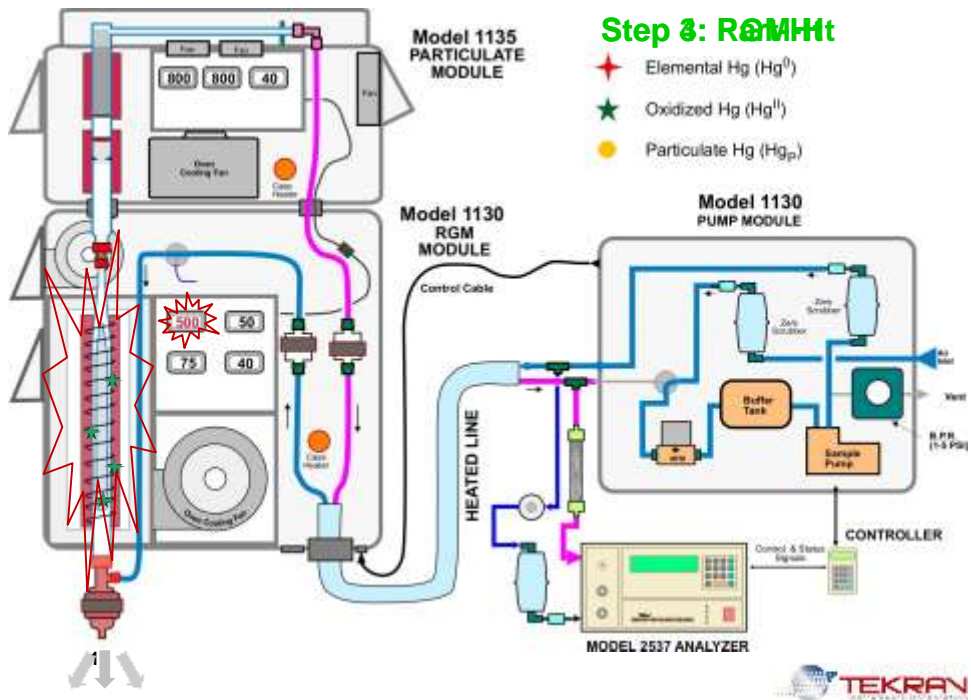
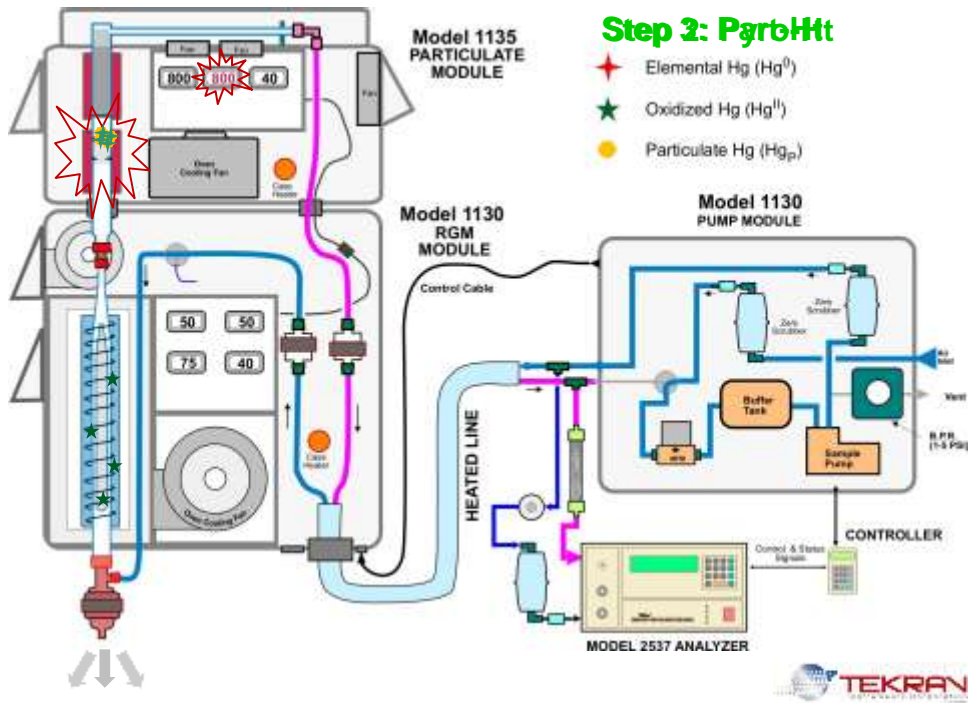
-1130 Gaseous Oxidized Mercury

