



**VIETNAM ENVIRONMENTAL ADMINISTRATION (VEA)  
CENTRE FOR ENVIRONMENTAL MONITORING (CEM)**

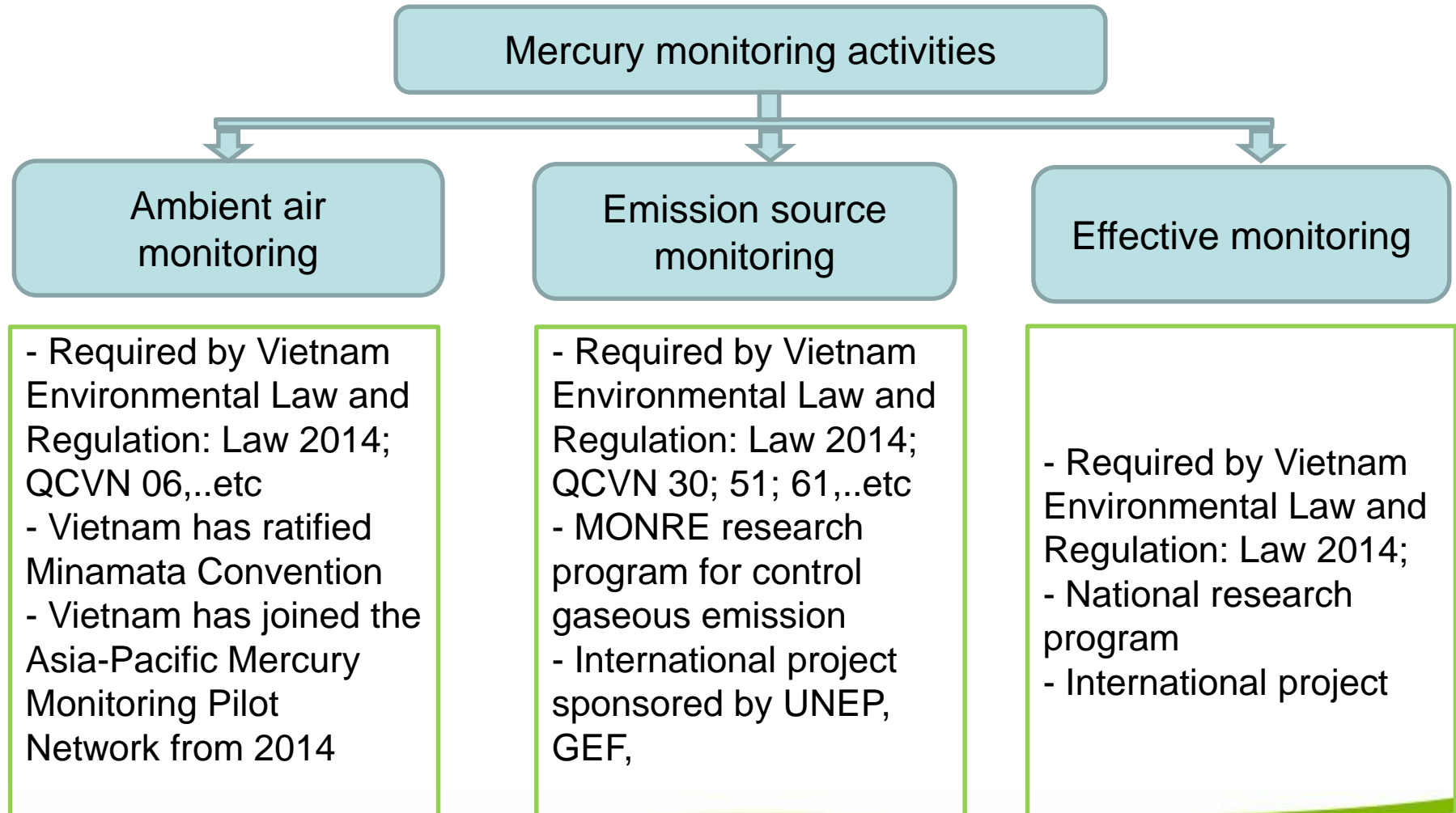
**Website: <http://www.quantracmoitruong.gov.vn/>**

