Local Oil and Gas Comprehensive Plan

The Governor's Oil and Gas Task Force's Recommendation #17:

"The purpose is to reduce impacts to and conflicts with communities, and include siting tools to locate facilities away from residential areas when feasible."

"Creates incentive for early resolution of concerns about siting in urban communities by providing local government with opportunity to participate in siting facilities before an Operator finalizes locations."

from Colorado Oil and Gas Task Force Final Report, February 27, 2015, Pages 5-6
Broomfield City Council created an Oil and Gas Comprehensive Plan Update Committee, by resolution, which consisted of 14 Citizen Members, with oil and gas, legal, environmental, and other backgrounds.

The Committee conducted meetings for 6 months, engaging with consultants and researchers, and produced a new chapter to Broomfield's Comprehensive Plan on Oil and Gas Development.

The presentations, legal analysis of issues, and complete Oil and Gas Chapter can be found at this link: https://drive.google.com/drive/folders/0BxAJnoFWbi4RR1U3YU5RX2dHc00
Committee Perspective

Recognizing the many challenges facing our community, as technological advances in oil and gas exploration and production evolve, Broomfield desires to focus on the health, safety, welfare and environment of our community as our top priority.
The Committee created the following four sub-committees:

- Community Impacts
- Health
- Legal Impacts
- Planning
Health Impacts Sub-committee:

- Air measurements at three existing Weld County Extraction well sites (one drilling, one fracking, one flowback)
- Model air quality impacts (VOC, particulate matter, nitrous oxides) on case study
- Air & Noise baseline and on-going measurements at case study sites
- Baseline measurements of hydrocarbon gases in soils in vicinity of proposed pads
- Secure CDPHE agreement to utilize their mobile air quality monitoring station in area of the proposed pads for several periods, included pre-construction and drilling (case study)
- Study of pipeline regulations and consider additional safety and inspection requirements.
- Establish minimum design standards (grid power for drilling, tankless facilities, closed loop system, pipelines for transport of oil, gas, and produced water off-site, etc.)
- Enhance inspection and monitoring requirements for all project phases
  - Require ongoing air, noise, and groundwater monitoring programs
  - Increase scope of LDAR (Leak Detection and Repair) program
  - Increase scope of pipeline inspection program
  - Enhance local inspector access to sites for planned and unplanned inspections
Community Impacts Sub-committee

- Site-Specific Studies
  - Noise measurements at three existing Weld County Extraction well sites (one drilling, one fracking and one flow-back).
  - Review of traffic plan and referral to City's Traffic Engineer for follow-up.
  - Changes recommended to emergency response plan to include notice to City and Fire Rescue District of all planned facilities, final approval by fire district, contact information for subcontractors, and operator to pay for costs of emergency incidents i.e. costs of training and foam.
  - Study of pipeline regulations and consider additional safety and inspection requirements.
  - Establish noise standards of 50 dB(A) at 1000 ft and 60 dB(A) at 500 feet, consider low frequency (C scale) noise limits.
  - Require grid powered electric drilling rigs and quiet fracking trucks.
  - Require minimum 32 feet soundwalls, downward faced lighting, landscaping with irrigation, and maintenance and reclamation plan.
  - Propose additional pipeline regulations that may include additional pressure testing and leak detection measures.
  - Limit truck traffic to specific hours (i.e. 10 a.m. to 2 p.m.).
  - Risk assessment - sources of risks and mitigation measures.
  - Timely notice to prospective homebuyers of planned oil and gas development.
There are several key principles and concepts underpinning the work:

- Select a wide variety of possible sites; don't pre-judge
- Take many possible factors into account in site analysis
- Use best available data
- Build a tool to help analyze alternatives based upon weighted factors important to the community like proximity to neighborhoods and water sources
- Involve an independent petroleum engineer and geologist to test the proposed alternative sites regarding mineral access
- Did not include municipal or county boundaries
Planning Sub-committee:

