The Arapahoe County Board of County Commissioners typically holds weekly Study Sessions on Monday and Tuesday. Study Sessions (except for Executive Sessions) are open to the public and items for discussion are included on this agenda. Agendas (except for Executive Sessions agendas) are available through the Commissioners’ Office or through the County’s web site at www.arapahoe.gov. Please note that the Board may discuss any topic relevant to County business, whether or not the topic has been specifically noticed on this agenda. In particular, the Board typically schedules time each Monday under “Committee Updates” to discuss a wide range of topics. In addition, the Board may alter the times of the meetings throughout the day, or cancel or reschedule noticed meetings. Questions about this agenda? Contact the Commissioners’ Office at 303-795-4630 or by e-mail at commissioners@arapahoe.gov

Study Session Topics

1:00 P.M.  *Oil And Gas Regulations Recommendations (WHR)
Discussion of potential Land Development Code changes or changes to the Oil and Gas Memorandum of Understanding (MOU), as well as an update to the Board of County Commissioners concerning the changes underway at the Colorado Oil and Gas Conservation Commission in the wake of Senate Bill 19-181

Request: Information/Direction

Diane Kocis, Energy Specialist, Public Works and Development
Jason Reynolds, Current Planning Manager, Public Works and Development
Jan Yeckes, Planning Division Manager, Public Works and Development
Bryan Weimer, Director, Public Works and Development
Todd Weaver, Budget Manager, Finance
Robert Hill, Senior Assistant County Attorney

Documents:

MAY 21 2019 OIL AND GAS STUDY SESSION BSR.PDF
OIL GAS REGULATIONS CONSIDERATIONS 5-10-19.PDF
OIL GAS ISSUES AND LESSONS LEARNED 4-26-19 CLEAN.PDF
MOU COMPARISONS.PDF

2:00 P.M.  *Revolving Loan Fund Discussion (WHR)
Study Session
May 21, 2019

Study Session Topics

*Oil And Gas Regulations Recommendations (WHR)
Discussion of potential Land Development Code changes or changes to the Oil and Gas Memorandum of Understanding (MOU), as well as an update to the Board of County Commissioners concerning the changes underway at the Colorado Oil and Gas Conservation Commission in the wake of Senate Bill 19181

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Todd Weaver, Budget Manager, Finance
Robert Hill, Senior Assistant County Attorney

Documents:

CEF - COMMUNITY LOAN POOL OVERVIEW 2019.PDF

*Revolving Loan Fund Discussion (WHR)
Discussion of the Colorado Enterprise Fund Community Loan Pool overview

Request: Information/Direction

Carrie Hanson, Director of Development, Colorado Enterprise Fund
Lewis Haglar, Director of Credit, Colorado Enterprise Fund

Documents:

CEF - COMMUNITY LOAN POOL OVERVIEW 2019.PDF

* To Be Recorded As Required By Law

WHR - West Hearing Room

Arapahoe County is committed to making its public meetings accessible to persons with disabilities. Assisted listening devices are available. Ask any staff member and we will provide one for you. If you need special accommodations, contact the Commissioners' Office at 303-795-4630 or Relay Colorado 711.

Please contact our office at least 3 days in advance to make arrangements.
BOARD SUMMARY REPORT

Date: May 10, 2019

To: Board of County Commissioners

Through: Bryan Weimer, Department Director
Through: Jan Yeckes, Planning Division Manager
Through: Jason Reynolds, Current Planning Manager

From: Diane Kocis, Energy Specialist

Subject: Oil & Gas Regulations Recommendations Study Session

Direction/Information
Public Works & Development Staff is seeking direction from the BoCC and will be providing information on potential Land Development Code changes or changes to the Oil & Gas Memorandum of Understanding (MOU). Furthermore, Staff is requesting direction on whether to update the Oil and Gas Regulations of the Land Development Code or update the current MOU.

Request and Recommendation
The purpose of this BSR is to update the BoCC concerning the changes underway at the Colorado Oil and Gas Conservation Commission, in the wake of Senate Bill 19-181, and to request direction on staff identified issues regarding updating the Energy Facilities section of the Land Development Code and/or the Oil & Gas MOU. COGCC will be conducting a meeting for local government representatives on May 15th and staff will provide a brief summary of that meeting so that the BoCC will learn what other jurisdictions are considering for rule updates. The BoCC can choose to implement some, all, or none of Staff’s recommendations or delay decisions for the immediate future, until COGCC rulemaking addresses or does not address the issues and lessons identified by Staff.

Staff has prepared an evaluation of eleven areas of concerns with oil and gas well sites and additional suggestions to reduce oil and gas impacts and issues that have been experienced with oil and gas exploration and production in the County. The evaluations are outlined in the attached Oil and Gas Regulations Considerations spreadsheet. They include mitigation of noise, lights, emissions, lightning strikes, and visual impacts, as well as incentivizing pipelines to reduce traffic and vehicle emissions and additional noticing requirements for area residents.
Background
Under the County’s Land Development Code, siting of oil and gas wells in Arapahoe County is governed by a process where, as long the operator has signed an MOU with the County, the site location of a well can generally be considered and approved/denied administratively. This is basically a contractual siting process and was developed because local authority over oil and gas wells was largely preempted by state law. Thus, unlike other industrial uses, oil and gas development could occur in any zone district and the drilling and fracking phases involve 24/7 operations with little local regulation. With the enactment of SB19-181, that state preemption was removed and local governments now have local land use authority to develop regulations to govern site approval for oil and gas wells and more authority to control how they are operated on-site in order to mitigate off-site impacts.

Accordingly, Staff has prepared an evaluation of various topics associated with oil and gas wells for the BoCC to consider regarding siting and operational matters to decrease the impacts from oil and gas development near residential uses. These topics of concern are based on lessons learned from processing and dealing with oil and gas impacts in the recent past. The concerns are categorized under the headings of Quality of Life, Safety, Environmental, and Process.

The existing Land Development Code and the oil and gas MOUs were developed when the County was largely pre-empted by state law, and when oil and gas well pads in the County typically had only 1-2 wells and were located further from residential units. In the past two years Staff has seen a significant increase in the number of wells per pad (up to 24/pad), an increase in initial traffic due to recovery of greater volumes of fluids, and many pads are now proposed closer to homes than in prior years. These increases has created a more industrial type operation from initial stages of oil and gas operations in Arapahoe County.

