

Update on Air Quality Monitoring for Kingston Ash Spill

Presentation to the State of
Tennessee Air Pollution Control
Board

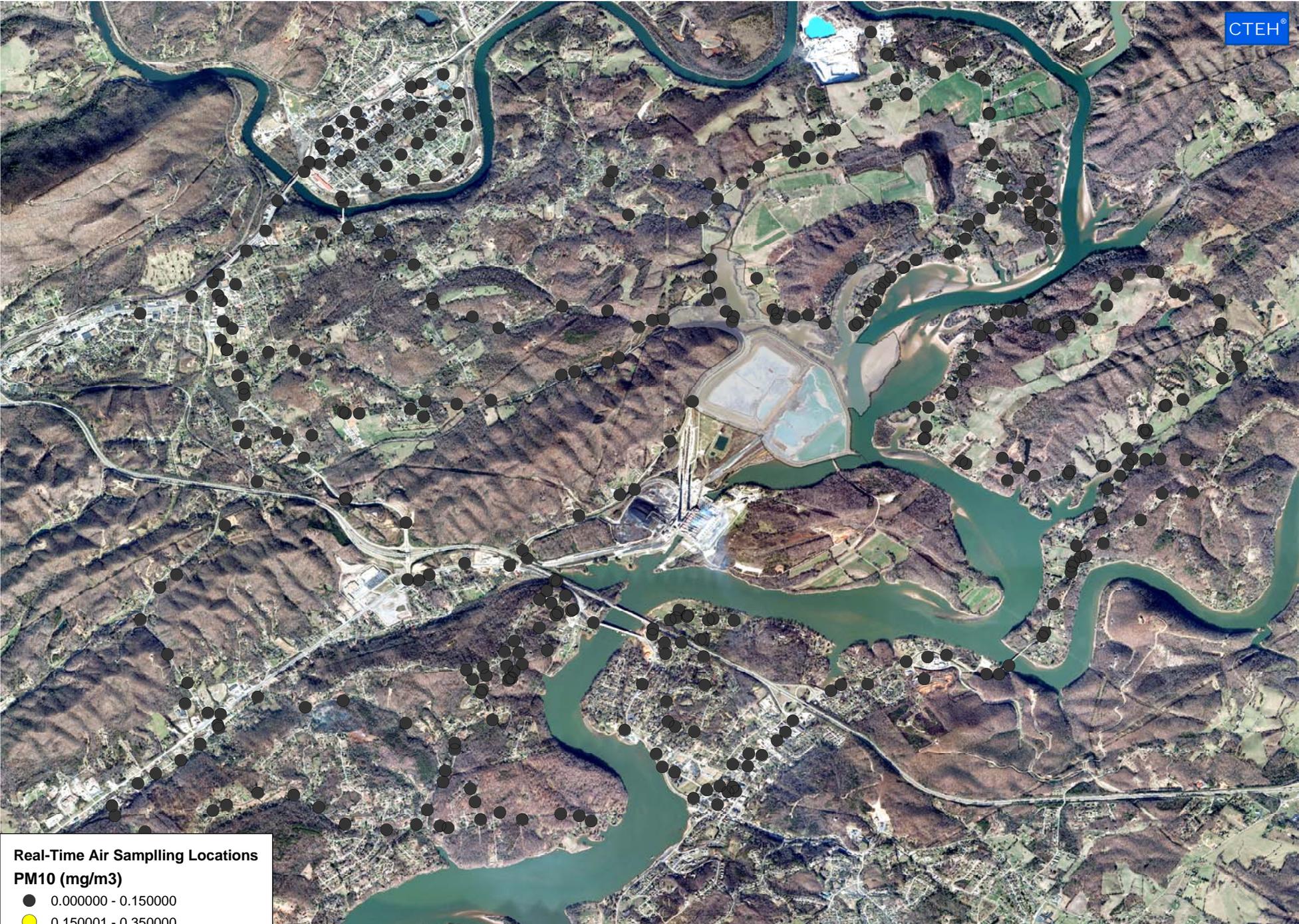
Tennessee Valley Authority
April 8, 2009

Monitoring in Progress

- Center for Toxicology and Environmental Health (CTEH):
 - Real-time, instantaneous PM_{10}
 - Federal Reference Method (FRM) analytical monitoring, PM_{10} and $PM_{2.5}$
 - High-volume analytical monitoring, TSP and PM_{10}
 - Low-volume NIOSH analytical monitoring for quartz

TDEC

- PM_{10} TEOM
- High-volume analytical monitoring, TSP



Real-Time Air Sampling Locations

PM10 (mg/m3)

- 0.000000 - 0.150000
- 0.150001 - 0.350000
- 0.350001 - 1.000000
- Ash Extent as of 12/23/2008

