OIL & GAS FLOWLINES: INSTALLATION, OPERATION AND REGULATION

Mark Schlagenhauf P.E., Engineering Integrity Supervisor, COGCC (Part 1)

and

Jake Janicek, EHS Professional, Caerus Oil and Gas L.L.C. (Part 2)

April 6, 2017 Energy Advisory Board
Part 1: Mark Schlagenhauf

FLOWLINE LAW and REGULATIONS
Statutes
PETROLEUM OR OTHER OILS.

An Act

TO PROHIBIT THE EMPTING OR RUNNING OF OIL OR PETROLEUM, OR OTHER OLEAGINOUS SUBSTANCE, INTO ANY WATERS OF THIS STATE, AND TO IMPOSE A PENALTY FOR THE VIOLATION OF THIS ACT.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. If any person or persons, corporation or corporations, shall hereafter empty or cause to be emptied, or allow the emptying or flowing of oil, petroleum or other oleaginous substance into any of the waters of this State, or deposit or cause the same to be deposited at such distance that the same may be carried into such waters by natural causes, such person or persons, corporation or corporations, so offending shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine not exceeding one thousand dollars, or imprisonment in the county jail not exceeding six months, or both such fine and imprisonment, for each such offense.

Approved March 7, 1889.
Colorado Oil & Gas Conservation Act
(Title 34, Article 60)

• Gave COGCC “the authority to require: [c]ertificates of clearance in connection with the transportation and delivery of oil and gas or any product and; [m]etering or other measuring of oil, gas, or product in pipelines, gathering systems, loading racks, refineries, or other places.” § 34-60-106(1)(i-j)
1994: Senate Bill 94-177

• 1994 Amendment to the Colorado Oil and Gas Conservation Act
• Declared it in the public interest to foster oil and gas development “in a manner consistent with protection of public health, safety, and welfare.” §34-60-102(1)
• Increased COGCC membership to 7, including at least 2 commissioners with “formal training or substantial experience in agriculture, land reclamation, environmental protection, or soil conservation.” §34-60-104(2)(a)
Senate Bill 94-177

- Assigned COGCC “the authority to regulate: [oil and gas operations so as to prevent and mitigate significant adverse environmental impacts on any air, water, soil, or biological resource resulting from oil and gas operations.”” § 34-60-106(2)(d)

- Required COGCC, in consultation with state agriculture authorities, to “promulgate rules to ensure proper reclamation of the land and soil affected by oil and gas operations and to ensure the protection of the topsoil of said land during such operations.” § 34-60-106(12)
Senate Bill 94-177

- Defined “Oil and Gas Operations” in part as production operations “including the installation of flowlines § 34-60-103(6.5)
Pipeline Regulators

- PHMSA-Federal DOT
- PUC-State
- CDPHE-State
- COGCC-State
Rules
1100 Series: Flowline Regulations

• “FLOWLINES,” which the 100 Series define to mean “those segments of pipe from the wellhead downstream through the production facilities ending at: In the case of gas lines, the gas metering equipment; or in the case of oil lines the oil loading point or LACT unit; or in the case of water lines, the water loading point, the point of discharge to a pit, the injection wellhead, or the permitted surface water discharge point.
1100 Series: Flowline Regulations

• 1101. Installation and Reclamation
  a) Material
  b) Design
  c) Cover
  d) Excavation, Backfill, and Reclamation
  e) Pressure Testing
1100 Series: Flowline Regulations

- 1102. Operations, Maintenance, and Repair
  a) Maintenance
  b) Repair
  c) Marking
  d) One Call Participation
  e) Emergency Response*

* Added in 2005 to require emergency response plans where gathering lines fall under USDOT jurisdiction.
1100 Series: Flowline Regulations

• 1103. Abandonment
  – Required abandoned lines to be disconnected, purged, depleted to atmospheric pressure, and sealed
    * Cut off depth requirement added in 2002
    * Abandonment requirements extended to compressor and gas plant feeder pipelines in 2002
600 Series Safety Regulations

• 605.d. **Mechanical Conditions.** All valves, pipes and fittings shall be securely fastened, inspected at regular intervals, and maintained in good mechanical condition.
900 Series E&P Waste Management

- 906. SPILLS and RELEASES
906b. Reporting Spills or Releases

• A spills/release of any size that impacts or threatens to impact any waters of the state, a residence or occupied structure, livestock, or public byway;
• A spill/release in which one (1) barrel or more of E&P Waste or produced fluids is spilled or released outside of berms or other secondary containment;
• A spill/release of five (5) barrels or more
906d. Spill/release prevention and evaluation

- 906.d. (1) **Secondary containment.**
- 906.d. (2) **Spill/release evaluation.** Operators shall determine and document the cause of a spill/release of E & P Waste or produced fluids and, to the extent practicable, identify and timely implement measures to prevent spills/releases due to similar causes in the future.
APRIL IS DIG SAFELY MONTH

• “811, know what’s below, call before you dig”

• WHEREAS, Coloradans recognize the Utility Notification Center of Colorado for its continuing efforts to reduce the incidence of preventable utility damages and so help protect the health and prosperity of our state;

• Therefore, I, John W. Hickenlooper, Governor of the entire State of Colorado, do hereby proclaim, forever after, April 2017, as DIG SAFELY MONTH
WHEREAS, damage to Colorado’s underground utilities by excavation and digging projects directly affects the safety and the economic welfare of our people and communities; and

WHEREAS, Colorado established the One-Call Notification System in 1986 as a fast, easy, and comprehensive way to ensure that underground facilities are properly marked before an excavation project or any digging begins; and

WHEREAS, it is important for excavators, contractors, and homeowners to know that state law requires them to call Colorado 811 (the Utility Notification Center of Colorado) before embarking on any excavation or digging project; and

WHEREAS, during the month of April, the Utility Notification Center of Colorado, in partnership with the Common Ground Alliance, will host activities to raise awareness for the damage prevention industry so as to help put out its message: “811, know what’s below, call before you dig”; and

WHEREAS, Coloradans recognize the Utility Notification Center of Colorado for its continuing efforts to reduce the incidence of preventable utility damages and so help protect the health and prosperity of our state; Therefore, I, John W. Hickenlooper, Governor of the entire State of Colorado, do hereby proclaim, forever after, April 2017, as DIG SAFELY MONTH in the State of Colorado.

