COMPREHENSIVE LIFECYCLE PLANNING AND MANAGEMENT SYSTEM FOR ADDRESSING WATER ISSUES ASSOCIATED WITH SHALE GAS DEVELOPMENT IN NEW YORK, PENNSYLVANIA, & WEST VIRGINIA

DavidAlleman, ALL Consulting
Bill Hochheiser, ALL Consulting

NETL Project Kick-off Meeting

January 7, 2010
WHO WE ARE

• ALL Consulting, LLC
  – Formerly Arthur Langhus Lane, LLC
  – HQ in Tulsa, Oklahoma

• Multi-Disciplinary Consulting Firm
  – Energy (oil & gas, regulatory affairs, permitting, planning, & more)
  – Engineering (well and facility design, construction oversight, etc.)
  – Technology (Databases, GIS, Data Mining, Software Development, etc.)
  – Environmental Consultants (Air, Water, and Waste – COMPLETE Services)
  – Planning (NEPA, State Environmental Policy Acts, Resource Management, etc.)

• Shale Gas Expertise
  – Co-author with GWPC on Shale Gas Primer
  – Multiple technical papers and presentations

ALL Consulting
SHALE GAS BASINS OF THE U.S.
MARCELLUS SHALE PLAY
WATER LIFECYCLE ISSUES

• **Withdrawal**: Access to supply sources, timing, permitting, compliance and reporting
• **Transport**: transport options (truck, pipeline, rail), environmental and best practices, cost, timing
• **Storage**: Cost, surface disturbance, permitting
• **Drilling and Fracturing**: Surface handling, produced water mgmt
• **Treatment**: Benefit, Cost, volume of resulting concentrate
• **Reuse/Recycle**: Reuse for HF, other markets for recycled water, demand characteristics (quantity, quality, timing)
• **Disposal**: Availability/permitting of injection zones, capacity at commercial/municipal plants, discharge permits, compliance
LIFECYCLE SYSTEM

• Goals:
  – Ability to analyze impacts and options
  – Regulatory tracking and compliance
  – Plan for future water use and disposition

• Modules addressing:
  – Withdrawal
  – Recycling/Reuse
  – Disposal
  – Etc…
PROJECT PARTNERS

• NY State Energy Research & Development Authority (NYSERDA) ($200K cash cost share)
• Susquehanna River Basin Commission (SRBC) ($50K in-kind cost share)
• Delaware River Basin Commission (DRBC)
Project Advisory Council

• NYSERDA
• SRBC
• DRBC

• Proposed:
  – NY DEC, PA DEP, WV DEP
  – Producers, landowner assoc., local government
  – Others
THREE PHASE PROJECT

- Project started October 1, 2009
- Phase 1: Data collection; initial design
- Phase 2: System design and construction
- Phase 3: Pilot test; final system; distribution; user support
Major Milestones

- Complete initial issue analysis and site visits (9/30/10)
- Complete final system requirements (4/30/11)
- Draft operating water management system for testing (9/30/11)
- Deliver final operating water management system (3/31/12)
PROJECT PHASE I

• Project started October 1, 2009
• Data collection and issues analysis
  – Literature
  – Internet
  – Input from stakeholder groups
  – Compile datasets, documents, maps, and photos
• Begin initial system design
**Phase I-Tasks 1, 2, 3, 4**

- PMP and TSA
- Research Water Issues in the Target Area, Initial System Design and Establish Project Advisory Committee
- Data Collection and Field Site Assessments
- Technology Transfer
  - Project website, presentations and papers
Project Phase II

- System design and development
- Review with PAC and stakeholder groups
- Incorporate PAC/stakeholder input
Phase II-Tasks 5, 6, 7

• Final System Requirements
  – Database tables and key data relationships
  – Module design by phase of water lifecycle
  – Permit tracking and compliance capabilities
• System Development
• Continuation of Technology Transfer
PROJECT PHASE III

- Pilot test with stakeholders
- Incorporate feedback and finalize
- Announce availability through emails, project website, DOE-NETL, and presentations
- Offer user support through FAQs, email, project website, etc.
SYSTEM CAPABILITIES

• Planning and Permit Management
• Compliance tracking
• Economic management: – volumes, costs, and influences on development strategy
• Cumulative impact analysis
• System is a one-stop-shop for management of shale gas water
PROJECT BENEFITS

• Facilitate planning and evaluation by operators and regulatory agencies (Water Management Planning)
• Perform “What If” scenario analyses
• Incorporate/track regulatory requirements of the appropriate state and regional agencies
• Facilitate permit applications, reporting and compliance management
SUSTAINABLE DEVELOPMENT

• Overall, the water volume needed for shale gas development is small and temporary compared to much more long-term, traditional uses such as electrical power generation.

• Management of water resources will influence the pace of shale gas development.

• Sustainable shale gas development will benefit from a toolbox approach to managing water lifecycle issues.

• This project will allow planning and optimization of water management operations.
PROJECT Overview

• Principle Investigator: Dan Arthur, P.E., ALL
• 36 month period of performance
• Total Cost: $1.2 Million   Cost Share: $335K (27%)
## Cost Breakout ($Thousands)

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CONTACT INFORMATION

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