**Air Sampling Locations
for 04/01/2009**

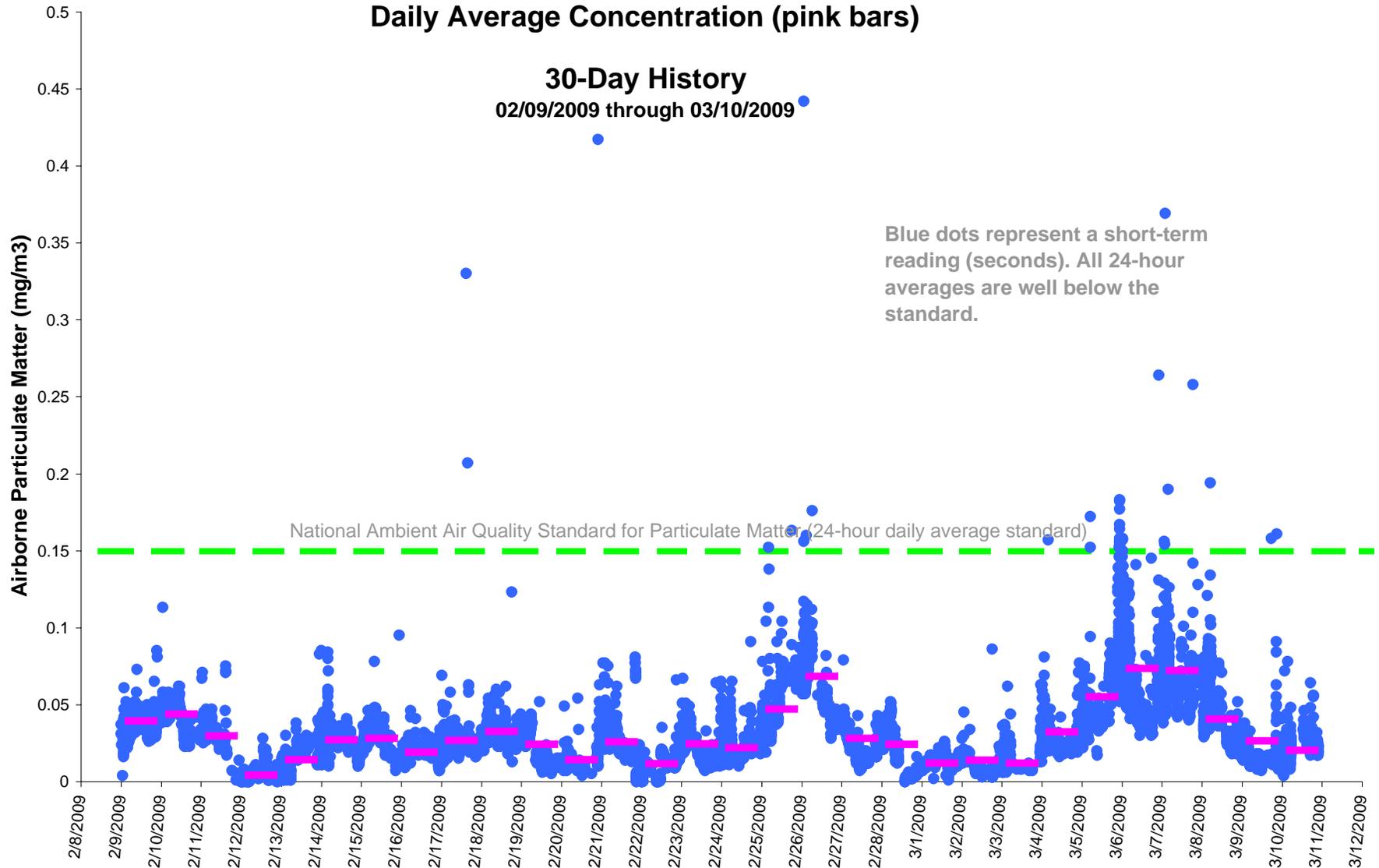


0 0.2 0.4 0.8 Miles

CTEH®	Tennessee Valley Authority
	Kingston, TN
Project No. 4735	Roane County
	Date Created: 04/02/2009

Air Sampling Results (blue dots)

Daily Average Concentration (pink bars)



* The particulate monitor is affected by humidity. High relative humidity causes the instrument to read higher than the true particulate level in air.

* Elevated reading on 2/9/2009 at 9:31 PM is due to a nearby large brush fire (0.674 mg/m3, not pictured).

* Elevated reading on 2/17/2009 at 3:02 PM was taken near Quarry entrance as trucks were entering and leaving.

* Elevated reading on 2/17/2009 at 3:44 PM was taken near Swan Pond Circle near Berkshire as a truck passed.

* Elevated reading on 2/20/2009 at 9:57 PM was taken near the presence of strong burning wood odor.

* Elevated readings on 2/25/2009 were taken near the presence of smoke and burning odors.

* Elevated readings on 2/26/2009 were taken near the presence of smoke and burning odors.

* Elevated readings on 3/04/2009 at 12:29 AM (0.783 mg/m3, not pictured) and 4:00 AM (0.157 mg/m3) were taken near active fireplaces.

* Elevated reading on 3/06/2009 at 10:09 PM was taken in the presence of heavy smoke.

