Base-Line Sampling Strategy:

In order to establish the baseline water quality, seasonal sampling prior to any drilling activity is recommended. The ideal schedule would be to sample for the parameters described above in the late fall and the spring of each year to account for the natural variability characteristic of the changes in ground water hydrology. As noted above, measuring the static water level at the time of each sample is strongly recommended.

During drilling in proximity of the water well under consideration, such as the initial drilling of a well, drilling of subsequent wells on the multi-well pad, or high-volume hydrofracturing of a well, monitoring of indicator parameters should be conducted.

Indicator parameters are reflective of a wider array of parameters and their use is a cost effective way to reduce the number of analysis needed to detect a change in water quality. The presence of, or change in, indicator parameters may signify contamination has occurred. The recommended schedule for monitoring of indicator parameters is once every 2 months after an event until the next regular base-line (spring or fall) test of all the parameters described above.

The recommended indicator parameter list is:

pH	Conductivity
Chloride	Barium
Sulfate	Potassium
Total Dissolved Solids	Dissolved Methane & Ethane

If one or more of the indicator parameters is outside of the normal baseline range of results or previous results of indicator testing, the full suite of 24 parameters should be tested for again. As noted above, consultation with the commercial laboratory used for analysis in interpreting results is recommended.

Considering that local precipitation may vary from year to year which will effect the natural variability of water quality, that potential gas development may be long term and the possibility that well contamination from well drilling activities may not occur for several years (owing to the slow movement of groundwater in some circumstances), it is recommended that base-line sampling be ongoing.

Snap-Shot Sampling Strategy:

In those cases where the cost of base-line sampling is prohibitive but where the concern level is such that some water quality information is desired, a 'snap shot' sampling strategy is recommended. In order to establish a 'snap shot' of a well's water quality, one sample analyzed for the full suite of parameters described above is required. The

ideal time to sample would be the fall, if time permits. If drilling is about to commence, a 'snap shot' sample should be taken prior to drilling, regardless of season.

If possible, seasonal sampling of the indicator parameters as identified and described above is recommended. If not, sampling for indicator parameters during drilling activities (as described above) should be conducted. The recommended schedule for sampling of indicator parameters is once every 2 months after an event for a period of 6 months after which sampling for indicator parameters should take place annually to coincide with the date of the initial 'snap shot' analysis or until the next regular indicator test (spring or fall).

If one of the indicator parameter results is significantly higher than the "snap shot" test results or previous results of indicator testing, the full suite of 24 parameters should be tested for again. As noted above, consultation with the commercial laboratory used for analysis is recommended.

Note: The information provided here is meant to serve as general guidance until such time as New York State (DEC or DOH) provides an official protocol to the public for the purpose of monitoring water quality well water as it relates to potential contamination from high volume, horizontal hydrofracturing natural gas development.

For questions or comments on this guidance, please contact the Otsego County Soil and Water Conservation District at (607) 547-8337 x4.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PA-DEP Recommended Basic Oil & Gas Pre-Drill Parameters

The Pennsylvania Department of Environmental Protection (DEP) has developed the following list of parameters that are recommended for homeowners who wish to have their private well tested. The following list is not an exhaustive list of testing, homeowners may wish to have their water tested for a more extensive list of parameters. Additionally, while it is not recommended, if a homeowner wishes to test for less than the recommended list, the minimum parameters that should be analyzed for are printed in **bold** in the table below. It is recommended that homeowners test their water within one year prior to well drilling. Homeowners can sign up for DEP's e-notice system to receive notice of well permit applications DEP has received for wells in the area they choose. The Web site address is: http://www.ahs2.dep.state.pa.us/eNOTICEWeb/.

Analyte (Inorganic)
Alkalinity
Chloride
Conductivity
Hardness
Oil and Grease
pH*
Sulfate
Total Dissolved Solids*
Residue - Filterable
Total Suspended Solids
Residue – Non Filterable

Analyte (Trace Metal)
Barium
Calcium
Iron*
Magnesium
Manganese*
Potassium
Sodium*
Strontium

Analyte (Organic)
Ethane*
Methane*

Analyte (Microbiology)
Total Coliform/E.coli

* As a minimum, a homeowner wishing to have their private well tested should analyze for these parameters.

How to find a laboratory to perform the testing:

1. The DEP Laboratory Accreditation Program offers a "Search PA Accredited Environmental Laboratories" option at the following Web site www.depweb.state.pa.us/labs. Choose "Laboratory Accreditation Program" on the right-hand side of the page. Scroll to "Search Environmental Laboratories." Use this search to find a laboratory accredited to perform these tests.
2. Contact a local laboratory and ask if it can perform the above testing or if it could help you find a laboratory.
3. Contact the DEP Laboratory Accreditation Program via e-mail at eplabaccredit@state.pa.us or via telephone at 717-346-7200.

What to ask/tell the laboratory before you send samples:

1. Inform the chosen laboratory that you are a homeowner who wants to have well water tested for Oil & Gas Pre-Drill parameters.
2. Ask the laboratory if it is accredited to perform the requested testing. If the laboratory is not, ask if it will subcontract to an accredited laboratory.

FACT SHEET

3. Ask the laboratory if it provides sample-collection services. DEP recommends that a third party (a consultant or the laboratory) collect and transport the sample for testing.
4. Instruct the laboratory to perform the testing and reporting of your sample(s) in accordance with all Chapter 252 Accreditation Requirements.

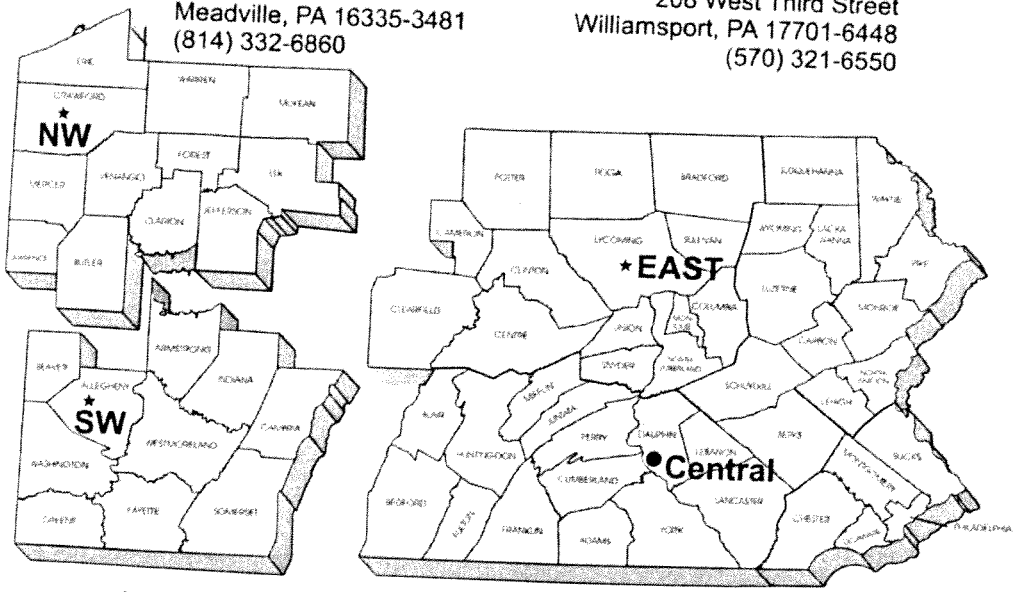
This map shows DEP Regional Office coverage by county for oil and gas activities.
Please contact the Regional Office for your area for information about well permits, transfers, or bonds.
Report complaints about wells to Regional Offices.★

