Staying Out of Trouble Meets Doing the Right Thing: DOT Methods for Systematic Environmental Compliance in Construction

AASHTO Construction Meeting
August 2006

Marie Venner
Albert Einstein

“We can't solve problems by using the same kind of thinking we used when we created them.”
Overview

• Recent Trends: Threats/Wake-Up Calls on the Horizon
• Systematic Environmental Process Improvement Efforts in Construction
  – Erosion and Sedimentation Control
  – Commitment Tracking Systems
• Examples:
  – Maryland SHA
  – TxDOT
  – Utah DOT
  – Colorado DOT
Threats/Wake-Up Calls: Consent Decrees!

• Recent Consent Decrees related to Water Quality Violations:
  – Arizona DOT
  – Colorado DOT
  – Hawaii DOT
  – Idaho DOT
  – Maryland DOT-Transit Administration
  – Tennessee DOT
  – Texas DOT

• EPA and State DEPs/EPAs are increasingly active in this area!
What Did the Regulators Find?

- Erosion prevention and sediment controls largely lacking
- Repeated failures to fix a significant ESC problem
- Installed BMPs ineffective
- Lack of BMP maintenance
- Problems on target sites said to be indicative of larger problems
What the Regulators Asked For:

• **Fix immediate site problems** and prepare and submit **restoration plans** for polluted streams and drainage ways, but also in the future:

• **Pre-construction walk-through and stream surveys**, 1 upstream and 4 downstream. **Biologist evaluation**.

• Prepare and **submit plan to assess the degree of sediment contribution from the site & change in pollutant concentrations in a stream**

• **Assess stream conditions**, runoff turbidity/opacity, sediment accumulation
What the Regulators Asked For: (cont.)

- **Determine BMP effectiveness.** Use in-stream gauges. If NTU rise above 25 NTU or other method determined by DEQ from the level of upstream control, DOT will revise BMP strategy.
- **Include special provisions on all projects** for ESC supervisor.
- **Commit to attend public hearings** on DOT permits.
- **Collect storm water samples on projects during storms exceeding .5” and evaluate for TSS.** If more than 40 mg/l, DOT will revise BMP strategy.
- **State 401 certification pending performance on the above.**
- **Establish QA/QC teams and monthly site visits** to assess implementation and ensure prompt corrective action.
Effects on Construction

- Fines
- Bad publicity
- Project shut downs
- Delays
- Rework
- Added inspections, internal and regulatory
What would it take to run an effective, reliable ESC program?

- Organizational commitment/will – communicated policy that this will be a priority.
- Objectives/targets – what is the standard?
- Procedure revisions if necessary
- Monitoring performance – “i.e. establish QA/QC teams and monthly site visits to assess implementation and ensure prompt corrective action…”
- Tracking/documentation
- Feedback to actors, incentives, training
- Revision to whole system as needed
EMS Structure

- ISO 14001:2004
  - Applied as a conceptual model within transportation settings
  - Some use full ISO 14001 with registration
EMS Structure

• **12 Element Compliance Model** (used in Consent Decrees)
  – Environmental Policy
  – Organization, personnel, and oversight of EMS
  – Accountability and Responsibility
  – Environmental Requirements
  – Assessment, Prevention, and Control
  – Environmental Incident and Noncompliance Investigations
  – Environmental Training, Awareness, and Competence
  – Environmental Planning and Organizational Decision-Making
  – Maintenance of Records and Documentation
  – Pollution Prevention Program
  – Continuing Program Evaluation and Improvement
  – Public Involvement/Community Outreach
How WSDOT Did It - Construction EMS for Erosion & Sedimentation Control?

