SLIDES: Innovative Best Practices for the Western Slope: Stormwater Management Solutions and Philosophy for the Oil and Gas Industry

Kyle N. Schildt

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Presentation to:

Innovative Best Practices for the Western Slope

Stormwater Management Solutions and Philosophy for the Oil & Gas Industry

October 14, 2009

Presentation by:

LT Environmental, Inc.
Why Stormwater Matters

- Water is a precious resource that must be protected.
- Flood-defensive measures will protect life, property and your investment (roads, pads, associated delays).
- Clean Water Act mandates regulatory compliance.
Four Stages in Management

- Planning
- Design
- Construction
- Inspection
Stage 1: Planning

Identify the primary considerations

- Can you improve your situation by moving pad location or access point?
- Proximity to U.S. or State waters and/or wetlands
- Neighboring homes and property
- Who is the Stormwater Manager? What is the team?
- Overall goal is to have cost efficient, low maintenance, easily implemented and functional Best Management Practices.
Stage 2: Design

Determine your Constraints

- **Siting restrictions**
  - Terrain
  - Nearby existing pipelines/utilities
  - Cattle and wildlife

- **Climate / Hydrology**
  - Decide best analysis methods and data source
  - Runoff factors include watershed size, slopes, soil type/saturation, vegetative cover and area of disturbance/construction limits

- **Length of service**
  - Balance likelihood of storm event with cost. What if design storm is exceeded?

- **Effect on business operations**
  - Installation/maintenance interfere with operations? Traffic control needs?
Stage 3: Construction

Field Installs Meet Design Intent

- Hire a contractor with stormwater experience.
- Precise site data not always readily available.
- Construction staking typically not done (nor necessary).
- Stormwater team must understand drainage and construction standards.
Stage 4: Inspection

Eyes in the Field

- **Routine Inspection (14-day typical)**
  - Regulatory required from construction start
  - Assures continued operational success of your investment

- **Post-Storm Inspection**
  - Regulatory required from construction start
  - Compares design intent to “real world”

- **Post-Construction**
  - Update SWMP and as-builts to reflect field modifications to design
  - Assure design intent has been met

- **Record Keeping**
Western Slope BMPs

Roadside Diversion Ditch & Culverts

- Direct runoff where you want it to go
  - Stabilize channel
  - Stabilize outfall
- Size appropriately
  - Culverts to handle “major” storm event (as determined by engineer)
  - Minimizes flooding hazards to life and property
- Provide Inlet & Outlet Protection
Western Slope BMPs

Sediment Traps & Basins

- **Traps contain minor flows**
  - Reduces runoff rates
  - Promotes sedimentation
  - Compact design with multiple in-line traps for tight fit

- **Basins contain 2-year, 24-hour storms**
  - Per EPA (engineer’s discretion)
  - Minimizes minor-storm flooding
  - Promotes sedimentation
  - Larger in surface area than traps
  - Landowner concerns – livestock and wildlife friendly
Western Slope BMPs

Mulch, Hydromulch, Erosion Control Blankets & Turf Reinforcement Mats

- Promotes efficient re-vegetation
- Immediate temporary stabilization
- Stabilize high-flow channels
- Stabilize large cut/fill slopes
Stormwater Philosophy

- Public health, safety and welfare must come first.
- Solutions must be feasible; stormwater team must work to strike the appropriate equilibrium between necessary improvements and potential injury or damages.
- Place checks-and-balances at the planning stage, towards the middle and near completion of the project.
- Focus on team effort rather than “who’s responsible?”.
- Be Results-Driven
  - Innovation not necessary – does not need to be fancy, only needs to work!
  - Each stage needs attention or else failure will result; follow-through is critical.
  - Keep the “big picture” in mind.
Thank you!