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OIL & GAS OFFICES

Oil and Gas Regions

★ **Northwest Region**
230 Chestnut Street
Meadville, PA 16335-3481
(814) 332-6860

★ **Eastern Region**
208 West Third Street
Williamsport, PA 17701-6448
(570) 321-6550



★ **Southwest Region**
400 Waterfront Drive
Pittsburgh, PA 15222-4745
(412) 442-4024

● **Central Office**
Bureau of Oil and Gas Management
PO Box 8765
Harrisburg, PA 17105-8765
(717) 772-2199

For more information, visit www.depweb.state.pa.us, keyword: Oil and Gas.

Water Wells in Proximity to Natural Gas or Oil Development

6/7/2011

NGWA Information Brief

Information for well owners

The National Ground Water Association encourages water well owners to test the quality of their water regularly.

As oil and gas development increases around the country, NGWA reminds water well owners about the importance of testing their water wells prior to oil and gas well installation. This provides a baseline for comparison after oil and gas production.

Relationship of hydraulic fracturing for oil or gas development and groundwater used for drinking supply

Hydraulic fracturing, or fracing, has captured headlines in areas where gas development is occurring. Fracing is a petroleum-industry process in which fluids, commonly made up of water and a small percentage of chemical additives, are combined with sand and are pumped at very high pressure into a geologic formation holding gas. The resulting fractures allow the release of natural gas, which can be collected.

A 2004 U.S. Environmental Protection Agency study of hydraulic fracturing of coalbed methane reservoirs found little or no threat to underground sources of drinking water. Currently, the U.S. EPA is studying whether fracing adversely affects groundwater quality as the practice expands rapidly into other types of geologic formations, particularly shales. Preliminary results from this study are expected in late 2012. The primary questions the U.S. EPA hopes to answer in the study are:

- What fracing scenarios might cause impacts on drinking water resources?
- What approaches are effective for protecting drinking water?

Suggested options for water well owners

NGWA suggests all water well owners regularly test their water quality because:

- Many areas of the United States have geologic conditions that release natural constituents into groundwater.
- Water quality in private wells is not regulated by the federal government or by many state and local governments.
- Below-ground activities such as oil and gas drilling can potentially affect their drinking water quality.

It is difficult to give a universal recommendation for water testing that proves damage to a well has occurred. This is because the rate at which groundwater flows and the risk of water well contamination depend on site-specific geology, among other factors. NGWA encourages water well owners to review additional sources of information that may be relevant to your specific circumstances, or the state or county where you reside. One such information source will be listed later in this brief.

national ground water association

Phone/ Toll-free 800 551.7379/ 614 898.7791 Fax/ 614 898.7786
Web/ www.ngwa.org and www.wellowner.org
Address/ 601 Dempsey Road/ Westerville, Ohio 43081-8978 U.S.A.

For some water well owners, the cost of water testing may be an issue. In the rare cases where regulatory or legal action is necessary, a comprehensive analysis is often better. However, water testing—especially for organic chemicals or chemicals in minute amounts—can be expensive.

NGWA has compiled a list of constituents to test in areas of oil or gas development. It includes the major ions in groundwater, which consist of calcium, magnesium, sodium, potassium, alkalinity (bicarbonate and carbonate), sulfate, and chloride. These usually make up more than 90% of all dissolved constituents in groundwater, and are used to define a water "type"—similar to labeling blood types. Analyzing this suite of ions both pre- and post-drilling allows for quantitative changes in water quality to be determined.

Bromide is an ion common to brackish water and brines. A measure of the ratio of bromide to chloride has been used to "fingerprint" saltwater—for example, to help distinguish whether salt contamination in a water well is from road salt or contamination from oil brines.

Barium is a potentially harmful element that sometimes can be an indicator of radioactive elements in oil brines or production fluids.

Uranium is a radioactive element that can occur naturally in groundwater or be released from a geologic formation by contamination from brine.

The **pH** of water is a measure of the water's acidity or alkalinity, and can cause the release of other undesirable metals, such as iron, into groundwater.

The **total dissolved solids (TDS)** is a measure of the sum of all dissolved constituents in water. It can be used to compare samples for any net increase in salt or other dissolved constituents. It also can be used to see if all of the changes in subsequent water sampling have been accounted for, since the TDS should about equal the sum of all other dissolved constituents in the sample. If it doesn't, then there may be other constituents in the water that have been overlooked.

The **specific conductance** is a measure of the electrical current that can be transmitted by the water, and is directly proportional to the amount of dissolved solids. It can be used in subsequent sampling as a cost-effective screening tool to determine if more comprehensive sampling may be needed.

Iron, manganese, selenium, chromium, arsenic, and boron are other naturally occurring minor and trace elements that may cause cosmetic or ill health effects to consumers. An increase in the concentration of these constituents may indicate changes in the aquifer due to the drilling process or stimulation fluids.

Organic chemicals such as toluene, benzene, oil, and grease may be by-products of oil and gas production, or well stimulation activities.

Methane is a naturally occurring gas that can dissolve into groundwater. It is common to areas with oil and gas development because the rocks underlying these areas by nature contain petroleum, natural gas, and coal. Methane can seep to the surface and into fresh groundwater under natural conditions. Processes near the earth's surface (e.g., decomposition of organic matter in swamps and wetlands) can also produce methane, so the mere presence of methane in well water does not immediately indicate contamination related to oil and gas production.

However, an unusual change in the amount of methane in water may indicate changing conditions underground. In this case, enhanced analysis of the gas can help determine its origin.

Turbidity is a measure of the cloudiness of a water sample from suspended particles, and may indicate disruption of the flow system that provides water to a well.

NGWA has developed Best Suggested Practices (BSPs) for groundwater professionals on topics that include reducing problematic concentrations of arsenic, boron, iron, manganese, methane, and uranium in well water. NGWA also has developed a BSP on reducing and mitigating problematic concentrations of stray gases in water well systems.

It is important to collect a sample before oil and gas drilling in your area to establish the baseline conditions of your groundwater supply. It is also important to test after completion of drilling activities. Some states require energy companies to collect samples and may have time limits for sample collection. So, each water well owner should contact their state or local regulatory authority to find out about any requirements.

States also may have agreements with energy companies detailing constituents that the company will cover for pre- and post-drilling well water quality testing. In the absence of such programs, the list in this brief provides constituents to test in order to establish a water quality baseline.

Following are steps well owners can take before and after oil and gas production takes place.

