From:	Food & Water Watch on behalf of kris young
To:	#LandUsePlanner
Subject:	Please ban fracking in Boulder County
Date:	Tuesday, November 06, 2012 1:17:55 PM

Nov 6, 2012

Boulder County Planning Commissioners
CO

Dear Planning Commissioners,

I urge you to protect our drinking water, our clean air and our property by banning fracking in Boulder County.

The rest of the country has already shown us what happens to to the environment when it is fracked. The toxic results of using hydraulic fracturing to extract natural gas have led to the contamination of drinking water, cattle being quarantined in Pennsylvania, and dangerous explosions in states across the country, among other issues.

I find it hard to believe we are even considering fracking in Boulder County... this in an unnecessary risk of our health and the health of generations to come in a part of the country that has more than enough renewable resources to provide us with energy that will last forever.

I urge you to protect Boulder County residents and the environment by banning fracking.

Sincerely,

kris young
1777 Grape Ave
Boulder, CO 80304-2202

From:	mariheart@aol.com
To:	Boulder County Board of Commissioners
Subject:	PLEASE SAY NO TO FRACKING IN BOULDER COUNTY!!!
Date:	Wednesday, November 07, 2012 2:23:30 PM

Dear Commissioners,

I'd like to go on record as a citizen who is extremely opposed to fracking in Boulder County.
There is no scientific proof that fracking is safe, regardless of the industry propaganda.
There is plenty of evidence that air and water pollution occur in the process.
We must say no to fracking in Boulder County for the sake of all our children and grandchildren.

Thank You!
Mari Heart
3235 Noble Ct.
Boulder, Colorado 80301

From: jademermaid17@netzero.com
To: Boulder County Board of Commissioners
Subject: NO FRACKING--we can"t afford the consequences-see below info from PA
Date: Wednesday, November 07, 2012 2:29:32 PM

NO FRACKING in Boulder or anywhere else!!!

"The Pennsylvania Department of Environmental Protection produces incomplete lab reports and uses them to dismiss complaints that Marcellus Shale gas development operations have contaminated residential water supplies and made people sick, according to court documents."[i]

When I read this opening sentence in the Pittsburgh Post-Gazette I almost fell out of my chair. This seemed like something from a bad movie from the 1980's about how the big bad corporate lobbyists have influenced government watchdogs by contributing millions to the state's governor.

But it's not a movie. It's happening now.

Gov. Corbett received $1.3 million from drilling interests in his campaign for governor. He also received another $6 million from organizations affiliated with the drillers.[ii]

And in return the drillers received a Department of Environmental Protection that may be routinely falsifying reports to homeowners who ask for their water to be tested.

When homeowners suspect that their water has been contaminated by drilling in their area, they can ask the DEP to check for metals, organic material and volatile organic compounds (VOC). Depositions of two DEP employees allege that the DEP tests for all contaminants, but omits some of the most dangerous contaminants in their reports to the homeowners.

According to the Post-Gazette,

"The omissions include heavy metals, including lithium, cobalt, chromium, boron and titanium, some of which are human carcinogens or toxics, as well as volatile organic compounds that are associated with hydraulic fracturing fluids."[iii]

If it is true, then it is criminal. Everyone involved should go to jail for putting Pennsylvania's families at risk.

State Representative Jesse White (D, Allegheny, Beaver, Washington) has called for an investigation for "alleged misconduct and fraud."[iv]

We agree. PA's enforcement agencies are too tightly controlled by Tom Corbett to conduct an independent investigation. So we're calling on U.S. Attorney General Eric Holder to investigate whether these allegations are true, and if so, to find out who ordered reports that mislead the public and put us all at risk of cancer by hiding the contamination of our water and air.

WE the people have spoken....Sheryl Munday, Boulder, CO 80303

Fast, Secure, NetZero 4G Mobile Broadband. Try it.
http://www.netzero.net/?refcd=NZINTISP0512T4GOUT2

From: dexterpayne1@gmail.com on behalf of Dexter Payne
To: Boulder County Board of Commissioners
Subject: Fracking in Boulder County
Date: Wednesday, November 07, 2012 2:54:25 PM

Dear COunty Commissioners,

I stand with the majority who oppose fracking in Bolder County. And I am willing to speak out. Loudly.

It is time for Boulder to stand up to corporate interests when it comes to our health and quality of life, like so many other counties across this country. If they can do it in Pennsylvania, and other states, there is NO REASON why we cannot do it here.

We demand it!

Sincerely,
Dexter Payne
Boulder

From:	Susan Marie Frontczak
To:	Boulder County Board of Commissioners
Subject:	Please make Boulder County Frack-Free
Date:	Wednesday, November 07, 2012 3:06:39 PM

Please guard our water and our health. Please make Boulder Frack-Free. I won't be in town to attend the rally on November 13, but I will be there in spirit.

Regards,
Susan

Susan Marie Frontczak
3664 Chase Court
Boulder CO 80305-5531
303-442-4052
susanmarie@storysmith.org

From: Don Barshay
To: Boulder County Board of Commissioners
Subject: A WORD TO THE WISE...
Date: Wednesday, November 07, 2012 10:12:45 PM

STOP FRACKING!

From: Goeldner Jacqui
To: Boulder County Board of Commissioners
Subject: Ban Fracking in Boulder County
Date: Thursday, November 08, 2012 10:11:06 AM

Dear Commissioners,

After seeing documentaries like GASLAND and LAST CALL AT THE OASIS, reading widely, attending hearings and study sessions in Boulder and Longmont, I am more convinced than ever that we must do all we can to save Boulder County and ALL Colorado from the environmental and public health damages caused by fracking. (Just ask Ohio, Pennsylvania, and New York if you haven't already.

I am an 80-year-old retired teacher with allergies and emphysema. My health and the health of thousands of others depends on what you do! So does our planet.

Study the issues, speak to Longmont leaders, and follow them in demanding, at the very least, stiff regulations. Best of all, of course, is to ban fracking entirely. Our Gov is on the wrong side of the issue this time.

Thank you for listening and for all your hard work.

Sincerely,

Jacqui Goeldner
303-447-2931

From:	Oak Chezar
To:	Boulder County Board of Commissioners
Subject:	stop fracking
Date:	Thursday, November 08, 2012 10:11:55 AM

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dear friends

please hear the voices of the citizens of boulder county, and do what you can, with your great power, which is so much more direct (and legal) than ours can be.
stand with the earth, and protect the future.
ban fracking now!
we are entering history, and we are charged with energy, the sustainable energy of our own hearts and minds to win greater and greater battles in the war of the oil companies vs. everyone and everything else in this world.

thank you for your courage
Oak Chezar
landowner, taxpayer, earth lover

From:	Erin Espelie
To:	Boulder County Board of Commissioners
Subject:	Oil & Gas Development
Date:	Thursday, November 08, 2012 4:56:34 PM

Dear Commissioners,

As a Boulder-County homeowner who relies upon a local well for water, I am incredibly grateful that you are giving great care and attention to the future of drilling in the area. It strikes me as unlikely that any short-term resource gain could justify the possibility of long-term, even permanent, disruption of the local water table. Particularly in the parched West, nothing outweighs the need for clean, safe drinking water.

Thank you again for taking prudent measures to assess the dangers, even in the face of other pressures.

sincerely,
Erin Espelie

From:	Scott
To:	Boulder County Board of Commissioners
Subject:	NPR.org » Sick From Fracking? Doctors, Patients Seek Answers
Date:	Saturday, November 10, 2012 2:04:52 PM

When considering fracking regs in Boulder County consider the story in the link below. Also, at the current low prices and high availability of ng, why do we need to risk our health and groundwater to get more? To make a few 1percenters richer?

http://m.npr.org/story/152268475?url=/2012/05/15/152268475/sick-from-fracking-doctors-patients-seek-answers

E Scott MacInnis, CMT
303.875.9446
Energeticmassageboulder.com

From:	Scott
To:	Boulder County Board of Commissioners
Subject:	New economic study: fracking risks reduce value of properties dependent on groundwater | Amy Mall"s Blog | Switchboard, from NRDC
Date:	Saturday, November 10, 2012 2:12:16 PM

Ready to flush quality of life, land values, our health, and our water quality down a really deep hole? The link is a report on fracking effects on property values.

http://switchboard.nrdc.org/blogs/amall/new_economic_study_fracking_ri.html

E Scott MacInnis, CMT
303.875.9446
Energeticmassageboulder.com

From:	Rod Brueske
To:	Boulder County Board of Commissioners
Subject:	Fwd: Regulations for responsible gas & oil development
Date:	Sunday, November 11, 2012 6:11:18 PM

---------- Forwarded message ----------
From: **RobertRWinkler** <robertrwinklerxx@yahoo.com>
Date: Sat, Nov 10, 2012 at 1:01 PM
Subject: Regulations for responsible gas & oil development
To: DNR_COGCC.Rulemaking@state.co.us

Director Matt Lepore,

Development of gas leases produces substantial amounts of air pollution. In particular, these operations emit large amounts of natural gas, which consists primarily of methane. Natural gas and petroleum systems are substantial sources of anthropogenic natural gas

and methane emissions, with natural gas systems in particular being the largest single source. The U.S. oil and gas industry produced 26,000 billion cubic feet ("Bcf") of gas in 2009 from both private and public lands. According to a very conservative estimate that very likely underestimates emissions rates, 623 Bcf of this was lost to the atmosphere. These emissions account for approximately 37% of all U.S. methane emissions.

Methane emissions occur across all phases of the natural gas production cycle. Emissions are both intentional and unintentional, and occur during normal operations, as well as a result of leaks and system upsets. While significant uncertainty exists regarding emission rates, production likely produces the most emissions from natural gas systems by a large margin. Substantial sources of emissions are compressors (accounting for an estimated 15 percent of emissions); wellhead facilities, including well clean ups (33 percent) and well completions and walkovers (9 percent); fugitive emissions (15 percent); dehydrator vents (1 percent); pneumatic controllers (11 percent); pipeline emissions (3 percent); and tank venting (1 percent). While most emissions come from natural gas operations, oil operations are also significant emissions sources. One report states that 12 percent of methane emissions from U.S. oil and gas operations come from liquid petroleum systems. The primary sources from oil activities are field production, oil storage tanks, and production-related equipment. Specifically, sources of emissions are fugitive emissions (49 percent), pneumatic controllers (29 percent), tank venting (14 percent), combustion and process upsets (6 percent), and refining (2 percent).

In addition to methane emissions, oil and gas operations' leakage and disposal of

natural gas causes other air pollution emissions that are harmful to the climate, public health, and the environment. While natural gas is primarily methane, it is also approximately 3.5 percent volatile organic compounds ("VOCs") by volume. The VOCs emitted include the harmful BTEX compounds—**benzene, toluene, ethyl benzene, and xylene—which Congress listed as Hazardous Air Pollutants under the Clean Air Act**. There is substantial evidence of harm from the VOCs oil and gas operations emit. For instance, one analysis found that 37 percent of the chemicals

used during natural gas drilling, fracturing, and production were volatile and able to become airborne. Further, this study found that the volatile chemicals were likely to be very harmful, stating that of the VOCs reviewed **"(81%) can cause harm to the brain and nervous system. Seventy one percent of the volatile chemicals can harm the cardiovascular system and blood, and**

66% can harm the kidneys."

The flaring (combustion) of natural gas also causes harmful air pollution. The complete combustion of the gas results in the emission of carbon dioxide and water. Carbon dioxide is a greenhouse gas and the principle driver of climate change, so flaring still contributes to global warming, albeit at a lesser rate than simply venting or leaking the methane. However, flaring results in other emissions as well, since combustion during flaring is rarely complete. Other harmful pollutants emitted during flaring include nitrogen oxides, particulate matter, and VOCs. NOX and VOCs are ozone precursors, meaning they contribute to ground level ozone (smog) formation. Ozone has serious health effects. It can **irritate the respiratory system, reduce lung function, aggravate asthma, and inflame and damage the lining of the lungs, and may aggravate chronic lung disease.** Smog has become a serious problem in a number of rural areas

where oil and gas activities are occurring. For instance, in 2009, the governor of Wyoming nonattainment area. Also, in 2011 alone, the residents of Sublette County had thirteen "unhealthy" ozone days, under EPA's current air-quality index, including days when the **ozone**

pollution levels exceeded the worst days of smog pollution in Los Angeles. Particulate matter consisting of tiny particles suspended in the air also results from flaring activity. Some of the health effects associated with particulate matter exposure are **"premature**

mortality, increased hospital admissions and emergency department visits, and development of

chronic respiratory disease." Sensitive populations, include the elderly, children, and people with existing heart or lung problems, are most at risk from particulate matter pollution.

With that said a number of affordable technologies exist which can greatly reduce the amount of pollution oil and gas operations emit. Numerous studies and articles, including a 2010 Government Accountability Office (GAO) Report to Congress,

identify many different

technologies that are available to reduce methane leakage at various stages of oil and gas operations. According to EPA data, 40 percent of vented and flared gas from leases could be feasibly captured, representing an additional royalty revenue. According to industry and EPA officials, the cost of implementing these technologies is recovered quickly as newly captured gas is sold, and as EPA's Natural Gas STAR program demonstrates, in most cases, the cost of implementing these control technologies can be recovered in less than one year.