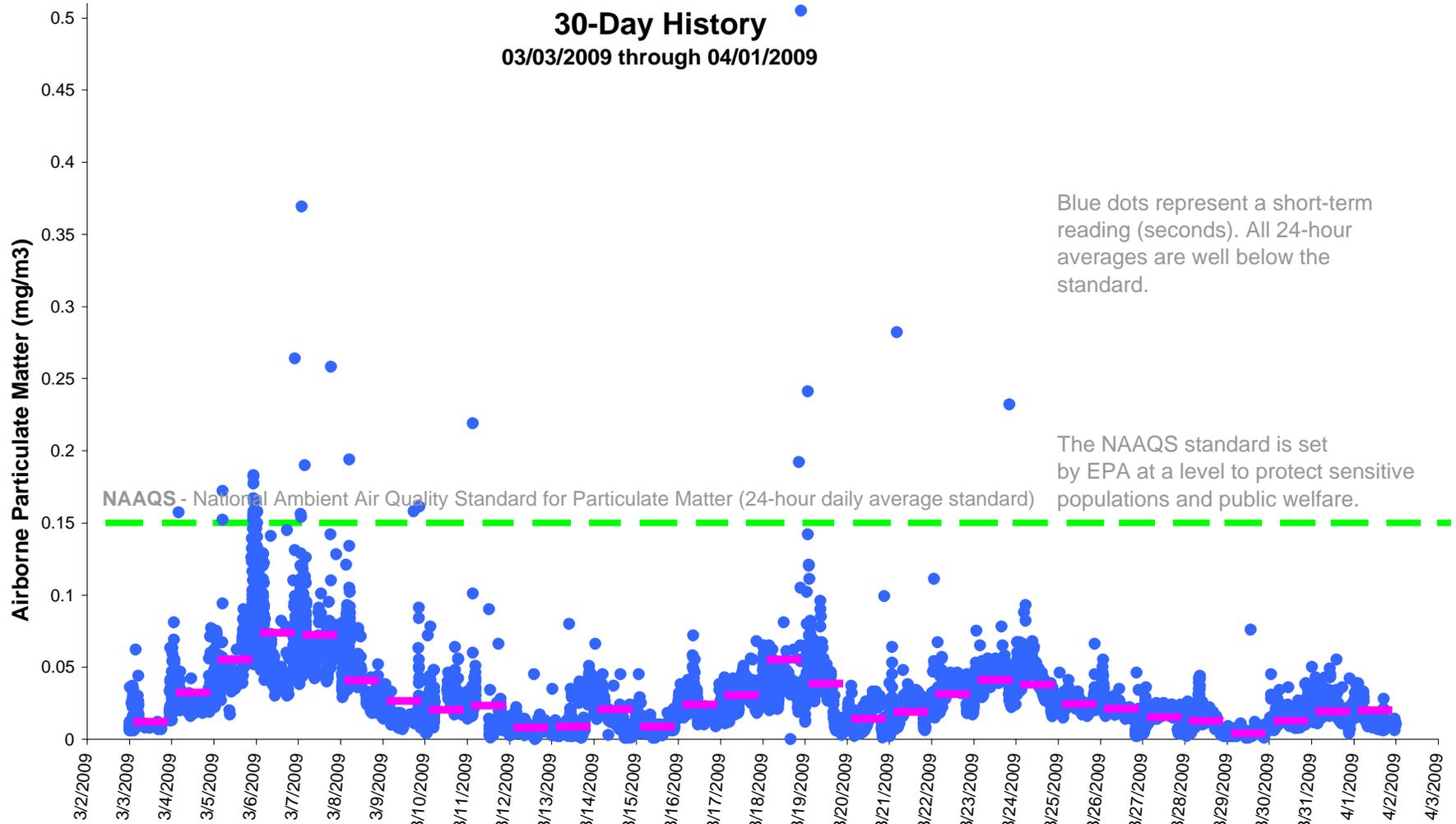
* Elevated readings on 3/07/2009 were taken in the presence of odors of burning wood and leaves.

* Elevated readings on 3/09/2009 at 5:16 PM (1.43 mg/m3, not pictured) and 5:23 PM (0.866 mg/m3, not pictured) were taken in close proximity of burning yard waste.

TVA Kingston Air Sampling Results (blue dots)

Daily Average Concentration (pink bars)