# **UPDATES ON RECENT MERCURY MONITORING ACTIVITIES IN VIETNAM**

**NGUYEN VAN THUONG**  
**Centre for Environmental Monitoring,**  
**Vietnam Environmental Administration**

June 2016

# Current mercury monitoring activities in Vietnam



# Updates on current mercury ambient air monitoring

- Atmospheric mercury monitoring activities supported by Vietnam CEM/VEA:
- Wet deposition sampling site at Nr. 556 Nguyen Van Cu, Hanoi, Vietnam from 2014 under APMM pilot Network is **ongoing** monthly sampling and send to NCU for Hg analysis
- Continuous atmospheric Hg monitoring site at Ho Chi Minh Mausoleum is pending for technical **troubleshooting**



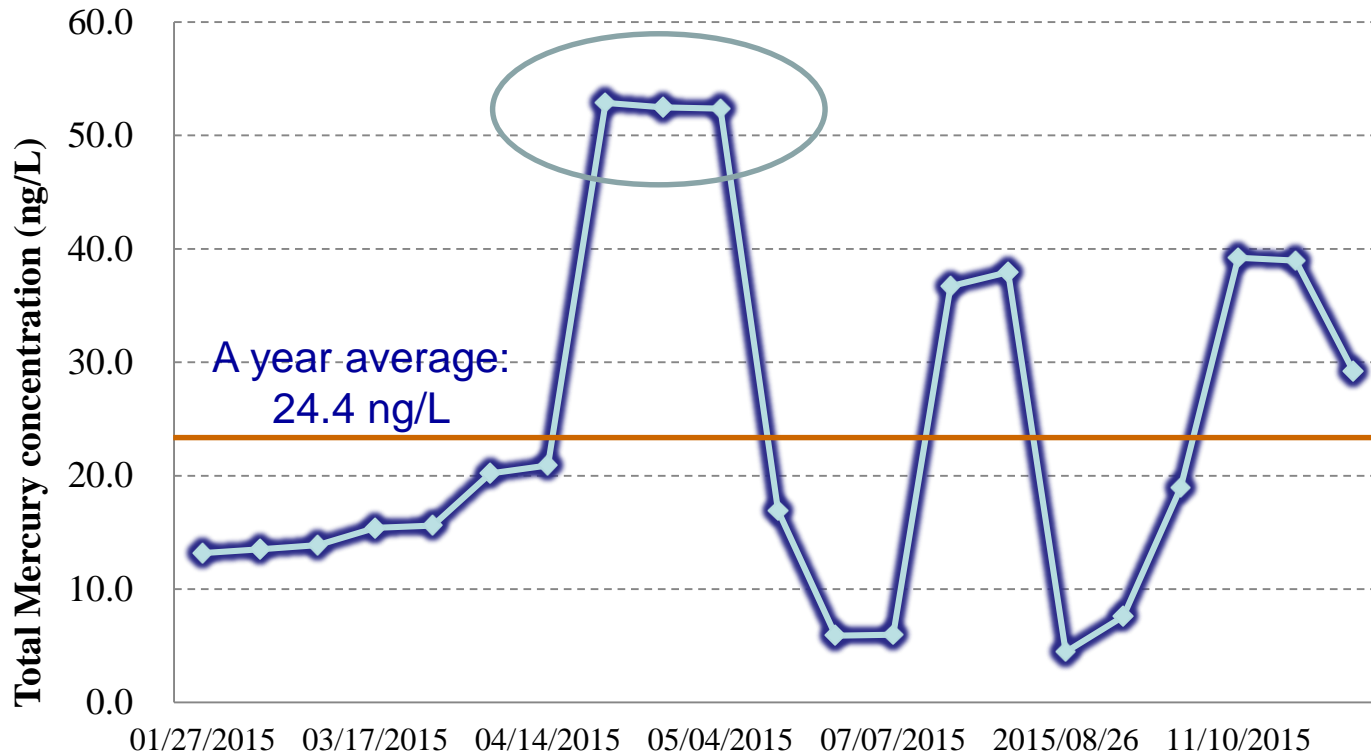
## Asia – Pacific Mercury Monitoring Network