Examples of effective technologies include:

-green completions, also known as reduced emissions completions, that capture liquids and gases coming out of the well during "completions" using equipment brought to a well site. The equipment routes fluids and gases to a tank for separation to enable sale

of gas and condensate;

- liquids unloading systems, which are systems installed to lift accumulated liquids in the wellbore to the surface, allowing the capture and sale, rather than venting, of methane gas;

-TEG dehydrator emission controls or desiccant dehydrators that capture methane gas while the gas is being dehydrated;

-dry seal systems that reduce emissions from centrifugal compressors that often leak from the seals in centrifugal compressors and the rod packing mechanisms in reciprocating compressors;

-leak monitoring and repair.

One recent report found that the implementation of technologies and practices to prevent wasteful emissions of natural gas could reduce methane emissions from the oil and gas industry overall by 80 percent and generate additional revenue. Also, the elimination of natural gas emissions would have the added benefit of reducing VOC emissions significantly, since natural gas is usually about 3.5 percent VOCs by volume. Further, the use of these techniques and technologies would help eliminate the need for flaring, which would eliminate harmful NOX, PM, and VOC emissions.

The COGCC must update its regulations as described below in order to improve its management of gas and oil development ensure compliance with its statutory duties. New standards will benefit owners and operators, as well as the public and the government. Many existing technologies can greatly reduce emissions of methane into the ambient air, and are so cost effective that their implementation cost can be recovered in a short period of time.

We request a set of changes that clarify and ensure compliance with the underlying

obligation of all lessees to minimize waste of natural gas. Operators must operate in a manner that protects the environment and conserves mineral resources as follows:

Conducting all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; which protects other natural resources and environmental quality; and which protects life and property.; The operating rights owner or operator shall conduct all operations in a manner and which, as a first priority, **protects the environment and public health** including by minimizing waste and which also results in maximum ultimate economic recovery of oil and gas and, as a second priority, results in with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.

COGCC BLM should add a definition of "best available technology for oil and gas operations" as follows:

Best Available Technology means the following:

(1) Best Available Technology shall result in an emission rate that does not exceed the natural gas emissions performance standard.

(2) Best Available Technology at a minimum includes the use of the following controls:

Recovery and Storage—All recovered liquids must be routed into storage vessels and all recovered gases must be routed into a gas gathering line or collection system.

Compressors—Operators shall implement a maintenance program for compressors that is in line with best industry practices. Operators shall also employ tandem dry seals for all centrifugal compressors used in the production and transmission of natural gas.

Wellhead Facilities—Operators shall employ at wellhead facilities:- reduced emission completions equipment to eliminate

emissions from wells at all times following perforation of the well casing until flowback has ceased;- and a plunger lift system or similar system with an equal or greater methane capture rate to remove accumulated fluids from wells.

Vapor Recovery Units—Operators shall employ vapor recovery units with all storage tanks that recover, at minimum, 99 percent of all vapors. Recovered vapors shall not be leaked to the ambient air.

Dehydrators—In removing water from produced gas prior to transmitting the gas, Operators shall dehydrate the gas using technology that results in no emissions to the ambient air.

Pneumatic Devices—For all pneumatic devices, Operators must employ no-bleed controllers. If Operators are able to demonstrate to the satisfaction of BLM that the use of a no-bleed controller is impossible, the Operators may use a low-bleed controller. High bleed pneumatic devices are prohibited in all circumstances.

Pipelines—All pipelines shall be constructed using plastic pipe. Operators shall

employ plastic insert liners to reduce gas leakage. Excess flow valves shall be installed in all pipelines.

Inspection and Maintenance—Facilities shall employ best industry practices for inspection and maintenance.

(3) Best Available Technology shall also include any measures, technologies, or processes that become available after the effective date of these regulations that allow for recovery of additional natural gas, unless the Operators have demonstrated to the satisfaction of COGCC that such technologies are not technically feasible or pose a significant, elevated health or safety risk.

In addition, The COGCC must adhere to its mandate under Colorado law to protect "public health, safety, and welfare, including protection of the environment" (C.R.S. 34-60-102(1)(a)(I)). The current 350-foot setback is woefully inadequate in meeting this mandate. The rule must include a setback distance of 2,000 feet, plus an additional 100 feet per additional onsite wellbore near residences, schools, playgrounds/sports fields/parks, hospitals, nursing homes, and other similar facilities, due to the concentration of on-site emissions from aggregated wellbores.

A recent public health study found that **residents living within ½-mile from oil and gas development are at a greater risk of health effects** (McKenzie et. al. Human health risk assessment of air emissions from development of unconventional natural gas resources, Sci Total Environ (2012), doi:10.1016/j.scitotenv.2012.02.018).

Furthermore, the draft Battlement Mesa Health Impact Assessment's preliminary findings were very troubling: **"gas processes release chemicals that are known to impact health; chemicals emitted into the air from natural gas processes are more likely to impact health than chemicals released into the water or the soil; exposures from air emissions are likely to be highest during well completion activities; and residents living near a well pad (defined as within** ½ mile) are more likely to experience health effects than residents living farther away from a well pad (defined as greater than ½ mile)" (Colorado School of Public Health. Draft Battlement Mesa HIA, Revision 1 ES-page II. February 2011).

Please take protective measures to fulfill your duty to protect the public health of Colorado citizens, and select a protective setback of a minimum of 2,500 feet.

Respectfully,

Robert Winkler

Weld County Colorado

Robert (Bob) Winkler, CDRP

International Institute for Risk Management

Washington University

Thanks for your support in preserving the precious clean air we breathe, water we drink, good health we take for granted, and property values of where we choose to live and make our homes...

From:	Joni Kozdeba
To:	Boulder County Board of Commissioners
Subject:	Fracking Meeting
Date:	Sunday, November 11, 2012 8:05:08 PM

Dear comissioners,

I really believe fracking poses significant health risks to us, our animals, our water, our air quality, and our soil. I love Boulder County for it's beauty, the healthy lifestyle, the recreational opportunities on open space and feel that fracking will significantly destroy all of this.

I will be unable to attend the next meeting and want to express my position against fracking and that fracking should be banned in Boulder County.

Thank you ,
Joni Kozdeba

From:	anita li
To:	Boulder County Board of Commissioners
Subject:	Ban fracking
Date:	Sunday, November 11, 2012 10:11:30 PM

Dear Boulder County Commissioners,

I urge you to extend the moratorium on fracking and work toward a state-wide ban on this dangerous practice.
The people and animals and crops of Colorado depend on clean water and air, so you MUST protect our water and air (and health and property values).

The burden of proof is on the oil and gas industry. They have not proved that fracking is safe.

Also, I urge you to use your position and your visibility to call for an end to government subsidies to the oil and gas industry; transfer that money to subsidize renewable energy - before it is too late.

Please go out on a limb and protect us. Thank you.
Anita Li
Boulder, Colorado

From:	Leah Conroe-Luzius
To:	Boulder County Board of Commissioners
Subject:	representing the people
Date:	Monday, November 12, 2012 8:50:35 AM

It is important to remember that your job is to represent the people. Fracking and extraction industries do not belong in Boulder County. Nor do GMO crops belong on County Land.

If you vote to represent the oil and gas industries and not the people, recall is possible.

Leah Conroe-Luzius

From:	Rod Brueske
To:	Boulder County Board of Commissioners
Subject:	Fwd: [bococcr] important talk tonight in Boulder
Date:	Monday, November 12, 2012 9:47:37 AM

---------- Forwarded message ----------
From: **BoCoCCR Members** <members@bococcr.org>
Date: Mon, Nov 12, 2012 at 8:46 AM
Subject: [bococcr] important talk tonight in Boulder
To: BoCoCCR Members <members@bococcr.org>

Too many place to be at once... sigh
While BoCoCCR is having a *sign-making party tonight at Unity*, here's another important event that we need to publicize. Please pass the word.
-nancy

The Effects of Oil and Gas Drilling on Human Communities and the Environment

Pete Morton, PhD., former economist for the Wilderness Society will discuss the effects of oil and gas drilling on human communities and the environment.

Link:
http://planboulder.org/Default.aspx?pageId=245680&eventId=568450&EventViewMode=EventDetails

_____
Members mailing list
Members@bococcr.org
http://bococcr.org/mailman/listinfo/members_bococcr.org

From:	Rod Brueske
To:	Boulder County Board of Commissioners
Subject:	Fwd: [bococcr] Credibility Gap
Date:	Monday, November 12, 2012 9:59:52 AM

---------- Forwarded message ----------
From: **BoCoCCR Members** <members@bococcr.org>
Date: Mon, Nov 12, 2012 at 9:51 AM
Subject: [bococcr] Credibility Gap
To: EBCU <eastbocounited@lists.riseup.net>
Cc: members@bococcr.org

Credibility Gap

On November 6, 2012 the city charter of Longmont banned fracking from its city limits. In doing so, Longmont has overcome the influence of corporations powerful enough to have the full public blessing of Presidential candidates, our Governor, and most all local politicians to one degree or another. It is an industry that was able to find $500,000 in its back pocket to throw at the problem of a citizenry disillusioned and moving into action. Some of the names on that list of industrial contributors against Ballot Question 300 ranged from the corrupt to the outright murderous. All of them wished to confuse and exploit the community for nothing more than profit and dividends. They tried through threat and deception to do just this. Longmont never blinked, and today fracking is banned in their town.

As a result, the movement against hydraulic fracturing and for the safety of our families and communities has entered a new and higher phase.

Beyond the intimidation of industry and state politicians, there were also other highly relevant hurdles that the people of Longmont pushed out of their way. One of these is the illusion and concessionary idea that hydraulic fracturing can be done safely, and that it can be regulated by the very state apparatus that is now suing Longmont for riding itself of fracking. By approving Ballot Question 300 Longmont did not seek to introduce symbolic and meaningless regulations, and it did not ask vacant politicians to protect its homes. It cut the Gordian Knot on the issue, and delivered a victory based on community need, science, and genuine self-defense.

This is particularly difficult for a community to do. At every stage, the voices of science and community have been told to bend to the will of the gas and oil industry. The general social forces that have propagated this idea come from every manner of political office and include select environmental leaders. The argument advanced is very simple in its formulation, even if its consequences complicate the

movement against fracking in every way. What's behind the argument is the notion that fracking is inevitable, and that to fight it in its entirety is simply not politically possible. To ignore this bit of advice means being shut out of the offices of our so-called representatives. It means political isolation. It means that the only governmental figures we have would willingly and with great determination ignore our concerns, and return to the same business as usual that would lead to the inevitable poisoning and loss of our communities.

On the politicians themselves, I will ignore the question, "What kind of person would be able to do such a thing, to ignore people fighting to protect their families from the threat of a toxic industrialization forcing itself upon them"? This question does not need to be answered. Every genuine person reading these words already knows.

Instead of attempting to rid ourselves of another empirically toxic fossil fuel, we are told instead to be "Credible", which according to the Merriam-Webster dictionary is defined as, "Offering reasonable grounds for being believed". So what is this credibility, or the grounds for being believed by our officials, based on? Is it based on the study of the Colorado School of Public Health that showed elevated cancer rates within a half of a mile around fracking sites? Is it based in the research of toxicologist Dr Theo Colborn, who has exposed the deadly mix of chemicals in fracking fluid and their affects on our health? Is it based on the exhaustive research of Shane Davis about the failing of the industry and government alike? Or is our credibility based, is this particular circumstance, on the politician's unwavering and cynical view that to defy the profits of the oil and gas industry is to pull at the fabric of their personal political ambitions, of larger economic forces, and therefore not negotiable in any real sense?

You see if we follow the best science that is available, we cannot be credible. To be credible is a function of bending to the political will of elected and appointed individuals, and by extension, to the profits of the oil and gas companies. If we offer capitulations point black to a lying and enormously destructive industry we are given the respect and time of our representatives. If we fight for the safety of our families and homes, we are disingenuous, shunned, and marginalized as a force of mislead individuals and groups.

One does not have to look far for examples of this type of thinking. Take the Colorado Environmental Coalition, for example, who are telling people and representatives that, "Colorado needs 1,000 foot setbacks from homes and requirements that industry use best available technology to mitigate the impacts to our air and water." Where does the figure of the 1000-foot setback come from? While it alludes to an idea that setbacks can determine a level of safety for our children, there is absolutely no study available to science that suggests a safe distance from hydraulic fracturing, and the authors of this demand are well aware of this fact. Instead, the figure is physical representation of the Orwellian science of political capitulation, nothing else. Many so-called environmentalist groups and leaders have similar, made up figures that do nothing for science and health but go

a long way to accommodate the oil and gas companies. Most recently, U.S. Congressman Jared Polis claimed, “A 500-foot buffer around residences is a sensible approach to ensuring that Boulder County residents are not exposed to hazardous chemicals used in, and resulting from fracking while still allowing the extraction of natural gas in less populated areas.” If 500’ is safe, surely Mr. Polis can show us what he is reading that leads him to educate us on this fact. Again, the 500’ figure told to us by Polis, one of the proponents of the Frac Act, has no basis in reality, except for the reality of capitulation.

What is this game that we are playing now, especially in view of the tremendous, authoritative, and uncompromising victory in Longmont? The game of setbacks, and other quasi measures that are supposed to make us feel better about the gas industry is nothing short of toxic roulette, a tangible negotiating of acceptable levels of poisoning. And this game that we are playing, and that we are being told to play by various environmental groups and political leaders is not being done in the name of science, it is for the “Credible” benefit of industrial profit.

Hydraulic fracturing is poisonous. It is a process that is being conducted by private multinational corporations that have taken ownership of the political system, and that are now forcing themselves into our communities and aquifers, our air and land, and all for the prospect of massive financial enrichment. These are not charities, and they do not care about the lives of our people. The gas companies will disappear as soon as the financial incentives are gone and we will be left with countless insults to our heath and an environmental destruction that will extend for generations to come. Is this the force that we should be accommodating in our efforts? Should we willing pay lip service to their messengers and base our strengths on concessions to their mineral rights and profits?