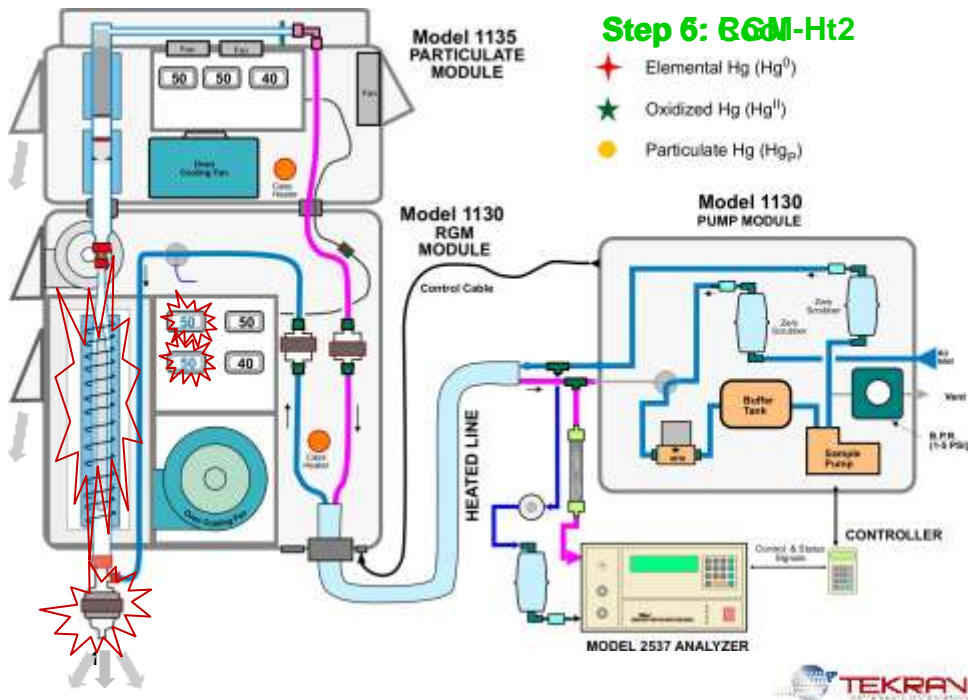
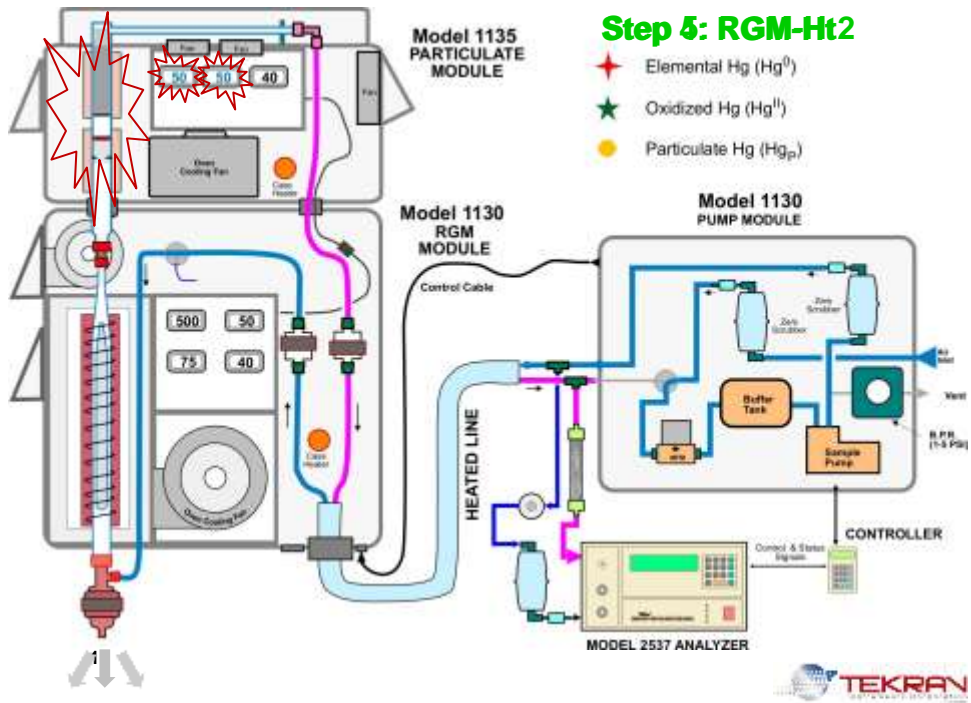
-1135 Particulate Bound Mercury

