Unconventional Gas Regulations & the Environment

State Regulatory Perspective: Pursuing a Working Regulatory Model for Shale Gas

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1) Background on Oil and Gas in Colorado

2) Colorado’s Legal and Regulatory Structure

3) Key Elements of Colorado Approach
Background on Oil and Gas Development in Colorado
Historic Oil and Gas Development in Colorado
Active Oil and Gas Basins in Colorado
Active Oil and Gas Wells in Colorado
Colorado Oil and Gas Industry at a Glance

• Ranked 9th in US for oil production, 5th for natural gas

• 51,929 Active Wells, 33,000 “plugged/abandoned” wells

• Produced 64 million bbls in 2013 - all-time high

• Approve ~300 drilling permits each month, most within 35 days
Colorado Natural Environment at a Glance

• 55 mountains over 14,000 feet

• 42 State Parks, 4 National Parks, 41 Wilderness Areas

• 12,000,000 annual skier visits

• Over 1 million fishing licenses and 650,000 hunting licenses sold annually
Recent Rapid Increase in Drilling

**HISTORIC ANNUAL COLORADO DRILLING PERMITS  04-02-14**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Drilling Permits</th>
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<tbody>
<tr>
<td>1996</td>
<td>1,002</td>
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<tr>
<td>2004</td>
<td>2,915</td>
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<td>2007</td>
<td>6,368</td>
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<td>2008</td>
<td>8,027</td>
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Legal and Regulatory Structure for Oil and Gas Development
Oil and Gas Conservation Act

“Foster the responsible and balanced development of Colorado’s oil and gas resources in a manner consistent with protection of public health, safety, and welfare, including the environment and wildlife resources.”

- Creates Oil and Gas Conservation Commission
  - 9 members, appointed by Governor, serve 4-year terms
  - 95 member staff to issue permits, inspect facilities

- Broad jurisdiction over oil and gas “operations,” along with role in preventing “waste” of resource

- Local government jurisdiction over noise, traffic, other nuisance impacts
Significant Changes to Law in 2007

- **WAS:** Commission to “promote development” in 2006
  - **NOW:** Commission to “foster responsible, balanced development.”

- **WAS:** Industry held 5 of 7 seats on Commission in 2006
  - **NOW:** Industry holds 3 of 9 seats on Commission (33%)

- **WAS:** 49 employees at Commission in 2006
  - **NOW:** 95 employees at Commission

- **WAS:** Decisions by Commission staff only in 2006
  - **NOW:** Consultation with health and wildlife officials where appropriate
Rules Amended in 2008 to Reflect these Changes in Law

100 Series: Definitions
200 Series: General
300 Series: Drilling, Development, and Abandonment
400 Series: Units, Enhanced Recovery, and Storage
500 Series: Hearings
600 Series: Safety
700 Series: Financial Assurance and Bonding
800 Series: Aesthetic and Noise
900 Series: Waste management
1000 Series: Reclamation
1100 Series: Pipelines
1200 Series: Wildlife Protection
Rules Continue to Evolve to Address New Concerns

• What is in Hydraulic Fracturing fluid, and is it safe?

• Will my groundwater be impacted by drilling and hydraulic fracturing?

• How close should facilities be to homes, schools, hospitals, etc?

• What is going into the air, and what effect will it have on my family’s health?
Colorado’s Approach to Protecting Citizens and the Environment
1) **Active Engagement with Affected Parties**

- **Local Communities**
  Local Government Designee program

- **Citizens**
  Public comment on drilling permit applications
  Operators meet with affected citizens

- **Stakeholders**
  Consultation with health and wildlife officials
2) **Ensure Protection of Environment & Communities**

- **Well-Construction Rules**
  - Cementing and surface casing
  - Cement bond logs and Mechanical Integrity Tests
  - Bradenhead testing during hydraulic fracturing

- **Site Permitting Rules**
  - Review for proximity to surface waters, dwellings, etc.
  - Evaluate presence of valuable wildlife habitat
2) **Ensure Protection of Environment & Communities**

(cont.)

- **Air Emission Rules**
  - First in US to require detection and reduction of methane emissions
  - Must identify and repair leaks from facilities
  - Will reduce methane emissions by 65,000 tons/year

- **Waste Management Rules**
  - Waste pits must be lined to prevent groundwater contamination
3) **Address Concern about Contamination**

- Must maintain Chemical Inventories and disclose chemicals used in Hydraulic Fracturing
- Must disclose Hydraulic Fracturing fluids
- Must report spills greater than 1 bbl
- Must sample groundwater to detect any releases
4) **Encourage Innovation in Oil and Gas Sector**

- Water Recycling and Reuse
- On-site use of produced gas rather than diesel engines
- Capture of flared gas from tanks at multi-well pads
- Landscape-scale planning of facilities
- Horizontal Offset Wellbore Policy
5) **Ensure Local Enjoyment of Economic Benefits**

- Operators pay local property tax
- Operators pay State Severance Tax
- Operators partner with local communities and NGOs to address community needs
6) Ensure Adequate Resources for Regulatory Agencies

- Support from Colorado Governor and Cabinet
- Sufficient inspection staff to meet expectations
- Robust Enforcement Program
- Adequate Penalty Authority
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