Lets embrace the heights that Longmont compels us to as a movement. Lets use the science and the studies that exist, and that are becoming more available at every stage. We do not need, and should openly defy, any force that suggests that minimal demands will buy us a seat at the table, regardless of who is asserting it. That table is the property of Encana and Anadarko, not the citizens of Colorado, and the lungs and health of our children are not items negotiation. The sooner we take ownership of this fact, the truer we become to the issue itself and to the science that commands us to fight hydraulic fracturing to begin with.

The politics of accommodation do not work when it comes to our health and welfare. The days of retreat are now behind us and Ballot Question 300 has opened up a new chapter in this fight. Now it is time for our offensive, and when history is written about the defense of Colorado form profit and pollution, this can be one of our bravest and proudest moments.

Ban fracking, fight concession, and speak the truth. We truly have a world to gain.

Members mailing list
Members@bococcr.org
http://bococcr.org/mailman/listinfo/members_bococcr.org

From: eravitz@gmail.com on behalf of Evan Ravitz
To: Boulder County Board of Commissioners
Subject: You DO have the power to stop fracking
Date: Monday, November 12, 2012 10:11:42 AM

Dear Commissioners,

I listened to Will Toor this morning on KGNU say that you don't have the power to stop fracking because state law supersedes local control.

Pete Morton, who spent 15 years as an economist with the Wilderness Society, is addressing Plan Boulder tonight on this very subject and oil and gas operations in general, upstairs at Sherpa's 7-9. You are invited, but come on time as space is limited to 30 people.

We wouldn't have a US Constitution if what Will says was true. The so-called First Principle of the US and all democracies is "The People are sovereign." So, when the 13 State legislatures refused to ratify the Constitution, James Madison recalled, "The people were in fact, the fountain of all power, and by resorting to them, all difficulties were got over."(See his 2nd response in the 1787 Debate: http://avalon.law.yale.edu/18th_century/debates_831.asp)

Thus the ad hoc delegates of the people ratified the Constitution at the conventions. They did this by representing the people, what we hired you Commissioners to do, not by bowing to existing State power.

The question is if any of you have the courage to stand up for the overwhelming desire of your constituents, as reflected in Tuesday's vote of Longmonters on ballot issue 300. With Longmont being the most "conservative" part of the County, I'm sure sentiment against fracking OUR land is much higher county-wide.

Sincerely,
Evan Ravitz
1109 Portland Pl.
Boulder CO 80304
(303)923-5918

--
Evan Ravitz Freelance Editing (303)923-5918
Gates of Paradise hot springs backpacking trips
Iridescent cloud cards, prints, iPad covers, etc.
Vote the "mock" out of democracy at Vote.org!

From:	Don Barshay
To:	Boulder County Board of Commissioners; council@bouldercolorado.gov
Subject:	re: fracking...
Date:	Monday, November 12, 2012 11:15:27 AM

Robert F. Kennedy Jr.: Renewable Energy Is Key to U.S. Growth

The method of extracting natural gas from shale rock formations has come under intense scrutiny and many local cities and communities where there are natural gas deposits have banned the practice. Hydraulic fracturing, more commonly referred to as hydrofracking or fracking, involves injecting large amounts of sand, water and chemicals into the ground at high pressures. Critics of fracking say this process produces millions of gallons of wastewater that contain highly corrosive salts and carcinogens. These radioactive elements could pollute water sources such as rivers and underground aquifers and pose serious dangers to the environment and individuals.

Boulder County Commissioners and Boulder City Council are going to have to show more spine in this situation than they have exhibited to date.
Don

From:	Lisa Jhung
To:	Boulder County Board of Commissioners
Subject:	Fracking concerns
Date:	Monday, November 12, 2012 11:18:12 AM

Hello there,

I am writing because I've been made aware of the fracking situation and the potential health hazards fracking imposes on us and our environment. The hazards are alarming, and I implore you to take the strongest action possible against fracking until a neutral party can prove no risks to humans, animals, water, air quality, soil, and so forth.

Thank you for your action in protecting the health and well-being of Boulder County residents.

- lisa jhung

l i s a j h u n g
.....
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Boulder, CO 80304
lisajhung@comcast.net
(303) 443-1090

From:	KATE JOHNSON
To:	Boulder County Board of Commissioners
Subject:	Extend the Moratorium
Date:	Monday, November 12, 2012 11:21:51 AM

Dear Boulder County Commissioners,

I am writing to you today to ask that you respect and comply with the recommendation of the Boulder County Planning Commission and extend the current moratorium on fracking in the county for at least 3-6 additional months! Why?

1. The current draft regulations were rushed through and are not yet completed.
2. The extension is necessary to get the air quality monitoring done and done right.
3. The public has not been adequately informed, engaged or updated about the issue and all its ramifications (something you promised you would do). Several open houses sponsored by the county with meaningful panel discussions and factual information are necessary.

I look forward to speaking with you tomorrow at the public hearing. Thanks for the work you've done so far - you're just not done yet and once you lift the moratorium, we're fracked and there's no going back. You DO have the power to do this, so please consider carefully who your constituents are: the people of the county or the oil & gas industry, their shills and the lawyers?

With respect,
Kate Johnson
Unincorporated Boulder County

From:	Mindy Eckhardt
To:	Boulder County Board of Commissioners
Subject:	No To Fracking
Date:	Monday, November 12, 2012 3:20:17 PM

To Whom It May Concern,

I've been a resident of Boulder County for twelve years and I'm proud of how environmentally conscious the major of the population here is.

I'd like to believe the same is true for our city and county officials.

Natural gas is already a limited resource, must we destroy phenomenal quantities of fresh water (another limited resource) in the process of obtaining a soon-to-be obsolete form of energy? Hydraulic fracturing makes people, plants, and animals sick, and pollutes the earth..

We'd be better off using the money for fracking, to support more environmentally friendly forms of obtaining energy.

Fracking Is Doing Us More Harm Than Good.

Please support NO Fracking In Boulder County.

Sincerely,
MIndy Eckhardt

From:	Linda Foos
To:	Boulder County Board of Commissioners
Subject:	increased awareness
Date:	Monday, November 12, 2012 3:21:57 PM

Dear Commissioners, Please be infromed of the bigger picture of what fracking is doing and how the earth has to be looked at as a whole, it's not just only about Boulder but we can make a difference. Please goggle Lousianna Sinkhole, click on Dutchsinse and watch what fracking is doing from space to the whole country. It's not very long. Just think what happens to your house when the foundation gets cracked, then cracked again, then again, pretty soon you don't have a house. Shale is one of earth's foundations, should we really be breaking it up just because we can?

From:	Wendy Underhill
To:	Boulder County Board of Commissioners
Subject:	ban fracking
Date:	Monday, November 12, 2012 8:30:29 PM

Hello Boulder County,

I believe that the commissioners will be discussing banning fracking in the very near future. Here are a few things I'd like you to think about:

--once the process is started, it is hard to reverse it—contaminants in ground water can't be removed, so let's wait until we know more about how the process works.

--because it is new technology (sort of), we don't have regulations yet that adequately address it; again, waiting until the state can take action would be the conservative thing to do.

--I've seen what polluted, pooled water looks like next to a natural gas pipeline that leaked. Let's not add to the potential for more of the same.

Thank you for being thoughtful, cautious and conservative on this one.

Wendy Underhill

300 Arapahoe Av

Boulder, CO 80302

From: anne harper
To: angelsisters@googlegroups.com; billgruening@hotmail.com; bodhitucker@yahoo.com; clarischmidt@comcast.net; Boulder County Board of Commissioners; dharmaoceanboulder@gmail.com; katharinekaufman@gmail.com; malbrittain@earthlink.net; nathan@barrettstudio.com; pagezekonis@gmail.com; ragageneva@aol.com; reuvainbacal@gmail.com; robkeeley@pol.net
Subject: Fracking on Boulder County land
Date: Monday, November 12, 2012 9:39:39 PM

Hi Everyone,

If you are interested in prohibiting fracking on Boulder County land (outside of Longmont) please attend or email the Commissioners. Information for both is below.

Padma

We are at a crucial point in Boulder County.
EVERYONE's support is needed to keep fracking out of our community.

Please join us November 13 for:

"Ban Fracking" Rally

Tuesday, November 13th
3:00 – 4:00 pm
in front of the Boulder County Courthouse
(14th and Pearl)

Bring your own signs or join us for a sign-making party on *Nov. 12th at 7:00 pm at Unity Church in Boulder.*
(Note: signs are not allowed in the hearing room.) **SCROLL DOWN FOR MORE IMPORTANT INFORMATION...**

After the rally, stay for the

County Commissioners' Meeting and Public Hearing
4:00 pm (3rd floor of the courthouse)

Plan to speak or *pool your time with other speakers*.
This may be one of our few chances to give public testimony on the county's plans for the permitting of oil and gas development.

What can we say now about these regulations? Among other things ...
The process for updating regulations was rushed and the regulations are as protective as they could be. A moratorium extension is needed to do due diligence.

Scientific evidence about the perils of fracking is mounting.
Political momentum toward banning fracking is growing.
The public has not been adequately involved and informed – more outreach needed.

Numbers matter and we need everyone to attend.
All eyes in the state will be on our county and we have to show the commissioners that we are paying attention!

E-mail the commissioners to voice your concerns BEFORE the hearing : commissioners@bouldercounty.org

From:	Reuvain Bacal
To:	Boulder County Board of Commissioners
Subject:	I"m Concerned About Fracking in Boulder County
Date:	Monday, November 12, 2012 11:11:02 PM

Attention: Boulder County Commissioners

As a land owner in unincorporated Boulder County, I'm very concerned about the potential negative environmental impacts of fracking in our county.

I'm asking you to extend the moratorium on this practice in order to gather more scientific information, and ultimately to prohibit fracking on Boulder County land to protect our land and water sources from polluted wastewater.

Thank you for considering extending the moratorium on fracking.

Reuvain Bacal, MA

REUVAIN BACAL, MA
Psychotherapy
720.530.4859
www.reuvainbacal.com
2805 Broadway
Boulder, CO 80304

NW Corner of Broadway and Balsam.
Entrance and parking on Balsam, to the South side of building.
Inside the Mandala Clinic at the top of the stairs.

"Truly, the greatest gift you have to give is that of your own self-transformation".
Lao Tzu

Create your free signature: CLICK HERE!

From:	Karen Sandburg
To:	Boulder County Board of Commissioners
Subject:	Fracking
Date:	Tuesday, November 13, 2012 7:19:54 AM

I urge you to vote for an extension on the fracking moratorium. Fracking is a health hazard, plain and simple and proceeding with allowing it should be only under very strict conditions which protect our air and water.

Extending the moratorium will permit the county time to draft a comprehensive plan on how to move forward.

From:	Laura Ruby
To:	Boulder County Board of Commissioners
Subject:	Fracking Regulations
Date:	Tuesday, November 13, 2012 10:04:04 AM

Hello County Commissioners,

I am writing to express my opposition to fracking in Boulder County, or anywhere, for that matter. It is a highly dangerous and volatile process that threatens our water supply through contamination and mis-use. We are already stressing our water systems, and with a changing climate, our water supply will shift in patterns and affect us in ways that have yet to reveal themselves. We show no foresight in allowing such a dangerous process to happen around us.

Further, the process for updating regulations was rushed and the regulations are as protective as they could be. A moratorium extension is needed to do due diligence. Scientific evidence about the perils of fracking is mounting. Political momentum toward banning fracking is growing. As a natural products hub and environmental epicenter, we would be negatively affecting our reputation. The public has not been adequately involved and informed– more outreach needed.

Laura Ruby
Hawthorn Ave, Boulder, CO

From:	Nancy Hall
To:	Boulder County Board of Commissioners
Subject:	comments 11/13/12 re: oil & gas regulations
Date:	Tuesday, November 13, 2012 10:53:40 AM
Attachments:	nov13-2.docx EC excerpt.pdf tp114-c1.pdf WestBranchOilFieldsHC532010.pdf

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Attached are some comments and supporting documents re: the proposed oil and gas regulations. I apologize for the late submission.
Sincerely,
Nancy Hall

To: County Commissioners

From: Nancy Hall, 12892 Sheramdi St., Longmont 80503

Re: Draft oil and gas regulations DC 12-0003

Date: Nov 13, 2012

I am writing about the proposed oil and gas regulations before you now. I have followed the development of this draft throughout this spring and summer. Please consider the following comments.

Executive Summary

A. The draft regulations are inadequate; much more needs to be done.
B. There are good reasons for adopting some portion of these regulations soon - even if they are unfinished ; but adoption doesn't mean they are complete, or that oil and gas development should be allowed to proceed.
C. Adoption of the regulations at this stage does not preclude further refinement, which can happen concurrently with implementation of the regulations or portion thereof that have been adopted.
D. The work done to date may be for naught if Longmont does not prevail in *COGCC v City of Longmont*, so it is imperative that Boulder County intervene in that suit to protect its own interests.
E. The result of *COGCC v City of Longmont* might very well mean that BoCo could have done, and can still do more than it presently assumes it can do. For that reason the county must prevent oil and gas development from proceeding while the Longmont case is decided.
F. The county must reach out to all other zoning authorities in the state - municipalities and counties - to broaden the base of support for local zoning powers by convincing them to intervene in the Longmont case, as soon as possible.

