June 2009

Public Service Company of New Hampshire

Merrimack Station
Clean Air Project

Cost, Contract, Construction, and Schedule Update

Cost & Contract Information

1. **Total Project Cost Estimate** (no change from figure contained in Summer, 2008 filings with U.S. Securities and Exchange Commission and N.H. Public Utilities Commission) — **$457 million**

ITEM	*APPROXIMATE COST*
▪ **Portion of Estimated Total Project Cost resulting from Contracted Goods and Services**	$345 million
▪ **Portion of Estimated Total Project Cost from Investment Carrying Costs (Allowance for Funds Used During Construction [AFUDC])**	$55 million
▪ **Portion of Estimated Total Project Cost from Fees & Payments**	$8 million
▪ **Internal Labor Costs**	$7 million
▪ **Indirect Costs and Contingencies**	$42 million
TOTAL	**$457 MILLION**

2. **Status of Contracted Work**

Portion of Estimated Total Project Cost for Goods and Services under Contract as of this Date: *Approximately $256 million (about 75% of total estimated project contract costs)*

Major Contracts Executed and in Place include:

- *Program Manager Services (Engineering Design and Construction Management)*
- *Flue Gas Desulphurization System (Scrubber system)*
- *Material Handling System*
- *Site Preparation*
- *Chimney*
- *Wastewater Treatment Facility*
- *Foundation Installation & Misc*
- *Electric Power Distribution U/G*
- *Booster Fans and Motors*

Contracts Remaining:

- *No major contracts remain*
- *A number of minor contracts including ductwork, dampers and piping; plant control systems; continuous emissions monitoring system; etc.*

Contract Structure: *Majority of costs are controlled by fixed price contracts, reducing future escalation exposure.*

Construction

3. Status of Construction

Major Construction began on March 9, 2009 with the receipt of the Temporary Permit

Number of jobs created:

- *approximately 150 - 200 contractors on site at this time*
- *at peak construction, 300-400 jobs*

New Hampshire contractors and companies on site at present:

Contractors on site at this time include:

- *Carpenters*
- *Laborers*
- *Iron workers*
- *Operators*
- *Concrete finishers*
- *Pipe fitters*
- *Electrical workers*

(Representing members of the following unions: New Hampshire Local 668, Local 118, Local 7, Local 98, Local 3, Local 490. Local 131, Local 669, Local 609, Local 4 Massachusetts Local 127, Local 549, Local 687, Local 1485, Local 534, Local 1282, Local 70, Local 1, Local 107, Local 108, Local 243, Local 537, Local 387, Local 175)

New Hampshire companies on site at this time:

Over 30 NH companies are providing primary services to the project with over 25 additional support companies (including as shown below)

- *Aggregate Industries*
- *Ayer Electric*
- *Eastern Analytical, Inc*
- *George Cairns & Sons*
- *New Quality Fence Corp.*
- *North Branch Construction, Inc*
- *Redimix Concrete Inc.*
- *Scanada International Inc.*
- *TF Moran*
- *Weaver Brothers*

Schedule

4. **Status of Schedule**

Effective Date of Scrubber Law: June 8, 2006

Statutory Mandatory Project Completion Date: July 1, 2013

Current Estimated Project Completion Date: June, 2012

Estimated Benefits to Customers from Early Completion (June 2012):

- ***ECONOMIC***
  RSA 125-O:16 Economic Performance Incentives: Customers benefit from early emissions reduction credits that can be converted to fungible SO2 allowances

  AFUDC Carrying Costs: At end of project, AFUDC is high, so completing the work ahead of schedule can save millions of dollars.

- ***ENVIRONMENTAL***
  Estimated Additional Emissions Reductions Achieved with an Early Project Completion:
  - *Eliminates over 220 pounds of mercury;*
  - *Eliminates over 31,000 tons of SO2;*
  - *Provides additional reduction to particulate emissions.*

Note: *These early completion benefits to customers are contingent upon the estimated early project completion date. Any delays in the project, whether from technical, regulatory, or judicial causes, will reduce these projected benefits.*

Clean Air Project Permit Overview

Below is a list of the majority of permits obtained to date.

Federal

FEDERAL AVIATION ADMINISTRATION (FAA):

- Chimney
- Temporary Cranes

ENVIRONMENTAL PROTECTION AGENCY (EPA):

- Storm Water Discharge – Notice of Intent

State

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NH DES):