Drilling and fracking periods will be significantly longer to complete a greater number of wells and may last well over one year, although the drilling and fracking periods may not be contiguous. Impacts related to drilling and fracking, such as traffic, noise, lights and odors will last longer due to the drilling of multiple wells per pad and be greater in magnitude for wells closer to homes. Staff continues to receive numerous complaints from impacts related to wells currently drilling.

It is also important to note that the newer wells have drastically improved production volumes, due to fine-tuning of fracking techniques recently. The increased number of wells/pad and the higher volumes of fluids recovered from these wells will put more stress on County roads and impact residents longer than prior oil and gas development, until liquid lines have been installed in the pipeline network.

Visual impacts are also greater for multi-well pads, where much of the equipment is at the level of second story windows and will remain for the life of the well, now anticipated to be over 20 years.

Links to Align Arapahoe
This matter links to the Align Arapahoe goal for Quality of Life for Arapahoe County citizens who will be impacted by neighboring large-scale oil and gas facilities and to the goal of Fiscal Responsibility, for anticipating potential damage and subsequent repairs and improvements to County roads.
**Discussion**

The siting of large-scale oil and gas facilities near residential areas will inevitably lead to land-use conflicts, traffic issues and impacts to the daily lives of our citizens. Our existing Oil & Gas MOU is currently our main way of regulating oil and gas development. Our MOU was a cutting edge document in 2012 and 2013, when the Niobrara Formation in Arapahoe County was initially explored and tested. Since the MOU template was adopted, many other jurisdictions have successfully negotiated new oil and gas MOUs with operators. Those more recent MOUs contain many conditions stricter than currently existing COGCC rules to address impacts from the new larger facilities that are closer to residences and have greater traffic, visual and noise impacts. Staff is proposing to amend the Land Development Code to incorporate many of the conditions specified by other jurisdictions in their MOUs rather than having an MOU. The use of an MOU appears outdated as the pre-exemption concern is no longer an issue and Land Use Codes seem to be an appropriate way to regulate this particular land use, as is done with other land uses. The attached spreadsheet describes eleven topics that Staff has identified should be considered and addressed with the changes, some of which are outlined here.

It is also important to note that rather than setting noise, light, emissions or landscaping standards, Staff is proposing mitigations when drilling, fracking and production operations are near homes. Staff is also proposing that the latest technology be used for mitigating lightning strikes, that emergency response plans be developed prior to the beginning of well pad construction and that all residents within one mile of a pad be notified of each phase of operation, as many of the impacts affect more than just the adjacent properties.

To mitigate drilling and fracking noise, Staff is proposing that operators use sound walls during the drilling phase as well as the fracking phase or place hay bales between the source of the noise and nearby homes. Currently, operators commonly use sound walls for the fracking phase but not the drilling phase and despite the effectiveness of hay bales, they are rarely used in Unincorporated Arapahoe County to absorb sound.

To mitigate the extremely bright lights on locations during drilling and fracking, Staff are proposing that operators make appropriate adjustments within a day of receiving a complaint or that operators limit the height of light poles or limit the wattage.

To mitigate emissions and odors, Staff is suggesting that the County consider ways of incentivize electric drilling rigs, electric generators and electric compressors. Other jurisdictions are requiring baseline air quality surveys for sites within 1,200 feet of residences. Staff supports these measures as well as collecting funds for air sampling canisters.

To mitigate lightning strikes, Weld County requires operators to install the latest lightning mitigation, which currently consists of placing flagpoles adjacent or within tank batteries. This is an inexpensive but effective measure that Staff concurs with.

Regarding postings and notifications and project schedules for all phases, our current Land Development Code requires that only adjacent residents are notified when an application is submitted. Staff is suggesting that all residents within a mile of a proposed pad are notified of an application submittal, the start of pad construction, the start of drilling and the start of fracking.
because oil and gas operations impact more than just the adjacent properties. Studies conducted elsewhere have shown that being informed about oil and gas operations helps to decrease the stress associated with uncertainty.

To mitigate visual impacts, other jurisdictions may require landscaping near wells and production equipment. Staff concurs with this approach and adds that eighteen feet tall low-profile tanks are more appropriate than the standard crude oil and produced water tanks which are 25 feet tall.

Regarding Emergency Response Plans, Staff and Bennett-Watkins Fire Rescue (BWFR) agree that operators should provide emergency response plans prior to drilling and update them as appropriate.

Staff is also recommending that we develop an incentive for pipeline installations. Currently a pipeline application requires between seven and nine months of processing time, largely due to the requirement for two public hearings. If pipeline applications for some specified length did not have to have two public hearings, pipelines could be installed faster after the design phase, improving air quality and potentially decreasing traffic impacts.

Lastly, many of the impacts from oil and gas operations can be mitigated with increased setbacks. Staff is also recommending a setback of at least 1,200 feet from the edge of a pad to the nearest occupied structure. An increased setback would reduce the impact of hazardous air emissions potentially released from any tank fire. BWFR has stated that they respond to tank fires, initiated by lightning, at least every other year. BWFR has further stated that 1,200 feet is the common distance to expect significant air quality impacts from a single tank fire.

Based on the Board’s direction, these areas of concerns or other potential regulations could be addressed for new oil and gas well applications either through the current MOU process with updates to the MOU or through amendment of the Land Development Code to enact new oil and gas regulations. Staff recommends the use of Land Use Code to address the issues as opposed to an MOU update. This approach will treat all operators the same and does not require an operator to execute an MOU.

Staff will provide additional information at the update, concerning lessons learned from impacted citizens and lessons learned from examining provisions in place in other jurisdictions.

Alternatives
The Board of County Commissioners has 5 alternatives regarding the Staff evaluation of the various topics identified:
1. Identify the areas of concern that the BoCC would like to be considered in a Land Use Code and/or MOU update.
2. Direct Staff to draft changes to the Land Development Code based on BoCC identified areas of concerns listed under #1 above, subject to BoCC approval.
3. Direct Staff to draft changes to the existing MOU based on BoCC identified areas of concerns listed under #1 above, subject to BoCC approval.
4. Do nothing and direct Staff to continue to process Oil & Gas land development cases using the existing MOU template and existing Energy Facilities section of the Land Development Code.