Supporting Comments

A. Regulations are inadequate

1. Insufficient time. The subject matter before you is so complex that it is unreasonable to expect good regulations to be developed in such short time. By comparison with the time taken for house-size rules, the few months and 3 meetings with the planning commission is woefully inadequate. This is not meant to criticize the staff, who have done well with the severe limitations given them.

2. No opportunity for information *exchange*. The limit of 3 meetings with two opportunities for public input doesn't allow for meaningful exchange or conversation.

At the last opportunity for public input before the planning commission, I brought up two items of concern that were not addressed by the regulations. The planning commission agreed that these issues were worthy of attention and the staff were requested to look into them. The staff put the issues, both health-related, before the industry consultant (not the person to whom these issues should have been

addressed), who dismissed them. I believe there was some misunderstanding of my reasons for concern. But there was no opportunity for further input on this matter before the regulations were to be passed along to you. These two issues are A) inorganic emissions, and B) silica dust.

The regulations address air quality through an emphasis on VOCs, and my point is that there are inorganic compounds that have been shown to be cause for concern in areas of oil and gas production. I selected two that I had read about, but not being a chemist, I am in no position to enumerate them all. County staff have articles -- Lana Skrtic, *Hydrogen Sulfide, Oil and Gas, and Peoples' Health*, and the EC study, and *Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe* (which, despite its name, relies heavily on data from United States studies) describing concerns regarding both the oxides of nitrogen (EC) and hydrogen sulfide(Skrtic) .

Regarding hydrogen sulfide, Ms. Skrtic concludes that hydrogen sulfide, while naturally occurring, is clearly a reason for elevated concern in the vicinity of oil and gas development. Additional studies show that it is associated with oil and gas development, and poses a hazard, and children are at higher risk than adults; I attach these documents to my comments.

Regarding oxides of nitrogen (of which there are a variety, as I understand), the European Commission identified these as a matter of concern. My understanding of the comments of the health department is that their attention is devoted to VOCs and their effect in the production of ozone, and that inorganic compounds are not a matter of concern. I believe that if we are going to hang our regulatory-protection hats on air quality monitoring, we need to include inorganics, or - at the very least - not write the regulations to exclude inorganics - from our monitoring requirements.

My concern with silica dust is that it poses a new, unstudied hazard. To date, silica dust and silicosis have been studied only in an occupational (adult population) setting, where prevention consists in wearing protective clothing and masks, and in using some mechanisms to suppress ambient dust, often in a controlled environment. Transportation and dumping of large quantities of silica sand (in an often-windy, and residential environment) and its impacts on residents and especially children, have not been addressed. Yet this is precisely the situation we now confront. I am told that you have been sent the photographs of silica dust clouds recently observed blowing from one of the drilling sites in the eastern part of the county. The county health department representative at the last Planning Commission meeting suggested that it is sufficient to have people trained to see visible dust clouds to address this concern. This response to the commissioners' questions perturbed me, leaving me wondering where the neighbors will find masks sized for newborns-to-two-year-olds. Seeing the dust clouds does not *prevent* exposing residents to the hazard (in the case of the aforementioned photos, residents more than a mile away). To quote OSHA, *"If it's silica, it's not just dust."*

Putting the question to the industry consultant, Mr. Matheson, who apparently responded to the effect that OSHA handles silica dust, confirms that my point (and, by agreement, the planning commission's point) was entirely missed.

3. Planning for air quality monitoring takes time. At the last Planning Commission meeting, a representative of the health department was questioned about the time required to prepare a plan for study of emissions, to which she reported that 3-6 months would be needed to prepare this plan, apparently in conjunction with CU, using a new grant they received to study emissions from oil and gas. The result of this response was a Planning Commission request for a 3-6 month extension to the moratorium. This is clearly needed so that a meaningful air quality program can be put into place, because, while monitoring is not prevention, enforcement cannot happen without monitoring.

In summary: further work on the regulations is needed and fully justifies an extension to the moratorium.

Attachments:

Excerpt from European Commission study (EC excerpt.pdf)

Agency for Toxic Substances and Disease Registry Health public health statement for hydrogen sulfide (tp114-c1.pdf)

Health Consultation for oil field in Lawrence County, Illinois, example of H2S study in oil field (WestBranchOilFieldsHC532010.pdf)

B. There are good reasons for adopting some portion of these regulations soon - even if they are unfinished ; but adoption doesn't mean they are complete, or that oil and gas development should be allowed to proceed.

It seems that in all discussion of the moratorium and the regulations there is an implicit assumption that the two are necessarily tied in time. I question that assumption. Because the strength of the regulations relies in large part on air quality monitoring, which cannot be implemented soon enough and appears to be the reason for the Planning Commission's request for a moratorium extension, work in this area must continue. Perhaps the path that relies on the air quality monitoring remains unavailable while that work is completed.

C. **Adoption of the regulations at this stage does not preclude further refinement, which can happen concurrently with implementation of the regulations adopted**.

The Planning Commission, in recognition of a number of facts -- that things like setbacks are not based on science, that the behavioral effect of the dual-path approach cannot be predicted, and the fact that new data are coming out daily -- asked that they be given an opportunity to revisit the regulations periodically. I suggest that it is appropriate to continue work on these regulations continuously, even as the first "phase" is being implemented, so that the county can quickly respond to new data, new political and legal scenarios. In other words, adopt a series of refined amendments over time.

D. **The work done to date may be for naught if Longmont does not prevail** in ***COGCC v City of Longmont*** **so it is imperative that Boulder County intervene in that suit as soon as possible.** If Longmont does not have the resources to mount a strong defense, and fails to establish an adequate factual record at the trial stage, we all could lose. It is imperative that Boulder County intervene before the appellate stage. I understand that many people believe that the joining at the appeal stage is good enough, but I fear that that might be too late. If Boulder County needs to adopt regulations before it can intervene, it should adopt something forthwith, but not consider its work on the regulations finished.

E. The result of *COGCC v City of Longmont* might very well mean that Boulder County can still do more than it presently assumes it can do. For that reason the county must prevent oil and gas development from proceeding while the Longmont case is decided. The "legal box" that constrains us could change shape in any direction as a result of the Longmont case. Given that our assumed legal box denies us the ability to adopt policies and ordinances consistent with our county vision, we have a moral and legal obligation to - at the very least - prevent further damage while the zoning authority question is decided in court. This would argue for a new moratorium at the time these regulations become effective, this one based on the uncertainty of the regulatory climate.

The county must reach out to all other zoning authorities in the state - municipalities and counties - to broaden the support for local zoning powers and convincing them to intervene in the Longmont case also, as soon as possible. For the above-mentioned reasons, we need to engage as many other counties and cities as possible in defense of our local zoning powers. Their arguments for not intervening now are based on litigation costs, and willingness to rely on waiting for the appeals. But if Longmont loses they are likely to find their costs higher -- in externalized costs of oil and gas development. I am told that questions of preemption are decided on the particulars of the case – namely the factual record, which means that by the time of the appeal, it's probably too late to help much. Please reach out now while there is time, before it is determined whether the suit will move forward.

Excerpt from:
Support to the identification of potential risks for the environment and human health arising from hydrocarbons operations involving hydraulic fracturing in Europe
European Commission, DG Environment

2.5.3 Release to air

Risk Characterisation

	Hazard classification	Probability classification	Risk ranking
Individual installation	*minor*	*occasional*	*moderate*
Cumulative effects of multiple installations	*major*	*occasional*	*high*

Peer-reviewed research

As described in New York State DEC 2011 PR (page 6-114), drilling operations can lead to air emission from 1) combustion from diesel-powered plant on site; and 2) truck activities near the well pad. The overall impact of these is affected by the period over which the activities take place.

New York State DEC 2011 PR (page 6-105) identifies the primary pollutants as particulate matter (PM), NO_x, CO, VOCs and SO_2, and estimates, based on industry data, emissions for drilling, completion and production under flaring and venting scenarios. While there is a complex picture of diverse impacts and stages, the overall assessment of hazardous air pollutants shows greatest impacts associated with flaring of wet gas, production of wet gas and drilling in all scenarios. Wet gases from some fields have relatively high levels of higher molecular weight VOCs (Academic sector consultation response 2012 NPR). In dry gas scenarios, drilling is the largest single emitting activity when pollutants are aggregated. These figures are indicative and New York State DEC 2011 PR should be examined for further details and also regarding the extensive modelling performed to calculate expected air quality impacts from potential developments.

The main issue of potential concern with regard to emissions to air during well drilling is the risk of emissions of diesel exhaust fumes from well drilling equipment (Howarth and Ingraffea, 2011 NPR ; Academic sector consultation response 2012 NPR).

Other research

The period of well drilling is typically four weeks per well(Broderick et al 2011 NPR). Lechtenböhmer et al. (2011 NPR)concur that the main issue of potential concern with regard to emissions to air during well drilling is the risk of emissions of diesel exhaust fumes from well drilling equipment.

Emissions from numerous well developments in a local area or wider region could potentially have a significant effect on air quality. For example, diesel emissions are considered likely to be a contributory factor to winter ozone episodes in rural Wyoming and Ohio (Argetsinger, 2011 NPR ; University of Wyoming, 2012 NPR ; Academic sector consultation response 2012 NPR).

Preliminary judgment

The potential effects of emissions from diesel-powered plant would in principle be greater for HVHF than for conventional gas extraction because of the larger well volumes, as described in Section2.5.2. Emissions from diesel-engined plant are well understood and emissions from plant up to 560 kW are controlled in Europe. In view of this, the emissions from individual installations are judged to be of “minor” significance. No significant adverse effects on health would be expected to arise from a properly designed and operated individual installation.

In view of the evidence from non-peer reviewed but independent sources of the cumulative effects of emissions to air from hydrocarbon facilities on environmental levels of ozone, the potential significance of these impacts was described as “major.” The atmospheric chemistry

environment in Europe differs from that in continental North America, in that ozone is typically associated with summertime photochemical activity rather than calm winter conditions (Derwent et al. 2003 PR). Nevertheless, it is considered in principle possible for emissions to air to have a comparable indirect effect on summer ozone levels in Europe, although it is not possible to quantify the scale of this potential effect on air quality and hence on health. Exposure to elevated levels of ozone can have an adverse effect on respiratory health, and this impact was also considered to be potentially “major”.

Additionally, there is a risk of fugitive emissions to air in the event of an equipment fuel or oil spillage, but this risk would be common to any similar activity. There is no centralised database of information on such spillages during shale gas drilling activities. No evidence was found that fuel spillages pose a significant risk to air quality. It was judged that the potential effects of any intermittent spillage would not be significant in the overall context of gas extraction processes.

1. PUBLIC HEALTH STATEMENT

This public health statement tells you about hydrogen sulfide and the effects of exposure to it.

The Environmental Protection Agency (EPA) identifies the most serious hazardous waste sites in the nation. These sites are then placed on the National Priorities List (NPL) and are targeted for long-term federal clean-up activities. Hydrogen sulfide has been found in at least 35 of the 1,689 current or former NPL sites. Although the total number of NPL sites evaluated for this substance is not known, the possibility exists that the number of sites at which hydrogen sulfide is found may increase in the future as more sites are evaluated. This information is important because these sites may be sources of exposure and exposure to this substance may harm you.

When a substance is released either from a large area, such as an industrial plant, or from a container, such as a drum or bottle, it enters the environment. Such a release does not always lead to exposure. You can be exposed to a substance only when you come in contact with it. You may be exposed by breathing, eating, or drinking the substance, or by skin contact.

If you are exposed to hydrogen sulfide, many factors will determine whether you will be harmed. These factors include the dose (how much), the duration (how long), and how you come in contact with it. You must also consider any other chemicals you are exposed to and your age, sex, diet, family traits, lifestyle, and state of health.

1.1 WHAT IS HYDROGEN SULFIDE?

Hydrogen sulfide (H_2S) is a flammable, colorless gas with a sweetish taste and characteristic odor of rotten eggs that can be poisonous at high concentrations. Other names for hydrogen sulfide include hydrosulfuric acid, sewer gas, hydrogen sulphide, and stink damp. People usually can smell hydrogen sulfide at low concentrations in air, ranging from 0.0005 to 0.3 parts per million (ppm) (0.0005–0.3 parts of hydrogen sulfide in 1 million parts of air); however, at

high concentrations, a person might lose their ability to smell it. This can make hydrogen sulfide very dangerous.

Hydrogen sulfide occurs both naturally and from human-made processes. It is in the gases from volcanoes, sulfur springs, undersea vents, swamps, and stagnant bodies of water and in crude petroleum and natural gas. Hydrogen sulfide also is associated with municipal sewers and sewage treatment plants, swine containment and manure-handling operations, and pulp and paper operations. Industrial sources of hydrogen sulfide include petroleum refineries, natural gas plants, petrochemical plants, coke oven plants, food processing plants, and tanneries. Bacteria found in your mouth and gastrointestinal tract produce hydrogen sulfide during the digestion of food containing vegetable or animal proteins. Hydrogen sulfide is one of the principal components in the natural sulfur cycle. You will find more about the properties, production, and use of hydrogen sulfide in Chapters 4 and 5.

1.2 WHAT HAPPENS TO HYDROGEN SULFIDE WHEN IT ENTERS THE ENVIRONMENT?

Hydrogen sulfide is released primarily as a gas and spreads in the air. However, in some instances, it may be released in the liquid waste of an industrial facility or as the result of a natural event. When hydrogen sulfide is released as a gas, it remains in the atmosphere for an average of 18 hours. During this time, hydrogen sulfide can change into sulfur dioxide and sulfuric acid. Hydrogen sulfide is soluble in water, and is a weak acid in water. You will find more about what happens to hydrogen sulfide when it enters the environment in Chapter 6.