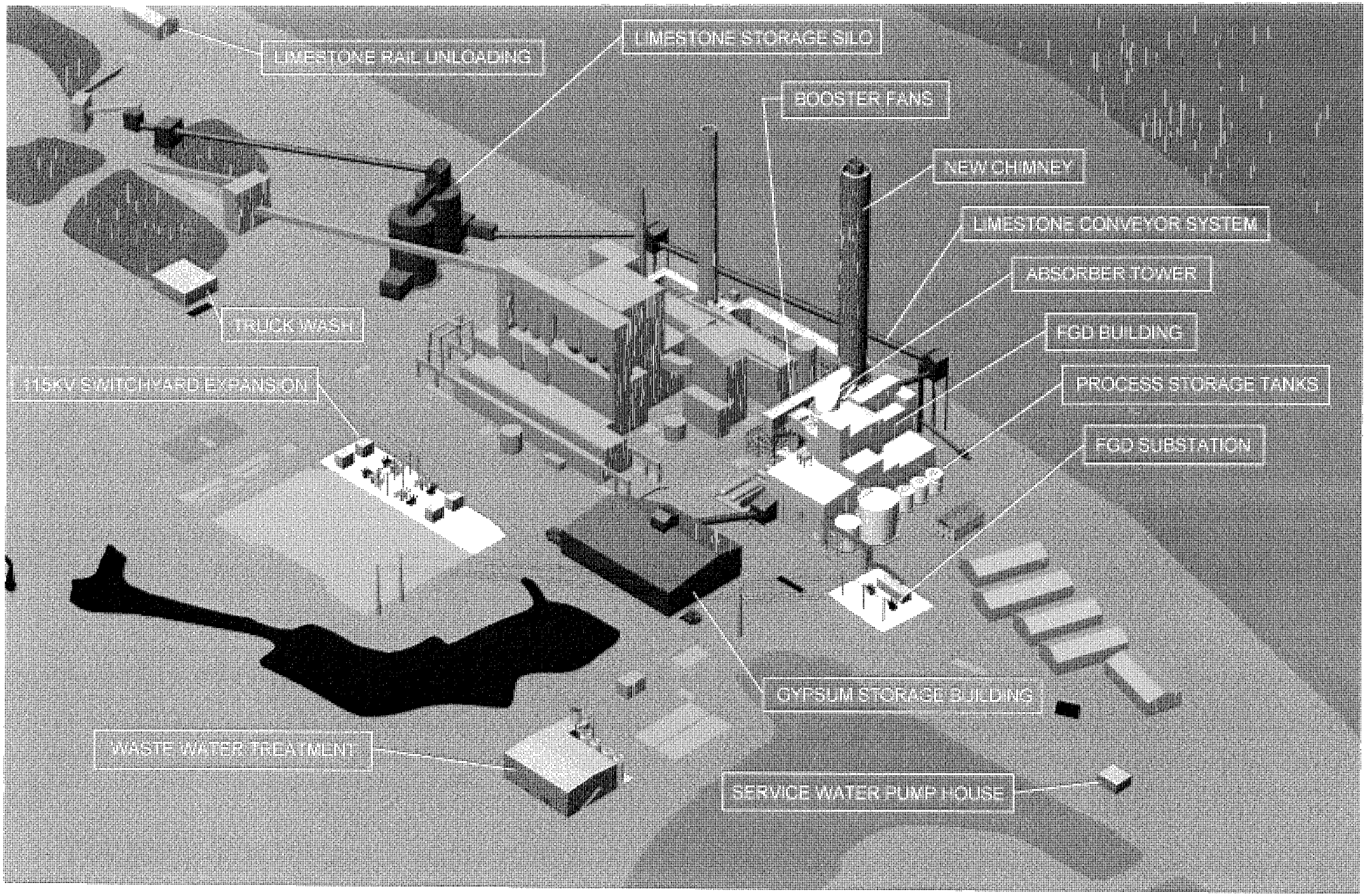
- Air Permit
- Styrene Air Permit (Chimney Liner Fabrication)
- Phase 1 Alteration of Terrain Permit
- Phase 2 Alteration of Terrain Permit
- Asbestos Demolition/Renovation Notification
- Approval of Construction of Guard Station Septic System
- Exemption for Vested Rights Shoreland Protection
- Approval of North Septic System
- Wetlands Permit/Dept. of Army Corp. of Engineers / Dredge and Fill Permit
- Approval of South Septic System (CMA)