5. Direct Staff to return with revised recommendations after the majority of new COGCC rulemaking, resulting from Senate Bill 19-181, is adopted in 2020.

Staff recommends Alternative #2 in combination with Alternative #1.

**Fiscal Impact**

At this point, the fiscal impact has not been identified as the specific solution to the identified concern/topic has not occurred. However, depending on the specific changes proposed, it is likely a minimal financial impact will occur for the County. Also, depending on the change, Planning and Zoning Staff may have more regulatory requirements and as such may have to visit oil and gas locations more frequently, in order to assess if mitigations are necessary or possible.

**Concurrence**

PWD Staff are in support of addressing the areas of concerns/topics identified in this report and attachments. The County Attorney’s office has reviewed this BSR and the staff evaluation.

cc:
- Jason Reynolds
- Jan Yeckes
- Chuck Haskins
- Robert Hill
- Bryan Weimer
- Todd Weaver
- Ron Carl
## Oil and Gas Regulations Considerations

<table>
<thead>
<tr>
<th>Topic</th>
<th>Issue</th>
<th>Result/Concern/Lesson</th>
<th>Current MOU</th>
<th>Others/Best Practices</th>
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<tr>
<td>Noise</td>
<td>24/7 Industrial or Light Industrial COGCC criteria in Non-Industrial Locations. Does not take adjacent zoning into account.</td>
<td>Citizen complaints of sleeplessness, aggravated chronic pain and lack of mitigation or responsiveness when operator is contacted.</td>
<td>Operator shall provide 24/7 contact information to respond to all noise complaints</td>
<td>Electric motors; &quot;Additional noise mitigation if requested.&quot; Town of Timnath requires compliance with town noise town noise regulations.</td>
<td>Drilling, facility installation or maintenance are subject to maximum permissible noise levels for Light Industrial Zones as measured at the nearest building unit: 70 db from 7 am to 7 pm and 65 db 7 pm to 7 am.</td>
<td>Noise standards or mitigation may be handed over to local governments.</td>
<td>COAs could include: &quot;Noise mitigations may be required&quot;. Mitigations would include: Electric motors, sound walls, weed-free hay bales, location/orientation of generators. County could require sound walls be constructed for the drilling stage. County could require the operator to perform to meet a standard or County could prescribe what we'll allow for pads near homes.</td>
<td>Conoco is currently using 24/7 noise monitoring equipment for drilling 1,400' from homes to ensure that they are meeting the current state standards, due to numerous complaints. COGCC may inspect the Conoco monitoring equipment. Could potentially ask that nighttime truck traffic be routed away from neighborhoods where alternate routes exist.</td>
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| Light | Industrial levels of light in residential areas. | Citizen complaints of sleeplessness due to extremely bright lights. | Temporary lighting shall conform to the COGCC rules. Permanent lighting shall be directed downward and internally. | None known. | To the extent practicable, site lighting shall be directed downward and inward and shielded so as to avoid glare on public roads and Building Units within 1,000'. | Unknown if lighting regulation will be handed over to local governments. | Operator shall respond to lighting complaints within 1 day and make all appropriate adjustments. Or: Lighting should be no brighter than OSHA standards; Or: Require oil & gas operations to meet Arapahoe County lighting code. | Conoco currently does respond to complaints and makes adjustments within 24 hours. Citizens are not satisfied with the adjustments. |
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<td><strong>Setbacks</strong></td>
<td>Impacts related to noise, air emissions, lights, fire danger from lightning strikes to tanks, and visual impacts are all mitigated to some extent by greater setbacks. Current State setback is 500’ although operators have usually maintained a setback of 1,000’ from homes.</td>
<td>With a 1,000’ well setback, the well pad boundary, the tanks, and the access road can be closer to homes than the well. It depends how the pad is laid out. Many citizens feel that 1,000’ between wells and homes is insufficient to address safety concerns and visual impacts. Fire district has indicated that the dense smoke from a single tank fire can travel more than 1,200’.</td>
<td>Does Not Address</td>
<td>Others specify 1,000’ and at least 750’ in MOUs 2 and 6 years old. 500’ from nearest building measured from the center of the well to the nearest wall of the nearest home; 1,000’ from schools.</td>
<td>COGCC is currently delaying applications within 1,500’ of a building unit or withing 2,000’ of a school.</td>
<td>Options: 1) Could assign a 1,200’ - 1,500’ setback from homes for greater separation between edge of pad and property lines to be better protective of tank fire smoke impacting homes and to decrease impacts from noise, lights and odors. 2) Could increase this distance if nearest homes are downwind. 3) Could require a greater setback from tanks to homes than the wells to homes setback.</td>
<td>County can consider assigning additional setbacks for parks, business uses, day cares, schools, or water sources.</td>
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<td><strong>Emissions/Odors</strong></td>
<td>Citizens downwind have experienced respiratory and nervous system symptoms.</td>
<td>Locating tanks greater than 1,000’ from homes seems to eliminate this problem.</td>
<td>Does Not Address</td>
<td>Baseline air quality surveys; Annual air compliance reports; Destruction of 98% of methane and VOCs; Money for air sampling.</td>
<td>Defer to CDPHE.</td>
<td>Defer to CDPHE</td>
<td>Incentivize electric drilling rigs, electric generators and electric compressors. Require baseline sampling or annual air compliance reports for sites within 1,200’ of residences. Obtain funds for canister sampling that can be returned if not used.</td>
<td>With baseline air quality data CDPHE could potentially measure problematic emission levels during all phases.</td>
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<td>Lightning Mitigation</td>
<td>Lightning strikes ignite tanks. Fairly common.</td>
<td>Heat from one tank fire causes a 2nd or 3rd tank fire. Toxic smoke is likely to migrate offsite.</td>
<td>Does Not Address</td>
<td>Weld County COA</td>
<td>Not addressed.</td>
<td>Not expecting COGCC to address in near future.</td>
<td>Require lightning mitigation recommended by Fire District</td>
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<tr>
<td>Emergency Response Plan</td>
<td>Industrial facilities in rural residential areas.</td>
<td>Concern for well pad emergencies that could impact nearby homes. Some operators already provide an ERP.</td>
<td>Does Not Address</td>
<td>Broomfield requires.</td>
<td>Does Not Address</td>
<td>Not likely to address.</td>
<td>Develop standardized ERP format with fire districts, OEM and Sheriff. Require ERP prior to drilling phase. Require ERP Biannual updates, if necessary or as requested by emergency responders.</td>
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<td>Timing of Applications</td>
<td>Some operators submit COGCC applications months/years prior to County application, thereby getting COGCC approval way before County gets applications.</td>
<td>County does not have opportunity to discuss COAs with COGCC. Citizens don’t have a coherent comment submission process.</td>
<td>Does Not Address</td>
<td>Town of Timnath requires notice of pending COGCC applications. Broomfield requires applications submitted to them no later than 30 days prior to COGCC applications. Others require a &quot;development plan&quot; or an &quot;activity plan&quot;, so that the local government is aware of planned locations.</td>
<td>No current specifications.</td>
<td>Likely to require local applications submitted prior to COGCC applications.</td>
<td>Require operators to submit County applications prior to COGCC applications</td>
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<td>Notifications and Postings</td>
<td>Only adjacent residents are currently notified but traffic impacts a bigger area. Light and noise also impacts a bigger area.</td>
<td>Area residents impacted by traffic (and other impacts) who need to make adjustments to their routes and travel times are not aware until construction starts.</td>
<td>Does Not Address</td>
<td>Adams: all property owners within 1/2 mi.</td>
<td>Not covered.</td>
<td>Likely to be left up to the local jurisdiction.</td>
<td>Require notifications by letter for all residents w/in 1 mi at the time of original application.</td>
<td>1/2 mile may not be sufficient, as rural residents are more sensitive to light and noise, where property distances are greater.</td>
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### Oil and Gas Regulations Considerations