1.3 HOW MIGHT I BE EXPOSED TO HYDROGEN SULFIDE?

Your body makes small amounts of hydrogen sulfide. Hydrogen sulfide is produced by the natural bacteria in your mouth and is a component of bad breath (halitosis). Breakdown of sulfur-containing proteins by bacteria in the human intestinal tract also produces hydrogen sulfide. The levels of hydrogen sulfide in air and water are typically low. The amount of hydrogen sulfide in the air in the United States is 0.11–0.33 parts per billion (ppb) (one

thousandth of a ppm). In undeveloped areas of the United States, concentrations have been reported at 0.02–0.07 ppb. The amount of hydrogen sulfide in surface water is low because hydrogen sulfide readily evaporates from water. Groundwater concentrations of hydrogen sulfide generally are less than 1 ppm; however, measured sulfur concentrations in surface and waste waters have ranged from slightly less than 1 to 5 ppm. Household exposures to hydrogen sulfide can occur through misuse of drain cleaning materials. Hydrogen sulfide can be found in well water and formed in hot water heaters, giving tap water a rotten egg odor. Cigarette smoke and emissions from gasoline vehicles contain hydrogen sulfide. The general population can be exposed to lower levels from accidental or deliberate release of emissions from pulp and paper mills; from natural gas drilling and refining operations; and from areas of high geothermal activity, such as hot springs.

People who work in certain industries can be exposed to higher levels of hydrogen sulfide than the general population. These industries include rayon textiles manufacturing, pulp and paper mills, petroleum and natural gas drilling operations, and waste water treatment plants. Workers on farms with manure storage pits or landfills can also be exposed to higher levels of hydrogen sulfide than the general population. As a member of the general public, you might be exposed to higher-than-normal levels of hydrogen sulfide if you live near a waste water treatment plant, a gas and oil drilling operation, a farm with manure storage or livestock confinement facilities, or a landfill. Exposure from these sources is mainly from breathing air that contains hydrogen sulfide. You will find further information about hydrogen sulfide exposure in Chapter 6.

1.4 HOW CAN HYDROGEN SULFIDE ENTER AND LEAVE MY BODY?

Hydrogen sulfide enters your body primarily through the air you breathe. Much smaller amounts can enter your body through the skin. Hydrogen sulfide is a gas, so you would not likely be exposed to it by ingestion. When you breathe air containing hydrogen sulfide or when hydrogen sulfide comes into contact with skin, it is absorbed into the blood stream and distributed throughout the body. In the body, hydrogen sulfide is primarily converted to sulfate and is excreted in the urine. Hydrogen sulfide is rapidly removed from the body. Additional information about how hydrogen sulfide can enter or leave your body is discussed in Chapter 3.

1.5 HOW CAN HYDROGEN SULFIDE AFFECT MY HEALTH?

Scientists use many tests to protect the public from harmful effects of toxic chemicals and to find ways for treating persons who have been harmed.

One way to learn whether a chemical will harm people is to determine how the body absorbs, uses, and releases the chemical. For some chemicals, animal testing may be necessary. Animal testing may also help identify health effects such as cancer or birth defects. Without laboratory animals, scientists would lose a basic method for getting information needed to make wise decisions that protect public health. Scientists have the responsibility to treat research animals with care and compassion. Scientists must comply with strict animal care guidelines because laws today protect the welfare of research animals.

Exposure to low concentrations of hydrogen sulfide may cause irritation to the eyes, nose, or throat. It may also cause difficulty in breathing for some asthmatics. Brief exposures to high concentrations of hydrogen sulfide (greater than 500 ppm) can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in some individuals, there may be permanent or long-term effects such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of hydrogen sulfide (0.00011–0.00033 ppm). Deaths due to breathing in large amounts of hydrogen sulfide have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools.

Very little information is available about health problems that could occur from drinking or eating something with hydrogen sulfide in it. Scientists have no reports of people poisoned by such exposures. Pigs that ate feed containing hydrogen sulfide experienced diarrhea for a few days and lost weight after about 105 days.

Scientists have little information about what happens when you are exposed to hydrogen sulfide by getting it on your skin, although they know that care must be taken with the compressed liquefied product to avoid frostbite. Hydrogen sulfide will irritate your eyes if you are exposed to the gas. These types of exposures are more common in certain kinds of jobs.

Hydrogen sulfide has not been shown to cause cancer in humans, and its possible ability to cause cancer in animals has not been studied thoroughly. Hydrogen sulfide has not been classified for its ability to cause or not cause cancer.

1.6 HOW CAN HYDROGEN SULFIDE AFFECT CHILDREN?

This section discusses potential health effects in humans from exposures during the period from conception to maturity at 18 years of age.

Children are likely to be exposed to hydrogen sulfide in the same manner as adults, except for adults at work. However, because hydrogen sulfide is heavier than air and because children are shorter than adults, children sometimes are exposed to more hydrogen sulfide than adults. There is very little information on possible health problems in children who have been exposed to hydrogen sulfide. Exposed children probably will experience effects similar to those experienced by exposed adults. Whether children are more sensitive to hydrogen sulfide exposure than adults or whether hydrogen sulfide causes birth defects in people is not known. The results of studies in animals suggest that exposure to low concentrations of hydrogen sulfide during pregnancy does not cause birth defects.

For more information about the potential health effects of hydrogen sulfide on children, see Sections 3.7 and 6.6.

1.7 HOW CAN FAMILIES REDUCE THE RISK OF EXPOSURE TO HYDROGEN SULFIDE?

If your doctor finds that you have been exposed to substantial amounts of hydrogen sulfide, ask whether your children might also have been exposed. Your doctor might need to ask your state health department to investigate.

Hydrogen sulfide is part of the natural environment; the general population will have some exposure to hydrogen sulfide. Families can be exposed to more hydrogen sulfide than the general population if they live near natural or industrial sources of hydrogen sulfide, such as hot springs, manure holding tanks, or pulp and paper mills. However, their exposure levels are unlikely to approach those that sicken people exposed at work. Families can reduce their exposure to hydrogen sulfide by avoiding areas that are sources of hydrogen sulfide. For example, individuals of families that live on farms can avoid manure storage areas where high concentrations of hydrogen sulfide may be found.

1.8 IS THERE A MEDICAL TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO HYDROGEN SULFIDE?

Hydrogen sulfide can be measured in exhaled air, but samples must be taken within 2 hours after exposure to be useful. A more reliable test to determine if you have been exposed to hydrogen sulfide is the measurement of increased thiosulfate levels in urine. This test must be done within 12 hours of exposure. Both tests require special equipment, which is not routinely available in a doctor's office. Samples can be sent to a special laboratory for the tests. These tests can tell whether you have been exposed to hydrogen sulfide, but they cannot determine exactly how much hydrogen sulfide you have been exposed to or whether harmful effects will occur. Exposure to high levels of hydrogen sulfide can cause long-term effects on the nervous system. There are tests that can measure nervous system function. However, these tests are not specific for hydrogen sulfide and could indicate that you have been exposed to other chemicals that affect the nervous system.

See Chapters 3 and 7 for more information on tests for exposure to hydrogen sulfide.

1.9 WHAT RECOMMENDATIONS HAS THE FEDERAL GOVERNMENT MADE TO PROTECT HUMAN HEALTH?

The federal government develops regulations and recommendations to protect public health. Regulations *can* be enforced by law. The EPA, the Occupational Safety and Health Administration (OSHA), and the Food and Drug Administration (FDA) are some federal agencies that develop regulations for toxic substances. Recommendations provide valuable guidelines to protect public health, but *cannot* be enforced by law. The Agency for Toxic Substances and Disease Registry (ATSDR) and the National Institute for Occupational Safety and Health (NIOSH) are two federal organizations that develop recommendations for toxic substances.

Regulations and recommendations can be expressed as “not-to-exceed” levels, that is, levels of a toxic substance in air, water, soil, or food that do not exceed a critical value that is usually based on levels that affect animals; they are then adjusted to levels that will help protect humans. Sometimes these not-to-exceed levels differ among federal organizations because they used different exposure times (an 8-hour workday or a 24-hour day), different animal studies, or other factors.

Recommendations and regulations are also updated periodically as more information becomes available. For the most current information, check with the federal agency or organization that provides it. Some regulations and recommendations for hydrogen sulfide include the following:

OSHA has established an acceptable ceiling concentration of 20 ppm for hydrogen sulfide in the workplace, with a maximum level of 50 ppm allowed for 10 minutes maximum duration if no other measurable exposure occurs. NIOSH has set a maximum Recommended Exposure Limit (REL) ceiling value of 10 ppm for 10 minutes maximum duration. A more complete listing of federal and state regulations and recommendations is found in Chapter 8.

1.10 WHERE CAN I GET MORE INFORMATION?

If you have any more questions or concerns, please contact your community or state health or environmental quality department, or contact ATSDR at the address and phone number below.

ATSDR can also tell you the location of occupational and environmental health clinics. These clinics specialize in recognizing, evaluating, and treating illnesses that result from exposure to hazardous substances.

Toxicological profiles are also available on-line at www.atsdr.cdc.gov and on CD-ROM. You may request a copy of the ATSDR ToxProfiles™ CD-ROM by calling the toll-free information and technical assistance number at 1-888-42ATSDR (1-888-422-8737), by e-mail at atsdric@cdc.gov, or by writing to:

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Environmental Medicine
1600 Clifton Road NE
Mailstop F-32
Atlanta, GA 30333
Fax: 1-770-488-4178

Organizations for-profit may request copies of final Toxicological Profiles from the following:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161
Phone: 1-800-553-6847 or 1-703-605-6000
Web site: http://www.ntis.gov/

Health Consultation

WEST BRANCH OIL FIELDS

OGEMAW COUNTY, MICHIGAN

Prepared by the
Michigan Department of Community Health

MAY 3, 2010

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

You May Contact ATSDR Toll Free at
1-800-CDC-INFO
or
Visit our Home Page at: http://www.atsdr.cdc.gov

HEALTH CONSULTATION

WEST BRANCH OIL FIELD

OGEMAW COUNTY, MICHIGAN

Prepared By:

Michigan Department of Community Health
Under A Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

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Acronyms and Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ATSDR	Agency for Toxic Substances and Disease Registry
H_2S	hydrogen sulfide
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
MRL	minimal risk level
ppb	parts per billion
ppm	parts per million
SO_2	sulfur dioxide
TRS	total reduced sulfur

Summary

Introduction	A resident of West Branch contacted the Michigan Department of Natural Resources and Environment (MDNE) and complained about a "rotten egg" odor causing eye irritation and a worsening of her respiratory problems. An investigation was conducted into the source of the odor, including stationing of a hydrogen sulfide meter in the vicinity of the resident's apartment. Levels of H_2S measured by the monitor were detectable but not reliably accurate due to the monitor's limit of detection in the ten-day sampling time. The resident was subsequently relocated and is no longer in the area.
Conclusion	MDCH cannot currently conclude whether H_2S concentrations reached levels that could harm people's health at the apartment complex. The detection limit on the H_2S monitor was higher than the MRL for intermediate duration exposure (20 ppb). H_2S measures did not exceed the acute H_2S MRL (70 ppb).
Basis of Conclusion	H_2S measure did not exceed 40 ppb and measures less than 60 ppb were not reliable due to the type of detection unit deployed. However, the proximity of the oil extraction operations are such that H_2S levels could become elevated if equipment failure were to occur.
Next Steps	MDCH will remain available to review future odor complaints reported to MDCH.
FOR MORE INFORMATION	If you have concerns about your health, you should contact your health care provider. Please call MDCH Division of Environmental Health at 1-800-648-6942 regarding this health consultation.

Purpose and Health Issues

A resident of the community contacted the Michigan Department of Environmental Quality (MDEQ) and complained about a "rotten egg" odor causing eye irritation and a worsening of her respiratory problems. An investigation was conducted into the source of the odor, including stationing of an Eagle Model Portable Multi-Gas Monitor to assess levels of hydrogen sulfide (H_2S) in the vicinity of the resident's apartment. Levels of H_2S measured by the monitor were detected but not reliably accurate due to the monitor's limit of detection in the ten-day sampling time. The resident was subsequently relocated and is no longer in the area.

Background

West Branch is the county seat of Ogemaw County, in the northeast Lower Peninsula with a population around 2,000 people (See Figure 1 for a map of West Branch.). The West Branch Oil Field is about 9 miles long and approximately 1 mile wide. West Branch Township has approximately 311 wells, run by primarily small companies, with most being outside of the city. Of those wells, 78 are "sour gas" wells, containing 400-54,995 ppm H_2S in the gas stream.