### Mercury Wet Deposition Network Field Standard Operating Procedures

Version 1.0, January 2014

# Updates on current mercury ambient air monitoring

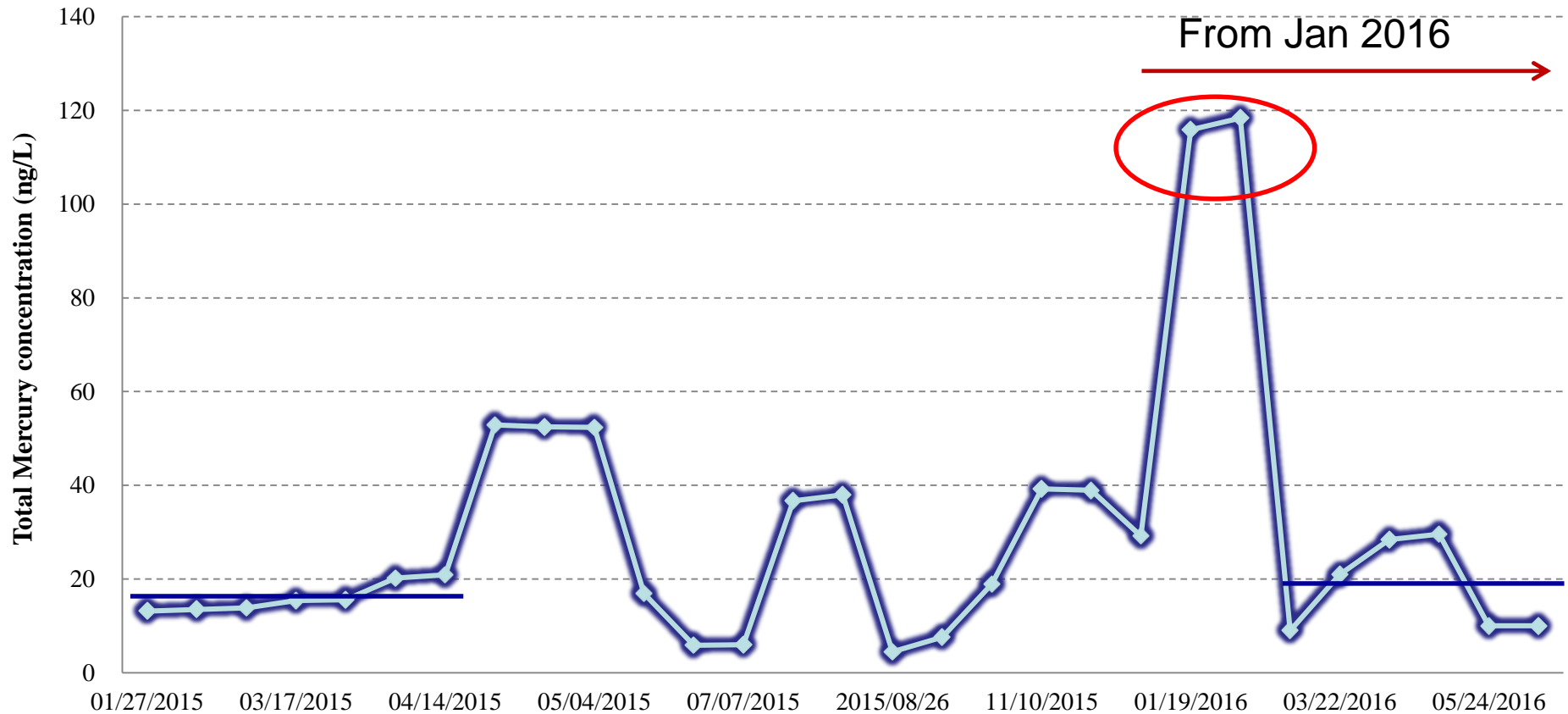
- Mercury wet deposition results from Hanoi sampling site:



- The total Hg wet deposition concentration range from 4.47 to 52.9 ng/L, mean value is 24.4 ng/L. Temporal variation of total Hg concentration measured in Hanoi air is consider higher from May to October