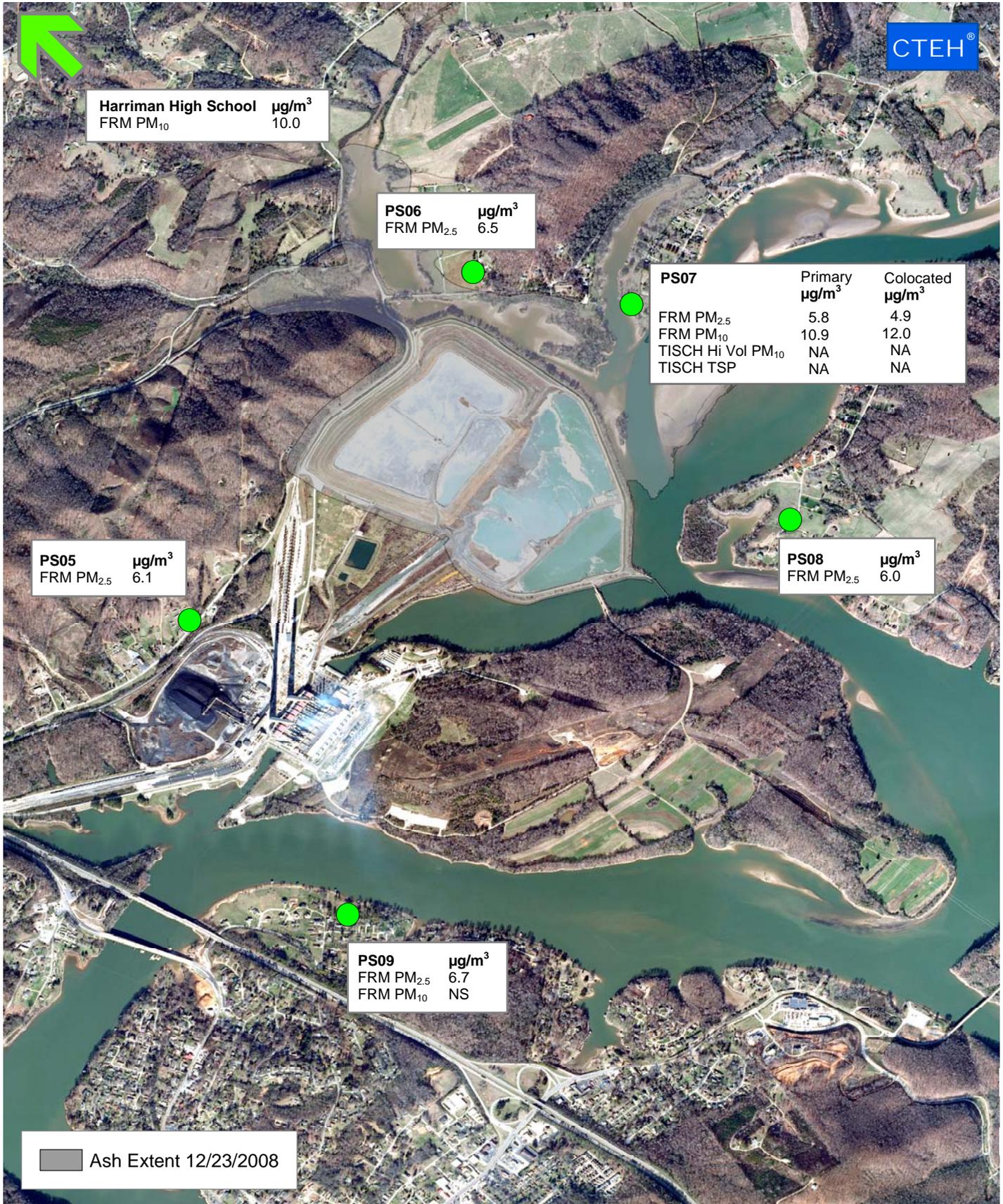
30-Day History
03/03/2009 through 04/01/2009



* The particulate monitor is affected by humidity. High relative humidity causes the instrument to read higher than the true particulate level in air.
 * Elevated readings on 3/04/2009 at 12:29 AM (0.783 mg/m3, not pictured) and 4:00 AM (0.157 mg/m3) were taken near active fireplaces.
 * Elevated reading on 3/06/2009 at 10:09 PM was taken in the presence of heavy smoke.
 * Elevated readings on 3/07/2009 were taken in the presence of odors of burning wood and leaves .
 * Elevated readings on 3/09/2009 at 5:16 PM (1.43 mg/m3, not pictured) and 5:23 PM (0.866 mg/m3, not pictured) were taken in close proximity of burning yard waste.
 * Elevated reading on 3/11/2009 at 3:18 AM was taken in presence of burning wood odor.

* Elevated reading on 3/19/2009 at 8:40 PM (0.192 mg/m3) was taken in presence of a smoke plume rising from a leaf fire.
 * Elevated readings on 3/19/2009 at 9:46 PM (0.505 mg/m3), at 9:53 PM (1.08 mg/m3, not pictured) , at 10:02 PM (5.06 mg/m3, not pictured) were taken near a hillside forest fire. Local fire crew were on scene.
 * Elevated reading on 3/21/2009 at 4:21 AM (0.282 mg/m3) was taken approximately 30 yards from an active fireplace. Wood burning odor was noted.
 * Elevated reading on 3/23/2009 at 10:09 PM (0.232 mg/m3) was taken approximately 30 yards from burning wood at nearby residence.

Ambient Air Monitoring Network Particulate Matter Results



Harriman High School $\mu\text{g}/\text{m}^3$
FRM PM_{10} 10.0

PS06 $\mu\text{g}/\text{m}^3$
FRM $\text{PM}_{2.5}$ 6.5

PS07	Primary $\mu\text{g}/\text{m}^3$	Colocated $\mu\text{g}/\text{m}^3$
FRM $\text{PM}_{2.5}$	5.8	4.9
FRM PM_{10}	10.9	12.0
TISCH Hi Vol PM_{10}	NA	NA
TISCH TSP	NA	NA

PS05 $\mu\text{g}/\text{m}^3$
FRM $\text{PM}_{2.5}$ 6.1

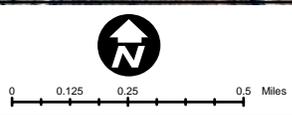
PS08 $\mu\text{g}/\text{m}^3$
FRM $\text{PM}_{2.5}$ 6.0