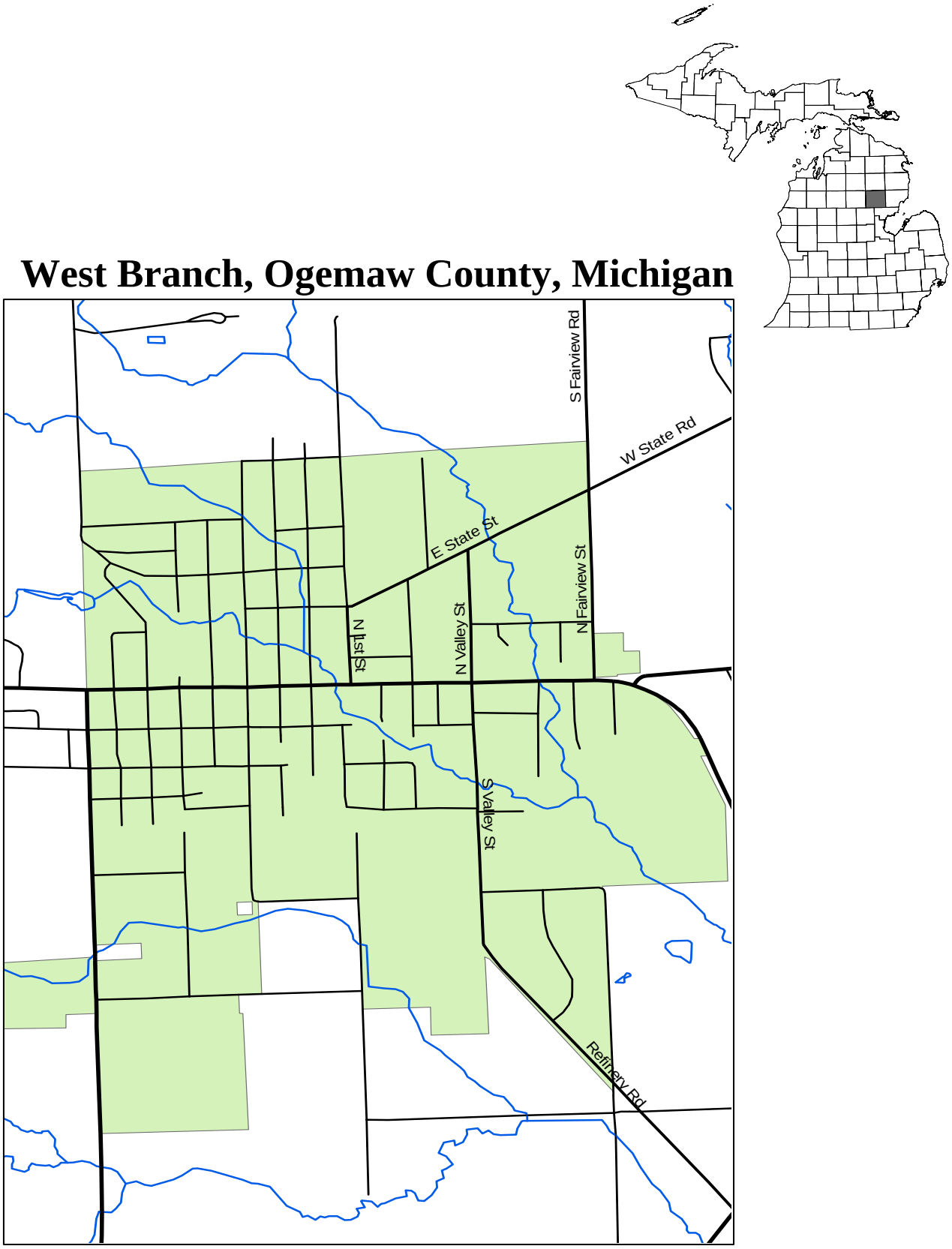

Figure 1: Map of West Branch in Ogemaw County, Michigan.

Discussion

Site Visit

Michigan Department of Community Health (MDCH) and MDEQ personnel visited several of the wells, tanks, and flaring stations in the West Branch area. Many did not have any sort of fencing to restrict access. Valves (Figure 2), and other controls of the system were easily accessible.

Figure 2: Easily accessible oil field equipment at the West Branch oil fields, Ogemaw County, Michigan.

Signage warning of poison gas seemed small, however are in compliance with regulatory requirements of a minimum of1.5 inch lettering and visible at 25 feet. People would need to be closer to clearly read the warning (Figure 3). Additionally, some flaring stations were unfenced and near vegetation (Figure 4).

Figure 3: Example of poison gas warning sign around West Branch oil field equipment, Ogemaw County, Michigan.

Figure 4: Example of a flaring station in the West Branch oil fields, Ogemaw County, Michigan.

One non-sour gas pumping station was located close to an elementary school. This pumping station had a fence with wires at the top, but the gate was bent, potentially allowing children access to that pump (Figure 5).

Figure 5: Pumping station for a non-sour gas well near an elementary school in West Branch, Ogemaw County, Michigan.

Environmental Contamination

Levels of H_2S were measured with an Eagle Model Portable Multi-Gas Detector equipped with a hydrogen sulfide sensor (part number: ES-23AH-H2S, RKI Instruments, Inc) capable of measuring levels of H_2S between 10-1000 parts per billion (ppb). However, reliable measures start at 60 ppb and measures between 10-50 ppb are not reliable. The machine was located in the parking lot of the resident's apartment complex from July 13-20 and 24-31, 2007 and recorded measurements 24 hours a day. H_2S levels did not exceed 40 ppb, a level that is in the lower end of the sensor's reliable detection limit. Most of these levels occurred between early morning and noon.

Exposure Pathways Analysis

An exposure pathway contains five elements: (1) the contaminant source, (2) contamination of environmental media, (3) an exposure point, (4) a human exposure route, and (5) potentially exposed populations. An exposure pathway is complete if there is a high probability or evidence that all five elements are present. Table 1 describes human exposure to H_2S from air in the vicinity of the West Branch oil fields.

Table 1: Exposure pathway for West Branch oil fields, Ogemaw County, Michigan.

Source	Environmental Transport and Media	Chemicals of Interest	Exposure Point	Exposure Route	Exposed Population	Time Frame	Status
Oil wells, pipelines and flaring systems	Air (gas)	Hydrogen sulfide	Outdoor and indoor air	Inhalation	Residents, workers, and visitors	Past	Potential
						Present	Potential
						Future	Potential

Toxicological Evaluation

Hydrogen sulfide (H_2S) is a colorless, flammable gas that smells like rotten eggs and can temporarily shut down a person's sense of smell at concentrations ranging between 100-200 parts per million (ppm). Sources of H_2S can either be natural, such as volcanoes, hot springs, and natural gas, or industrial, including wastewater treatment, tanneries, and pulp or paper mills. Ambient air concentrations can range from 0.11 ppb to greater than 90 ppb depending on proximity to natural or industrial sources. Areas of the U.S. without any natural or industrial H_2S sources nearby have ambient levels of 0.02-0.07 ppb. Humans can smell H_2S levels as low as 0.5 ppb. (ATSDR 2006)

People are primarily exposed to H_2S through the air they breathe. Acute exposure to high levels (thought to be greater than 500 ppm) can result in unconsciousness and death. Additional symptoms to acute exposure can include reduced respiratory function, eye and nasal irritation, headache, and nausea in humans (ATSDR 2006). People's responses can vary depending on the presences of other sulfur containing compounds, including sulfur dioxide (SO_2), which are often present in the air along with H_2S.

The Agency for Toxic Substances and Disease Registry (ATSDR) minimal risk level (MRL) for acute-duration (up to 14 days) inhalation exposures is 0.07 ppm (70 ppb). This value was derived from a study in 1990 where ten individuals with asthma were exposed to 2 ppm of H_2S continuously for 30 minutes (Jappinen et al. 1990). While there were no statistical changes in respiratory function, three of the ten subjects reported headaches and two of the ten had a greater than 30% change in respiratory function, indicating bronchial obstruction. An additional study of a community in Oulu, Finland located near several industrial sources of H_2S reported that there was a significant correlation between weekly levels of H_2S and weekly attendance at a hospital for treatment of severe asthma attacks (Rossi et al. 1993). However, the authors noted that individuals with asthma were more sensitive to the presence of SO_2 than non-asthmatic individuals. SO_2 is a common contaminant along with H_2S at sour gas wells and was not analyzed for in West Branch air. The data from these two studies (Jappinen et al. 1990; Rossi et al. 1993) indicates that individuals with asthma may potentially be a sensitive population to H_2S exposure.

A MRL of 0.02 ppm (20 ppb) was set for intermediate-duration (15-365 days) exposure based on a study in 10-week-old Sprague-Dawley rats exposed to 0, 10, 30, or 80 ppm for 6 hours every day for ten weeks (Brenneman et al. 2000). Nasal tissue and olfactory nerve damage occurred in the rats exposed to 30 and 80 ppm H_2S.

Recently, the ATSDR conducted a multi-year study on a community in Nebraska exposed to eight industrial sources of H_2S, with measurements exceeding the Nebraska's Department of Environmental Quality total reduced sulfur (TRS) value of 100 ppb monthly, mainly due to H_2S levels (Inserra et al. 2002). As found in measurements at West Branch, there were higher levels of H_2S overnight with levels noted to be higher in the summer and fall seasons (Inserra et al. 2002). In agreement with the observation that the highest levels were found at night, a study in Finland noted that the highest concentration was measured at 2:00 am (Haahtela et al. 1992).

An additional study was conducted on the Nebraska population to assess potential neurobehavioral effects of exposure comparing people exposed to greater than 90 ppb to people with exposed to less than 50 ppb (Inserra et al. 2004). No statistical differences were found in this study although the authors noted that their assigned exposure groups might have resulted in a "mis-classification bias". A third study was conducted on this area by the ATSDR to determine if hospital visits for respiratory diseases correlated with elevated H_2S and TRS levels. Exposure was classified as high if one or more of the 30-minute rolling averages for the day was ≥30 ppb TRS or H_2S and low if all of the day's averages were <30 ppb (Campagna et al. 2004). This study found that there was a positive association between hospital visits for asthma for both children under 18 years of age and adults the day after a high exposure to H_2S, with a more positive association occurring with the children compared to the adults. Additionally, digestive diseases, conditions not associated with H_2S exposure, were also examined. There was no association between H_2S or TRS levels and hospital visits due to digestive diseases. The authors noted that asthma or other respiratory diseases might be a problem with exposure to H_2S and TRS.

The above discussion applies to residents and other people that are not receiving their exposure through required work-related activities. Occupational exposure levels for H_2S were set by the

American Conference of Governmental Industrial Hygienists (ACGIH) in order to reduce the possibility of eye and respiratory tract irritation among other adverse effects and are currently 10 ppm for a continuous 8-hour exposure during a 40-hour work week and 15 ppm for short term exposure (less than 15 minutes of continuous exposure). In agreement with these values, Jappinen et al. (1990) evaluated respiratory function of 26 pulp mill workers, with an occupational exposure ranging from 1-11 ppm on the testing days. No differences were found in the respiratory function of these workers, including those who smoked or had preexisting allergies. However, these ACGIH values are currently under review and may be lowered in the near future. One reason for this adjustment is the possibility that H_2S may cause eye irritation at levels as low as 25 ppb, averaged over 24 hours (Haahtela et al. 1992). Additionally, as discussed above with the ATSDR studies in Nebraska, incidences of hospital visits increased with high exposure, defined as one 30-minute rolling average of greater than or equal to 30 ppb, which was below the ATSDR levels for an acute exposure (Campagna et al. 2004).

Children's Health Considerations

Children may be at greater risk than adults from exposure to hazardous substances at sites of environmental contamination. Children engage in activities, such as playing outdoors and on the ground and may encounter hazardous substances for a longer time than adults. They are shorter than most adults, and therefore breathe dust, soil, and vapors found closer to the ground. H_2S is denser than air and may be more concentrated near the ground than higher up. Due to their lower body weight and higher intake rate, such as increased respiration and hand-to-mouth activities, may receive a larger dose of hazardous substance per unit of body weight. Children under 18 years of age had a stronger association between hospital visits for asthma and a high exposure to H_2S (on the day previous) as compared to the association with adults (Campagna et al. 2004).

The developing body systems of children can sustain permanent damage if toxic exposures are high enough during critical growth stages. Injury during key periods of growth and development could lead to malformation of organs (teratogenesis), disruption of function, and premature death. Exposure of the mother could lead to exposure of the fetus, via the placenta, or affect the fetus because of injury or illness sustained by the mother (ATSDR 1998). The obvious implication for environmental health is that children can experience substantially greater exposures to toxicants in soil, water, or air than adults can.

Conclusions

MDCH cannot currently conclude whether H_2S concentrations reach levels that could harm people's health at the apartment complex. The detection limit on the H_2S monitor was higher than the MRL for intermediate duration exposure (20 ppb). H_2S measures did not exceed the acute H_2S MRL (70 ppb).

Recommendations

- MCHD should remain available to consult on odor complaints in West Branch.
- The health consultation should be made available to the public on the internet.
- The health consultation should be provided to the regional office of the MDNRE that covers West Branch.

Public Health Action Plan

- MDCH will remain available to consult on future odor complaints in West Branch.
- MDCH will make the health consultation available on the internet.
- MDCH will provide the health consultation to the MDNRE regional office that covers West Branch.

Preparers of Report

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References

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Certification

This Health Consultation was prepared by the Michigan Department of Community Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures. Editorial review was completed by the cooperative agreement partner.

Technical Project Officer, Cooperative Agreement Program Evaluation Branch (CAPEB), Division of Health Assessment and Consultation (DHAC), ATSDR

The Division of Health Assessment and Consultation, ATSDR, has reviewed this public health consultation and concurs with the findings.