Local

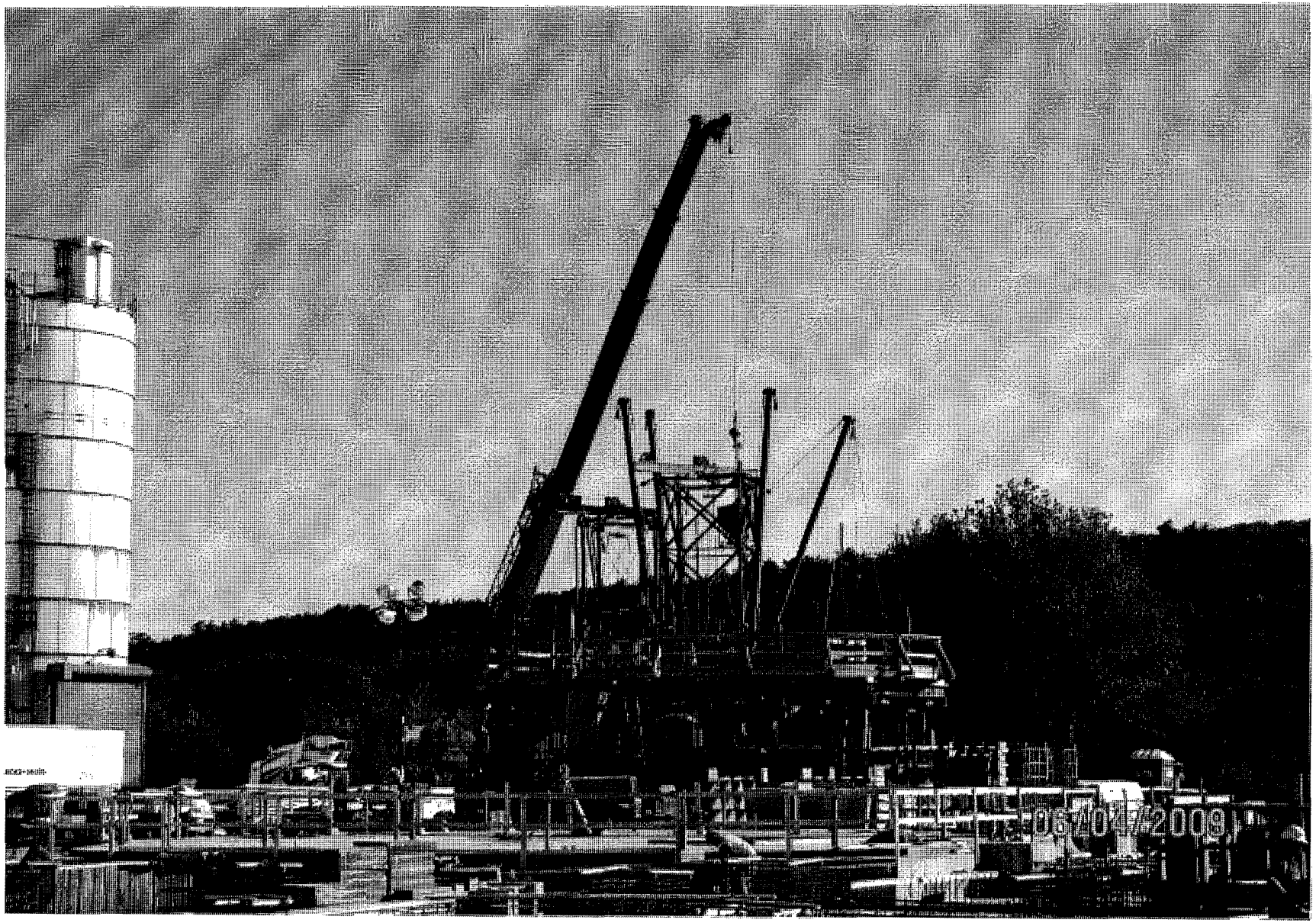
TOWN OF BOW:

- Phase 1: Site Plan Review 203-08; Wetlands CUP 410-08; Aquifer Protection Conditional Use Permit (CUP) – 411-08
- Phase 2: Site Plan Review 203-08; Wetlands CUP 410-08; Aquifer Protection CUP – 411-08
- Construction/Building Permits:
  - Chimney Foundation
  - Absorber Vessel Foundation
  - Scrubber Bottom Mat Foundation
  - FRP Building Foundation
  - Chimney Shell
  - Scrubber Top Mat
  - Guardhouses and Attendee Booths
  - Application for Driveway Permit
  - Chimney Building Structure
  - Installation of Construction and Storage Trailers
- Demolition Permits: Unit 1 Original out Buildings, Plant Entrance and Guard Office
- Special Exceptions and Variances:
  - #106-08 Special Exception – Gypsum Storage Bldg.
  - #107-08 Special Exception – WWT.
  - #106-09 Special Exception - FRP Bldg.
  - #108-08 Limestone Silo (1) Variance; and Silo (2) Variance
  - #109-08 Wet FGD Bldg Variance