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<td></td>
<td>Signs are required for 14 days at time of application</td>
<td>When projects don’t start for years after approval citizens would like additional sign postings or letter notifications</td>
<td>Does Not Address</td>
<td>Signs are not specified by other jurisdictions.</td>
<td>Does Not Address</td>
<td>Likely not to address because this is a local matter.</td>
<td>In addition to current requirement for posting at time of application, require mailings or postings of new signs 2-4 weeks prior to construction, drilling or fracking.</td>
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<td>Project schedules for all phases</td>
<td>Staff and citizens don’t know when traffic, noise or other impacts will start or end. Scientific studies have shown that uncertainty about O&amp;G operations is a major stressor that could impact health.</td>
<td>Staff better equipped to answer questions if a rough schedule is is provided.</td>
<td>Does Not Address</td>
<td>Broomfield requires notifications 30 days prior to each phase. A few jurisdictions require a &quot;Development Plan&quot; so that local governments are aware of future development areas.</td>
<td>Does Not Address</td>
<td>Not likely to address. Could possibly require Development Plan submittal to local governments.</td>
<td>Require notifications 2-4 weeks prior to construction, drilling and fracking.</td>
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<td>Incentivize Pipelines</td>
<td>Full USR + 1041 process takes 7-12 months, largely due to having 2 hearings.</td>
<td>Pipelines help to maintain better air quality and keep trucks off roads once liquid lines are installed.</td>
<td>Does Not Address</td>
<td>Weld County and Garfield Counties have a more efficient pipeline application process. Weld County process is administrative unless the pipeline is sufficiently long to warrant a longer application process.</td>
<td>NA. Not regulated by COGCC.</td>
<td>NA. Not regulated by COGCC.</td>
<td>Offer administrative process for pipeline applications with an MOU; This would require a change to our Land Development Code. Need limitation on amount of pipeline that qualifies for the administrative process. Could set that limitation at 3 or 5 miles of pipeline.</td>
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<td>Wish list: Citizen outreach in the Planning stage; Alternative Site Analysis for wells near homes; Development Plan; Consider Health and Safety with setbacks for new construction near existing wells; Closed-loop (pitless) drilling required; Stipulations for wetlands, riparian areas, critical habitats and endangered species - such as surveys and mitigation.</td>
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Oil & Gas Challenges and Lessons Learned

QUALITY OF LIFE

Noise

Issue
Drilling and fracking generates noise comparable to industrial uses and current COGC regulations allow those operations to follow the State’s light industrial noise limits (70 db). The regulations also allow the noise to exceed those light industrial noise limits for 15 minute intervals. Unlike many business operations, drilling and fracking happen 24/7 for several weeks per well. While industrial uses noise is acceptable in areas zoned for industry, noise created by oil and gas can affect other land uses that are not industrial in nature (i.e. residential, agricultural, commercial, etc.), as oil and gas can be placed near any land use.

Generators are commonly used at pads for the production phase. Generators can be a big source of noise.

Results/Concern/Lessons
Citizens have experienced sleepless weeks and aggravated chronic pain levels from drilling and fracking noise and onsite generator noise. If the noisy end of the generator is oriented toward the nearest neighbors, the noise can be disruptive, especially to those with chronic pain. We had an instance where it took nearly three years to remedy noise emitted by a generator.

What Others Communities Require/Best Practices
The Town of Timnath requires compliance with town noise regulations. Brighton requires noise mitigation for drilling, completion and production. Other jurisdictions list “additional noise mitigation if requested”.

Options/Solution
If this is a topic to address, there are two ways of doing such, 1) performance based standard which would set a allowable noise level at a location and the operator is charged with meeting that standard or 2) a prescriptive standard in which a set of mitigation requirements are met with the application. There are pros and cons to both alternatives. Typical mitigation measures include temporary sound walls hay bale placement, site design considerations, etc.

Temporary noise walls can be constructed but design has to be considered. If sound walls do not enclose an entire site, they sometimes channel noise in the direction of one or more residents, while mitigating sound to other nearby residents.

Operators have historically used hay bales to mitigate sound. They are inexpensive and very effective. Layout and height are also critical for mitigation.

Note that one operator has stated that they couldn’t use hay bales because they contain weed seeds, which can be addressed by weed free certifications. Another operator stated their pad wasn’t big enough to install the bales, after we waited for a mitigation remedy and response for about 2 weeks. This could be addressed if this becomes a requirement.
Also note that one operator erects sound walls for the fracking phase but not for the drilling phase, unless sound modelling indicates that state noise standards will be exceeded during drilling. This practice results in a high volume of citizen complaints under the current COGCC standards for noise. With stricter County noise standards or mitigation requirements, sound walls or hay bales would be installed during the drilling phase and allow for a better quality of life for nearby residents during drilling.