Team Leader, CAPEB, DHAC, ATSDR

From:	Raga Hanzlik
To:	Boulder County Board of Commissioners
Subject:	Fracking
Date:	Tuesday, November 13, 2012 11:02:22 AM

I am a Boulder resident and my family and I hope you will continue Boulder's environmental legacy by banning fracking,
Thank you,

Meagan Hanzlik
7598 Chatham Way
Boulder, CO, 80301

From:	Kirsten Boyer
To:	Boulder County Board of Commissioners
Subject:	please ban fracking on Boulder County Land
Date:	Tuesday, November 13, 2012 11:24:08 AM

Dear Commissioners,

I can hardly describe how opposed I am to fracking anywhere -- especially in my precious Boulder County. It will great moment when our leaders figure out that it is WATER and AIR and healthy SOIL that are our MOST precious resources. Polluting them and/or using them to extract natural gas from the earth is not wise-- especially in a state where WATER is so scarce.

It will be a tragedy if our leaders figure this out too late and we look back in hindsight at the damage that could have been prevented.

We elected our leaders to make hard and wise decisions. PLEASE set a precedent in Boulder County and choose our HEALTH and the purity and stability of our natural resources over the perils that WILL come with fracking.

Thank you,

Kirsten Boyer
6675 Bluebird Avenue
Longmont, CO 80503

From:	eravitz@gmail.com on behalf of Evan Ravitz
To:	Boulder County Board of Commissioners
Subject:	New study on drilling air contamination
Date:	Tuesday, November 13, 2012 11:53:19 AM

Peer-reviewed and accepted for publication by Human and Ecological Risk Assessment (November 9, 2012).
An Exploratory Study of Air Quality near Natural Gas Operations
http://www.endocrinedisruption.com/files/HERA12-137NGAirQualityManuscriptforwebwithfigures.pdf

"Methylene chloride, a toxic solvent not reported in products used in drillingor hydraulic fracturing, was detected 73% of the time; several times in high concentrations. A literature search of the health effects of the NMHCs revealed that many had multiple health
effects, including 30 that affect the endocrine system, which is susceptible to chemical impacts at very low concentrations, far less than government safety standards. Selected polycyclic aromatic hydrocarbons (PAHs) were at concentrations greater than those at which prenatally exposed children in urban studies had lower developmental and IQ scores."

--
Evan Ravitz Freelance Editing (303)923-5918
Gates of Paradise hot springs backpacking trips
Iridescent cloud cards, prints, iPad covers, etc.
Vote the "mock" out of democracy at Vote.org!

From:	Ginger Ikeda
To:	#LandUsePlanner
Subject:	Please DO NOT ALLOW FRACKING
Date:	Tuesday, November 13, 2012 12:51:16 PM

New report today

http://priceofoil.org/2012/11/12/iea-acknowledges-fossil-fuel-reserves-climate-crunch/

I am so proud of Longmont for moving ahead, testing the legal waters, being a leader, standing up for what is right for local citizens and local health, economy and environment.
I fervently hope Boulder will do the same. Be strong, Commissioners and planners. We will support you!!

We DO NOT WANT hydraulic fracturing in Boulder. Safeguards are not enough, no matter how tight you try to make them. Oil and Gas will WORK-AROUND, and you know this.
Please "speak for the trees". We are counting on you!

--
Ginger

SHARE THE ROAD :)
Riders: Be Bright and Be Seen; Rules of the Road
Drivers: Put down the @%$ cell phone and Save a Life; 3 Feet Between; Pass <15 mph above bike's speed. THANKS!

"Unless someone like you cares a whole awful lot, nothing is going to get better. It's not!"
Dr. Seuss

From:	Senior Wellness Consultants Inc.
To:	Boulder County Board of Commissioners
Subject:	Fracking
Date:	Tuesday, November 13, 2012 1:16:58 PM

Dear County Commissioners,

I'm sure you are aware of the pros and cons of fracking and that you receive plenty of correspondence from people on their soapboxes so in lieu of a lengthy explanation as to why we oppose fracking, let us put it simply: there are already too many things adversely affecting our environment these days and we have cancers and other illnesses (my children and I have celiac disease) that limit our ability to live life to its fullest. We strive against all these challenges every day to help our children grow up healthy and to enjoy their lives. Fracking and GMO's are two things that do not help our mission. It takes a strong community with sometimes unpopular views to create a beautiful place. I moved to Boulder county 22 years ago and this is my home that I love but lately, I'm hearing about other places like Washington state that have taken strong stances against these big companies who simply care more about how deep their pockets are than the health of the rest of us.

Please know that we STRONGLY oppose FRACKING and GMOS. Thank you for your time,

Kylie Booth

Phil Booth

And our 3 children, 29 hens, 3 goats, 2 dogs and 1 elderly pot bellied pig.

From:	Bevin Gumm
To:	Boulder County Board of Commissioners
Subject:	Please help ban fracking
Date:	Tuesday, November 13, 2012 1:34:19 PM

Dear Commissioners,

Thank you for all your hard work. I can imagine how many issues you are working hard to make fair for the people.

I attended the Bioneers Conference at CU Boulder's campus this weekend and learned much more clearly how fracking
is unknown territory especially in regards to long term health effects on on people.
I think people are our greatest resource left in society. We elect you to speak up for us, please listen to our concerns.

I am a mom of two children in BVSD and for all moms and families I am asking you please to learn much more about the effects
of fracking before you vote to allow it in our county and in any surrounding counties.

PLEASE set a precedent in Boulder County and choose our HEALTH of people over any possible short term gains especially economic
gains.

Thank you,
Bevin Gumm

From:	Nathalie Pratt
To:	Boulder County Board of Commissioners
Subject:	Please ban fracking in Boulder County!
Date:	Tuesday, November 13, 2012 1:35:42 PM

Dear County Commissioners,

I cannot be at the meeting at the Courthouse today, however, I want to express my deepest desire for Boulder County to prohibit fracking on our land. Our Earth cannot continue to handle the environmental impacts. Our children, our grandchildren, our animals and all of us deserve to live in a community where we can thrive -- where the Earth is healthy, protected and plentiful -- where we show we care about one another and every living cell on this amazing planet. Make the right decision to keep us healthy and as free of toxins as we possibly can!

Thank you for your time.
Kind regards,
Nathalie Pratt
Boulder County Resident for over 20 years!

From:	Lorna Kellogg
To:	Boulder County Board of Commissioners
Subject:	Please no fracking in Boulder County
Date:	Tuesday, November 13, 2012 1:36:29 PM

Dear Commissioners,
Please vote against and do whatever it takes to prevent fracking in our beautiful community.
Thank you kindly,
Lorna Kellogg

From:	Liza Oxnard Aratow
To:	Boulder County Board of Commissioners
Subject:	banning fracking....
Date:	Tuesday, November 13, 2012 3:08:21 PM

Dear Commissioners,

Fracking is a bad idea in Boulder County. Fracking is just a bad idea anywhere. It is toxic and lethal. Spend money on renewable resources. NOT fracking.

thank you,

Liza Aratow
Boulder CO 80305

From:	Alice Shuffield
To:	Boulder County Board of Commissioners
Subject:	Fracking
Date:	Tuesday, November 13, 2012 3:38:16 PM

To Boulder County Commissioners,

For the sake of clear air, clear water and clean soil, I am writing to express my opposition to fracking in Boulder County.

Thank you for your attention,

Alice
Boulder Resident

Alice Shuffield Hartman
http://welcomethat.blogspot.com

From: pumpkin.yang@gmail.com on behalf of Pumpkin Yang
To: Boulder County Board of Commissioners
Subject: Ban fracking in Boulder County
Date: Tuesday, November 13, 2012 3:47:41 PM

Please protect our most valuable resources and the public's health by prohibiting hydraulic fracturing ("fracking") in Boulder County. I am writing to you today to express my concerns regarding the practice of hydraulic fracturing, otherwise known as fracking. This procedure uses large amounts of water in combination with sand and chemicals to push natural gas out of the ground. My concerns include:

1. Water contamination. Even a small accident could permanently contaminate a drinking water supply.

2. Air Pollution: Heavy power equipment and vehicle exhaust makes polluted air over a wide geograhical area a certainty with fracking.

3. Fracking fluid contains toxic chemicals, including many compounds linked to cancer, birth defects and other serious health problems.

4. Wastewater can bring up dangerous radioactive particles that have been buried underground for millions of years.

5. Safe disposal of radioactive wastewater is unachievable. Water processing facilities cannot handle this highly toxic fluid.

6. Fracking operations are exempt from the federal *Safe Drinking Water Act*, the *Clean Air Act* and the *Clean Water Act*. Why?

7. Cleanup of spills and accidents is often the legal responsibility of landowners, not fracking companies.

All Coloradans deserve clean air and fresh safe drinking water. Please support transparency and regulation of hydraulic fracturing process to ensure a healthy Colorado.

Sincerely,

Catherine Yang
Lafayette, CO

Jamie Jost

encana

noble energy

November 13, 2012

Via Email: commissioners@bouldercounty.org
Boulder County Board of County Commissioners
Boulder County Courthouse, Third Floor
1325 Pearl Street
Boulder, CO 80302

Dear Honorable Commissioners:

As two of the largest owners of oil and gas interests in Boulder County, Encana Oil & Gas (USA) Inc. ("Encana") and Noble Energy, Inc. ("Noble") have devoted considerable time and resources to reviewing and evaluating various drafts of Boulder County's proposed oil and gas regulations ("Proposed Regulations") which are now before this Commission. The two companies have submitted detailed written comments on the Proposed Rules, attended every public meeting of the Planning Commission since the rules were introduced, and – between them – have met on five occasions with Boulder County staff including an all-day meeting yesterday. Both companies have also conducted site tours for County staff.

Encana and Noble recognize that Boulder County has a legitimate interest in addressing real issues caused by oil and gas activities within its borders and share Boulder County's desire to meaningfully address these issues. Encana and Noble want to ensure that the Proposed Regulations provide an efficient and workable process by which oil and gas operations can be reviewed and approved and have made specific suggestions to help achieve that goal. For example, because oil and gas operations in Colorado are already subject to numerous Federal regulations and some of the most rigorous state regulations in the country, Encana and Noble have suggested that Boulder County's process be streamlined with regard to various matters to ensure regulatory certainty and efficiency. Similarly, we have recommended that Boulder County refrain from adopting duplicative financial assurance requirements given that operators must post substantial security under existing state rules and should not be required to bond twice for the same activities.

Encana and Noble also share Boulder County's desire to have a viable alternative to the Standard Development Plan Review ("DPR") process. As currently drafted, however, the majority of Encana and Noble's oil and gas resources are either ineligible for or infeasible to develop via the Expedited DPR process. We have made numerous suggestions to make the Expedited DPR process more balanced and manageable, such as modifying the siting

requirements and aligning with existing state and federal regulations. In addition, under both the Standard and the Expedited DPR approach, Encana and Noble have suggested that operators and Boulder County would benefit from adoption of regulations that would allow "comprehensive" drilling plans by which operators could submit and negotiate area-wide development programs as opposed to a seriatim well-by-well, permit-by-permit approach. Not only would this process be more efficient, it would give operators and the county the ability to manage development with greater certainty based on a long-term view of cumulative development.

Encana and Noble very much appreciate Staff and the Commissioners' consideration of the foregoing suggestions and of our more detailed comments and feedback previously submitted. We will be submitting additional comments on the Proposed Regulations to the Commission in the coming days including, in particular, information that shows significant flaws in and refutes the Colorado School of Public Health/McKenzie Report that has received so much public attention.

In sum, Encana and Noble are determined to achieve a successful outcome with the Boulder County staff in the coming weeks. Difficult preemption and operational issues remain to be resolved and, without waiving their legal rights, Encana and Noble look forward to continued progress and dialogue and urge the Commission to recognize these on-going efforts as it crafts legitimate final rules that are feasible and protective of human health and the environment.

Sincerely,
ENCANA OIL & GAS (USA) INC.

Darrin Henke
Vice President, South Rockies Business Unit

Sincerely,
NOBLE ENERGY, INC.

Donnie Moore
Vice President

From: Bollinger
To: #LandUsePlanner
Subject: Comment on Boulder County "Fracking" regs, w/ Docket #
Date: Tuesday, November 13, 2012 10:05:25 PM

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more specifically re:
Public Hearing: Docket DC-12-0003 Amendments to Oil and Gas Development Regulations; Considerations of proposed amendments addressing oil and gas development within the Boulder County Land Use Code.

On Nov 13, 2012, at 10:02 PM, Bollinger wrote:

> Boulder County Commissioners & staff
>
> re: Comment on Proposed Regulations on Hydraulic Fracturing for nat. gas drilling. 11/13/2012
>
> My brief proposal to your commission and county government regarding your draft regulations is to add a protection clause that pertains to the following nature:
>
> " **In cases that Boulder County government finds excess risk regarding Health or Safety to the those residing in the County,**
> **the County recognizes and reserves the right to suspend permits for such nat. gas drilling operations, even if the State of Colorado and COGCC claim otherwise.**
>
> **It shall be confirmed that the burden of proof that the drilling operation is safe for current & future area residents, rests upon the nat. gas extracting industry corporation and the State per COGCC, in order to meet reasonable Health & Safety concerns to the satisfaction of the respective City/County government authority.** "
>
> Thank-you for your dedicated & valuable service,
> John C. Bollinger, PE, CEM, BPI/BAP
> 143 Salina St.
> Lafayette, CO 80026

From:	fostertlu@gmail.com
To:	Boulder County Board of Commissioners
Subject:	Most recent "brown cloud" over Weld County
Date:	Wednesday, November 14, 2012 10:30:40 AM

This us an indication of the severity of toxic VOC air pollution occurring every day out east.

Is this what you envision for Boulder County?

Please support Longmont's ban!