Step 1. Prior to oil and gas operations, have a professional, such as a qualified water well system professional, test your groundwater quality for appropriate constituents to establish a water quality baseline for post-fracturing or drilling analysis.

When seeking a qualified drinking water testing lab, check with your state or local health department, or go to NGWA's Web site *www.wellowner.org* and click on "Water Quality" on the menu and then "Water Testing" beneath. If local labs do not test for substances you wish to check, there are national water testing labs that may be able to help, such as the National Testing Labs (*www.ntllabs.com*) and Underwriters Laboratories (*www.ul.com*).

Step 2. In the absence of a list developed specifically for your area by a credible source, the following list from NGWA includes basic constituents that should be considered for water quality analysis prior to oil and gas operations.

Major Ions:
alkalinity, calcium, chloride, magnesium, potassium, sodium, sulfate
Minor and Trace Elements:
arsenic, barium, boron, bromide, chromium, iron, manganese, selenium, uranium
Water Quality Parameters:
pH, specific conductance, total dissolved solids (TDS), turbidity
Organic Chemicals:
benzene, toluene, ethyl benzene, xylene (BTEX); diesel range organics (DRO); dissolved methane; gasoline range organics (GRO); total petroleum hydrocarbons or oil and grease (HEM)

Examples of other localized water quality testing recommendations can be found at *http://wri.eas.cornell.edu/gas_wells_5_1489175471.pdf.*

Step 3. Once hydraulic fracturing has taken place, water well owners should consider retesting their water quality against the baseline results and against any additional fracturing fluid chemicals that have been voluntarily disclosed. The Ground Water Protection Council (GWPC) Frac Focus Web site *(http://fracfocus.org)* lists chemicals used in fracturing fluids voluntarily disclosed by some companies.

To learn more about laws regarding disclosure of chemicals, visit GWPC's "Chemicals and Public Disclosure" and "Find a Well by State" sections of its Frac Focus Web page.

Post-drilling water quality testing should be done within six months of completion of drilling and fracing. Continued sampling should be done at least annually as long as practicable. Subsequent screening using the pH and specific conductance, or total dissolved solids measurements, can be less expensive ways to see if changes have occurred. An increase in the concentration or occurrence of these constituents could indicate that further, more sophisticated water quality testing should be done.

You can learn more about the toxicity of chemicals by searching for the chemical using the name or CAS number on the U.S. EPA National Center for Computational Toxicology Web site. The U.S. EPA also maintains a Drinking Water Hotline that is available Monday through Friday from 8:30 a.m. to 4:30 p.m. ET at 800 426.4791. Only a trained water quality professional can tell you if your water is safe to drink.

What to do if water quality changes

If there is a change in water quality, the well owner should discuss it with local or state health or environmental protection authorities.

Most constituents can be treated by in-home systems. When considering a water treatment device, make sure its specifications match the substances and concentrations you wish to treat. You may want to check with the Water Quality Association *(www.wqa.org)* and NSF International *(www.nsf.org)* to determine whether the technology being considered has been performance tested.

References

Hydraulic Fracturing EPA Public Information Meeting, Binghamton, New York. September 15, 2010. Summary of Public Comments. *http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/upload/hfsummarybinghampton3.pdf*

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U.S. EPA, 2010. Hydraulic Fracturing Background Information. *http://water.epa.gov/type/groundwater/uic/class2/hydraulicfracturing/wells_hydrowhat.cfm*

U.S. EPA, 2010. Opportunity for Stakeholder Input on EPA's Hydraulic Fracturing Research Study: Study Design. *http://www.epa.gov/indian/pdf/discussion-document-study-design.pdf*

Revised 7/8/2011

The National Ground Water Association is a not-for-profit professional society and trade association for the groundwater industry. Our 12,000 members from all 50 states include some of the country's leading public and private sector groundwater scientists, engineers, water well contractors, manufacturers, and suppliers of groundwater-related products and services. The Association's vision is to be the leading groundwater association that advocates the responsible development, management, and use of water.

Columbiana County Health Department

7360 State Route 45 · P.O. Box 309 · Lisbon, OH 44432 · Phone (330) 424-0272 · Fax (330) 424-1733

Hours: Monday thru Friday, 8:00 am to 4:00 pm - *Closed Legal Holidays*

Home
Cancer Detection Clinic
Medical Services
- Health Services
- Specialty Clinic

Environmental Services
- Sewage
- Water
- Food
- Manufactured Home Parks
- Recreational Parks
- Real Estates
- Pools
- Nuisances
- Tattoo & Body Piercing
- Rabies & Vector Control
- Plumbing
- Private Water Monitoring Program

Other Services
- Vital Statistics - Birth/Death Records
- Injury Prevention
- Help Me Grow
- Public Health Emergency Preparedness

Board of Health
Helpful Links
Contact Us

Private Water Monitoring Program

The Columbiana County Health Department is a regulatory authority over private drinking water systems in Columbiana County. Water systems include drilled wells, springs, ponds and holding tanks. Our current regulations only regulate bacteria and nitrates in private drinking water supplies. The Columbiana County Health Department would like to take a more active approach in determining if there is a potential health risks associated with construction activities in Columbiana County such as mining, oil and gas wells, and solid and construction waste landfills. These more technical surveillance activities should give the general public more confidence that these sites are not presenting an imminent danger to their health.

The Columbiana County Health Department will offer this testing for the private water systems only at the following fee structure:

Basic Testing
Total Dissolved Solids
Arsenic
pH
Conductivity
Sodium
Strontium
Chloride
Barium
$ 210 Fee (includes well analysis, flow test)

Moderate Testing
Antimony
Beryllium
Copper
Nickel
Sodium
Chloride
Magnesium
Calcium
Total Dissolved Solids
Iron
Lead
Alkalinity
pH
Conductivity
Potassium
Sulfate
Strontium
Nitrate
Manganese
Barium
Arsenic
Oil & Grease
$505 fee (includes well analysis, flow test)

Complete Testing
Antimony
Beryllium
Copper
Nickel
Sodium
Chloride
Magnesium
Calcium
Total Dissolved Solids
Iron
Lead
Alkalinity
pH
Conductivity
Potassium
Sulfate
Nitrate
Strontium
Manganese
Barium
Arsenic
Oil & Grease
*Volatile Organic Chemicals (55 chemicals-see below)
$ 755 Fee (includes well analysis, flow test)

Download Our Forms Here:
Requires Adobe Reader to view.

- Private Water Monitoring Program Policies and Procedures (PDF)
- Private Water Monitoring Program Application (PDF)

Additional Resources:
Requires Adobe Reader to view.