# Updates on current mercury ambient air monitoring

- Mercury wet deposition results from Hanoi sampling site (cont)



- The total Hg wet deposition concentration range from 9.02 to 118 ng/L. From March to May get the same value compare to 2015, while the concentration in the January 2016 was much higher than observed in 2015

# Updates on current mercury monitoring from emission sources

- Monitoring and emission control activities:
  - CEM carry out monitoring Hg emission from waste incineration follow Vietnam Regulation (QCVN 02; QCVN 30; QCVN 61). US EPA 29 has been used as a standard method for heavy metal sampling and analysis.
  - Mercury particle bound phase range from N.D to 0.3 ng/Nm<sup>3</sup> in which close to Vietnam Regulation.

Incineration type	Number of sample	Concentration (mg/Nm <sup>3</sup> )	Duration
Municipal waste	05	Nd-0.2	From Jan 2016
Hospital waste	02	0.2-0.3	From Jan 2016
Industrial waste	03	0.1-0.3	From Jan 2016

# Updates on current mercury monitoring from emission sources

- Monitoring and emission control activities:

- CEM is collaborating with Pollution Control Dept (PCD) in order to monitoring of Hg emission from 03 thermal coal power (TCP) plants. This activities will be completed in August 2016.

- Total 84 samples will be collected for total Hg analysis which include flue gas, fly ash and coal powder samples. Flue gas samples will be collected by both of US EPA 29 and US EPA 30B.



Hai Phong TCP plant



Mong Duong 2 TCP  
plant



Ninh Binh TCP plant

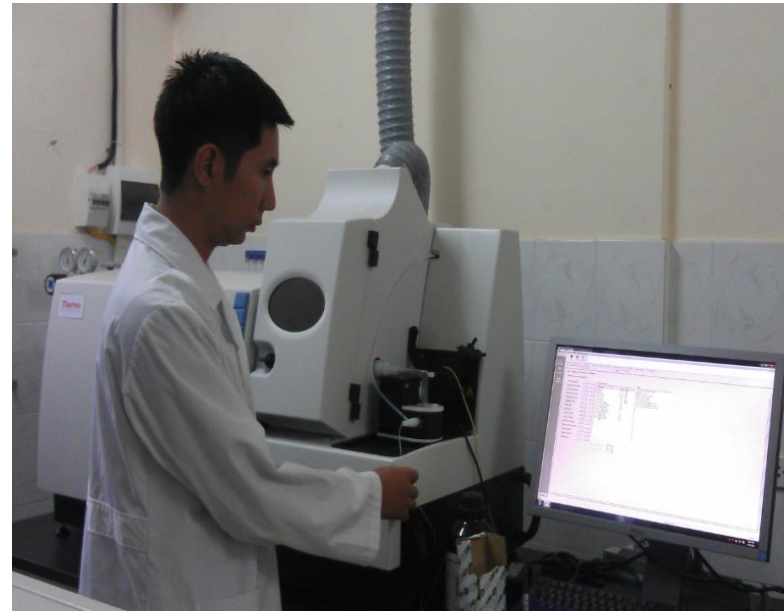
# Updates on capacity building of mercury monitoring for CEM - VEA

Updates on equipment capacity for mercury monitoring

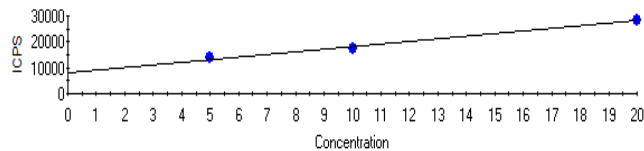
Equipment	Method	Quantity
Wet deposition sampler	APMMN SOP	02 sampler (international sponsor)
Isokinetic sampler	US EPA 29	03 sampler
Mercury on-site sampling and analysis (Apex Ainstruments )	US EPA 30A	01 MODULE (international sponsor)
AAS	USEPA 29	01 analyzer
ICP-MS	US EPA 200.8	01 available 01 ongoing
Mercury analyzer	US EPA 1631	01 ongoing



