

# Mercury/Methyl Mercury Characterization of Flue Gas Desulfurization Wastewater

Methyl Mercury Site-specific Bioaccumulation Factor

## 2012 METHYL MERCURY PROJECTS

FEBRUARY 2012: 198<sup>TH</sup> ORSANCO TECHNICAL COMMITTEE MEETING

# EVALUATION OF FLUE GAS DESULFURIZATION WASTEWATER AND FLY/BOTTOM ASH POND METHYL MERCURY DISCHARGES

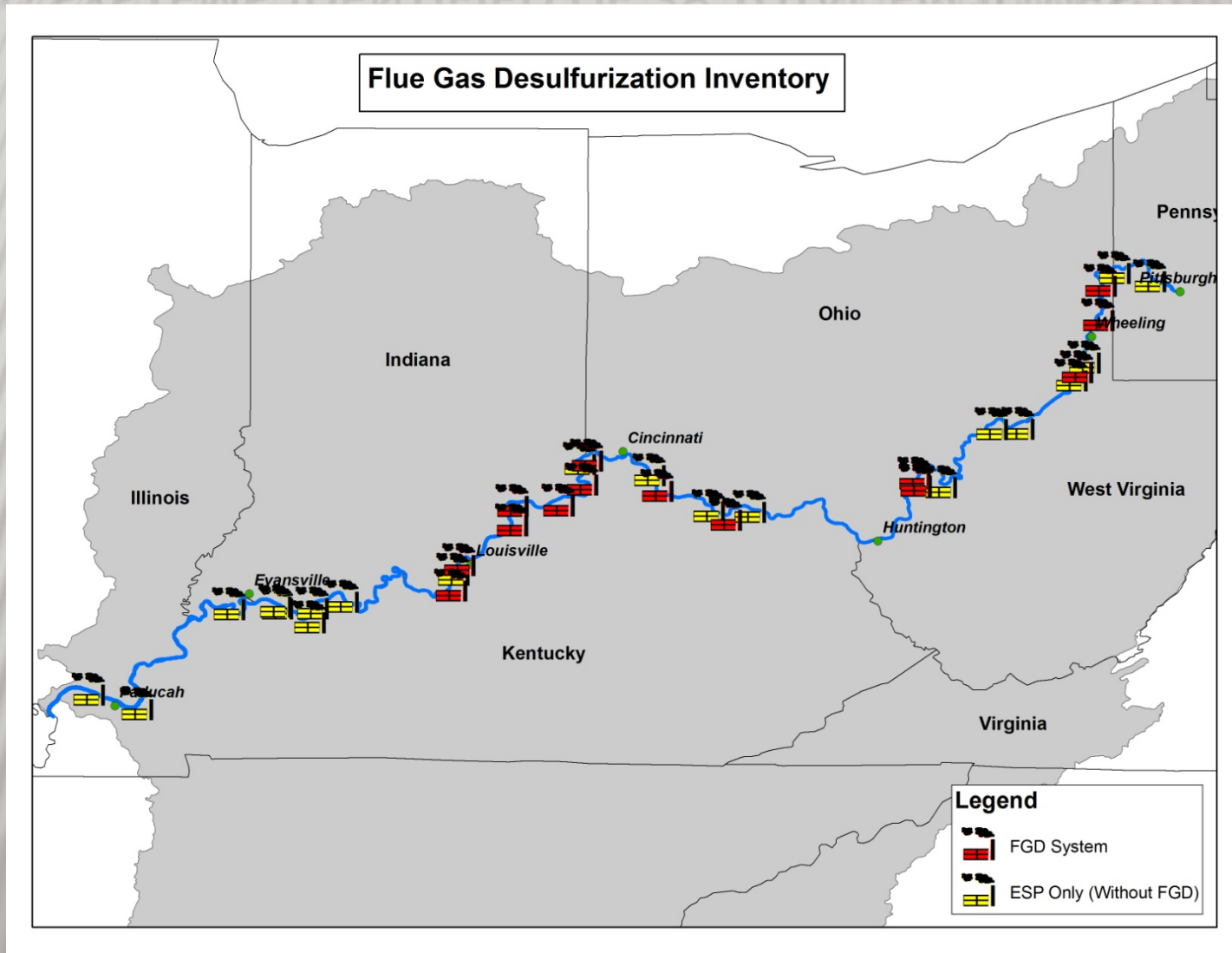
## Objectives:

- ✖ Create inventory of FGD systems and ash ponds on the Ohio River
- ✖ Characterize total and methyl mercury discharges from FGD systems
- ✖ Characterize total and methyl mercury discharges from fly and bottom ash ponds