PS09 $\mu\text{g}/\text{m}^3$
FRM $\text{PM}_{2.5}$ 6.7
FRM PM_{10} NS

 Ash Extent 12/23/2008

**TVA Ambient Air Monitoring
Network
03/20/2009**

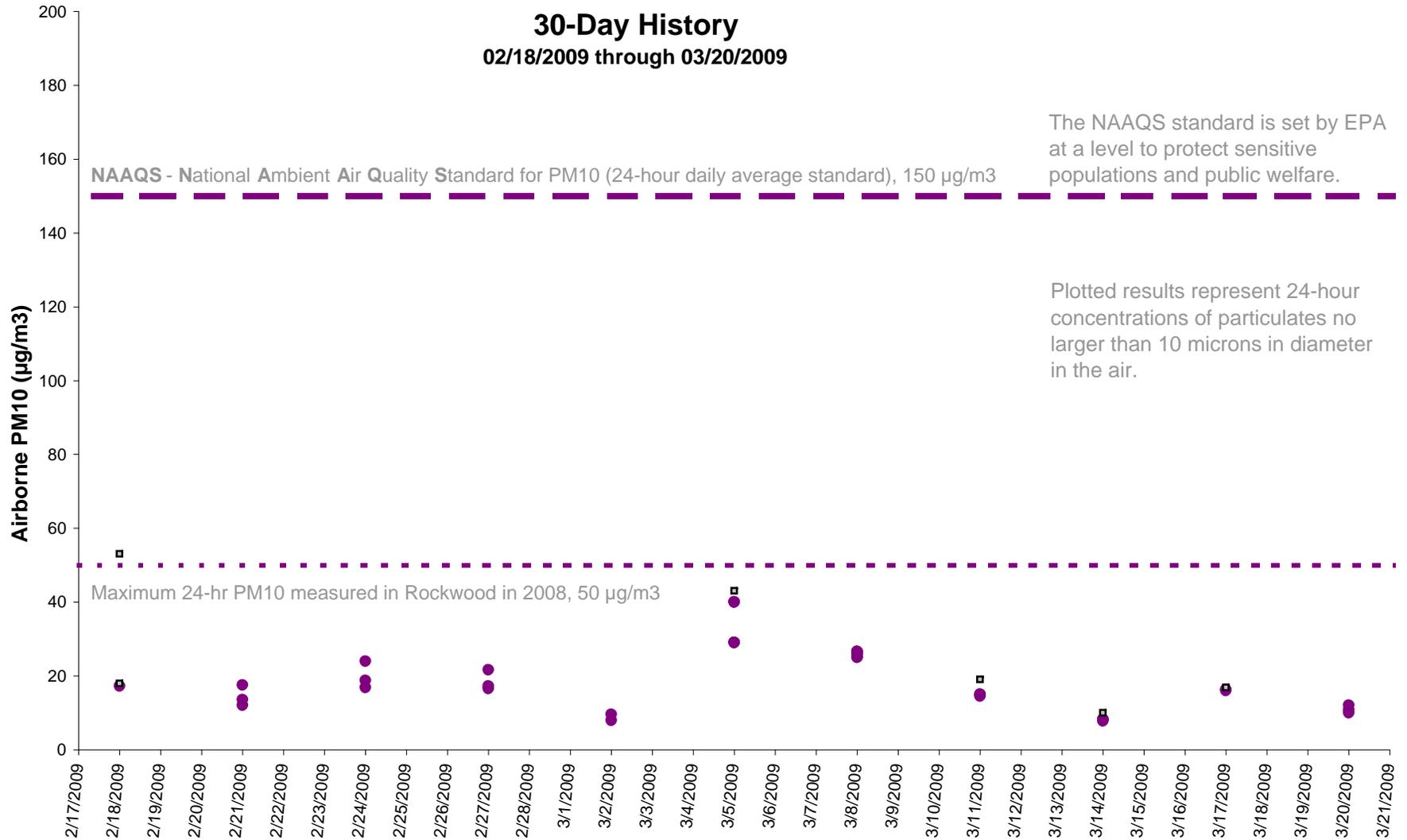
ND - Non Detect
NS - Not Sampled
NA - Not Analyzed
IF - Instrument Fault



CTEH Project No. 4735	Tennessee Valley Authority Kingston, TN
	Roane County Date Printed: 03/29/2009