- Marcellus Shale Fact Sheet (PDF)
- Ohio's Regulations on Natural Gas Development and Disposal of Oilfield Wastes (PDF)

*Volatile Organic Chemicals
Benzene
Carbon Tetrachloride
o-Dichlorobenzene
1,2-Dichlorobenzene
1,1-Dichloroethylene
Cis-1,2-Dichloroethylene
Trans-1,2-Dichloroethylene
Dichloromethane
1,2-Dichloropropane
1,2-Dichloropropane
Ethylbenzene
Monochlorobenzene
Styrene
Tetrachloroethylene
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Vinyl Chloride
Xylenes (total)
Bromodichloromethane
Bromoform
Chloroform
Dibromochloromethane
Bromobenzene
Bromochloromethane
Bromomethane
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Chloroethane
Chloromethane
o-Chlorotoluene
p-Chlorotoluene
Dribromomethane
m-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
1,3-Dichloropropane
2,2-Dichloropropane
1,1-Dichloropropene
1,3-Dichloropropene
Fluorotrichloromethane
Hexachlorobutadiene
Isopropylbenzene
p-Isopropylbenzene
Naphthalene
n-Propylbenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
1,2,3-Trichlorobenzene
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethybenzene

Public Health
Prevent. Promote. Protect.

Mahoning County District Board of Health
Laboratory Services Division

116 Westchester Drive
Youngstown, OH 44515
(330) 270-2841

Suggested Drinking Water Test Parameters for Private Water Wells Potentially Effected by Marcellus or Utica Shale Gas Well Drilling

In recent months much information has been publicized regarding Marcellus Shale drilling and the potential effects it may have on private water drinking wells. Realizing that individuals may want to have their water tested before agreeing to gas well drilling on their property the Mahoning County District Board of Health developed the following tiered list of parameters a homeowner may want to test for to obtain a baseline for water quality of their well. Realizing that testing can be expensive, the list is divided into three tiers. This list was developed using information obtained from:

- The Ohio Environmental Protection Agency
- The Ohio Department of Natural Resources
- Pennsylvania State University
- Pennsylvania Department of Environmental Protection
- Bucknell University

This list may be modified in the future based on changes recommended by regulatory agencies or if research indicates specific test parameters should be added or deleted.

Tier 1: 107.00*
Parameters
Alkalinity
Barium
Bromide
Chloride
pH
Sodium
Strontium
Sulfate
Total Dissolved Solids

Tier 2: $ 263.00*
Parameters
All parameters in Tier 1 plus the following:

Calcium
Conductivity
Hardness
Iron
Magnesium
Manganese
Oil & Grease
Potassium
Total coliform
Total Suspended Solids

Tier 3: $ 438.00*
Parameters
All parameters in Tier 1 and 2 plus the following:

Volatile Organic Compounds

Radionuclides may also be considered for testing in Tier 3; however they are not included in the Tier 3 price. If testing for radionuclides is desired please contact the laboratory to discuss pricing and collection of that parameter.

Methane may also be a desired parameter to be tested. However, collection of methane involves special procedures; therefore, contact the laboratory to determine if collection of methane is possible. This cost is also not included in any of the above pricing.

***Pricing subject to change. Collection fees will be set by the agency collecting the samples. There will be a $25.00 processing fee for each sampling event. In Mahoning County samples can be collected by Board of Health Sanitarians for a $55.00 collection and processing fee.**

2/15/11

Div. Oil & Gas Resource Mgt.

Water sampling Fact Sheet 10/3/

- Collection costs
Isotope analysis
private labs - $700 ea

USGS - chlo
bromide
study

Brine - Primary Components

1. Chloride
2. barium
3. Strontium
4. TDS
5. Sulfate

→ Also looking at ratios

USGS - add methane, iron & manganese to Tier I

Bromide - ratios w/ chloride → good to fingerprint

Issue of DNR certified methods
- USEPA Method - Haz Waste / Landfill
- AWWA

Addendum
- Approved methods
- Minimum reporting limits

Chuck Texas

Shale Gas Call

9/6/11

ASTHO Jim Blumenstock – Chief – Public Health Practice Utah

Members EH Gov Rel.

Raman Terry Andrea

Nancy Goff

NY – Howard Free – Bob Kenney – Dir EH

PA – Dr. Ely Arula

WVa – Kris (F) Curtis – Comm Barb Taylor – EH

Walt Ivy – Env. Eng

Utah – David Patton – U. Dept Health

Sam Lefevre / Craig Dietrich Env Epi

Wyoming Tracy Murphy – State Epi

Maryland – Clifford Mitchell

DR. W. Other state agencies – asking Dr W to make statements re: ph impacts

Air – Water – Radiation

Get perspectives & surveillance – Research?

NY – No horz. fracking in NY – Dependent on EI Statement when that finished – drillers will need this as a permit – advising on health issues

– up to state govt – will likely endorse

Env. Impact Statement – 10 items of concern & how to address –

Water supply & work on

9/6/11 Shale DOH call

W. Va – Gov. charged w/ leg rules re: drilling
- few leg efforts to expand O&G activities Dept of Agr.
- Interim committee that meets on WQ issues monthly – leg / industry / state agencies –
- public health not actively involved – some input on DW & source water protection – requests for info on locations of private wells (at LHD's)
- Dept. Env. Protection charged to develop emergency rule package → talked to DEP about protection of source water – issues w/ spills & related concerns Co linked to spill notification emergency n
- working w/ DEP to identify where water system intakes are → can notify water system of issuance of permits
- water withdrawal concerns → required to report w/in 1 yr which is a concern → have interacti Website to identify areas of low flow
- on-site sewage issues
- installation of transmission lines

Pennsylvania – Dr Avula
- testified 2x before gov. O&G commission
- Have developed a plan
- Presented detailed blueprint of what needs to be done Waiting to hear from gov re: funding 1.3-1.2 billion per yr
- concern about federal mandates w/out funding
- need to be proactive

Shale Survey ?

- Marcellus shale Coord. unit
  Grant health assess program, EH PH tracking — school PH
- responding to complaints — geocoding locations
  geomapping is key
- clinical data evaluation — making sure labs kn
  what to do
- working w/ DR's in rural areas — getting appropriate
  health data
- have subcomponents to one registry —
  drilling workers, pregnant women,
  pediatric cohort

Utah

- not big issue yet in Utah — central / SE sparse areas
- oilfields large & distant from communities
- public water supplies separate
- oil fields assoc. w/ reservations → not sure of
  interaction w/ reservation health care services

Wyoming

- lot of activity & hydr. fracking
- DFD has limited involvement —
- Commiss. tasked w/ reg & promoting industry
- no pre-event planning Pavillion
- ATSDR study — Civilian — found petr. hydrocarb.
  Sublet County — some water sampling —
  Contamination
  * Big issue is air quality — ozone issues

Use of Health Impact Assess in US
27 Case Study 1995-2007
American J. Prevent Me
(2008)

Wy (cont) - no direct tie to fracking yet
- Think should be env. monitoring proactively
- DEQ partnered w/ USGS to do some limited sampling
- suggestions to monitor re: pH have not been taken s
- Some drilling on BLM lands - if BLM issues permit - then DEQ tries to make sure air perm is met
- Known contam. may be related to poor drilling practices vs. fracking

Maryland
- Western area
- Gov + DEP - stated because of concerns - we refused to issue permits
- a few leg. bills to do study of water (no success)
- Gov. commission → DOH not a member but sm outreach has occurred likely Health will be adde
- 2x meet

[illegible] data on private wells

exposure of chemical

Rebecca Fugitt

Subject:	4:00 - Conference call w/SHOs of NY and PA - and others re: hydrofracking
Location:	Conference Call - Director's Conf Room, Phone: 877-722-1471/conference code - 7110865448
Start:	Tue 9/6/2011 4:00 PM
End:	Tue 9/6/2011 5:00 PM
Recurrence:	(none)
Meeting Status:	Accepted
Organizer:	Ted Wymyslo
Required Attendees:	Gene Phillips; Will McHugh; Rebecca Fugitt; Michael Snee

When: Tuesday, September 06, 2011 4:00 PM-5:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: Conference Call - Director's Conf Room, Phone: 877-722-1471/conference code - 7110865448

Note: The GMT offset above does not reflect daylight saving time adjustments.