It is also critical to orient generators away from noise sensitive areas and provide additional mitigation (sound walls) around generators. In the future, compressors will be installed at many well pads. Compressors can emit very high volumes of noise if not enclosed in insulated buildings. It is critical that we plan for much higher noise levels from compressors before any are installed.

**Light**

**Issue**
Light pollution from drilling rigs and fracking operations is very significant in rural areas where citizens are used to country conditions, not industrial conditions. COGCC only has broad lighting requirements (“to the extent practicable”) for wells within 1,000’ of homes.

**Results/Concern/Lessons**
Citizens have experienced disrupted sleep cycles and sleepless nights and weeks from drilling more than 1,400’ away.

**What Others Communities Require/Best Practices**
There are no known lighting rules in other jurisdictions.

**Options/Solution**
Operators should be required to adjust lighting so that it is directed inward and downward immediately after a complaint is received. Options include lighting no brighter than OSHA standards or to require operators to meet the Arapahoe County lighting code. Again, a performance based or prescriptive alternative approach could be pursued with pros and cons of each.

**Visual Impacts**

**Issue**
Dozens of calls and dozens of emails were received from citizens concerned by visual impacts for 2 reasons:

1) Citizens moved into the country for a quiet country setting with rural views and little traffic and noise. In the past, oil and gas sites were much smaller: a single well head and a few tanks. Now multi-well pads with a dozen or more tanks, basically industrial facilities, are proposed for properties adjacent to theirs. While the traffic and noise disruptions from drilling and fracking can last 3 weeks for every well on the pad, the visual impacts will likely last 25-30 years. Some citizens have asked for advice on where in Arapahoe County they could move that would be unlikely to have oil and gas development.

2) Citizens are concerned about their property values. It has been shown statistically that property values do decline during drilling and fracking for pads with 1 and 2 wells and then values rebound when the facility is in the production phase;
however, it’s important to note that there is a lack of data for real estate values for properties adjacent to multi-well facilities. It’s a valid assumption that the number of potential buyers is decreased by proximity to oil and gas facilities. Potential buyers are largely concerned about well water quality and the ability to sell the property in the future. One article reports that living within a mile of an active oil and gas site will probably impact property values and if the site is near or in the neighborhood, homeowners could see an estimated 15% reduction in property values.

**Results/Concern/Lessons – not sure if this (below) is adequate**
Without being able to require visual mitigation, we can only inform citizens that oil and gas operations are allowed in all zone districts and as such industrial facilities can be built on properties adjacent to theirs.

**What Others Communities Require/Best Practices**
Both Adams County and Brighton have stipulated that visual mitigation or landscaping “may be required”. Broomfield requires a Visual Mitigation Plan. Landscaping is generally accomplished using berms and fences. Low-profile tanks have been required by Prosper Farms as part of their Surface Use Agreement with Conoco.

**Options/Solution**
Require a combination of berms, privacy fencing and low-profile tanks for new pads located near subdivisions.

Native grasses should be required to stabilize the berms and to provide better visual mitigation.

**HEALTH AND SAFETY**

**Setbacks**

**Issue**
Current state setbacks or operator-chosen setbacks may not be sufficiently safe and may not protect quality of life.

**Results/Concern/Lessons**
With the current state minimum setback of 500’, tanks can be placed less than 400’ from the nearest home. We had a citizen who required medical attention when tanks less than 400’ away were collecting flowback fluids. Flowback operations have some of the greatest air emissions.

The majority of new wells installed in Arapahoe County in the past 5 years are slightly over 1,000’ from homes. Requiring a 1,000’ or 1,200’ setback will not make new locations economically unfeasible.

Bright lights, air emissions and noise will be less impactful where wells are at least 1,200’ from residents, as will the potential for health impacts from breathing any tank fire smoke.
What Others Communities Require/Best Practices
Two other jurisdictions incorporated minimum 1,000’ and 750’ setbacks into their MOUs in 2017 and 2012, respectively.

Options/Solution
COGCC is considering adopting a setback of 1,500’ from Building Units and 2,000’ from schools. The County could opt to not address setbacks or adopt the new state setbacks, when and if the state addresses setbacks. If the state does not adopt new setback rules, the County could adopt a 1,000’ to 1,200’ setback from homes at a later date.

Well pad fires could be less impactful to neighboring properties with a 1,200’ setback than a 500’ setback, the current state-regulated setback. Fire districts may be able to maneuver better around a facility on fire with setbacks of at least 1,200’ from homes.

Another setback tool the County could consider is to require minimum setbacks between new residential construction and existing or approved well sites.

Fumes/Emissions

Issue
Oil and gas operations result in hazardous air emissions and persistent fumes.

Results/Concerns/Lessons
Fumes/emissions from diesel engines, from flowback and from normal operations have impacted our citizens. Breathing emissions from tanks and equipment located 500 – 1,000 feet or less from a residence can result in nervous system and respiratory issues, including headaches, nausea and respiratory irritation. A flowback operation in Arapahoe County was curtailed when a citizen required medical attention. Front Range citizens living at slightly over 1,000’ from wells have also reported health issues related to emissions

What Others Communities Require/Best Practices
Baseline air quality surveys; Destruction of 98% of methane and VOCs; “Odor control”; Money for air sampling.

Options/Solution
The use of electric drilling rigs, electric generators and electric compressors should be incentivized. County could require 98% destruction of methane and VOCs but we would have no way to monitor compliance. County could also require baseline air sampling for pads within 1,200’ of homes so that future CDPHE data would have a baseline reference. Could structure that requirement for pads with greater than 4 wells. Could obtain operator funds for canister sampling that can be returned if not used. Citizens can conduct canister sampling with little to no training.

Lightning Mitigation

Issue
Lightning strikes are a common cause of tank battery fires.
The smoke from a tank fire can be an eye and breathing health hazard for healthy individuals and even more so for people with existing health issues. The plume of smoke always migrates offsite to neighboring properties and roads.

**Result/Concern/Lesson**
When one tank catches fire it’s probable that an adjacent tank or two will also catch fire. This has happened in both Arapahoe and Adams counties in recent years.

It is important to note that the possibility of tank fires increase with multi-well pads. To date we have not experienced tank fires near homes but with multi-well pads proposed closer to residences, the likelihood of a tank battery fire affecting residents becomes greater.