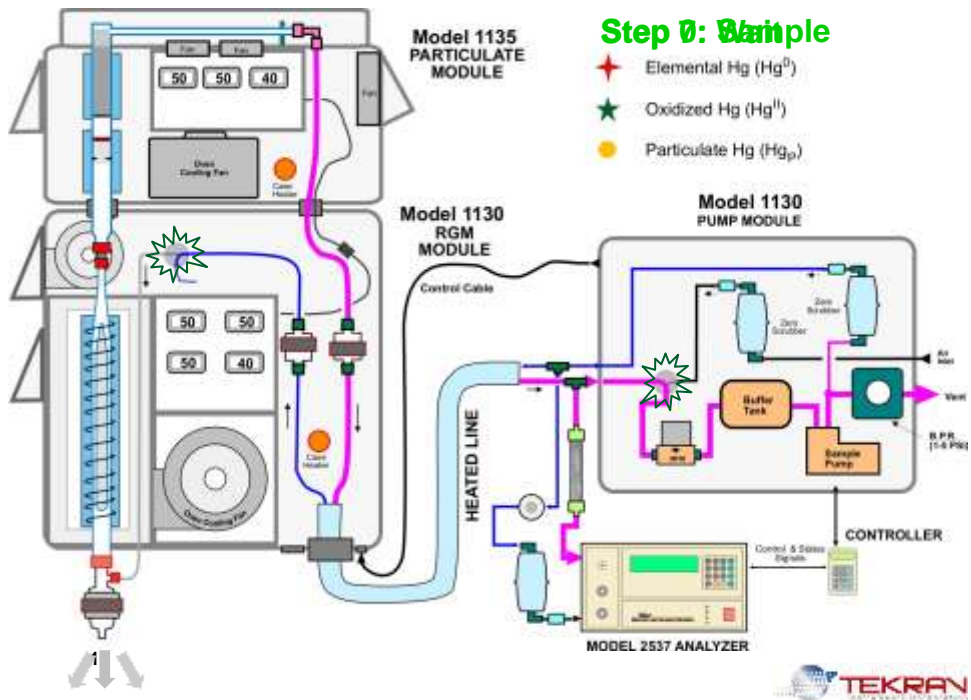
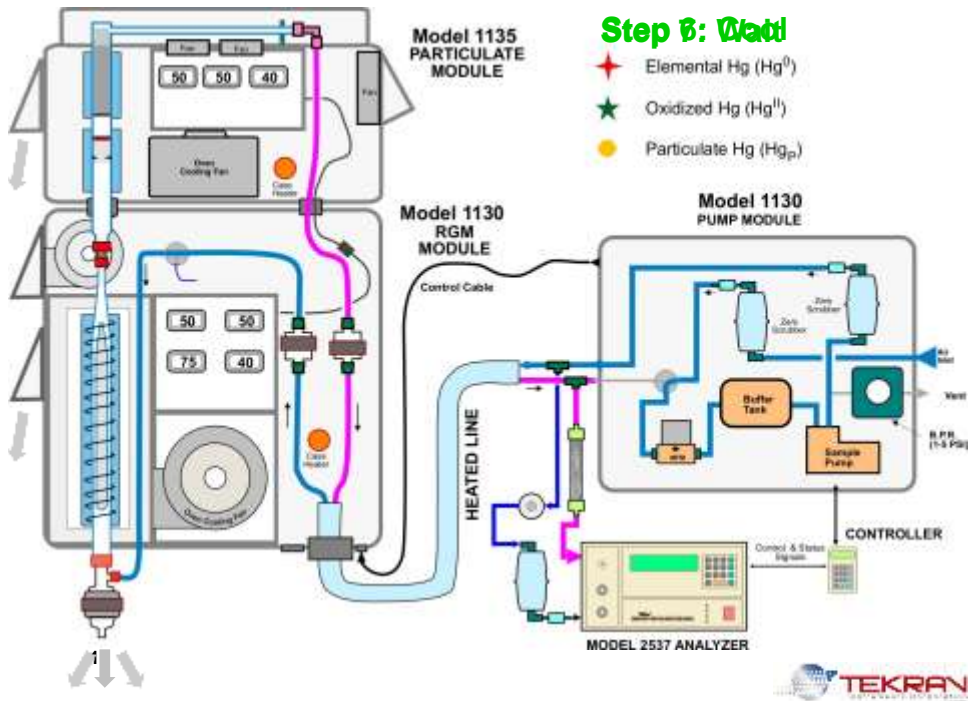