- Initial screening of potential well sites: establish evaluative matrix that allows various conditions to be considered in the location process, like:
  - Distance to Nearest Residential Property Line (ft)
  - Distance to Nearest School Building (ft)
  - Distance to Nearest School Property Line (ft)
  - Category of 80 acre surroundings:
    - Number of residences within 1000' (+/- 80 acres)
    - Types of land Uses
  - Number of Residences within 3000' (Catastrophic event case)
  - Waterway Disturbance potential:
    - Distance to nearest down-slope water body (ft)
    - Distance to nearest water body (pond, stream etc.)
    - Distance to nearest Wetland
    - Distance to nearest Floodplain
  - Visual Impacts
    - Drilling phase
    - Completions phase
    - Landscape (at planting)
    - Landscape (at 10 years)
  - Noise Impacts
  - Home Value Impacts during Drilling/Fracking

- Detailed evaluation of resource recovery and community / environmental Impacts of different well pad combinations compared to 5 pad base case proposal

- Develop code requirements for alternative site analysis
Weighted Criteria Were Used to Evaluate Potential Adverse Community Impacts to Public Health, Safety, Welfare and the Environment for Alternative Well Sites

**Weighting Criteria Development**

**Type of Impact**

General Comments on Approaches for Using Criteria to Evaluate Alternative Sites

<table>
<thead>
<tr>
<th>Factor</th>
<th>Site Criteria (10 Factors Total) on 1 to 10 Point Scale Weighting for each Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of Occupiable Residential Units within 1500 foot Radius Circle</td>
</tr>
<tr>
<td>2</td>
<td>Distance to Nearest Surface Water</td>
</tr>
<tr>
<td>3</td>
<td>Distance to Nearest Occupied Residence</td>
</tr>
<tr>
<td>4</td>
<td>Distance to Nearest School Property Line</td>
</tr>
<tr>
<td>5</td>
<td>Potential Impact on Residential Property Values during Drilling through Flowback Phases</td>
</tr>
<tr>
<td>6</td>
<td>Visual Impact during Drilling through Completion Phases</td>
</tr>
<tr>
<td>7</td>
<td>Distance to Nearest Hospital/Overnight Health Care Facility</td>
</tr>
<tr>
<td>8</td>
<td>Number of Occupiable Residential Units within 3000' radius (Major Event Impact Case)</td>
</tr>
<tr>
<td>9</td>
<td>Use of Active Well Site or Previously Disturbed Industrial Use Site</td>
</tr>
<tr>
<td>10</td>
<td>Distance to Nearest Platted Residential lot (ft)</td>
</tr>
<tr>
<td>11</td>
<td>Land Use % Breakdown within 80-Acre Circle (Radius of 1050 feet from Center of Well Site)</td>
</tr>
</tbody>
</table>

**TOTALS Pairing Votes 77 64**

Final Weighted Criteria

- Heavily Weighted towards Distances and Residential Density
- Distances from Well Site: Nearest Residence, School, Overnight Health Care Facility, Platted Residence, and Surface Waters (Environmental)
- Density of Residences: Number of Residences within Specific Distances of Well Site (3000', 2500', 1500')
- Visual Impacts: From Drilling thru Completion using Drone Panos (100' and 30' Elevations) and City Overhead Maps
- Types of Land Uses Nearest Well Site: Within 1050' (~80 acres)
- Current Use of Site: Active Well Site, Previously Disturbed Site, Industrial Site

**Categories of Criteria**

<table>
<thead>
<tr>
<th>Category</th>
<th>% Weight of Total Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resident Distances - (from Site to Buildings)</td>
<td>4 39%</td>
</tr>
<tr>
<td>Resident Density</td>
<td>3 31%</td>
</tr>
<tr>
<td>Environmental – Distance to Surface Water</td>
<td>1 16%</td>
</tr>
<tr>
<td>Visual Impact</td>
<td>1 8%</td>
</tr>
<tr>
<td>Current Land Use surrounding site</td>
<td>2 6%</td>
</tr>
</tbody>
</table>
OIL AND GAS COMMITTEE
Planning Sub-committee:
Large Compilation Map
COGCC RULES ARE NOT ADEQUATE IN URBAN AREAS:
The rules of the COGCC do not adequately protect the health, safety, welfare and environment of urbanized local communities in Colorado.
DISPARATE BURDEN OF IMPACTS

IN RURAL AREAS:
The surface landowner ranchers or farmers, often live some distance from the well location and receive little negative impacts of oil and gas development at their home.

IN URBAN AREAS:
Numerous residential homeowners live next to the well location and receive many adverse impacts from the oil and gas development.