~~*~*~*~*~*~*~*~*~*

08/18/11 – Meeting confirmed. Will also receive invitation from ASTHO. – Elizabeth Bradley

Organizer/Contact:
Elizabeth Bradley
(614) 466-2253

Ramon Bonzon
ASTHO
(571) 527-3158
rbonzon@astho.org

When: Tuesday, September 6, 2011, 4:00 p.m. EDT

Where: Conference Call
Phone: 877-722-1471
Conference code: 7110865448
Leader Pin: 1684

What: Conference call with Dr. Shah (NY) and Dr. Avila (PA) and any other states concerning the hydrofracking environmental aspects. ASTHO is willing to reach out to other SHOs in other states and set up conference call to discuss.

Hyrdrofracking and Environmental Health - Conference Call
Tuesday, September 6 at 4 PM EDT

Participants include health officials from Maryland, New York, Ohio, Pennsylvania and West Virginia.

What activities are you doing or considering about the environmental health concerns?

- Radiation
- Air
- Water

- Other

What types of surveillance or health impact assessments are you doing or considering?

- Research that can be shared

Other issues

Invitees:
Dr. Wymyslo
Will McHugh
Gene Phillips
Rebecca Fugitt
Michael Snee

Rebecca Fugitt

From: Stevenson, Laurie [laurie.stevenson@epa.state.oh.us]
Sent: Friday, September 16, 2011 10:36 AM
To: 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Baker, Mike; Eggert, Michael; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; Stephen Helmer; David Lipp; Hopkins, Mike
Subject: 7/12 Inter-Agency Shale Team meeting notes/question about next meeting
Attachments: ShaleTeamMeetingNotes7-12-11FINAL.doc

Follow Up Flag: Follow up
Flag Status: Flagged

Hi everyone. I'm attaching the final notes from our 7/12 meeting.

Per the notes, we're scheduled to meet again on **Wednesday, October 5th** from 1:30-4:00 at ODNR. I'm doing a quick poll of the group to see if we want to continue with a quarterly meeting. Our discussions thus far have been very productive I think for everyone, however, I do not know if we're to the point where we want to spread our meetings out a bit farther apart.

If we skipped October, this would put our next meeting in January. If people feel that we want to stay on track with the meeting schedule as is, I'm fine with that too.

If you can e-mail your preference to me directly, I'll collect the responses and let everyone know what the general consensus is on future meetings.
If we do decide to move forward with the October meeting, I'll get a draft agenda around to everyone.

Thanks.
Laurie

Ohio EPA/ODNR/ODH Shale Team Meeting
July 12, 2011 Notes

ODNR UPDATES

ODNR's tracking system is now for horizontal permits. Companies drilling vertical well (stratographic testing) – now removed from their tracking system. Status fields: permitted, drilling, completion, production, expired (never drilled). This should be more helpful/accurate information for interested parties wanting to know about current activity. Could be moving to a GIS based system down the road.

Utica: Buel well is actually producing for Ohio Buckeye Energy. Companies are required to submit an annual statement of activity to ODNR by march 31st. Do not know if it's oil or nat gas predominantly now.

ODNR's Technical Team – Geologic Survey

Technical information will be compiled by the team. Goal of understanding all technical issues related to hydraulic fracturing: chemicals, design, perforations, flowback volumes, production capability, etc. There's a need to get more scientific information out to the public regarding hydraulic fracturing.

UIC Disposal

- 178 permitted wells (6 not drilled yet, 172 active)
- 8 new applications since May (5 permits issued) 3 applications under review.
- Out of state wastes to UICs in Ohio – approximately - Oct-Dec 39% coming from PA. Jan-March 59%.

Permit Conditions (OEPA/ODNR), M. Baker, T. Tugend

In final stages of agreeing upon language that will go into future permits regarding protecting sensitive gw areas. Next steps include letter from OEPA to ODNR. T. Tugend indicates ODNR will follow-up on this.

OEPA UPDATES

401 General Permit, T. Harcarik

OEPA has drafted a 401 general permit which is under internal review in OEPA. Comments came in around 4th. Will be distributed to ODNR for review. Less than .5 acre wetland and less than 1,500 linear ft of stream – qualify for nationwide permit. OEPA is developing a GP which will get through OEPA. If you exceed thresholds, not eligible. Still may need to deal with Army Corps for individual 404 permit.

Once finished internally at OEPA, will submit to ODNR/USACE for review. Also, OEPA is planning outreach to industry and other interested parties. There will also be a public comment/review period.

Warren/Patriot (B. Hall)

No new developments following issuance of the Director's letter from OEPA to ODNR.

Air Permit Update (M. Hopkins)

Air general permit (GP) is being developed for natural gas drilling. Construction/installation sources – most of these are exempt from air permitting because either they are temporary in nature, are exempt by rule or would be classified as de minimis sources. Once completion is done and the site goes into production, these units are regulated – not exempt unless de minimis. GP sent out: several units identified. Met with the Ohio Oil and Gas Association and industry reps. They are preparing additional comments for OEPA.

Next steps: Will get comments, another review to more interested parties. Official 30 day comment period when the draft is issued.

Waste/Solid Waste (D. Lipp, ODH and A. Shear, OEPA)

David Lipp provided an update on ODH's recent site visit to drill site. They did some monitoring via. low level rad meter (nothing found above background). Could not find any evidence of llrw or exposure concerns.

TENORM, D. Lipp

TENORM (Technologically Enhanced Naturally Occurring Radioactive Material) rules approved to go out for public comment. By Weds or Fri of next week, should go on the ODH Website.

MEDIA/OUTREACH (OEPA/ODNR/ODH)

- ODNR receiving many Class II injection well inquiries.
- The group discussed an additional water sampling fact sheet – companion to initial fact sheet. This would focus on the question: What do the results mean? Water sampling factsheet sent out to the local HDs.
- General fact sheet update – ODNR wants to get this out to make available at the State Fair.
- ODNR has completed first line of general fact sheets (5 total). The next ones will focus on Class II injection wells and FAQs.
- OEPA – drillers fact sheet forthcoming.

NEXT MEETING

October 5th (Weds.), 1:30-4:00 at ODNR.