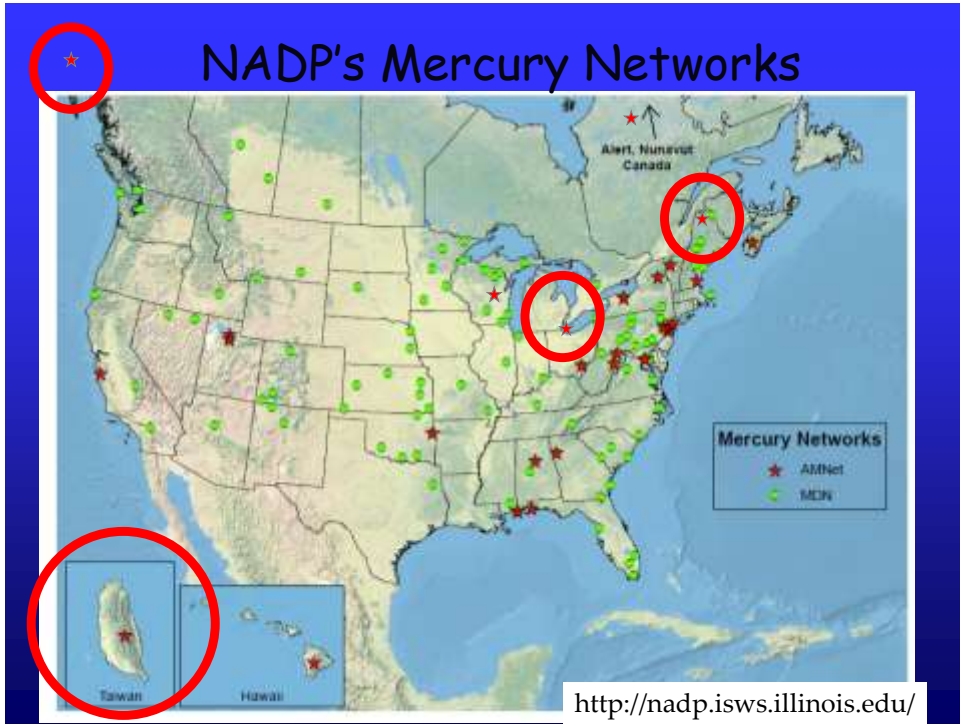












What AMNet Provides

- SOP's to keep measurements consistent
- Troubleshooting
 - Phone and email support
- Network Equipment Depot
 - Wide variety of parts available
- Data evaluation and quality assurance
 - Automated flag program
 - Site Liaison evaluates all data
- Site audits to evaluate performance