TVA Kingston PM10 Ambient Air Network Sampling Results

30-Day History
02/18/2009 through 03/20/2009



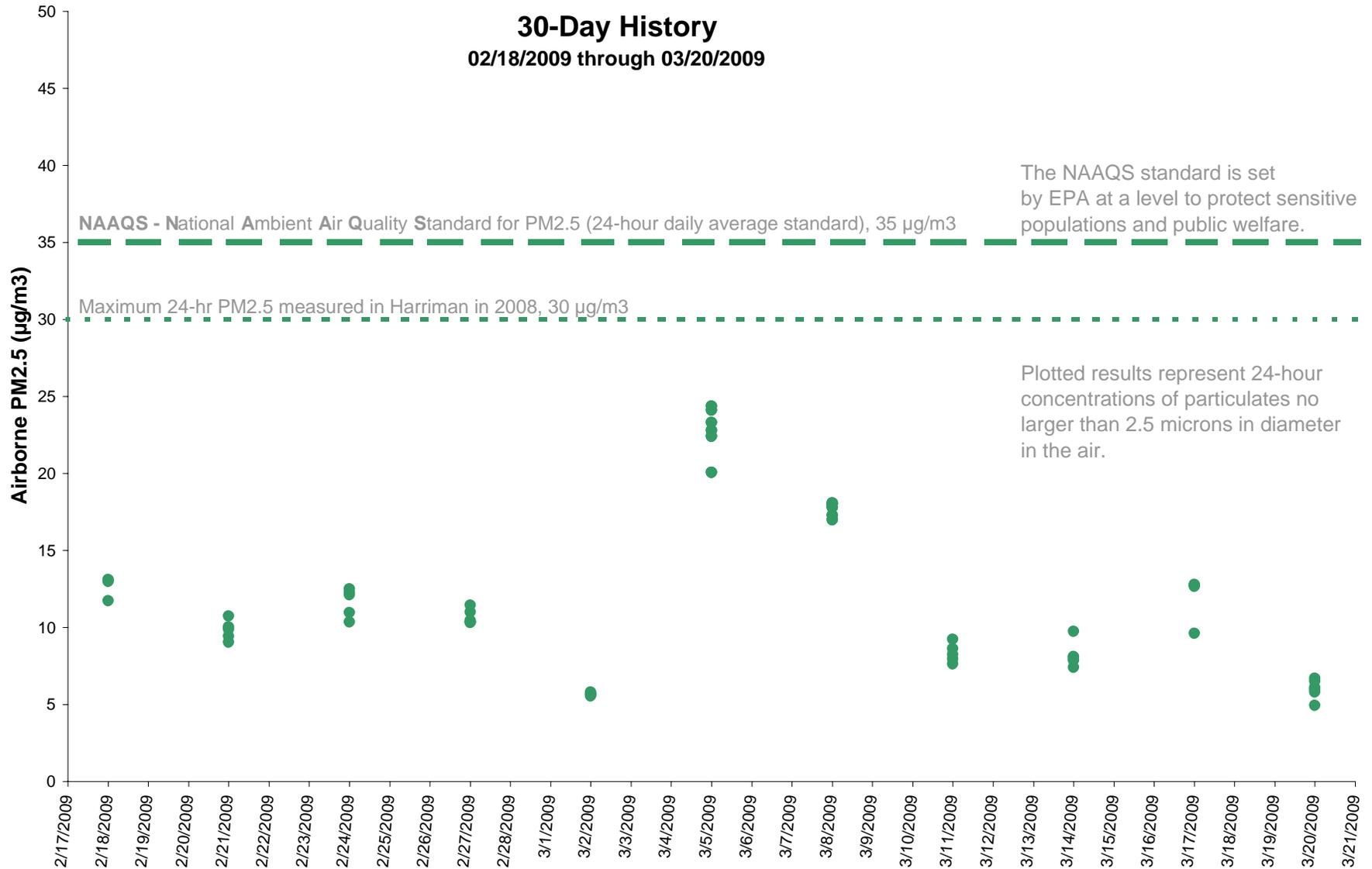
▣ Plotted (square) results represent samples that were intended to run 24-hours, but failed to run at least the required 23 Hours.

* On 2/18/2009 a 53.06 ug/m³ measurement had an elapsed time of 00:29
 * On 2/18/2009 a 17.93 ug/m³ measurement had an elapsed time of 11:48
 * On 3/5/2009 a 43.056 ug/m³ measurement had an elapsed time of 14:02
 * On 3/11/2009 a 19.056 ug/m⁴ measurement had an elapsed time of 16:05

* On 3/14/2009 a 10.000 ug/m³ measurement had an elapsed time of 12:05
 * On 3/17/2009 a 16.872 ug/m⁴ measurement had an elapsed time of 10:33

TVA Kingston PM2.5 Ambient Air Network Sampling Results

30-Day History
02/18/2009 through 03/20/2009



Ambient Air Monitoring Network Analytical Results

CTEH®

Harriman High School	µg/m³
FRM PM ₁₀ Arsenic	NA
FRM PM ₁₀ Thallium	NA

Station 6	µg/m³
FRM PM _{2.5} Arsenic	NA
FRM PM _{2.5} Thallium	NA

Station 7	µg/m³
FRM PM _{2.5} Arsenic	NA
FRM PM _{2.5} Thallium	NA
FRM PM ₁₀ Arsenic	NA
FRM PM ₁₀ Thallium	NA
Quartz	ND
TISCH Hi Vol Arsenic	0.00165*
TISCH Hi Vol Thallium	ND
TISCH TSP Arsenic	0.00127*
TISCH TSP Thallium	ND

* Arsenic results are within the low range of background concentrations in the U.S. (U.S. Dept. of Health and Human Services)

Station 5	µg/m³
FRM PM _{2.5} Arsenic	NA
FRM PM _{2.5} Thallium	NA

Station 8	µg/m³
FRM PM _{2.5} Arsenic	NA
FRM PM _{2.5} Thallium	NA

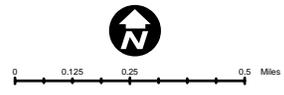
Station 9	µg/m³
FRM PM _{2.5} Arsenic	NA
FRM PM _{2.5} Thallium	NA
FRM PM ₁₀ Arsenic	NA
FRM PM ₁₀ Thallium	NA