Marcellus-Utica Shale Development and Hydrofacturing

Bureau of Environmental Health
Activities 8/11/2011

BEH Activities

- Completion of joint fact sheet prepared with Ohio EPA and Ohio Department of Natural Resources, Division of Mineral Resources Management on recommendations for water well sampling before oil and gas drilling. The fact sheet is posted on all three state agency websites and has been provided to all local health districts.
- Staff have been providing technical assistance on well sampling questions to the public, landowner associations and local health districts.

Other State Agency Activities:

- Ohio EPA and ODNR have completed additional fact sheets posted on their state agency websites providing more information to the public on the regulatory requirements. ODNR has posted a wide variety of information on shale gas drilling and hydraulic fracturing.
- The Ohio EPA air program is asking for comments from any interested party concerning a proposed General Permit for operations that occur at a natural gas drilling well site. A more detailed explanation of what is proposed is contained in the following letter. In addition, below are links to the proposed Qualifying Criteria and the proposed Model General Permit. Comments on these documents are due by August 12, 2011.
- Next joint agency meeting is scheduled for October 5, 1 to 4 pm.

Summary of State Environmental and Public Health Activities
Marcellus Gas Shale Development

August 10, 2011

Pennsylvania

- Governor Corbett established a Marcellus Shale Advisory Commission (2011) to identify, prioritize and craft recommendations regarding safe, efficient and environmentally responsible extraction and use of unconventional natural gas reservoirs in Pennsylvania. Key environmental and public health recommendations are:
  - Stronger regulations for drilling including tripling setback distances to surface water bodies
  - Increasing isolation distances from private water wells from 200 to 500 feet and to 1,000 feet for public water systems
  - Improve public access to information, violations, remedial actions and completion reporting.
  - Protect public health by creating a population based health registry, creating a system for investigation of complaints, and establish education programs on potential health impacts (see attached Pennsylvania health issues document)
- The Pennsylvania Department of Environmental Protection conducted a study on short term ambient air sampling near drilling sites and facilities. Results did not identify concentrations that would trigger air related health issues. The Department remains concerned about cumulative emissions and will conduct additional studies, and make recommendations.
- The Pennsylvania Department of Public Welfare has funded a $75,000 study for the Northeast Regional Cancer Institute to complete a community health survey in the Marcellus Shale region of northeast Pennsylvania. The goals of the study are to estimate the prevalence of a variety of acute and chronic medical conditions among residents living in counties where natural gas production has begun or is likely.

New York

- New York has a well established regulatory program that oversees oil and gas drilling with a rigorous permitting process.
- New York also requires the development of a Supplemental Generic Environmental Impact Statement (SGEIS) to assess issues unique to horizontal drilling and high volume hydraulic fracturing in the Marcellus shale to comply with the State Environmental Quality Review Act.
- The SGEIS has proposed identified areas where shale gas drilling will be prohibited – watersheds for New York city and Syracuse areas, reforestation areas, wildlife management areas, state parks, and "primary" aquifers identified by state regulations.
- The SGEIS also identifies adverse and non adverse findings and requirements for mitigation:
  - Prohibition in certain areas as identified above.

- No drilling operations within 2,000 feet of public water wells, within 500 feet of private water wells and floodplains.
- Requirement for enhanced well casing – adding a requirement for a third string of cemented surface casing
- Additional mitigation measures for air quality control and greenhouse gas emissions
- The SGEIS concludes that analyses demonstrate no significant adverse impact to water resources is likely to occur due to vertical migration of fracturing fluids through the shale formations.

- No state department of public health activity was identified.

West Virginia

- West Virginia has developed industry guidance for large water volume fracture treatments.
- West Virginia Department of Environmental Protection is in the process of preparing emergency rules for Marcellus Shale Drilling.
- WV Department of Public Health is concerned about wastewater management and fluids disposal from the sites, water withdrawal documentation and approval, improved monitoring and investigation of spills, and air quality monitoring.
- A requirement has been established for industry to determine all private wells within 1,000 feet of oil/gas drilling and conduct pre-drilling sampling. Homeowners may opt to have their own samples collected by the local health districts and analyzed at the state laboratory.
- No additional state department of health activity was identified.

Relevant Research and Data

- *Osborn, et al (2011)* is a Duke University study that evaluated the water quality of 68 private wells near active drilling sites (1 or more wells within 1 km) and nonactive sites (no gas wells within 1 km). Samples for dissolved salts, water isotopes, isotopes of dissolved constituents (carbon, boron and radium), dissolved gas methane, and carbon and hydrogen isotopes of methane.
  - In active gas extraction areas, average and maximum methane concentrations in water wells increased with proximity to the nearest gas well
  - Isotope and hydrocarbon ratio data suggest a deeper thermogenic source for the methane collected near active drill sites versus a shallow, microbial methane source
- *Horwitt, 2011* is an Environmental Working Group report that documents a the contamination of two water wells in West Virgina in 1987 to the drilling and hydraulic fracturing of an oil/gas well. The report suggests that hydraulic fracturing of the well provided a cross connection between the new oil/gas well and several older abandoned oil and gas wells drilled in the 1940's that had deteriorated or absent casing protecting fresh water aquifers. Fracking fluids may have migrated from the fracked zone into the abandoned oil and gas wells and moved upward into the aquifers.

- *US EPA Hydraulic Fracturing Study (ongoing)* - EPA has submitted its draft study plan on hydraulic fracturing for review to the Science Advisory Board. The overall purpose of the study is to understand the relationship between hydraulic fracturing and drinking water resources. The scope of the proposed research includes the full lifespan of water in hydraulic fracturing, from acquisition of the water, through the mixing of chemicals and actual fracturing, to the post-fracturing stage, including the management of flowback and produced water and its ultimate treatment and disposal.

  The SAB recommended conducing 5-7 case studies and US EPA has selected seven case study sites they believe will provide the most useful information about the potential impacts of hydraulic fracturing on drinking water resources under a variety of circumstances.

  Two sites are prospective case studies where EPA will monitor key aspects of the hydraulic fracturing process at future hydraulic fracturing sites. They are located in:

  - Haynesville Shale - Parish, LA
  - Marcellus Shale - Washington County, PA

  The five retrospective case studies, which will investigate reported drinking water contamination due to hydraulic fracturing operations at existing sites, are located in:

  - Bakken Shale - Dunn County, ND
  - Barnett Shale - Wise and Denton Counties, TX
  - Marcellus Shale - Bradford and Susquehanna Counties, PA
  - Marcellus Shale - Washington County, PA
  - Raton Basin - Las Animas County, CO

  The case studies were identified, prioritized and selected based on a rigorous set of criteria and site visits by EPA scientists who will be conducting the research. Decision criteria included proximity of population and drinking water supplies, evidence of impaired water quality (retrospective only), health and environmental concerns (retrospective only) and knowledge gaps that could be filled by the case study. Sites were prioritized based on geographic and geologic diversity, population at risk, site status (planned, active or completed), unique geological or hydrological features, characteristics of water resources, and land use. Initial research results are expected by the end of 2012 with a goal for a report in 2014.