# FGD INVENTORY STATUS

## 16 FGD SYSTEMS IDENTIFIED OF 38 TOTAL FACILITIES





# FGD SYSTEM/ASH POND INVENTORY

- ✖ Information gathered from permits on file and subcommittees: PIAC, NPDES:
  - + Type of FGD (wet or dry, WW discharge)
  - + FGD Installation date
  - + Hg monitoring requirement existing or upcoming
  - + FGD WW treatment
  - + FGD WW discharge location (i.e. to ash ponds, to cooling water)
  - + Ash movement within plant (sluice or dry transport)

# SAMPLING PLAN

## EVALUATION OF FLUE GAS DESULFURIZATION AND ASH POND METHYL MERCURY DISCHARGES

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Proposed facilities and selection rationale:

- ✖ Cardinal Operating Co. Cardinal Plant, Mile 76.5
  - + Ash ponds do not receive FGD Wastewater
- ✖ Ohio Power/AEP Mitchell Plant, Mile 112.5
  - + Advanced FGD treatment system meeting Hg criterion without mixing zone
- ~~✖ Dayton Power and Light J.M. Stuart Plant, Mile 404.7~~
  - ~~+ No treatment of FGD wastewater~~
- ✖ Indiana-Kentucky Electric Corp. Clifty Creek Plant, Mile 560
  - + FGD system to be installed 2013

# SAMPLING PLAN

## EVALUATION OF FLUE GAS DESULFURIZATION AND ASH POND METHYL MERCURY DISCHARGES

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- ✕ Four sample events (quarterly) at four coal-fired power generation facilities
- ✕ Three sample locations per facility:
  - + Upstream baseline or raw inflow
  - + FGD wastewater post treatment
  - + Fly/bottom ash pond final discharge to Ohio River
- ✕ Analytical parameters to be monitored:
  - Filtered total Hg
  - Unfiltered total Hg
  - Filtered methyl Hg
  - Unfiltered methyl Hg
  - Selenium
  - Bromide
  - Dissolved Organic Carbon
  - Dissolved Sulfate
  - Total Dissolved Solids
  - pH/Specific Conductance

# METHYL MERCURY BIOACCUMULATION FACTOR (BAF)

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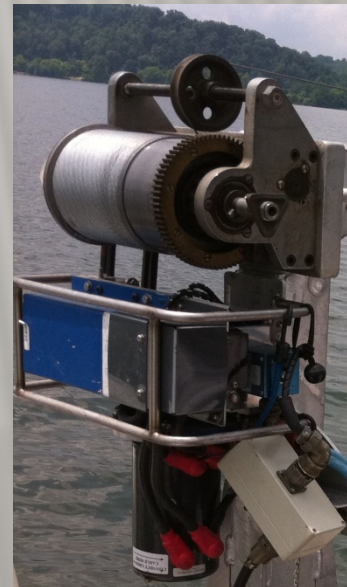
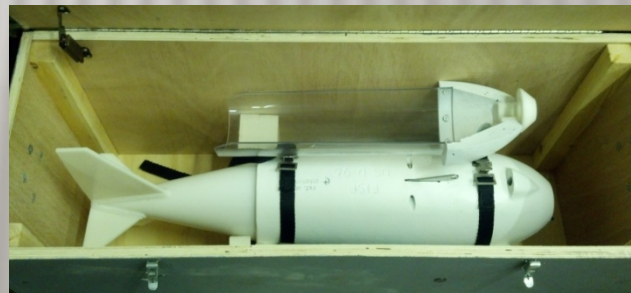
Objective: One Ohio River site-specific BAF for methyl Hg

- × Calculated from direct measurement of methyl mercury in water and methyl mercury in tissue
- × Project planned in area of mercury discharge variance request by PPG Inc. Natrium, WV mile 120



# PROPOSED SAMPLING PLAN FOR A METHYL MERCURY BAF

- ✖ 12 Equal Discharge Increment composite water samples (1 year/Monthly)
  - + Analysis for total and methyl mercury, filtered and unfiltered
  - + Known methylation factors: DOC, D SO<sub>4</sub>, Chlorophyll-a
- ✖ 8 composite fish tissue analyses:
  - + 4 TL4 composites
  - + 4 TL3 composites
- ✖ 4 sediment samples





# METHYL MERCURY BIOACCUMULATION FACTOR

## × Difficulties:

- + Extremely low levels of MeHg in water will reduce detections/available data
- + Sediment data cannot be directly incorporated into BAF calculation
- + Limited funding allows just one year of sampling, at one specific location

# METHYL MERCURY - NEXT

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- ✖ FGD Inventory – complete data gathering, begin telephone contacts
- ✖ Discharge Monitoring – site visits, first sample events
- ✖ MeHg BAF – install new equipment, first sample events