PUBLIC SE ICE OF NEW HAMPSHIRE
MERRIMACK CLEAN AIR PROJECT

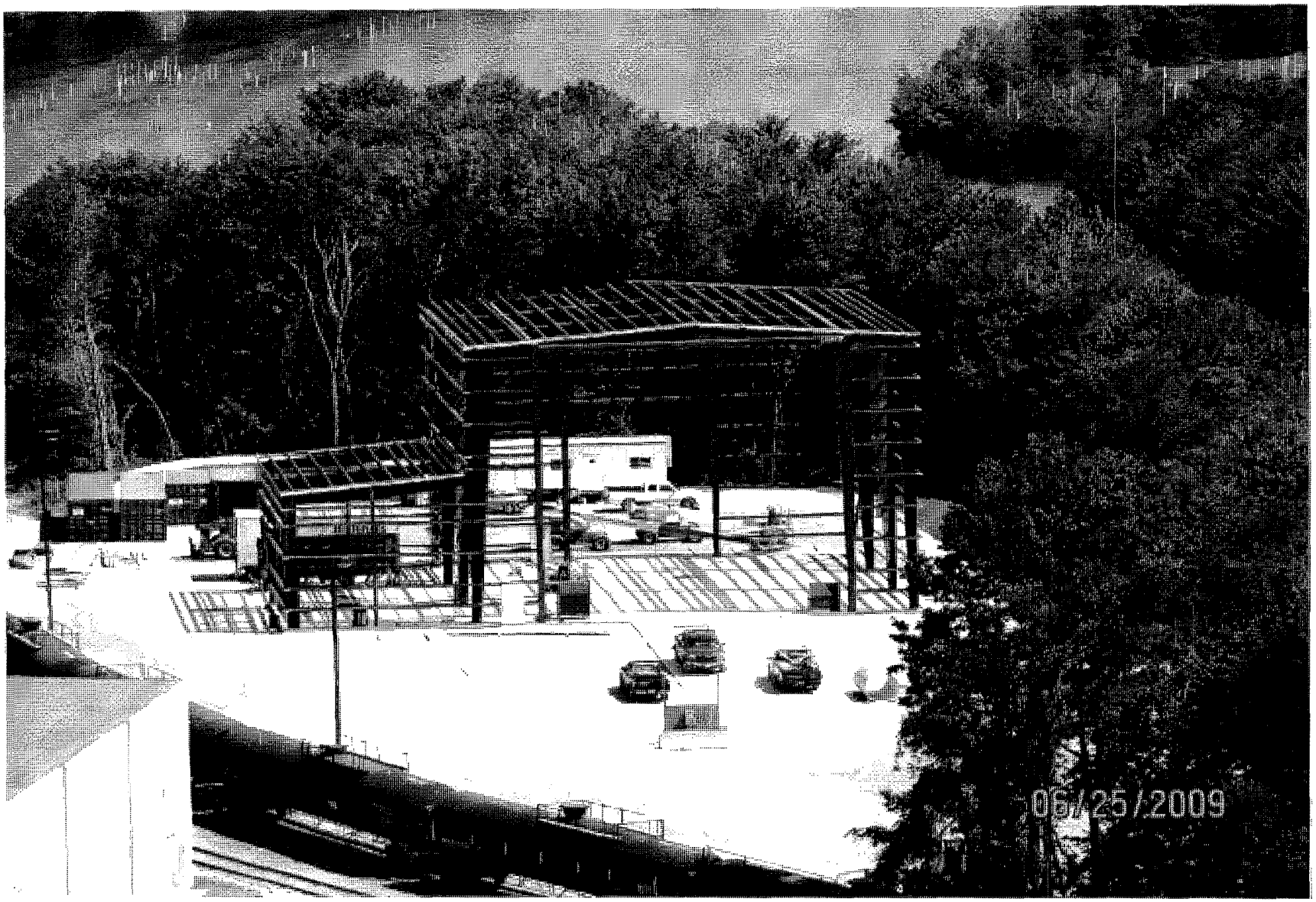


June 4, 2009 Start of Concrete Placement on Chimney Shell



Chimney Shell as of June 25, 2009

Stack Liner Fabrication Area



Major Foundations for the FGD Building including the Absorber Vessel

Merrimack Station

Unit 2

Activated Carbon Injection - Overview and Status

- Sorbent Injection Trial Results and background
- DOE Project Excerpts

Merrimack Unit 2 - Sorbent Injection Trial to Reduce Mercury Emissions Jan-05

Test Results as presented by Sorbent Technologies (STC) November 2005

Method	Initial Summary of Results - Nov 05	Revised Summary or Results- Jan 05	Change in Mercury Emissions Reduction	
SCEM (semi continuous emissions monitoring)	29%	29%	No change	
OHM (Ontario-Hydro method)	43%	11%	-32%	note 3
Method 324 (EPA alternative method)	25%	26%	1%	

Notes-

1. Changes were a result of the QA/QC (quality assurance/quality control) process required and completed by NHDES.
2. Three measurement testing methods were used. Both the OHM and Method 324 were stack/duct testing methods sub-contracted by STC.
3. A number of analysis and reference errors by sub-contractor completing the OHM method were identified by NHDES.

   This correction resulted in significantly less mercury removal calculated by this method.

The corrected data shows mercury removal during the trial was 20%+/-10%

Evaluation of Control Strategies to Effectively Meet 70 –90% Mercury Reduction

PSNH Merrimack Station
Site Project Kickoff Meeting

August 24, 2006

Jean Bustard, Tom Campbell - ADA-ES, Inc.
Bill Smagula, Paul Raichle, Laurel Brown - PSNH

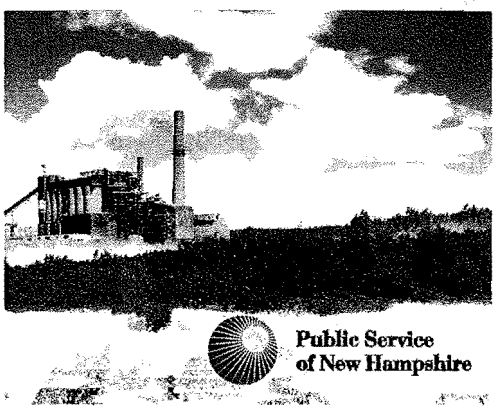
DOE/NETL Project Manager: Andrew O'Palko

Merrimack Unit 2

MK2: 335 MW

Coal: Eastern Bit and Venezuelan Blend
~50/50 split
1.0 – 1.3% sulfur
(1.2%S is current target)

Cyclone Boiler
SCR
C-ESP



ADA-ES

Project Goals

- Evaluate the capability of SO_3 tolerant sorbents to achieve 70 to 90% mercury removal
- Evaluate the effect of co-benefits from SO_3 mitigation on mercury control, and the balance of plant benefits from lowered flue gas temperatures of increased plant efficiency and overall reduced emissions
- Evaluate the impact of sorbent injection on ash disposal
- Support the education and transfer of information and results to local and state interests groups