- Serious commitment…
- Inventoried and analyzed existing internal policies, procedures, guidance
- Identified “inadequate standardization.” New specs require all construction contractors to follow regulatory guidelines
- Updated manuals to integrate Program improvements
- Worked with Design Office to create 14 erosion and sediment control Standard Plans — mirror Standard Specs and increase quality of ESC planning efforts
- Training: EC Design, EC Construction Course, Construction Site ESC Certification Course
- Creating compliance evaluation measures to monitor performance, analyze data, and report on Program effectiveness
- Assessment program identifies 1) how well protecting water quality, 2) areas that need improvement, 3) strategies to use in making improvements
WSDOT Environmental Compliance Focus

• Construction regions each have plans for how they will maintain compliance. Plans include:
  – Procedures
  – Training
  – Tracking performance
  – Conducting constructability reviews
  – Commitment tracking

• Construction compliance environmental support staff and environmental training for construction

• Commitment tracking system with tool for matching commitments with Standard Specs, General Special Provisions, Standard Plans, or writing a Special Provision to cover the commitment and ensure it is carried out
PROACTIVE, NOT REACTIVE
"NO LOOSE DIRT"
100'-0 RULE
HAVE WE PLANNED INTO OUR WORK?
- ENVIRONMENTAL HAZARD ANALYSIS
- MAJOR STORM RUN OFF
- INLET PROTECTION
- CONCRETE WASHOUTS
- TRACKING PADS
- SUBCONTRACTOR INVOLVEMENT
MDSHA Erosion & Sedimentation Control

• Stretch goal: 100% compliance on 100% of sites
• New Quality Assurance Rating System
• Inspection Checklist:
  – Project Scope
  – Installation of Controls
  – Maintenance of Controls
  – Stabilization
  – Timely Corrective Action
  – Contractor Proactivity
  – Ratings in each category — incentive/disincentive awarded quarterly based on average QA rating

• Training/Certification Program for contractors, inspectors, and designers. Contractor superintendents and ESC managers will be required to be certified. Revocations may occur for poor performance
• Incentive/Disincentive program
NCDOT Exploration of EMS for Erosion and Sedimentation Control Program – What Gaps Exist? Will it Add Value?

- NCDOT has had a well-functioning, delegated ESC program with:
  - Well-established and communicated policies and procedures
  - Monitoring and tracking of performance
  - Documentation and reporting
  - 3 Levels of ESC training
  - Management oversight, continuous improvement
Virginia DOT – Bringing Together Asset Management, Competency Building, and Performance Assessment

- Virginia’s system will track replacement, note who worked on it, whose skills may need to be improved (maintenance)
- Dramatically increased environmental support in Regions
- Define competency
- Evaluating and building competency

PennDOT’s Transportation University has also focused on defining competency, looking at 10 best in a skill, how they do it, and what is needed to perform well.
Evolution of Environmental Management

DOT and their operations range across the spectrum

- Pursuit of Excellence In Environmental Stewardship
- Sustainable Operations
- EMS/Functional Integration
- Single-focus Systems
- Acceptance & Compliance
- Tolerance
- Denial
State DOT EMS Driving Forces

• **Regulatory Compliance in Construction & Maintenance**
  – Storm Water Management
  – Erosion & Sediment Pollution
  – Pollution Prevention
  – Waste Management
  – Recycling
  – Energy Conservation

• **State-Level Directives on Greening Government**

• **Business Cost Savings**

• **Expedited/Streamlined Program Delivery**

• **Workforce Turnover**
UDOT EMS Focus

Identifying, Communicating, Implementing, and Verifying Implementation of Environmental Commitments from Project Development through Construction, Operation and Maintenance

- Addresses UDOT/FHWA Process Review Findings and Recommendations
- Assisted by Consultant Expertise
- Offers many benefits
Examples of Environmental Commitments for Transportation
Deer Escape Ramps
Landscape
Invasive Species Control
Hazardous Materials/Waste Management and Remediation

Old Landfill Remediation

After Remediation

← Old Landfill Remediation

After Remediation →
Historic Preservation
Bicycle and Pedestrian Facilities
Sediment and Erosion Control

Silt Fence

- 6' height
- 3' wide
- 3' wide filter fabric fastened to post
- Entrench the bottom 12" of silt fence directly in the ground after installation. Firmly placing upward on the top of the fence should not dislodge it.
- 2" square or 6" minimum wood post
- Do not disturb ground on backside of silt fence

Image of silt fence installation on a construction site.
Wetland Mitigation
Participants

• Lead – Central Environmental Unit

• Others involved at Central and Regions:
  – Planning
  – Preconstruction/Standards
  – Design
  – Construction
  – Maintenance
  – Project Management