AMNet Quality Assurance Overview

- **Field Operations SOP**
 - operation, reporting, etc.
 - weekly/monthly/quarterly maintenance
- **Data Management SOP**
- **Site Survey SOP**
 - siting criteria
- **Quality Assurance Plan**
- **Site pictures, information**

Available on the NADP Webpage



Automated Quality Assurance

- Upon import of raw data, flags are assigned to each observation
- AMNet currently utilizes 51 Quality Assurance flags, most are automated
 - 23 are warning flags which leave the data valid
 - 26 are control flags which invalidate the data
- Then manual review, with final flag assignment
- Same QA system used by GMOS, developed by AMNet

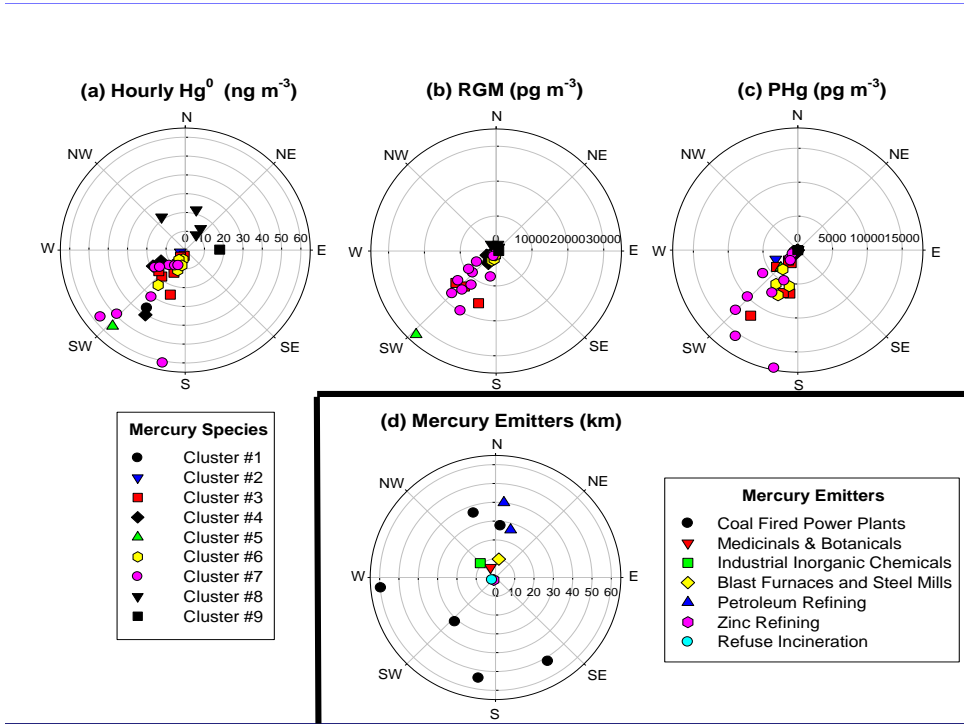
Check

Warning

Control

Data Availability

- **98 site years of data available**
 - Only validated data available
 - GEM averaged to hourly, 2-hourly GOM & PBM_{2.5}
- **Through December 2013,**
 - 291,000 valid observations
 - of GEM, of GOM, and of PBM_{2.5}
 - 2009 - current, ongoing
- **Available: <http://nadp.isws.illinois.edu>**



Tekran Mercury Analyzers

Who has heard of Tekran?
 Who owns a Tekran?
 Does anyone operate a Tekran?

Future Goals APMMN

Open discussion

Acknowledgements

A special thanks to VEA for organizing
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EPAT for additional support