Limit of Laboratory Detection (µg/m³)	
Thallium	< 0.000001
Quartz	< 2.7 - 2.8

 Ash Extent 12/23/2008

TVA Ambient Air Monitoring Network
03/20/2009

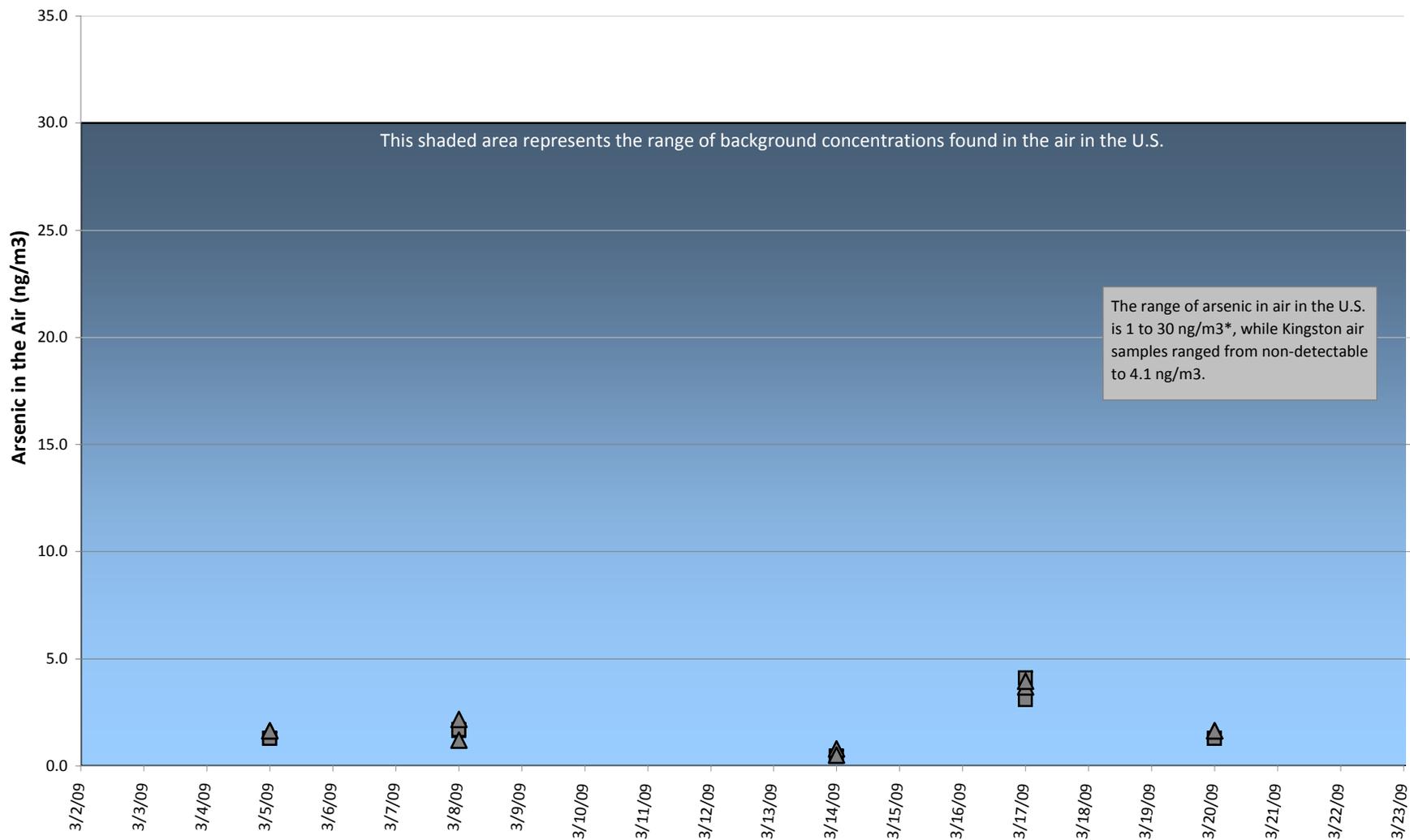
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CTEH®	Tennessee Valley Authority Kingston, TN
	Roane County
Project No. 4735	Date Printed: 04/01/2009

Arsenic Results

TVA Kingston Ash Spill Air Monitoring Network



■ Particulate Matter <10um in diameter (PM10)

▲ Total Suspended Particles (TSP)

* U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Toxicological Profiles

Airborne Dust Control for Kingston Ash Spill

Presentation to the State of Tennessee Air
Pollution Control Board
Tennessee Valley Authority
April 8, 2009

Plan Objectives

- Minimize the impacts of airborne dust from the Kingston ash spill
- Compliance with airborne dust regulations

Site Dust Controls

- On-site dust & erosion control
 - Water trucks and sweepers
 - Liquid dust suppression
 - Erosion control mulch
 - Removal of high wall and leveling of spill area
- Off-site dust control
 - Water trucks and sweepers
 - Vehicle & equipment wash area
 - Wheel washes