• Demonstrated commitment and support from Senior Leaders
Environmental Management System (EMS) Work Plan

December 2005

Identifying, Communicating, Implementing, and Verifying Environmental Commitments from Project Development through Construction, Operation, and Maintenance

Prepared with the Assistance of the AASHTO Center for Environmental Excellence
Major Work Plan Elements

• Improve Communication & Coordination
• Develop Tracking System Tools for Implementing Commitments
• Include a Summary of Environmental Commitments in Project Plans
• Provide Training
Resources and Schedule

- EMS to be developed in course of normal duties by June 2006
- Activities Include:
  - Product development
  - Reviews
  - Rollout in regions
  - Training
- Implementation through February 2007
Tracking System Tools

• Summary Sheets listing environmental commitments will ensure that all commitments are communicated to design staff phase, implemented in construction and tracked in maintenance.

• Environmental Commitment Summary/Approval Sheets:
  – Project Plan Set
  – Construction Crew
  – Maintenance Crew
Project Example: New Interchange
### Summary Sheet for Project Plans:

#### Environmental Commitment Summary Sheet

**Reference Post 13 Interchange on I-15 in Washington County**

<table>
<thead>
<tr>
<th>Subject</th>
<th>APPLNS</th>
<th>Brief Commitment Description</th>
<th>Plan Sheet Reference</th>
<th>Specification Reference</th>
<th>Responsible to Implement</th>
<th>PAID Under</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farmlands</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Economic</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restrictions</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right of Way</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pedestrians &amp; Bikes</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Quality</td>
<td>✓</td>
<td>Incorporate BMPs to minimize fugitive dust due to construction activities.</td>
<td></td>
<td></td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>✓</td>
<td>Noise abatement for the City roadway will be considered by Washington City during final design. Noise abatement measures may include walls, noise abatement fences, and landscaping.</td>
<td></td>
<td></td>
<td>Washington City</td>
<td></td>
</tr>
<tr>
<td>Storm Water Quality</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporary Erosion/Sediment</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Measures</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Bodies</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitats</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floodplains</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threatened or Endangered Species</td>
<td>✓</td>
<td>Prior to construction, a wildlife biologist will perform a field survey to determine the presence or absence of desert tortoises within the project boundaries. If tortoises are discovered, they will be relocated to the Red Cliffs Desert Reserve. Right of way fences will include tortoise fencing material to prevent tortoises from entering the highway right of way.</td>
<td></td>
<td></td>
<td>UDOT</td>
<td></td>
</tr>
<tr>
<td>Wildlife</td>
<td>✓</td>
<td>Impacts to wildlife habitat will be minimized by removing only vegetation that occurs within the project right of way necessary for construction. Reclamation and revegetation with native plant species will occur as part of the project.</td>
<td></td>
<td></td>
<td>Contractor &amp; UDOT</td>
<td></td>
</tr>
<tr>
<td>Historic Features</td>
<td>N/A</td>
<td>The prehistoric site and historic site in the project corridor will be “data recovered” in accordance with the approved MOA.</td>
<td></td>
<td></td>
<td>UDOT</td>
<td></td>
</tr>
<tr>
<td>Archeological or Paleontological Features</td>
<td>✓</td>
<td>Due to a high probability of tracks, vertebrate fossils, and plant material in the Kayenta Formation, a qualified paleontological monitor will be present during excavation activities.</td>
<td></td>
<td></td>
<td>UDOT</td>
<td></td>
</tr>
<tr>
<td>Hazardous Waste</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>✓</td>
<td>A Public Information program will be implemented to inform the community of construction activities.</td>
<td></td>
<td></td>
<td>Contractor &amp; UDOT</td>
<td></td>
</tr>
<tr>
<td>Permits</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastewater 404</td>
<td>N/A</td>
<td>a. National Permit b. Individual Permit</td>
<td></td>
<td></td>
<td>UDOT</td>
<td></td>
</tr>
<tr>
<td>Stream Alterations</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPDES</td>
<td>✓</td>
<td>Since the project disturbs an area greater than 1 acre, a UPDES Permit will be required for the project. BMPs will be implemented to control erosion and sediment generated from construction activities.</td>
<td></td>
<td></td>
<td>Contractor &amp; UDOT</td>
<td></td>
</tr>
<tr>
<td>Construction Permit</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland/Stream Alterations</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PF/CAFRA Approval Order</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ICF International. Passion. Expertise. Results. 36 icfi.com
## Summary & Approval Sheet for Construction:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Brief Commitment Description</th>
<th>Plan Sheet Reference</th>
<th>Specification Reference</th>
<th>Responsible to Implement</th>
<th>Commitment Complete &amp; Approved By</th>
<th>Date Approved</th>
<th>Issues or Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>Incorporate SHM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise</td>
<td>Noise abatement during Final or reduced speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threatened or Endangered Species</td>
<td>Prior to control detrimen the boundaries of CDF's Desert R. material to pre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife</td>
<td>Impacts to wildlife habitat will be minimized by removing only vegetation that occurs within the path of right of way necessary for construction. Reclamation and revegetation with native plant species will occur as part of the project.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Historic Features</td>
<td>The prehistoric and historic site in the project corridor will be “data recovered” in accordance with the approved MOA.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Archeological or Paleontological Features</td>
<td>Due to a high probability of tracks, vertebrate fossils and plant material in the Kayenta Formation, a qualified paleontological monitor will be present during excavation activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>A Public Information program will be implemented to inform the community of construction activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPDES</td>
<td>Since the project disturbs an area greater than 1 acre, a UPDES Permit will be required for the project. BMPs will be implemented to control erosion and sediment generated from construction activities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Environmental Commitment Summary & Approval**