# Updates on capacity building of mercury monitoring for CEM - VEA



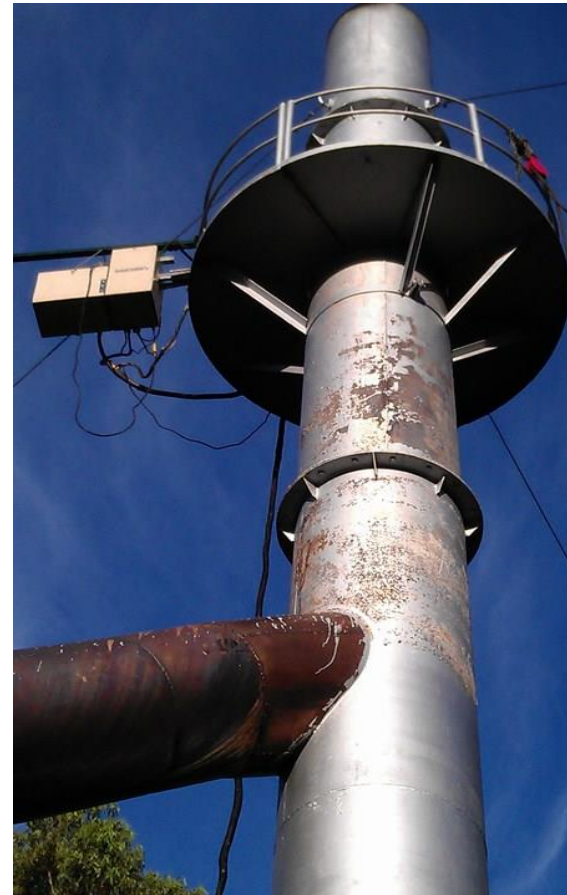
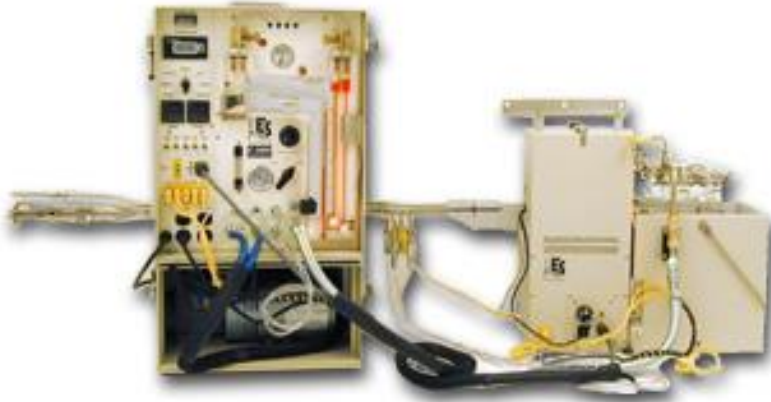
202Hg FQ Block 1



Intercept CPS=8209.248267 Intercept Conc=8.287984  
Sensitivity=990.499996 Correlation Coeff=0.993646

Laboratory analysis of Mercury in water and flue gas matrix samples (CEM 2015-2016)

# Mercury monitoring follow US EPA 29



# Mercury monitoring follow US EPA 30B



Trap ID  
  
 OL184342

**OHIO LUMEX**  
 Sorbent Trap Chain of Custody

Plant/Source: \_\_\_\_\_ Test 1: \_\_\_\_\_  
 Boiler ID: \_\_\_\_\_

Unspiked  Spiked

Spike Time: \_\_\_\_\_ Spike Time: 14:00

Sampled By: \_\_\_\_\_ Type: \_\_\_\_\_

Date	Time	Dust Temp (For °C)	SO <sub>2</sub> (ppm)	NO <sub>x</sub> (ppm)	Dry Gas Meter (Liters Initial)	Dry Gas Meter (Liters Final)	Total Volume (Liters)



# Future plan

- Capacity building of sampling and analytical mercury equipment for CEM, for example training technician, methodology of sampling and analysis when equipment are available
- Set up a mercury atmospheric monitoring program (dry and wet) in Vietnam include manual and continuous approach
- International collaboration for academic exchange and technical supporting
- QA/QC guarantee in sampling, analysis and data processing

THANK YOU FOR YOUR  
ATTENTION

