Ivey LC Pad Update
January 5, 2021

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Ivey LC Pad Update

Agenda

- Location of Ivey LC Pad
- Timeline of Ivey Permitting
- COGCC Director’s Objective Criteria (DOC)
- Adams County & Colorado Oil and Gas Conservation Commission (COGCC) Regulation Comparison
  - Setbacks
  - Estimated Noise
- Summary of Best Management Practices (BMPs)
Ivey LC Pad Update
Location Map

Nearest Home: 1,300-ft SE
Nearest School: 2,850-ft W / 3,300-ft E
Nearest Water Well: 1,075-ft NE
NRCO District: No  Floodplain: No
Ivey LC Pad Update
Permitting Timeline

- **June 2015**: AdCo signed MOU with Ward Petroleum
- **January 2015**: AdCo signed MOU with Great Western (GWOG)
- **December 2016**: Ward submitted AUSR application to AdCo for Ivey
- **April 2018**: GWOG acquired Ivey location from Ward
- **August 2018**: COGCC approved Ivey Form 2A
- **June 2019**: GWOG constructed the Ivey Pad
- **November 2019**: GWOG re-filed Form 2 applications with COGCC due to clerical errors on original applications AdCo submitted public comment to COGCC requesting additional BMPs at Ivey
- **November 2020**: COGCC approved 12 Form 2s for Ivey
- **January 15, 2021**: New COGCC rules become effective for new and pending applications
- **December 2020**: GWOG commenced drilling operations on 11 wells at Ivey
DOC added a level of scrutiny and analysis on pending oil and gas permits to ensure protection of public health, safety, welfare, the environment and wildlife resources. DOC were created to serve as a framework for the future oil and gas regulations and to allow the COGCC to evaluate and review applications during the Mission Change rulemaking process to ensure compliance with the intent of SB19-181.

COGCC Director has approved 128 Form 2 (Drilling) permits under the DOC since the passage of SB19-181 (April 2019) in Adams County.

**DOC triggers at Ivey LC Pad included:**

- Within 1,500-feet of a building unit and a jurisdictional boundary (Thornton)
- Near a floodplain, sensitive water resource area, and wildlife habitat
- Location included produced liquid storage in excess of 5,200 gallons
- A local government requests additional consultation (AdCo)

✓ All DOC triggers were addressed with additional BMPs to the COGCC permit approvals
# Ivey LC Pad Update

## Rule Comparison

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<tbody>
<tr>
<td>Setbacks</td>
<td>500-feet (same as COGCC at time of permitting)</td>
<td>500-feet from residences and school facilities</td>
<td>1,000-feet from residences, schools &amp; environmentally sensitive areas</td>
<td>2,000-feet from residences and schools 1,000-ft from water wells &amp; some water bodies</td>
<td>1,300-feet from nearest residence and 2,850-feet from nearest school/childcare center</td>
<td>No, but an Operator could still be granted an exception or waiver to these rules</td>
</tr>
<tr>
<td>Air Quality Monitoring</td>
<td>Not required</td>
<td>Not required</td>
<td>Required on site-specific basis</td>
<td>Not required</td>
<td>Air quality monitoring from drilling through the first 6 months of production</td>
<td>N/A</td>
</tr>
<tr>
<td>Noise</td>
<td>Same as COGCC</td>
<td>Various db(A) requirements based on land use, no db(C) restrictions</td>
<td>Same as COGCC, Baseline Noise Study required, and Continuous Noise Monitoring on site-specific basis</td>
<td>Requires continuous noise monitoring, lower maximum permissible noise in some areas, and AdCo determines land use designation for maximum noise at COGCC</td>
<td>Operator improved noise mitigation: 32-ft. sounds walls around entire site vs. 24-ft walls, sound dampening equipment, and use of lower decibel electric engines</td>
<td>Partially: based on noise modeling - with mitigation, Ivey will meet new noise standards at residences to the SE/NE</td>
</tr>
<tr>
<td>Alternative Location Analysis</td>
<td>Not required</td>
<td>Not required</td>
<td>Required for all new applications</td>
<td>Required for locations within 2,000-ft of homes</td>
<td>Operators conducted ALA to move location from Wadley Farms site</td>
<td>Partially: did not meet all submission requirements of a formal ALA</td>
</tr>
<tr>
<td>Cumulative Impacts Evaluation</td>
<td>Not required</td>
<td>Not required</td>
<td>Not required</td>
<td>Required for all new applications</td>
<td>Analysis not formally conducted</td>
<td>No</td>
</tr>
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Ivey LC Pad Update