ADA-ES

DOE Areas of Interest

- Testing with a cyclone boiler
  - *Limited testing data from Sorbent Technologies available from Summer 2005*
- High flue gas temperatures (330 - 350°F)
- Smaller SCA ESPs
- New SO_3 tolerant activated carbons
- Effect of different coal blends on mercury removal
- New technologies??? (Mobetec/MinPlus)

ADA-ES

Project Tasks

1. Pre-Test Planning
2. Design for site-specific needs and install equipment
3. Field testing
   - Sorbent Screening Tests
   - SO_3 Co-Benefits Analysis
   - Baseline testing
   - Parametric testing
   - Choose Long-Term Test Parameters
   - Long-term testing
4. Coal, Ash, and By-Product Sample Evaluation
5. Technology Transfer
6. Management and Reporting

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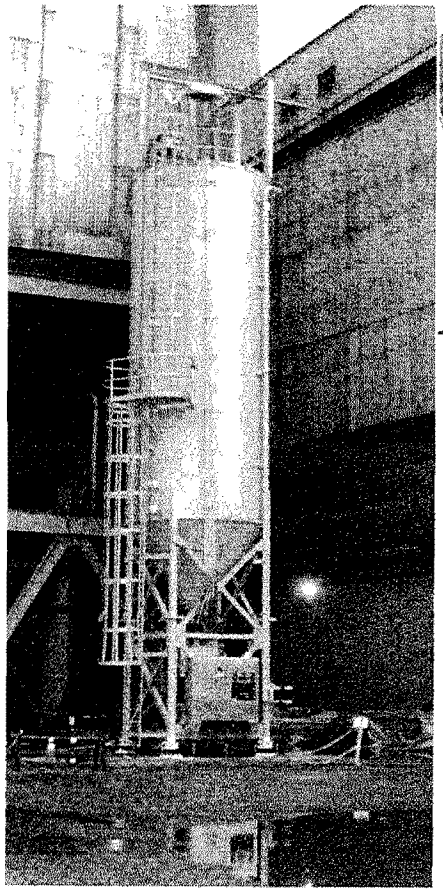
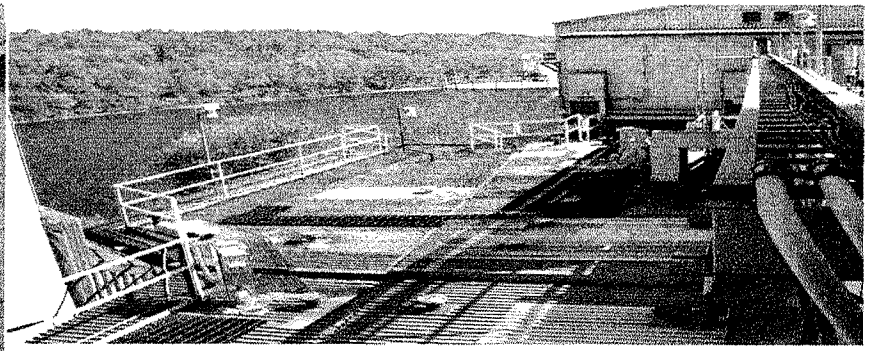
Evaluation of Sorbent Injection for Mercury Control





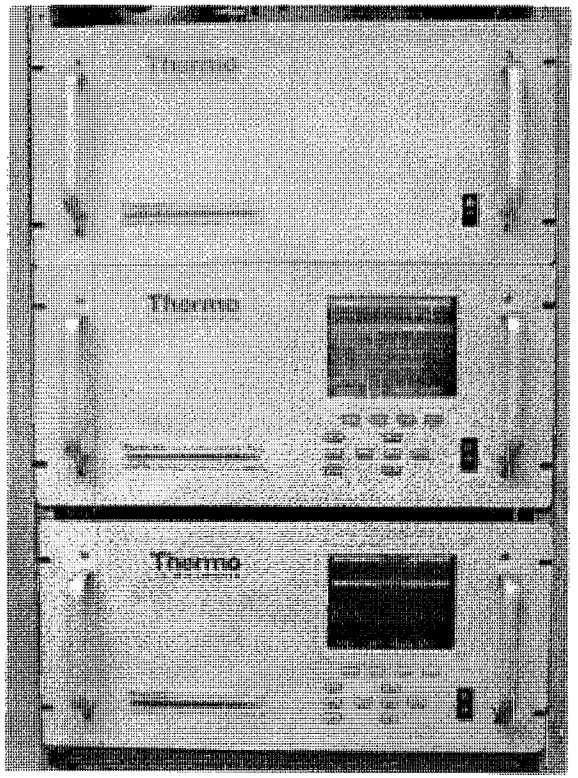
NETL
NATIONAL ENERGY TECHNOLOGY LABORATORY

Public Service of New Hampshire

The Northeast Utilities System

Project Review 2007

June 26, 2007



DOE Cooperative Agreement DE-FC26-06NT42780
DOE/NETL Project Manager: Andrew O'Palko

ADA-ES

Mercury Control Evaluations: ACI Timeline

Pilot Testing

1991 — **EPRI**: Comanche

1995 — **EPRI:** Hudson
DOE/EPRI: Comanche

EPRI: Boswell, Sherco, Pleasant Prairie
Nanticoke, Miller, Coal Creek, Others
DOE/EPRI: Valley, Powerton