GIVEN under my hand and the Executive Seal of the State of Colorado, this first day of April 2017.

John W. Hickenlooper
Governor
Materials

• Steel
• Polyethylene (HDPE)
• Fiberglass
• Composite
Apparent Causes of Flowline Releases
January 1, 2016 - December 31, 2016

- Corrosion: 49%
- Natural Force Damage: 2%
- Incorrect Operation: 12%
- Pipe, Weld, or Joint Failure: 3%
- Equipment Failure: 2%
- Other Outside Force Damage: 1%
- Excavation Damage: 21%
Part 2 Flowline Integrity Program

Jake Janicek
INSTALLATION
EXCAVATION
WELDING
PRIMING
TAPING
PRESSURE TESTING
BACKFILLING
UNCC REGISTRATION
EXCAVATION, WELDING (API 1104), PRIMING, TAPPING, COATED PIPE, X-RAY
MULTIPLE LINES ON LOCATION
ROCK GUARD
ANOTHER EXAMPLE OF ROCK GUARD
INITIAL PRESSURE TEST
INITIAL PRESSURE TEST
BEDDING MATERIAL
March 15, 2017
Caerus Oil & Gas, LLC

Dear Jake,

This letter serves as confirmation that Caerus Oil & Gas, LLC is currently registered under member codes in Colorado, as a Tier One member. Caerus Oil & Gas, LLC is in good standing in the year 2017, with UNCC (Utility Notification Center of Colorado AKA Colorado 811).

Please contact me if further information is necessary.

Sincerely,

Lynda Carpenter
Member Services Assistant
Colorado 811-UNCC
ANNUAL INTEGRITY TESTS
COGCC Rule 1101.e
ANNUAL INTEGRITY TEST FORM USED TO GUIDE ACTUAL TESTS

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**Caerus Oil and Gas**

**Facility Pressure Test Report**

**Step 2.3 Pressure Test Results**

<table>
<thead>
<tr>
<th>Well Name</th>
<th>Initial Test</th>
<th>Duration</th>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELL A</td>
<td>150</td>
<td>20 min</td>
<td>6/23/16</td>
<td>9:20</td>
<td>9:40</td>
</tr>
<tr>
<td>WELL B</td>
<td>160</td>
<td>20 min</td>
<td>6/23/16</td>
<td>9:20</td>
<td>9:40</td>
</tr>
<tr>
<td>WELL C</td>
<td>170</td>
<td>20 min</td>
<td>6/23/16</td>
<td>9:20</td>
<td>9:40</td>
</tr>
</tbody>
</table>

**Step 2.3 Additional Observations**

**Step 2.3.2 Water Production Information**

<table>
<thead>
<tr>
<th>Well Name</th>
<th>Initial Test</th>
<th>Duration</th>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>WELL A</td>
<td>110</td>
<td>20 min</td>
<td>6/23/16</td>
<td>9:20</td>
<td>9:40</td>
</tr>
</tbody>
</table>

Caerus Representative: Armin Hubbard
## Facility Pressure Test Report

**Objective:**
- Pressure test all BTEX flow lines existing with custody transfer facility.
- Pressure test all crude oil storage tanks connected to custody transfer facility.
- Pressure test all production/line sink Flow Control Valves (FCVs) to avoid hydrostatic head.

### Results:

<table>
<thead>
<tr>
<th>Work Item</th>
<th>Beginning Pressure</th>
<th>Ending Pressure</th>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROJECT 1-140</td>
<td>110</td>
<td>110</td>
<td>5/28/2022</td>
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<td>8:00</td>
<td>0:00</td>
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<tr>
<td>PROJECT 3-240</td>
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<td>110</td>
<td>5/28/2022</td>
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<tr>
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<td>5/28/2022</td>
<td>8:00</td>
<td>8:00</td>
<td>0:00</td>
</tr>
</tbody>
</table>

### Pressure Test Crude Oil Production Lines

- **Date:** 5/28/2022
- **Start Time:** 8:00
- **End Time:** 8:00
- **Duration:** 0:00

### Pressure Test Produced Water Lines (Optional)

- **Date:** 5/28/2022
- **Start Time:** 8:00
- **End Time:** 8:00
- **Duration:** 0:00

**Signatures:**
- CAERUS Representative (Print): [Signature]
- Signatory (Print): [Signature]

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**Note:**
- All pressures are in psi.
- All dates are in the format MM/DD/YYYY.
- All times are in 24-hour format.

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**Organization:** CAERUS OIL AND GAS LLC
FAILED LINE ASSESSMENT, SOIL ASSESSMENT, LINE REINSTALL
Integrity Testing in Sensitive Areas

Quarterly Tests
Bi-Monthly Tests
QUESTIONS?