Setbacks

<table>
<thead>
<tr>
<th>Measure from:</th>
<th>AdCo Setback at time of permitting</th>
<th>COGCC Setback at time of permitting</th>
<th>Current AdCo Setback</th>
<th>COGCC Rules effective January 15, 2021</th>
<th>Ivey LC Pad Setbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edge of the Pad</td>
<td>Not regulated</td>
<td>Not regulated</td>
<td>1,000-feet from residences, schools &amp; environmentally sensitive areas</td>
<td>2,000-feet from residences and schools &amp; 1,000-ft from water wells &amp; some water bodies</td>
<td>Residence – 1,300-ft SE (21 homes within 1,500-ft; 102 homes within 2,000-ft)</td>
</tr>
<tr>
<td>Nearest wellhead</td>
<td>500-feet (same as COGCC at time of permitting)</td>
<td>500-feet from residences and school facilities</td>
<td>N/A</td>
<td>N/A – factors into the granting of exceptions</td>
<td>Residence – 1,580-ft SE School – 3,135-ft W (childcare); 3,585-ft E (Elementary)</td>
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</tbody>
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*would require an exception/waiver to current AdCo rules & COGCC rules effective 1/15/21*
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Estimated Noise

<table>
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<tr>
<th>Noise during Drilling – with partial mitigation</th>
<th>Noise during Completions – with partial mitigation</th>
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<tbody>
<tr>
<td>Maximum Allowable Noise under COGCC rules at permitting</td>
<td>Maximum Allowable Noise under COGCC rules effective 1/15/20</td>
</tr>
<tr>
<td>Lightweight Industrial zoning noise standard</td>
<td>Agricultural zoning noise standard</td>
</tr>
<tr>
<td>A-scale (high frequency)</td>
<td>C-scale (low-frequency)</td>
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- **A-scale (high frequency)**
  - Daytime: 70 dB - 65 dB
  - Nighttime: 65 dB - 60 dB

- **Lightweight Industrial zoning noise standard**
  - Daytime: 65 dB
  - Nighttime: 60 dB

- **C-scale (low-frequency)**
  - Not regulated

Mitigated Modelled noise from Ivey Pad at residences (1300-ft)

- **45-55 dB** – drilling
- **55-65 dB** – completions

Meets January 15, 2021 rules?

- **Partially** – will comply with dB noise at 1,000-ft, no continual noise monitoring

*Mitigation included in modelling provided by the Operator does not include additional noise-related BMPs at the Ivey site.*
Ivey LC Pad Update

Summary of BMPs

**BMPs in place, above regulation requirements at time of permitting**

**Adams County 2017 Permit BMPs:**
- Quarterly neighborhood meetings
- Use of pipelines for transporting oil
- Reduced traffic and truck speeds on York St./E.152nd during peak school hours
- Deceleration and turning lane installation requirement
- Sound impact and modeling assessment study requirement

**COGCC 2020 Form 2 BMPs:**
- Air Quality Monitoring from drilling through the first 6 months of production
- Taller sound walls and other mitigation measures to further reduce noise
- Low odor mud
- More robust stormwater, spill prevention, and leak detection requirements

**Operator additional BMPs:**
- Location will comply with new Wellbore Integrity rules, which became effective on November 2, 2020
  - New requirements for protecting and isolating all groundwater-bearing zones
  - Increased requirements for regular pressure testing and monitoring
  - Enhanced blowout prevention equipment requirements