Fire districts expend considerable resources fighting tank fires. Lightning mitigation could significantly reduce the probability of a tank fire and operators should be required to incorporate and upgrade to the latest lightning mitigation technology. Greater setbacks would also significantly reduce the impact of smoke plumes on the public.

**What Others Communities Require/Best Practices**
Weld County has required the latest technology for lightning mitigation as a Condition of Approval.

**Options/Solution**
Could require the operator to install lightning mitigation recommended by fire district and upgrade to the latest lightning mitigation technology, if applicable, on a yearly basis. Emergency Response Plans provided prior to drilling would also help fire responders.

**Emergency Response Plans (ERPs)**

**Issue**
Industrial facilities in rural residential areas require emergency response planning and training, on the part of the operator, the appropriate Fire District, the Arapahoe County Sheriff’s Office, and the Office of Emergency Management (OEM).

**Results/Concern/Lessons**
Some operators do not provide ERPs for their facilities until months after production begins. Fire districts, the Sheriff’s Office and OEM would be better able to coordinate their efforts if given an opportunity to plan and train for emergencies that could occur during drilling or fracking or shortly after production begins.

**What Others Communities Require/Best Practices**
Broomfield specifies the content required for ERPs.

**Options/Solution**
Develop standardized ERP format with fire districts and Sheriff. Require an ERP prior to the drilling phase. Require that ERPs be updated at least biannually, if necessary, or as requested by emergency responders.
PROCESS IMPROVEMENTS

Timing of Applications

Issue
Some operators submit their COGCC applications months or years before the County land development applications. County staff might not be aware of some of the COGCC applications until it is too late to comment on the state permits.

Results/Concern/Lessons
If operators were required to submit their County applications at the same time or before their state applications and the public comment period overlapped for the COGCC permit applications and County applications, there would be a less confusing comment submission process for citizens. Also, the County would have a better opportunity to develop COAs that would carry more weight if the operator did not already have a COGCC permit. Those COAs could be shared with the COGCC during their permitting process.

What Others Communities Require/Best Practices
The Town of Timnath requires notice of pending COGCC applications. Ft. Collins requires an operator-city meeting prior to submission of COGCC applications.

Options/Solution
Require submission of County applications before submission of COGCC applications.

Postings and Notifications

Issue
There is usually several months to several years between the time an operator has a land development application approved and when well pad and access road construction starts. Without any notice of upcoming construction, drilling or fracking, citizens are not informed of the upcoming impacts, including traffic, noise, lights and odors.

Results/Concern/Lessons
Currently, operators are required to provide letter notifications to all adjacent property owners. Because the sharp, temporary increase in truck traffic will impact all area residents, letter notifications to all residents within a one mile radius would be more appropriate.

Currently we require operators to post a sign along the nearest County road at the time of application for 14 days. Citizens have complained that 14 days is not sufficient and have noted that if the well pad construction phase is 2 or more years after the applications have been submitted, sign postings a few weeks prior to construction would be appropriate to prepare for traffic delays and other disruptions to the residential environment. We could make it clear that we are not reopening the public comment process, but are only providing notification of a particular phase.

A scientific study established that when citizens were not informed what and when to expect for nearby oil and gas operations, their stress levels increased. Those elevated stress levels were linked to health impacts such as insomnia and depression.
What Others Communities Require/Best Practices
Broomfield requires notifications 30 days prior to construction, drilling, completion, recompletion and plugging.

Options/Solution
Require letter notifications of County and citizens within 1 mile 2-4 weeks prior to construction, drilling and completion. OR Require letter notifications and sign postings 2-4 weeks prior to construction, drilling and completion.

Project Schedules for All Phases

Issue
Staff and citizens don’t know when traffic, noise, lights or other impacts will start or end.

Results/Concern/Lessons
The scientific study referred to above showed that uncertainty surrounding nearby oil and gas operations was a major environmental stressor to communities near oil and gas development. The level of stress was associated with health impacts, such as a higher incidence of infections, neurological problems and depression, and a lower tolerance for noise and light impacts.

If staff were aware of pad construction, drilling, fracking and completions schedules we would be better equipped to address citizen inquiries and complaints. Knowing when drilling or fracking is scheduled to start or end has been helpful to impacted citizens.

What Others Communities Require/Best Practices
Broomfield requires notifications 30 days prior to each phase (pad construction, drilling, fracking, recompletion and plugging). A few jurisdictions require the submittal of periodic “development plans” so that the local government is aware of future development areas.

Options/Solution
Require 30 day notifications for all phases. OR: Require notifications 2-4 weeks prior to pad and access road construction, drilling and fracking. Notifications could be in the form of letters, signs or could be provided to the Planning Division. The Planning Division could then notify citizens via group emails and/or by publishing a notice in the newspapers of record.

Incentivize Pipelines

Issue
Pipelines improve the quality of life for residents by taking traffic off the roads and decreasing methane emissions. Pipeline applications require the full Use by Special Review process with 1041 components. The application and approval process takes 7-12 months, largely due to the requirement for two public hearings.

Results/Concern/Lessons
The length of the process adds significant cost to the operator and involves significant staff time for the Planning Division and Engineering Services Division.
What Others Communities Require/Best Practices
Both Weld County and Garfield County have a more efficient pipeline application process. Weld County has an administrative process for pipeline applications that includes elevating the application to their Board of County Commissioners if the Public Works Director deems it necessary.

Options/Solution
If we could adopt a pipeline MOU and associated administrative process for pipeline applications that would eliminate the two public hearings, significant time could be saved for the County and the operator. However, the Public Works and Development Director could still elect to elevate a pipeline case to the BoCC for a hearing, if the application posed risks to safety, health or the environment.

Another element to help incentivize pipelines comes into play if a maintenance and road impact fee were adopted as a requirement. The operator would receive a reduced fee if piping systems are used for different phases of the operations reflecting the reduction in truck traffic.

This would involve a Land Development Code change. There would also need to be a limit on the amount of pipeline that would qualify for the administrative process. The limit could be either 3 miles of 5 miles of new pipeline.

ADDITIONAL THOUGHTS:

Alternative Site Analysis required for locations near homes.

Staff would like to issue an actual permit for both administrative approvals and full USRs. The COAs could be listed on the permit.

Enter into an agreement to identify new well sites – also known as a Development Plan, updated annually, as other jurisdictions require.