2001 — **DOE Phase I:** Pleasant Prairie, Gaston, Salem Harbor, Brayton Point)
EPRI: Abbott, Laskin, Stanton, Coal Creek
DOE Gaston

Full-Scale Testing

2004 — **DOE Phase II:** Holcomb, Stanton, Yates, Meramec, Leland Olds, Laramie River, St. Clair, Buck, Monroe, Antelope Valley, Conesville, Independence, Big Brown, Council Bluffs,Louisa, Dave Johnston, Portland, Lee, Miami Fort

2006 — **Industry:** Multiple
DOE CCPI: Presque Isle
DOE Phase III: Hardin, Hawthorn, Mill Creek,

2008 — Limestone, Merrimack **Commercial:** 10+

DOE: No funding for 2008

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Mercury Control Evaluation: PSNH Merrimack

2006

DOE Phase III Award: Merrimack

Kick Off Meeting, Test Plan
Equipment Procurement

Baseline: October
Co-Benefit: October - November
Parametric: November

2007

Parametric: January - March

Balance of Plant: March
PAC Silo Install: May - June

Long Term Test: June

2008

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Why Merrimack?

- Cyclone Boiler: relatively small fleet
  - Different Combustion Process
  - Different Ash Characteristics
- SCR: Flue gas characteristics
- High Flue Gas Temperatures
- Dual Particulate Collection Devices: ESPs

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Laboratory/Pilot Scale Studies

- Performance of Powdered Activated Carbon (PAC) influenced by the flue gas characteristics
  - APC Configuration
  - Coal Type
    - Halogen content (Cl, Br, other)
    - Sulfur content (SO_3)
  - Flue Gas Temperature
  - SO_3
    - From coal
    - SCR
    - Flue gas conditioning

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Baseline Results

- Hg varies (range was 5 to 10 µg/m^3 from Aug 06 through Jan 07)
- No removal across the ESP
  - Based on CEM, STM
  - Low Hg levels in ash analysis (10 ppb)
- OH within 20% of Baseline CEM and STM results
- On and off site analysis of STM traps correlate well with inlet CEM
- >80% Oxidation of Mercury

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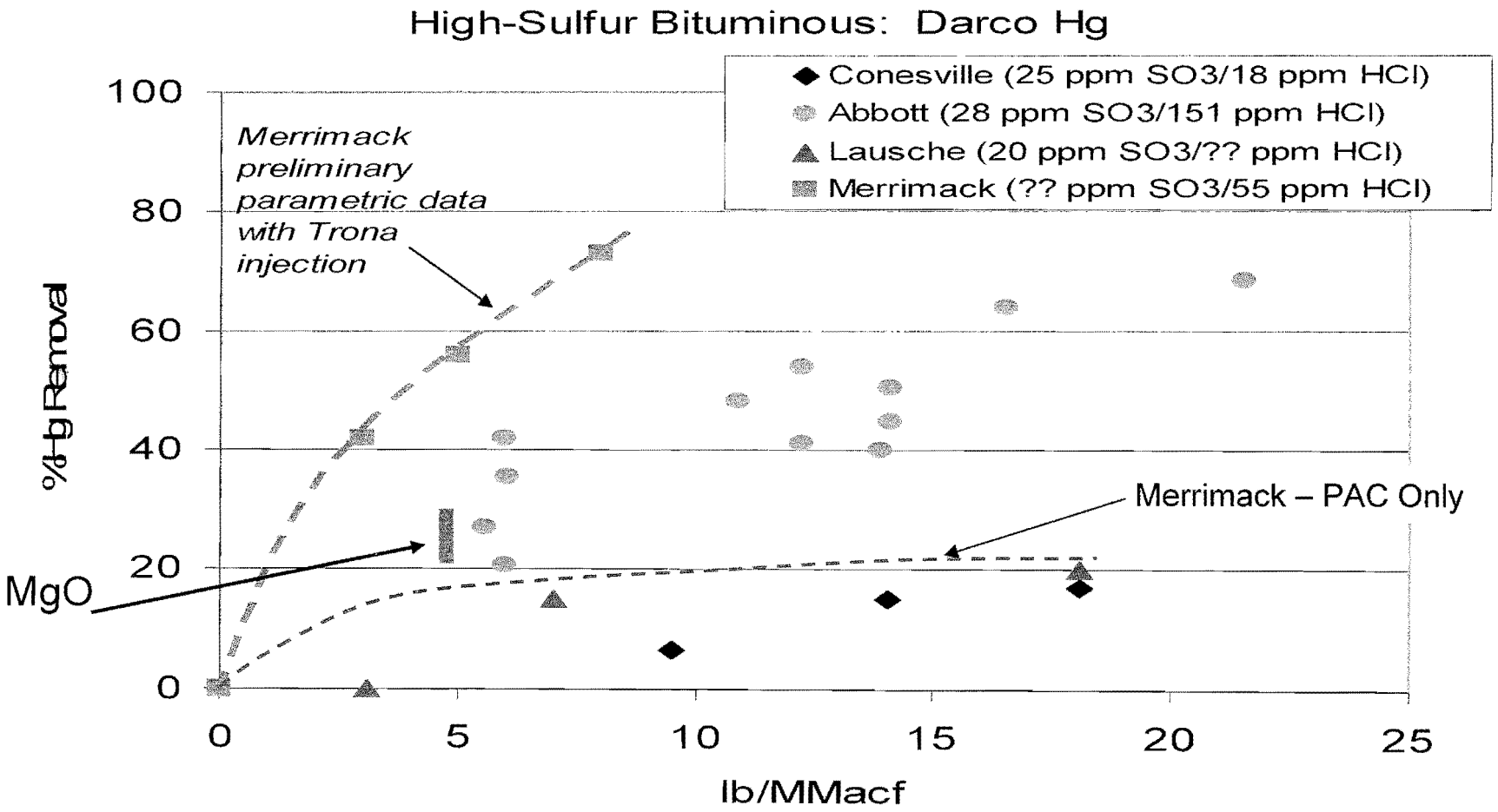
Parametric Test Results