References:

Osborne, et al., 2011. Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing. Publications of the National Science Academy Early Edition, www.pnas.org/cgi/doi/10.1073/pnas.110682108.

Horwitt, Dusty, 2011. Cracks in the Façade. Environmental Working Group. www.ewg.org/gas-drilling-and-fracking

Rebecca Fugitt

From: Rebecca Fugitt
Sent: Friday, June 17, 2011 2:16 PM
To: Local Health Districts; 'Becky Levernier'; 'Belmont County'; 'Brian Williamson'; 'C Schwalbauch'; 'Danton Hutton'; 'Gary Radabaugh'; 'Gary Young'; 'Jack Pepper'; 'Janelle McManis'; 'Jennifer Michaelson'; 'Jerry Crawford'; 'Jim Lynch'; 'Kate Siefert'; 'Keith Burt'; 'Kelly Spindler'; 'Kevin Aston'; 'Kirk Norris'; 'Kristen Miller'; 'Kurt Schroeder'; 'Laura Kuns'; Mary Helen Smith; 'Nate Bednar'; 'Paul Montgomery'; 'Paul Rosile'; 'Rick Setty'; 'Ryan Tekac'; 'Sandra Good'; 'Sandy Bridenstine'; 'Sharon Pennington'; 'Steve Mazak'; 'Steve Tostrick'; 'T Carpenter'; 'Tom LaPlante'; 'Wendy Hanna'
Cc: Russell Smith; Steven Schmidt; Doug Rogers; Gene Phillips; 'Kenah, Christopher'; Michael Eggert; Tom Tomastik; Jeff Patzke
Subject: Water Sampling Recommendations Fact Sheet for Well Owners Concerned about Marcellus/Utica Gas Shale Drilling
Attachments: Well Sampling before drilling Fact Sheet.pdf
Importance: High

Environmental Health Directors and Private Water Systems Program Staff:

ODH, Ohio EPA and ODNR have completed the fact sheet for homeowners on Recommendations for Water Well Sampling before Oil and Gas Drilling. Please distribute this fact sheet to homeowners who are interested in sampling their water system before oil and gas drilling occurs. We also are posting this fact sheet on the Homeowner page on our website.

ODNR - Mineral Resource Management has other related fact sheets on shale gas drilling, drilling activity and statistics and regulatory information at their website:
http://www.ohiodnr.com/oil/shale/tabid/23174/Default.aspx

The following report discusses the 2011 Ohio Hydraulic Fracturing Program review and may be of interest:
http://www.dnr.state.oh.us/Portals/11/oil/pdf/stronger_review11.pdf

ODNR - Division of Geological Survey has an excellent overview with maps, powerpoints and diagrams on the geology of oil/gas shale development at their website:

http://www.dnr.state.oh.us/geosurvey/tabid/23014/Default.aspx

Ohio EPA also has a website with fact sheets and information on oil/gas shale development:
http://www.epa.state.oh.us/shale.aspx

Ohio EPA is in the process of completing a companion fact sheet on naturally occurring ground water quality so homeowners can compare their water sampling results to natural background water quality information. This fact sheet will also be forwarded when it is available.

Rebecca J. Fugitt, MS, RS
Program Manager, Residential Water and Sewage Program
Bureau of Environmental Health
Ohio Department of Health
(614) 466-4801
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Week of Oct 5
PM ODN
1:3

Marcellus Shale Meeting

OEPA/ODNR/ODH
Tuesday, July 12, 2011
1:30 – 4:00 p.m.
Ohio EPA, Center for Excellence
AGENDA

Welcome/Introductions

Drilling Activity/Updates — All

- Ohio Drilling activity in the Marcellus/Utica – permit and drilling activity update — M. McCormac

New ODNR technical team to look at all the issues surrounding hydraulic fracturing — ODNR
Chris Ferran - OGS

Permit conditions to protect GW and other sensitive environments/update — OEPA/ODNR
- SWAP's, June 14 mtg to discuss other areas → 100ppm agri-fuse - related permit conditions

401/404

- Development of General Permit/401 authorization — T. Harcarik
will send out for external review - new pipeline addition to a pipeline that is being repurposed → El Paso line

Wastewater/Brine Management

- POTW wastewater management/update — Warren & Patriot concerned by about decision — Nally said to explore other options
- UIC disposal/capacity update — L. Stevenson/NEDO, T. Tomastik → Letters to Steubenville/El going out soon

Air
6178 permitted, 8 apps since May
Issued 5 permits, 3 in house, will see 2-3 more this week

- General Permit for natural gas drilling/production — M. Hopkins
sent out for interested party comment - ~~public~~

Waste

- Drill cuttings/solids sampling update — J. Goicochea, A. Shear
OEPA-ODH coordination — ODH
- will collect cuttings & drilling fluid
- no detection of radiation to date

Outreach/Education/Meetings
- Tristen approved to go out for public comment → public fact sheets
ODH will provide data for own to categorize & Noken

- Media Relations Update — OEPA/ODNR
- Legislative outreach/community meetings — OEPA/ODNR
- OEPA/Sierra Club Meeting — B. Hall/NEDO
- Fact sheets/update — OEPA/ODNR

Next Meeting/Agenda Items — All

refocus: com
ODNR has a fact line of fact sheets - General FAQ
Ask LHD's to check websites for new fact sheets

Drilling Activity
- Mike McCrimmon - update from website

ODNR - TechTeam
- Reviewing published docs
- Get industry expert / academia to discuss process
- Fact sheet & info to web / facilitate consistent communications

Lee ~~Sam~~ Tom → interview w/ NPR - WKSU

Tom - UIC disposal
last quarter 2010 - 39% out of state
1st quarter 2011 - 49% out of state

Outreach / Education

2-3 media calls daily

Rebecca Fugitt

From: Stevenson, Laurie [laurie.stevenson@epa.state.oh.us]
Sent: Thursday, June 09, 2011 4:19 PM
To: 'Chris.Perry@dnr.state.oh.us'; 'Heidi Hetzel-Evans'; Husted, John F.; 'mike.hallfrisch@dnr.state.oh.us'; 'mike.mccormac@dnr.state.oh.us'; 'rick.simmers@dnr.state.oh.us'; 'ted.lozier@dnr.state.oh.us'; 'thomas.tugend@dnr.state.oh.us'; 'tom.tomastik@dnr.state.oh.us'; Shear, Aaron; Cirker, Benjamin; Hall, Brian; Lowe, Chuck; Nygaard, Eric; Goicochea, Joe; Weiss, Kristopher; Burkleca, Lee; Taliaferro, Lindsay; Baker, Mike; Eggert, Michael; Hopkins, Mike; Parsons, Misty; Settles, Mike; Laake, Ryan; Freeman, Tracy; Harcarik, Tom; Nickel, Brian; Kniss, Donna; Underwood, Dan; Adams, Eric; Gomes, Erm; Snell, Fred; Riley, Keith; Rice, Nancy; Blasick, Rich; DiFranco, Stivo; Saines, Steve; Williams, Steve; Wilson, Virginia; Chuck McCracken; Michael Snee; Rebecca Fugitt; 'robert.owen@odh.ohio.gov'; Stephen Helmer; David Lipp
Subject: Follow-up items from our inter-agency shale team meeting on 5/4
Attachments: drillersfactsheetV.8.doc; Marcellus Shale-factsheetV.10.doc

Hello everyone. First, I apologize that you have not received the notes from our past meeting. Unfortunately, my laptop has crashed and I'm unsure of whether our IT shop will be able to recover my hard drive files as they work to repair things. I'll get these out to everyone in the event my notes are retrieved.