Closed-loop (pitless) systems required, as other jurisdictions require.
# MOU Comparisons

Most of these MOUs or contracts are with specific operators

<table>
<thead>
<tr>
<th>County or City</th>
<th>What’s Different from AC MOU?</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams</td>
<td>More specific on berm inspections re precipitation amount</td>
<td>2015</td>
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<td></td>
<td>More specific on noise mitigation along an adjacent edge. Baseline noise study required.</td>
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<td></td>
<td>More specific on spill reporting – to more departments and quantities.</td>
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<td>Roads: Operator required to repair within 10 days; Spot inspections by County.</td>
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<td></td>
<td>Dust mitigation: specifies no liquid or substance generated by production</td>
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<td></td>
<td>Fencing required around all equipment for safety and screening</td>
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<td></td>
<td>Landscaping may be required for screening.</td>
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<td></td>
<td>Contains Wildlife, Cultural and Historic sections.</td>
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<td>Notifications to landowners within ½ mile.</td>
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<td>Records retained and made accessible to County within 48 hours.</td>
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<td></td>
<td>Has an amendment section.</td>
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<tr>
<td>Brighton</td>
<td>“best efforts” for setbacks of at least 1000’ from public water supply or closest building unit.</td>
<td>Mar 2017</td>
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<td>Pits: Closed-loop systems</td>
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<td>Water sampling – attempt to sample alluvial aquifer; if CH4 increases &gt; 10 mg/l, notify city immediately</td>
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<td>Comprehensive Planning: for next 5 years + map</td>
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<td></td>
<td>Noise mitigation measures for drilling, completion and production.</td>
<td></td>
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<td></td>
<td>Visual mitigation – landscaping may be required.</td>
<td></td>
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<tr>
<td>Broomfield</td>
<td>Comprehensive Drilling Plans &amp; Applications no later than 30 days prior to COGCC 2 and 2A submission</td>
<td>2017</td>
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<tr>
<td>Mix of 2 MOUs</td>
<td>Project schedules for all phases</td>
<td></td>
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<td></td>
<td>Notifications 30 days prior to construction, drilling, completion, recompletion, plugging</td>
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<td></td>
<td>Limitation on number of wells/pad</td>
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<td>Detailed site plan for all well sites with all visible improvements</td>
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<td></td>
<td>Date of no new wells commencement</td>
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<td>Closed-loop (pitless) systems required</td>
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<td></td>
<td>Fresh water transport via pipeline</td>
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<td>Reclamation plans</td>
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<td></td>
<td>Noise Impact Mitigation Plan</td>
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<td></td>
<td>Specifies (12) on contents of Emergency Response Plans</td>
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<td>Traffic Management Plan</td>
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<td>Transportation Plan to include estimated loaded vehicle weights, access locations details, truck traffic volumes, cores drilled, truck routing map, complete traffic report with operational changes, identification of any additional traffic lanes, restriction of non-essential traffic to periods outside peak traffic periods.</td>
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<td>Chains removed before entering a city street</td>
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<td>Specifies on berm requirements; includes tertiary berming near surface water.</td>
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<td>Discharge valves secured and not accessible to public.</td>
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<td>Chemical disclosure; uploads to Frac Focus website w/in 60 days of end of fracking; 23 chemicals not allowed in fracking fluids.</td>
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<td>Baseline water sampling analytes specified</td>
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<td>Baseline surveys for air quality, noise and traffic</td>
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<td></td>
<td>Air quality modelling and air quality impact mitigation plan</td>
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<td>Air quality specifics (24)</td>
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<td></td>
<td>Odor control</td>
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<td></td>
<td>Annual air quality compliance reports</td>
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<td></td>
<td>Operator provides City with $20,000 annually towards air quality sampling</td>
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<td>Green completions with a list of specifics</td>
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<td>Noise modelling of equipment proposed</td>
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<td>Additional noise mitigation if requested</td>
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<td>Electric equipment during drilling and production</td>
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<td>Air quality modelling and air quality impact mitigation plan</td>
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<td>Visual Mitigation Plan</td>
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<td></td>
<td>Summary of the outcome of the alternative site analysis</td>
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<td>Future Regulations (reserves the right to enact and apply regs applicable to commercial and industrial operations)</td>
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<td></td>
<td>Ability to impose a future transportation impact fee</td>
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<td>Cultural and Historic Resource protection</td>
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<td>No injection wells</td>
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<td></td>
<td>Automatic Safety Protective Systems</td>
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<tr>
<td>Elbert County</td>
<td>Fire Protection &amp; Safety Agreement</td>
<td>June 2014</td>
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<tr>
<td></td>
<td>Master Road Use Agreement</td>
<td></td>
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<tr>
<td>Erie, Town of</td>
<td>Enter into agreement to identify new well sites</td>
<td>Aug 2015</td>
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<td></td>
<td>Provide for a centralized product gathering &amp; storage facility to consolidate infrastructure and reduce emissions.</td>
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<td></td>
<td>Term of 5 years</td>
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<td>Location</td>
<td>Agreement Details</td>
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<tr>
<td>Ft. Collins, City of</td>
<td>MOU term of 5 years</td>
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<td></td>
<td>Notes ordinance repealing moratorium on fracking</td>
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<td></td>
<td>Conceptual Review Meeting, 90 days prior to COGCC permit submittals</td>
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<td></td>
<td>Destruction of 98% of methane and VOCs</td>
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<td>Operator/City meeting prior to submitted COGCC applications instead of Development Plan,</td>
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<td></td>
<td>Landscaping and fencing around wells and production equipment</td>
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<td>May 2013</td>
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<tr>
<td>Hudson, Town of</td>
<td>MOU effective for 3 years</td>
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<td>“Contribution Agreement” for proportionate share of road repairs</td>
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<td>Nov 2013</td>
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<td></td>
<td>MOU effective for 3 years</td>
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<tr>
<td>La Plata County</td>
<td>Mentions differing legal positions</td>
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<tr>
<td></td>
<td>County shall regulate vehicular access to/from public highways</td>
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<td>County may interfere in COGCC adjudicatory proceedings to raise environmental or public health, safety and welfare concerns.</td>
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<td>Maximum density shall not exceed 4 wells in 640 acres</td>
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<td>Encourages drilling on existing pads, use of existing infrastructure for infill drilling (sharing between operators)</td>
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<td></td>
<td>Road Maintenance and Improvement Fees of $8,900 for each additional minor oil &amp; gas infill facility</td>
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<td>Road impact fee of $3500/facility</td>
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<td></td>
<td>Mud/debris tracked onto county roads must be removed promptly</td>
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<td>Quarterly updates to a forecasted “activity plan”</td>
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<td>Transport of produced water by pipe</td>
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<td>Green completions</td>
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<td>Low bleed pneumatic instrumentation, where feasible</td>
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<td></td>
<td>Electric motors for artificial lift</td>
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<td></td>
<td>Electrification for engines and motors within 1,320’ of distribution voltage</td>
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<td>95% emission control efficiency</td>
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<td></td>
<td>Odor control</td>
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<td></td>
<td>Water sampling: 2 wells within ¼ mile</td>
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<td></td>
<td>Use of produced water</td>
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<tr>
<td>Longmont, City of</td>
<td>Names specific wells and properties</td>
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<td>Setback of at least 750’</td>
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<td>Royalty account for City</td>
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<td>Access rights for inspections</td>
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<td>Non-binding mediation if negotiations fail</td>
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<td></td>
<td>Company agrees not to sue City</td>
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<td></td>
<td>July 2012</td>
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<tr>
<td>Timnath, Town of</td>
<td>Notice of pending COGCC applications and Operator-Town meetings</td>
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<td></td>
<td>Public meetings re future wells</td>
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<td>Chemical disclosures</td>
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<td></td>
<td>Aesthetic &amp; safety measures, including berming, fencing, sound walls and evergreen screening</td>
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<td></td>
<td>Monetary contribution for air, water, soil monitoring</td>
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<td></td>
<td>LDAR, Stormwater, and Erosion control plans submitted to town</td>
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<td></td>
<td>Accounts for future annexation</td>
<td></td>
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<td></td>
<td>$5,000/well road impact fees; updates if estimated truck volumes increase;</td>
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<td></td>
<td>Reservation of Rights on Impact Fees</td>
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<td></td>
<td>Compliance with Town noise regulations</td>
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<td>BMPs for Comprehensive Development Plan</td>
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<tr>
<td></td>
<td>Minimize cumulative impacts</td>
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<td></td>
<td>Comply with State and local restrictions, setbacks and environmental requirements</td>
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</tbody>
</table>
Community Loan Pool
Place-based Revolving Loan Funds