Reference Post 13 Interchange on I-15 in Washington County

Note: Refer to the "Environmental Commitment Summary Sheet" for the list of commitments.
## Commitment Tracking Sheet for Maintenance:

### Environmental Commitments Managed by Maintenance

**Reference Post 13 Interchange on I-15 in Washington County**

*Note: Contact the Region Environmental Engineer/Manager for work activities in wetland mitigation sites and next to natural waterways.*

<table>
<thead>
<tr>
<th>Subject</th>
<th>Brief Commitment Description</th>
<th>State Route</th>
<th>Reference Point/Location</th>
<th>Responsibility</th>
<th>Inspection Date</th>
<th>Status, Issues &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatened or Endangered Species</td>
<td>Prior to construction, a wildlife biologist will perform a field survey to determine the presence or absence of desert tortoises within the project boundaries. If tortoises are discovered, they will be relocated to the Red Cliffs Desert Reserve. Right of way fence will include tortoise fencing material to prevent tortoises from entering the highway right of way.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Permits:

- Wetland
  - a. N/A
  - b. In Stream
  - c. In Stream

<table>
<thead>
<tr>
<th>Subject</th>
<th>Brief Commitment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threatened or Endangered Species</td>
<td>Prior to construction, a wildlife biologist will perform a field survey to determine the presence or absence of desert tortoises within the project boundaries. If tortoises are discovered, they will be relocated to the Red Cliffs Desert Reserve. Right of way fence will include tortoise fencing material to prevent tortoises from entering the highway right of way.</td>
</tr>
</tbody>
</table>
EMS Benefits

• Improved communication of environmental commitments
• Demonstrated environmental stewardship
• Streamlined project delivery
• Reduced expenditures and schedules
Colorado Department of Transportation

- Environmental Stewardship Guide – 2005
  - Environmental Ethics Statement
  - Approach
    - Early consideration of environmental issues
    - Involvement and consultations with affected parties and agencies
    - Framework for ongoing cooperation and collaboration

Colorado Department of Transportation

• As part of the strategy, three environmentally related objectives have been adopted:
  – Ensuring that investments in the transportation system sustain and/or improve quality of life;
  – Ensuring environmental stewardship of the transportation system; and
  – Implementing transportation improvements that enhance the quality of life and promote community values.

• A plan to follow CDOT’s objectives and the activities and action items stemming from them is consistent with building an EMS.