Erosion Control Mulch

- Spray application of a cellulosic binder on ash surface
- Reapplied as necessary in areas disturbed during cleanup
- Application method
 - Truck
 - Amphibious Vehicle with Tow Sled
- Ongoing





Off-Site Vehicle Dust Abatement

- Three tire wash stations
- Wash station to clean any buildup from vehicles before exiting site
- Sweeper/vacuum trucks
- Water trucks periodically wash down the roads
- Trucking contractors are instructed as to acceptable speeds

On-Site Vehicle Dust Abatement

- Calcium Chloride application on graveled roads
- Water trucks used on plant roads and work areas
- Sweepers used on paved plant roads
- Speed limits are posted and a radar speed sign is utilized













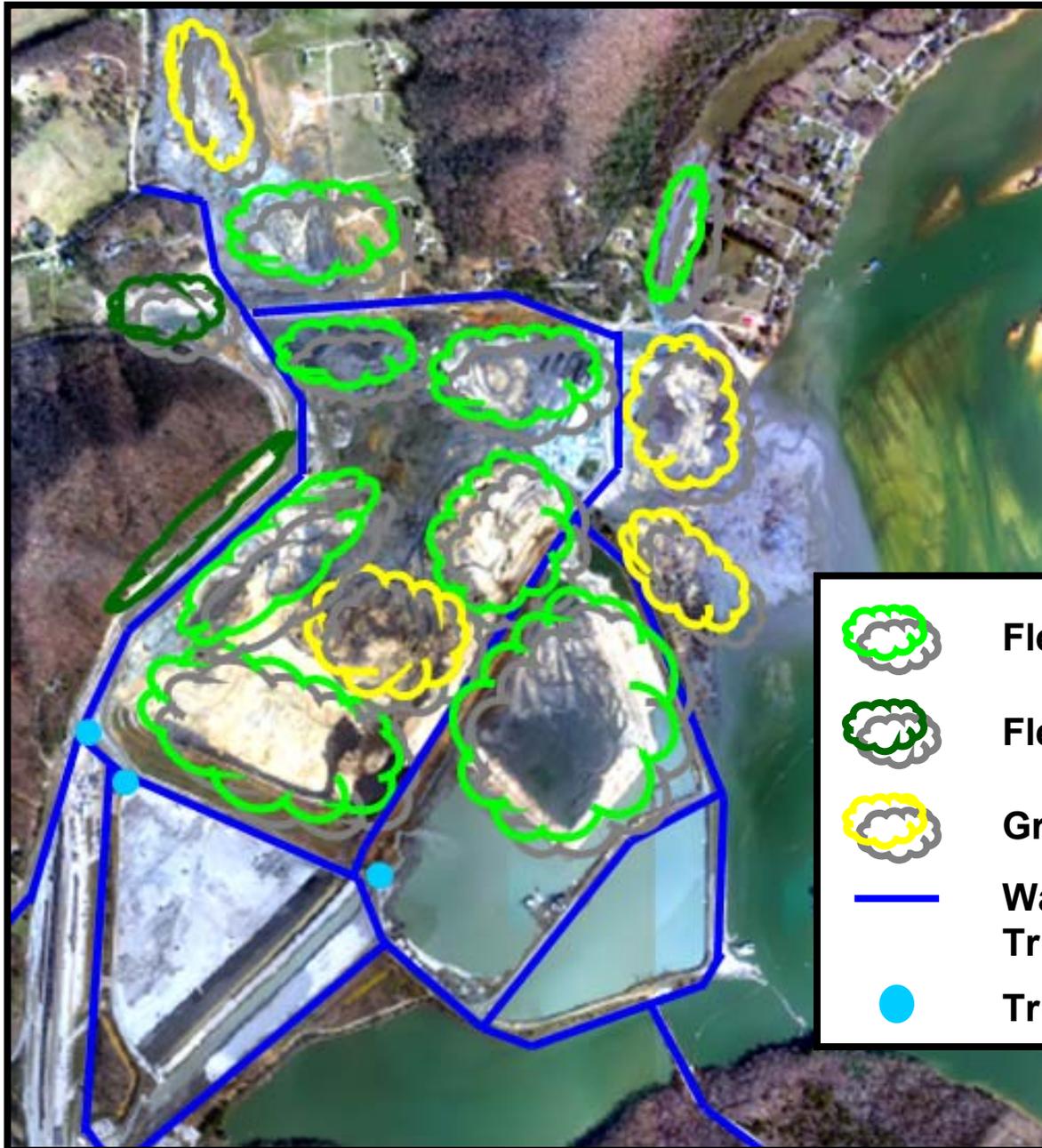








DUST SUPPRESSION SCHEMATIC 4/6/2009



FLEXTERRA COVERAGE

- ~192 acres placed
- ~134.5 acres of ash covered



Flexterra



Flexterra & Grass Seed



Grass Seed & Straw



Water and/or Calcium Chloride Trucks



Truck or Wheel Wash Stations

Oversight

- Ambient monitoring network
- CTEH personnel visually monitor for fugitives during routine ambient monitoring
- TVA contractor is on site to provide oversight on control measures