Carrie Hanson
carrie@coloradoenterprisefund.org
720-473-4075

Lewis Haglar
lewis@coloradoenterprisefund.org
720-473-4055
Underserved entrepreneurs/business owners face barriers in accessing capital

**Option A**
Credit Cards, Pay-Day Loans, Predatory Lending

- High interest rates
- Negative impact to credit
- Short term

**Option B**
Banks, Traditional Funding

- Strict requirements
- Often unable to qualify

Creating big opportunities for small business.
www.coloradoenterprisefund.org
When others say, “NO,” CEF can say, “YES!”

Loans up to $500K

Flexible terms & loan programs

Business assistance services
<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income borrowers</td>
<td>53%</td>
<td>2,400</td>
</tr>
<tr>
<td>Women borrowers</td>
<td>50%</td>
<td>19,000</td>
</tr>
<tr>
<td>Minority borrowers</td>
<td>26%</td>
<td>18,000</td>
</tr>
</tbody>
</table>

With over **40 years of impact**, we have a proven model for success.
Business Summary

**Started:** 2015  
**Type:** Manufacturer  
**Loan:** $51,130  
**Impact:** 3 FTE  
**Referred by:** US Small Business Administration

“We knew we wanted to start a business in our hometown someday, supporting the organic food movement and mission-based products we enjoyed on our trips.”

“Creating big opportunities for small business.  
www.coloradoenterprisefund.org”
Deal Structure

- Operating Budget: $4.6M
- Loan Capital: $35M
- Net Assets: $10M
- Earned Income: 60%

Economic Impact!: $50+M
Partnership Approach

Active Investors

Local connections & networks

Colorado Enterprise Fund

Lending expertise

IMPACT
Expected Outcomes

Active Investors
Support underserved businesses

CEF
Increases production/presence in your community

Economic Development

Job Creation

Creating big opportunities for small business.
www.coloradoenterprisefund.org
Together, we can continue to change lives in your community by:

✓ Expanding access to capital
✓ Increasing personal & community wealth
✓ Creating more quality jobs
✓ Stabilizing small communities
✓ Promoting equity and inclusiveness
Partner with CEF

Bring Capital, Coaching and Connections to entrepreneurs in your area

More information at:  www.coloradoenterprisefund.org
our loan programs

- **Microenterprise** - loans up to $50K
- **Small Business** – loans $50K - $500K
- **Commercial and Business Real Estate**
- **SBA Community Advantage**
- **Healthy Foods Financing (HFF)**
- **Veteran Access Loan Opportunity Resource (VALOR)**
- Business coaching and resources during loan repayment *(free service)*
our due diligence

For startups and existing businesses

- **Amounts:** Up to $500,000
- **Rate:** Varies depending on loan product, use and amount
- **Origination Fee:** Varies depending on loan product, amount
- **Flexible Terms:** Up to 10 years
- **Loan Uses:** working capital, equipment, inventory, property improvements, business purchase, commercial real estate

Ineligible Business Industries

- Pyramid or other networking sales enterprises
- Illegal activities
- Gambling /gaming entities
- Financial institutions
- Businesses that are explicitly sexual in nature
- Businesses where the majority of revenue is derived from e-cigarettes
- Any industry where federal and state laws conflict, e.g., marijuana or substantially marijuana-related businesses

Apply for a loan now
Considerations in Loan Process

1. Global cash flow

2. Personal credit:
   - No minimum credit score. Collections and charge-offs may be accepted. This will be reviewed with each applicant on a case by case basis.

3. Business plan/experience/traction

4. Equity Injection (personal funds = “skin in the game”):
   - Prefer at least 10% owner equity injection of the total project cost.

5. Collateral
   - Business and/or personal assets will be considered for the request.

6. Personal guarantor/co-signer

   Apply for a loan now
our technical assistance

Business Acceleration Services

- One-on-one business advising
- Business Progress Assessments
- Specialized consulting services with tax, legal and industry professionals
- Training workshops and programs
- Connecting with other resources

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