• CDOT has embarked on separate EMS development projects for:
  – Stormwater management
  – Office operations

• And is considering EMS development for:
  – Maintenance and operations
  – Potential long term adoption in other areas across the DOT
CDOT Stormwater EMS

• Stormwater management programs
  – Construction (starting here - others to follow)
  – Illicit discharge
  – Post construction
  – Industrial facilities
  – Facility runoff control
  – Herbicides / pesticides
  – Public street maintenance
  – Maintenance of structural controls
  – Wet weather monitoring

• EMS developed using AASHTO EMS model

• Areas where implementation activities will focusing
  – Improved training and communication
  – Ensure that monitoring and performance standards are met
  – Develop feedback and corrective action processes
  – Formal review and continual improvement
CDOT Office EMS

• Developed in keeping with Governor’s Greening of State Government initiative and CDOT environmental stewardship guide

• The Office EMS focuses on activities in such areas as:
  – Transportation
  – Purchasing
  – Energy and water conservation
  – Waste minimization

• Initial EMS rollout in a portion of Head Office to build awareness and an EMS model for other CDOT offices

• EMS is a simplified version of Plan-Do-Check-Act
**TxDOT’s EMS Includes Already Developed Commitment Tracking System (ETS + EPIC)**

- Enables tracking of issues/commitments, comments, permits requested, public involvement, agency coordination, re-evaluation/revisions and section 4(f)s from an easily navigable window.
- Facilitates project circulation to sections within the Environmental Division.
- Enables remote project entry and project status queries by district environmental coordinators.
- Automatically flags projects that have surpassed predetermined circulation periods within the Environmental Division.
- Allows tracking of project-specific and environmental section-specific information.
- Facilitates monitoring of environmental commitments.
TxDOT CTS Highlights cont.

- TxDOT has created four levels of access:
  - ADMIN – Administration, for user with administrative responsibilities
  - ENV – Environmental Users: Project managers, Project manager supervisors, Section reviewers
  - DIST – District: Environmental Coordinators & Supervisors
  - READ ONLY – Anyone who requests access for the purpose of viewing only
- The Design division reviews EPIC to determine if all Environmental Permits, Issues and Commitments (EPIC) are addressed in project plans.
- TxDOT envisions adding functionality to fully automate the ETS, including central repositories for:
  - Facility surveys with the ability to make compliance updates online;
  - Environmental policies and procedures
  - Job descriptions outlining how to perform environment related job duties.
## Evaluation of Commitment Tracking Systems

<table>
<thead>
<tr>
<th>Functional</th>
<th>Kentucky</th>
<th>Illinois</th>
<th>Maryland</th>
<th>New York</th>
<th>Texas</th>
<th>Washington</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track Commitments</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Prioritize Commitments or Actions</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Categorize Commitments (including commitments other than environmental)</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Commitment Checklist</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Track Permits</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>Filter, Sort, and Search to View Commitments and Permits</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Automatic Notifications (i.e.: send notification when prior to permit due date)</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Automatic Escalating Notifications</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>User Initiated Notifications</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Store Microsoft Word and Adobe PDF Documents</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>Document Management Version Control</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Document Scanning</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Ad-hoc Reporting</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>Standard Reports (i.e.: for annual reporting to regulatory agencies)</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
</tr>
<tr>
<td>GIS compatible</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Integrated with Project Management System</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
</tr>
</tbody>
</table>

## Technical Specifications / Non-functional

<table>
<thead>
<tr>
<th>Web-based</th>
<th>Kentucky</th>
<th>Illinois</th>
<th>Maryland</th>
<th>New York</th>
<th>Texas</th>
<th>Washington</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle/SQL Server database</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td>Enterprise Level Capacity (No limits to the number of users or commitments)</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Scalable (More users can be added without affecting performance)</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Flexible Security (i.e.: role-based)</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Shared with other organizations</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

- ● Fully meets requirement
- ○ Partially meets requirement
- ○ Doesn’t meet requirement
Points of Contact

• Michael DeWit
  Project Manager, ICF International
  (905) 274 0391 – Washington D.C. and Toronto
  mdewit@icfi.com
  http://www.icfi.com
  http://www.icfi.com/Markets/Environment/enviromanagement.asp

• Marie Venner
  Principal, ICF International
  (303) 798-5333 - Denver
  mvenner@icfi.com; marie.venner@earthlink.net