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Issues Remaining for Merrimack

- Ash Disposal
  - Plant has set up a schedule to dispose of the ash from the Original and Supplemental ESP hoppers separately
- NSR triggers – PM: 25ton/yr - ~7lb/hr – 98% ESP eff.
- Balance of Plant
  - Long term effects

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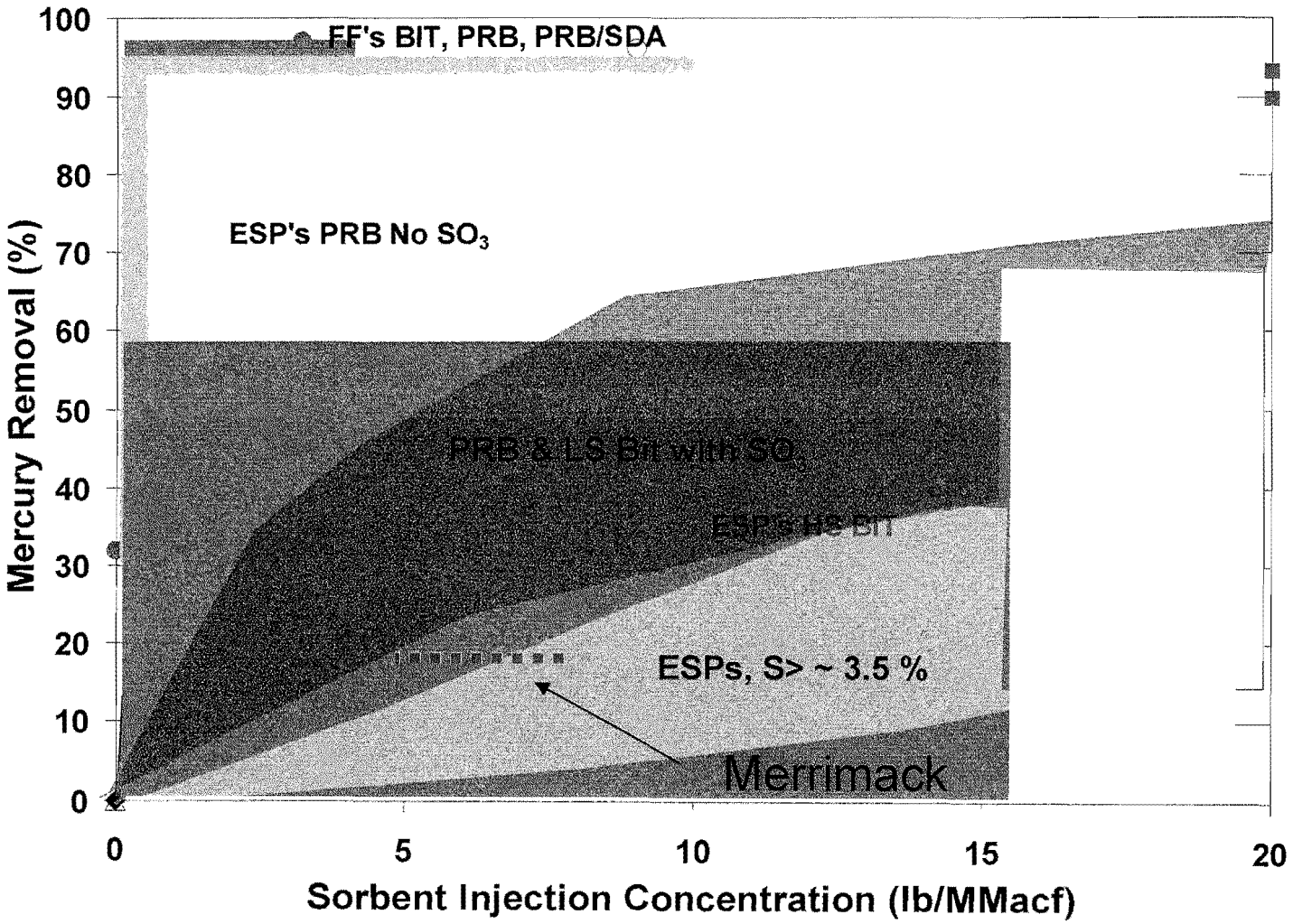
Mercury Reduction Trends with ACI on FF's and ESPs