THIS IS A MAJOR REASON WHY URBAN AREAS HAVE BECOME AVERSE TO OIL AND GAS DEVELOPMENT

OIL AND GAS COMMITTEE
COGCC Rule:
Operations involving pipeline or gas facility installation the use of a drilling rig, completion rig, ... is subject to the continuous maximum noise levels for industrial sources [80db(A) day 75 db(A) night] at 350 feet from well.*

PROBLEM:
This level of noise is equivalent to a car wash at 20 ft, propeller plane flyover at 1000 ft; diesel truck 40 mph at 50 ft; diesel train at 45 mph at 100 ft.; food blender; milling machine; garbage disposal; alarm clock or vacuum cleaner which is too high for residential area.

SOLUTION:
Reduce allowed noise level and limit residential area noise levels to 55 db(A) day and 50 db(A) night.

PROPOSED COGCC RULE CHANGE:
Remove exemption (1) from rule 802 b in residential, agricultural and rural areas.

*COGCC Rule 802 b 1 and c 1.
ONSITE POWER GENERATION

COGCC Rules:
Do not prohibit the use of on site diesel powered electric generation for drilling and completion.

PROBLEM:
Onsite diesel power generators are a major source of air emissions and noise from the well pad. They also require a great deal of truck traffic to continuously fuel the generators.

SOLUTION:
Require in urban areas that drilling rigs be powered by utility supplied electric line power.

PROPOSED COGCC RULE CHANGE:
Require that in urban areas no onsite power generation be allowed.

City and County of Broomfield
ON SITE STORAGE TANKS

COGCC Rules:
Allow the use of on site tanks for storage of produced water, oil and gas in urban areas.*

PROBLEM:
These tanks are a major source of air emissions from the well pad. They also require a great deal of truck traffic to continuously remove the liquids and gasses from the tanks.

SOLUTION:
Require that in urban areas that produced liquids and gasses be removed by buried pipelines to remote processing facilities.

PROPOSED COGCC RULE CHANGE:
Require that in urban areas no onsite storage tanks are allowed.

*COGCC Rules 604.c., 805.b.

City and County of Broomfield
CLOSED LOOP SYSTEMS WITH 98% HYDROCARBON CONTROL

COGCC Rules:
Do not require closed loop drilling mud handling and allows for open pits.*

PROBLEM:
Uncontrolled tank vents and open pits are a major source of air emissions from the well pad. Requiring closed looped systems and 98% hydrocarbon reduction greatly reduces emission sources.

SOLUTION:
Require that in urban areas closed looped systems and pitless drilling are required on well pads with 98% or more hydrocarbon reduction on tank vents.

PROPOSED COGCC RULE CHANGE:
closed looped systems are required on well pads with 98% or more hydrocarbon reduction. Require that in urban areas no onsite storage tanks are allowed.

*COGCC Rule 902.
FLOWLINES AND PIPELINES

COGCC Rules:
- Allows for flowline testing once annually, does not require testing of flowlines of 15 PSI or less,
- Allows abandonment of flowlines in place, and
- Does not maintain updated mapping of oil and gas flowlines and pipelines.

*PROBLEM:* No one entity maintains accurate maps of oil and gas pipelines so residents are at risk. Testing flowlines once a year is insufficient and flowlines under 15 PSI are not tested at all.

*SOLUTION:* Requiring operators to map and record flowlines and pipelines and require more frequent testing of all flowlines.

PROPOSED COGCC RULE CHANGE:
- Require mapping and recording of all oil and gas pipelines and flowlines.
- Require quarterly pressure testing of all flowlines.
- Require operators to physically mark flowlines and pipeline above ground.
- State should procure LDAR technology to routinely test for leaks from the surface.

*COGCC Rules 1101-1103.*
COGCC Rules:
Allows for 500 foot setback from a well or processing facility to any occupied building.

PROBLEM:
This rule was not based on any scientific evidence of a safe separation distance between a well and a nearby building. There is no recognition of the increased risk from a multiple well pad compared to the risk of a single well. The existing rule is not appropriate for urbanized areas.

SOLUTION:
Require larger setbacks for urbanized areas, based on the number of wells on a pad and the number of nearby homes.