Thank you,

Teresa Foster
Longmont, CO

Sent from my Verizon Wireless Phone

From:	Julie Zahniser
To:	Boulder County Board of Commissioners
Subject:	Economic considerations re: Boulder Oil/Gas-fracking regulation
Date:	Wednesday, November 14, 2012 10:39:03 AM
Attachments:	Morton Plan Boulder Presentation Nov 2012 at Sherpa"s FINAL.pdf

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Dear County Commissioners,
Thank you for listening to public comment on this "volatile" issue. I was almost the last speaker at the impassioned public participation meeting last night.

Thank you also, in advance, for reviewing Pete Morton's comments about the community economic implications of fracking regulations that are conveyed in the attached information. Also there is a youtube link to a presentation he gave in Utah on this topic. Pete is a well-respected economist who has specialized in this arena and is a Boulder resident resource whom you may already know.

Thank you for your forbearance and for your careful review and cautious, measured, future-looking response to this issue.
Best regards,
Julie Zahniser
http://www.youtube.com/watch?v=VjZH2p5Rajo&list=PLUF3cFT5aBZgFLsid4vZOHQrZ9t4aJ_Tb&index=9&feature=plpp_video

From:	N Hall
To:	Gardner, Deb; Toor, Will; Domenico, Cindy
Cc:	#LandUsePlanner
Subject:	CDC"s suggestions about frac sand
Date:	Wednesday, November 14, 2012 7:10:21 PM

Re: oil and gas regulations and silica sand

Here is a link to the CDC's comments about frac sand, which I just found -- I see they recommend avoiding silica sand altogether in favor of the ceramic beads.
http://blogs.cdc.gov/niosh-science-blog/2012/05/silica-fracking/

Perhaps that could be required here. If not in SDPR then in EDPR?

I noticed that they make no mention of the fact that the proppants (beads or sand) are coated with radioactive materials (to facilitate the remote sensing).

http://www.willistonherald.com/news/multiple-samples-fail-radiation-test-at-landfill/article_58426dcc-41f7-11e1-aba7-001871e3ce6c.html
(radioactivity found in landfills; claim it's because the proppants dumped there came from china)

https://en.wikipedia.org/wiki/Proppants_and_fracking_fluids
(explains use of radioactive isotopes on proppants)

Nancy Hall

Courage!

Fracking rigs on Open Space. Coming soon. Millions and millions of gallons of Colorado Water ruined during drilling procedures. Drought anyone?

Toxic pollutants seeping into groundwater? Never in the past has the line " Light my Fire" referred to a farmer's drinking water. Mystery chemicals eventually reaching our aquifers? Hopefully not.

The State says fracking is legal. The Governor says it is safe. Do we dare to stand up? Perhaps we should just try to re-regulate fracking. " Please, please don't frack us quite so much - not quite so close to our children's schools - our homes…

Once upon a time Boulder County symbolized leadership: clean air, clean water, education, conservation, recycling, organic farming, outdoor recreation, wildlife preservation…

Long term health and environmental considerations are increasingly becoming more evident. An extension of the drilling applications moratorium could buy our County time. A decision of this magnitude will be nationally significant. Courage…

Thank you.

Elizabeth

Elizabeth J. Asnicar
PO Box 941
Lyons, CO 80540
303 – 823 - 5552

RECEIVED
COUNTY COMMISSIONERS OFFICE
NOV 15 2012
REC'D BY
TIME

cc: BOCC
LU

From:	Bevin Gumm
To:	Boulder County Board of Commissioners
Subject:	The earth
Date:	Thursday, November 15, 2012 7:41:13 AM

Molly and I read the Book Cordoury Writes Letters and she would like me to write a letter for her about fracking....

Dear County Commissioners,

Do you even like kids? Do you ever want us not to breath? I want to be a mom! I want a future! Who will take care of my dolls if I can not breathe? Please how could you frack? Do you know what the effects of fracking are for me? I do not want to die? Who will take care of me if I am sick? Who will take care of my dolls if I die? Do you like the earth? Do you like parents?

Will you write back? I care for you, please care for me.

Molly Kolachov
Age 5

From:	Ellen Stark
To:	Boulder County Board of Commissioners
Subject:	fracking
Date:	Thursday, November 15, 2012 8:02:37 AM
Attachments:	screen_shot_2012-11-14_at_1.22.00_pm.png

Fracking Rush Threatens US Energy Security: Report

- Common Dreams staff

Despite gas industry claims that the natural gas extraction "revolution" will create energy security and affordable fuel for US consumers, fracking will in fact benefit those in the US very little, as the natural resource will most likely be shipped offshore to those who will "pay the highest price," according to a new report released Wednesday by Food and Water Watch. Additionally, there is far less oil and gas reserves to mine in the first place -- contrary to what industry leaders would have us believe.

(Image: FWW report)Market proposals by gas and oil companies revealed in the report will likely cause skyrocketing prices for US consumers and only vast amounts of pollution in the industry's wake.

The report U.S. Energy Insecurity: Why Fracking for Oil and Natural Gas is a False Solution shows that as of October 26, 2012 the Department of Energy has received 19 proposals from various US fossil fuel companies to export liquefied natural gas to foreign bidders. These companies stand to profit greatly by selling "huge amounts of natural gas overseas—as much as 40 percent of current U.S. consumption."

“The hype over fracking is giving Americans a false sense of energy security,” said Food & Water Watch Executive Director Wenonah Hauter. “The industry is making empty promises about U.S. energy security to prolong America’s destructive dependence on fossil fuels. At the same time, it is laying the groundwork to sell natural gas overseas to maximize profits. The gas will go wherever it can fetch the highest price—and right now that’s not the United States.”

Additionally, the report shows that natural gas resources will be far more scarce and difficult to extract than industry voices would like us to believe.

According to the group:

> The industry is also misrepresenting U.S. natural gas and tight oil supplies. Its claims rely on uncertain estimates of shale gas resources and on allowing the oil and gas industry to drill not just throughout the Marcellus Shale and other shale plays, but also all along the Pacific, Atlantic and Gulf coasts. Even if the industry's vision holds true, Food & Water Watch calculates that plans to create increased demand for U.S. natural gas translate to a supply of just 50 years and would require drilling hundreds of thousands of new shale gas wells.

Steve Horn at the Desmogblog wrote today:

> [The Report] shows, contrary to industry claims, there aren't 100 years of unconventional oil and gas sitting below our feet, even if President Barack Obama said so in his 2012 State of the Union Address. Far from it, in fact. [...]
>
> FWW crunched the numbers, estimating that there are, at most, half of the industry line, some 50 years of natural gas and much less of shale gas. This assumes the industry will be allowed to perform fracking in every desired crevice of the country. These are the same basins that advocates of hydraulic fracturing ("fracking") claim would make the U.S. the "next Saudi Arabia."

The study also exposes the myth that low fuel prices at the pump will be achieved through the exploitation of US oil reserves. Not only does the US have far less oil than generous industry estimates claim, but that amount of potential production in the US would not lower prices, because the price of oil is set on a global market.

"Gas is no bridge fuel, and investing in the infrastructure to support this would make the U.S. dependent on dirty fossil fuels for several more decades and would sacrifice our health and communities to the industry's thirst for profits. We need to ban fracking and remake our energy system now," concluded Hauter.

From: Jeannie DeMarinis
To: Boulder County Board of Commissioners
Subject: Draft Oil and Gas Regs
Date: Thursday, November 15, 2012 8:14:02 AM

November 14, 2012

To Will Toor, Deb Gardner and Cindy Domenico,

I attended the Tuesday Nov. 13 meeting on the amendments to oil and gas development in Boulder County and listened to the presentations by the staff and others. I appreciate the time and effort that has gone in to this. Although I signed up to speak, I had to leave before my name was called. I hope this written commentary will be accepted.

In the proposed regulations I saw many important issues addressed, including those related to noise and light pollution. However, I saw no mention of restricting the hours of operation. Because of the present nature of oil and gas drilling (working 24/7 until all the wells on a pad are complete) the companies use disturbingly bright halogen lights all night long. Additionally there is the constant noise of heavy trucks in and out 24/7. If you live anywhere near an oil and gas operation, it is like trying to sleep on a football field at a night game every night for months. This is an intolerable situation. Restrictions on lights and noise only have meaning if companies limit their work to a 12 hour span which is mostly daylight. The new regs need to include a restriction on hours of operation.

I also believe that the county needs to have just one set of rules for all--the stricter regs set out in the "expedited" plan rather than two plans to choose from.

Please don't let Noble Energy and Encana push you around. When they whine about "unfeasability" they are really complaining that we are cutting in to their profits. It's about time they start paying the true cost of their endeavors. Somebody has to start this process. Let Boulder County be the leader!

Please continue the moratorium as long as needed !

Thank You,

Jeannie DeMarinis
Sent from my iPad

From:	Bob Ross
To:	Boulder County Board of Commissioners
Subject:	A precious resource
Date:	Thursday, November 15, 2012 10:29:07 AM

Not caused by hydraulic fracturing but it raises the point, "what do we do if heavy industry contaminants our water supply?"
Honestly, this is a resource that should be treated with the ULTIMATE respect and custodianship.
What if this was you?

http://openchannel.nbcnews.com/_news/2012/10/28/14728166-nc-neighbors-aghast-to-learn-drinking-water-contaminated-for-years?lite

From:	Nanner Fisher
To:	Boulder County Board of Commissioners
Subject:	Victims Meeting
Date:	Thursday, November 15, 2012 1:25:52 PM

County Commissioners,
I was at the public hearing on 11/13/2012 and spoke to you about the silica dust 'accident' that occurred on 9/15/2012 at the Encana well site at 11890 Niwot Road. I, along with several neighbors, would like to have a meeting with you to discuss the implications of this accident, what is being done about it (as far as the people involved and Encana) and what you plan to do about future accidents that surely will occur. The Encana Representative at the public hearing said that you spent a day discussing things with them and I think we, the people you work for, deserve as much attention.
I look forward to hearing from you.
Nanner Fisher
12476 Niwot Road
Longmont, CO 80504
720-771-7823

ps. I will be sending you all a separate email with the details and photographs of the incident in case you have not received them from Pam Milmoe.

From:	Nancy Hall
To:	#LandUsePlanner
Subject:	1000-ft, 500-ft setback qualification for EDPR (oil and gas regulations)
Date:	Thursday, November 15, 2012 2:06:48 PM

Re: oil and gas regulations, qualifying for EDPR, 1000/500 foot implications

I have been mulling over the setback qualification for the EDPR and coming around to Planning Commissioner Young's perspective,
which, as I understand it, is this:

a) assuming that the EDPR provides stronger protections for air and water than the SDPR does, and
b) assuming that factors other than the EDPR path will have more to do with where the pad is located than the EDPR "carrot" will,
then perhaps having large setbacks as a qualification for the EDPR is going to work *against* the nearby residents;
Commissioner Young argued that the closer the well, the more you need the stronger AQ and WQ measures of the EDPR.

For illustration purposes, let's consider only the case in which the lease has no pad on it and we are looking at new development.
In this case, perhaps the qualifier should be something like: for the purposes of the setback-to-occupied-structures requirement,
you must site the pad at the best distance from all occupied structures of interest (to be defined),
where "best" is algorithmically determined, so it's still an objective requirement.
What the qualification says is that if do the best you can do within the constraints of the lease, you can still meet the
setback-from-occupied-structures qualification for the EDPR.

So the rule might read something like this:

- if you can meet the X-foot (1000/750/500, whatever) setback for occupied structures with this lease you must do so to meet this requirement,
otherwise
- if you site the pad the best you can given the lease constraints, then you meet this requirement

where "the best you can" is the centroid of the points defined by the closest occupied structures in any direction of the chosen site
within X-feet of the lease-boundary line or residing on the lease.
In the odd case in which the centroid doesn't lie on the lease or the surface owner has a real problem with this site, the SDPR is probably the
way to go anyway.

The devil is in the details, but it seems like there might be a way to do this to achieve the desired results.

Nancy Hall

From:	Nancy Hall
To:	#LandUsePlanner
Subject:	oil and gas regulations, re-use of well pads
Date:	Thursday, November 15, 2012 2:33:01 PM

Please consider the following comments and forward them to the county commissioners on my behalf.

I understand that you are thinking about encouraging consolidation of well pads.
I think this is another case, like the 1000-foot/500-foot issue, that could have unintended consequences.

For the purpose of this issue, "well pad" must be defined carefully, and for this purpose it
cannot be the same definition of "well pad" used elsewhere in the regulations where a new site is at issue. A new term is
needed.

There are, without doubt, situations in which re-use of an existing pad is exactly what you do not want to do,
if you believe that large distances from occupied structures is the most- (or one of the most-) desired of outcomes.

There are producing wells that are much closer to residences than they could or should be today, given increased lease-holdings since
the wells were first installed, given new technology, or given that consolidated well pads are large industrial sites, whereas some older producing wells
are not as obnoxious and might be near abandonment.
In other words, re-use of an existing well pad is not a desirable thing PER SE.
The desirability of re-use clearly differs from site to site.

Shane Davis talked about the "setback loophole", which, if I understand him, is a loophole in the state regulations that allows
any well, whether shut-in, producing, or abandoned, to be re-entered without regard to any setbacks. Please consider the implications
of this when you think about encouraging use of "existing well pads", but consider also my above comments. I submit that
even if you define "well pads" to be those with producing wells for this purpose, there will still be cases in which it is a mistake
to encourage consolidation.

As always, thank you for your hard work and for your consideration of public comments.

Nancy Hall