Update on Kingston Ash Spill

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World of Coal Ash
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Tennessee Valley Authority

Our Mission: Serving the Valley through Energy, Environment, and Economic Development

• Created in 1933 when Congress signed the TVA Act
• Nation’s largest public power provider; serves 8.6 million people
• 29 hyrdoelectric dams, 11 coal fired plants, 6 combustion turbines, 3 nuclear plants, a pumped storage hydropower plant & 18 green power sites
• Supports the nation’s fifth largest river system
• Stimulates economic growth
History of Kingston Fossil Plant

- TVA part of Kingston community since early 1950s
  - Construction of plant began in 1951
  - First unit began operation in 1955
- At time of completion, world’s largest coal-burning plant
- About 300 people work there
- Has nine generating units with a capacity of 1600MW
- Burns 14,000 tons of low-sulfur coal daily
  - 1,000 tons of ash produced daily
- Produces enough electricity to serve 700,000 homes
What Happened

• December 22, 2008, between midnight & 1 a.m.
  – Ash pond dike failed
  – Cause remains under investigation
• Initial effects
  – 5.4 million cubic yards of coal ash released
  – Debris covers about 300 acres (about half a square mile)
  – No injuries
  – 3 homes uninhabitable, 23 others damaged
  – Roads, rail line and utilities damaged
Aerial View of Site – Pre-Event
Aerial View of Site – Post Event
Initial Emergency Response

• Worked closely with:
  – Roane County Emergency Management Agency
  – Tennessee Department of Environment & Conservation (TDEC)
  – Tennessee Emergency Management Agency (TEMA)
  – U.S. Environmental Protection Agency (EPA)
  – U.S. Army Corps of Engineers
  – U.S. Department of Homeland Security

• Established unified incident command center with EPA, state and local agencies

• Inspected site to verify no further releases
Initial Outreach Response

- Ensure neighbors are safe
- Arrange temporary housing
- Respond to property damage
- Dispatch face-to-face outreach teams
- Conduct community meetings
- Establish comprehensive Web site to share information
- Establish an Outreach Center and public phone line
- Establish a Claims process
Early Environmental Monitoring

• Began ongoing sampling of air, water & soil

• Stabilized site to prevent further movement of ash
  – Deployed booms to confine floating debris and cenospheres
  – Began building dikes to confine ash in the water
  – Began dust control measures with spray-on dust inhibitors and applying straw & seeding
Dust Suppression

Dust Control Measures - Flexterra
Soil & Ash Sampling

• Except for arsenic, concentrations of metals in escaped ash are well below EPA Region 4 Removal Action Levels
  – In most cases, not much different from non-agricultural soils

• Ash and soil tested for radioactivity Dec. 29-30
  – Kingston ash less radioactive than low-sodium table salt
Water & Air Sampling Results

- Over a thousand tests by TVA, TDEC & EPA confirm …
  - Municipal drinking water & water sampled from private wells continue to meet standards for drinking water
    - Surface Water: 1,247 total samples (TVA)
    - Ground Water: 5 samples (TVA) & 100 samples of private wells (TDEC)
    - Ash/Soil/Sediment: 139 total samples (TVA)
    - Soil: 47 total samples (TVA)
    - Radiological: 7 total samples (TVA)

- More than 39,000 of air-quality results show the air is better than National Ambient Air Quality Standard for particulates
Kingston Recovery Objectives

- Ensure the Safety of Citizens and Response Personnel
- Keep the Public and Stakeholders Informed of Response Activities
- Maximize the Protection of Environmentally Sensitive Areas
- Return Community to Normal Conditions
Scope of Cleanup

An army of bulldozers, backhoes & dump trucks
Scope of Cleanup

Amphibious trackhoes
Scope of Cleanup

Building /repairing roads

Temporary seeding & strawing
Reconstructing railroad tracks
Scope of Cleanup

Collecting cenospheres …

… and storing them
Scope of Cleanup

Constructing rock weir
Dredging

Divers at Skimmer Wall Removing Ash
Failed Dredge Cell

Ash Spill In the Embayment

Ash Spill in River
Ash Recovery & Processing

- Dredge 1
- Dredge 2
- Dredge 3
- Temp Ash Storage Area
- Ash Recovery Area
Dredging Operation:

- Dredge "Cutter Head" lowered to target depth
- "Cutter Head" dislodges fly ash
- Fly ash/water mixture is removed from the "Cutter Head" through suction
- Pump transfers fly ash/water mixture to the floating collection pipe
- Dredge "sweeps" back and forth to expand removal zone at target depth
- Excavator mounted barge removes debris encountered in submerged fly ash

Removal Zone

Debris Removal

Submerged Fly Ash in Emory River

Posts used to sweep during dredging
Dredging

The Initial Dredge
Dredging

Booster Pump For Dredge Pipe
At Dike C
Dredging

Dredge Material Pumped Into Rim Ditch
Ash Recovery

Rim Ditch and Sluice Trench
Ash Recovery

Dredge Discharge Trench
Ash Recovery

Dipping Ash out of Rim Ditch
Temporary Ash Storage

Dike Test Trench and Ash Processing Area
Temporary Ash Storage

Wick Installation Machine

Hole Punch Machine
When the Kingston ash pond dike failed on December 22, 2008, TVA notified the National Response Center in accordance with Section 103 of the Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)

- In response, EPA Region 4 immediately dispatched an EPA CERCLA On-Scene Coordinator to Kingston and established a Unified Command Center with EPA as the lead Federal Agency
- In a January 10, 2009 memorandum, EPA transferred the lead Federal Agency authority to TVA to begin longer-term response efforts

On April 1, 2009, Tom Kilgore, TVA President & Chief Executive Officer, directed environmental response actions be consistent with the CERCLA Section 104 and the National Contingency Plan to ensure that response actions necessary to protect the public health or welfare or the environment are undertaken

CERCLA provides TVA, regulators, and the public with a clear path forward to clean up the site. Advantages include:

- Structured approach for making environmental remediation decisions
- Structured approach for community involvement
- Provides a clear set of worker health and safety requirements
- Meets Federal and State requirements; allows TVA to meet non-statute requirements that may be more stringent
Immediate Disposal Options (RFP):
• Transportation: Truck or Rail
• Potential Locations: Class I landfills in AL, GA, PA & local landfills

Long Term Options:
• Dry Fly Ash Collection
• Marketing
• Greenfields
• Existing Class I or II Landfills
Kingston Recovery Costs

Expenditures through 5/1: $85M

Daily Expenditures: Approximately $600K per day, currently

Estimated Cost for Recovery: $675M to $975M

Additional Costs for Remediation, Litigation and Ops:

- Litigation and Claims
- Community Recovery Support
- Environmental Remediation and Long term Monitoring
- Final Closure of Failed Cell
- Fines and other Regulatory Costs
- Implement alternative to wet stacked fly ash storage at Kingston
Accomplishments:
• Began Pilot Dredging Project 3/19/09 — Over 100,000 yds$^3$ dredged (as of May 1st). Three dredges in operation during day and night shifts
• Most Infrastructure activities are complete (e.g. roads, water and gas lines)
• Corrective Action Plan submitted to State and EPA
• Signed contract with Oak Ridge Association of Universities (ORAU) to provide health consultation
  – Related to ash spill and only potential effects that could be associated with the human pathway exposure to the ash
• Interagency Working Group process initiated
• Local Government Stakeholder Group established
• Purchased 80 properties to date

Future Challenges:
• Disposal options
• Unknown total costs
• Unknown potential for future regulations
• Possible impacts at other sites
Assessment of Other Sites

TVA Coal Plants:

- 12 Plants (11 active, 1 inactive)
  - 8 in TN - 7 active, 1 inactive
    - Active plants: Fly Ash 4-wet, 3-dry processes
    - All bottom Ash is Wet Sluiced
  - 2 in AL – 1- wet, 1-dry process
  - 2 in KY – 1- wet, 1-dry process
- Number of Pond Complexes*
  - 17 Ash
  - 5 Gypsum

* Pond Complex is defined as having common dikes and shared NPDES discharge point.
Assessment of Other Sites

• All dikes and impoundments have been inspected utilizing Dam Safety Inspection Standards:
  – Program implemented by a Third Party Inspection Company:
    • Program inspections led by experienced Professional Engineers
    • Process based on established Corp Of Engineers and TN Safe Dam Programs
    • Process complies with CFR Title 18, Part 12, as applicable to by-product facilities
  • Plan in place to address concerns
Ending

- Thank you for the opportunity to share with you what happened at Kingston

- My hope is that it was informative and helpful for you and your company!