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Ongoing Testing

- PAC Performance Enhancements
  - Fine PAC
  - Specialty Carbons and Blends
  - Co-Injection with Alkali Materials
  - Injection Location
- Balance of Plant Issues
  - Additional TOXECON II testing
  - Long Term testing of PAC injection upstream of an APH
  - Additional testing of Adsorbents for SO_3 control
  - General Specifications for TOXECON system designs

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Ongoing Testing

- Ameren's Labadie Power Plant
  - PRB coal
  - ESP
  - SO_3 FGC
- PSNH Merrimack Power Plant
  - E. Bit Coal + Offshore Supply
  - SCR + ESP
- RMP Hardin Generating Station
  - PRB Coal
  - SCR + Dry Scrubber + FF
- We Energies Presque Isle
  - PRB Coal
  - HS ESP + TOXECON

ADA-ES

Questions?

Jean Bustard or Tom Campbell
ADA-ES, Inc.
(303) 734-1727
jeanb@adaes.com
tomc@adaes.com

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PSNH Legislative Update- June 18, 2008*

Update relative to the reduction of mercury emissions at PSNH Coal Fired power plants as outlined in HB1673.

As required by HB 1673 (RSA 125-O:13 Compliance- Paragraph IX) PSNH shall report by June 30, 2007 to the legislative oversight committee on electric utility restructuring, and the chairpersons of the house science, technology and energy committee and the senate energy and economic development committee, on the progress and status of:

1) Achieving early reductions in mercury emissions:

DOE Mercury Reduction Project at Merrimack Unit 2

- **Program Schedule Fall 06 – Spring 08**
  - Completed Parametric Testing Nov 2006
  - Completed Long Term Testing April 1, 2008
  - Used various combinations of sorbents to assess effectiveness
  - Varied rates of injections
  - Varied location of injection points
- **Long term Test Evaluations**
  - Long term test – Fall 2007 thru March 2008
  - Equipment performance
  - Balance of Plant Issues
  - Mercury Removal Performance
- **Measurement tools and methods**
  - Completed sorbent trap measurements
  - Installed and monitored Hg CEMs
- **Results of Parametric tests**
  - Initial injection plan 10 – 30%
  - Enhanced injection resulted in a wide variation of results
  - Sustainable results will depend on the ability to resolve balance of plant issues

2) Installing and operating the scrubber technology:

CLEAN AIR PROJECT UPDATE

- **Engineering**
  - Projects defined in 5 major components
  - Specifications developed for 4 key components
- **Commercial and Purchasing**
  - Program Manager Hired Sept 2007
  - Scrubber Island and Chimney proposals are in negotiations
  - Vendor Proposals requested and received for Wastewater Treatment Facility and Material Handling System
- **Review, Permits and Approvals**
  - NHDES – May 12 presentation
  - Temporary Permit expected October 2008
  - Town of Bow –Local permitting
  - Regional Planning Commission
- **Site work**
  - Existing oil tank removed
  - Site surveys and studies completed
  - Warehouse construction underway
  - On-site engineering facilities completed
- **Schedule and Costs**
  - Tie-ins: MK#1 Fall 2012, MK#2 Spring 2013
  - Project Costs will be updated with review of major equipment bids

*year corrected to reflect June 2008 update

PSNH Legislative Update- June 26, 2007

Update relative to the reduction of mercury emissions at PSNH Coal Fired power plants as outlined in HB1673.

As required by HB 1673 (RSA 125-O:13 Compliance- Paragraph IX) PSNH shall report by June 30, 2007 to the legislative oversight committee on electric utility restructuring, and the chairpersons of the house science, technology and energy committee and the senate energy and economic development committee, on the progress and status of:

1) Achieving early reductions in mercury emissions:

DOE Mercury Reduction Project at Merrimack Unit 2

- **Parametric Testing**
  - September – November 2006
  - Used temporary equipment set-ups
  - Used various combinations of sorbents to assess effectiveness
  - Varied rates of injections
  - Varied location of injection points
- **Optimum plan for long term test**
  - Engineered and purchased equipment for long-term test and post DOE use
  - Installed and commissioned new equipment
  - Long term test – June to November 2007
- **Measurement tools and methods**
  - Completed sorbent trap measurements
  - Installed and monitored Hg CEMs
  - Identified testing methods for long-term test including new EPA methods
- **Results of Parametric tests**
  - Initial injection plan 10 – 30%
  - Enhanced injection plan scattering of individual points between 30 – 60%
  - Sustainable results to be determined during long-term test

2) Installing and operating the scrubber technology:

CLEAN AIR PROJECT UPDATE

- **Engineering**
  - Specifications developed for key components
  - Possible Site plan layouts developed
  - Equipment options identified
  - Vendor lists and contacts established
  - Industry impact of high number of scrubber installations analyzed
- **Commercial and Purchasing**
  - Contract Strategy determined and approved
  - Program Manager Specification written
  - Program Manager out to Bid
- **Permits and Approvals**
  - Temporary Air Permit Application submitted to NHDES-ARD June 7, 2007
  - Town of Bow presentations and submittals underway
  - Company financing approvals initiated
- **Site work**
  - Existing oil tank removal completed
  - Site surveys completed
  - South Yard studies completed