PROPOSED COGCC RULE CHANGE:
Taking into account the number of wells per pad and the number of existing or platted residences within 3,000 feet of such well pad, adopted a tiered approach to setbacks:

- Level 1: One well: Buffer zone of 500 feet
- Level 2: 2-8 wells per pad, buffer zone of 750 feet, unless there are more than 100 homes within 3,000 feet, in which case it moves to 1000 feet
- Level 3: 9-17 wells per pad, buffer zone of 1000 feet, unless there are more than 125 homes within 3,000 feet, in which case it moves to 1,320 feet
- Level 4: 18+ wells per pad, buffer zone of 1,320 feet

If the separation distance between the two nearest wellheads on two different well pads is less than 500 feet, the total number of wells on the two well pads will be treated as if those were located on one well pad.

If one or more occupied building(s) is outside the Buffer Zone of two or more well pads for that Buffer Zone level but within the Buffer Zone of the next level and the combined number of wells for such pads would place the well pads in a higher level of Buffer Zone, then for these occupied building(s) and such well pads are treated as combined and shall be required to meet the higher Buffer Zone level based upon the total number of wells on all well pads.

*COGCC Rule 604.a
SOIL & GAS MONITORING

COGCC Rules:
Has no rule that specifically requires soil and gas testing for pollution near existing and plugged and abandoned wells.

PROBLEM:
Periodic soil and gas monitoring is a first line of defense in locating liquid or gas leaks in urbanized areas.

SOLUTION:
Require in urban areas that periodic soil and gas monitoring is done near existing and plugged and abandoned wells by an independent tester.

PROPOSED COGCC RULE CHANGE:
Require that in urban areas site-specific soils testing and monitoring be performed periodically at existing oil and gas wellbores, within 150 feet of proposed new wellbores and upon plugging and abandoning of wells.
COGCC Rule:
COGCC requires an operator to have $1,000,000 of general liability insurance. Environmental liability insurance is not required.

PROBLEM:
This minimal amount of insurance is inadequate to cover the increased risks associated with oil and gas drilling in urban areas.

SOLUTION:
Require operators to have environmental insurance and a limit of liability insurance commensurate with the exposure to loss.

PROPOSED COGCC RULE CHANGE:
Require $100,000,000 of general liability insurance and $10 million of environmental liability insurance in urban areas per occurrence and $100,000,000 where the operator has more than 20 wells. Bonding limits need to reflect current technologies and cost of projects in order to protect the public if an operator fails to complete a project.

OIL AND GAS COMMITTEE
*COGGC R. 708.
BASELINE WATER QUALITY MONITORING

COGCC Rules:
Requires less protective water quality monitoring in the Greater Wattenberg Field than the rest of the state.

PROBLEM:
The Greater Wattenberg rule only requires operators obtain 1 baseline and 1 post-completion sample from the governmental quarter section in which the new well is located. The rule allows operator to use a previous sample that can be as old as 5 years, if a current sample is not obtainable. For comparison, the statewide rule requires operators sample up to 4 water sources within a ½ mile of the new well. Operators may only use a previously sampled water source in limited circumstances, and the sample cannot be older than 18 months.

SOLUTION:
Extend the more recent statewide rule to also apply to the Greater Wattenberg Field.

*COGCC Rule 318A.f. (Greater Wattenburg) and R. 609 (statewide).
ALTERNATIVE SITE ANALYSIS

COGCC Rules:

Does not detail the method of conducting an alternative site analysis.

PROBLEM:

In urbanized areas, the most ideal site from an operator's perspective might be objectionable when considering community impacts.

SOLUTION:

Require operators to work with local governments on well pad siting early on in the process prior to COGCC granting spacing application. The Committee is recommending that the City adopt new regulations that require an alternative site analysis discussion between the City and Operators using the criteria developed by the Committee.

PROPOSED COGCC RULE CHANGE:

Require operator to follow the alternative site analysis process in local communities with an oil and gas comprehensive plan.

- The independent study by a local government allows cities and counties to more effectively respond to our citizens' concerns about the proximity to neighborhoods of certain operator-proposed locations.
- This study will allow cities to explore and recommend SPECIFIC criteria to avoid potential adverse community impacts related to public health, safety, welfare and the environment.

*COGCC Rule 305A.