I think there were a few action items for the team as a follow-up to our meeting, and hopefully everyone can remember what they've committed to getting out to the group. To this end, I'm passing along two DRAFT fact sheets for review by team members. One is a general fact sheet on OEPA requirements for drillers. I mentioned during our past meeting that we were working on this. The second is a revised version of our general fact sheet that we had previously posted on the website. It's been updated to reflect options for brine/flowback management. For our ODNR team members, although the fact sheet for drillers is intended to focus on OEPA's regs., there are some references to ODNR's requirements, contact info., etc. in it. If we need to discuss/revise any of these items, let me know.

Feel free to mark up the attached electronic copies and send revisions to me. I would like to receive feedback on both items by **June 30th**.

Also, we are scheduled for our next inter-agency team meeting on **Tuesday, July 12th** here at Ohio EPA (Center for Excellence, 6th floor) from 1:30-4:00. I'll get a draft agenda together for review/comment here soon.

Thanks,
Laurie

Ohio EPA's Regulations:

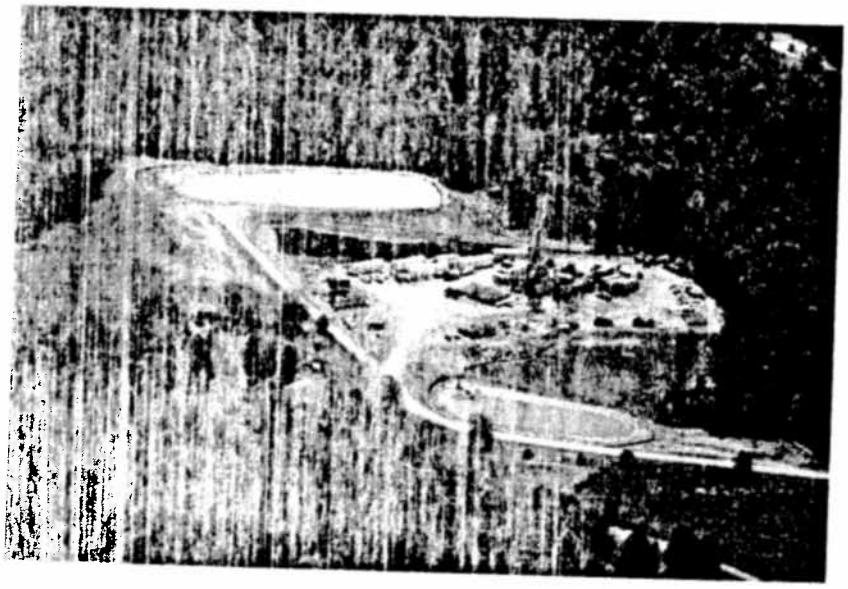
A Fact Sheet for Shale Drillers

DRAFT FACT SHEET

Ohio EPA

June 3, 2011

Introduction



With the state sitting over the Marcellus and Utica shale deposits and advancements in drilling technology, it is expected that Ohio will see a significant increase in oil and natural gas drilling in the near future.

For companies intending to drill in the shale regions of the state, this fact sheet summarizes the regulatory requirements and permits you may need from Ohio EPA. These requirements apply to any drilling operation, but are more likely to apply to activities associated with horizontal drilling and hydraulic fracturing operations.

Understanding these requirements and working [illegible] EPA and other regulatory agencies overseeing shale drilling can minimize permit [illegible] that drilling is done in a manner that protects our citizens and natural resources. [illegible] provides a summary of the ODNR and Ohio EPA regulatory authority over oil/gas drilling [illegible]

Ohio EPA's 401 Water Quality Certification (WQC) program requires you get authorization if site construction activities will have an impact on wetlands, streams, rivers or other waters of the state. Ohio EPA also regulates sources of air emissions, and may require air permits for some of the sources at the drill site. Any materials meeting the definition of solid waste sent off-site for disposal from the site must be properly managed.

Drillers also need to obtain permits from the Ohio Department of Natural Resources, Division of Mineral Resources Management (ODNR-DMRM). ODNR, DMRM regulates disposal of brine[1] and drilling fluids from oil and gas drilling/production. ODNR regulates Class II underground injection wells used for disposal of waste fluids from oil and gas drilling/production operations and transporters hauling these fluids in Ohio. ODNR-DMRM should be one of your first contacts if you plan to drill in Ohio. For more information, see their Web site at www.dnr.state.oh.us/oil/default/tabid/10371/Default.aspx.

1 "Brine" includes all saline geological formation water resulting from, obtained from, or produced in connection with the exploration, drilling, or production of oil or gas, including saline water resulting from, obtained from, or produced in connection with well stimulation or plugging of a well. (R.C. 1509.01(U))

Constructing in Areas that Impact Waters of the State

If construction at your drill site will impact wetlands, streams or other waters of the state, you must obtain authorization for these impacts from Ohio EPA under a Section 401 Water Quality Certification (WQC).

Examples of activities that require a 401 WQC include

- Excavating or placing fill material in a wetland, stream or lake;
- Stream piping, rerouting or straightening;
- Channelization;
- Dredging a wetlands to create a pond;
- Dredging or placing fill into waters of the state;
- Crossing streams or wetlands to construct roadways, water or wastewater piping.

Under the 401 program, you must mitigate wetland impacts by restoring or enhancing wetlands elsewhere. You may also be required to address stream impacts by restoring other stream segments or purchasing conservation easements within the watershed. Your plan for addressing these impacts (called a mitigation plan) is submitted with your 401 application and is reviewed by Ohio EPA.

If impacted streams or wetlands are covered under the jurisdiction of the U.S. Army Corps of Engineers (Corps), you must also obtain a 404 permit from the Corps to authorize impacts to these resources.

Some isolated wetlands are not covered under the federal Clean Water Act, but are regulated under Ohio's isolated wetlands law. If you will impact these areas, you must get an Isolated Wetland Permit from Ohio EPA.

Ohio EPA and the Corps regulate impacts to wetlands and other waters, and each has different authority and jurisdictions. This is why you need to work closely with both agencies. Ohio EPA coordinates with the Corps in the 401/404 permit application processes as much as possible. You must obtain the 404 permit and 401 certification before you start construction on the drill site.

IMPORTANT POINTS

You should consider hiring a consultant to inspect the site, as some wetlands may not be easily identifiable by reviewing documents, such as National Wetland Inventory maps.

Start the 401 process early, as on-site review and categorization of wetlands is primarily completed during the growing season.

Due to rule requirements for public notification, acquiring an individual 401 WQC can take 3-6 months.

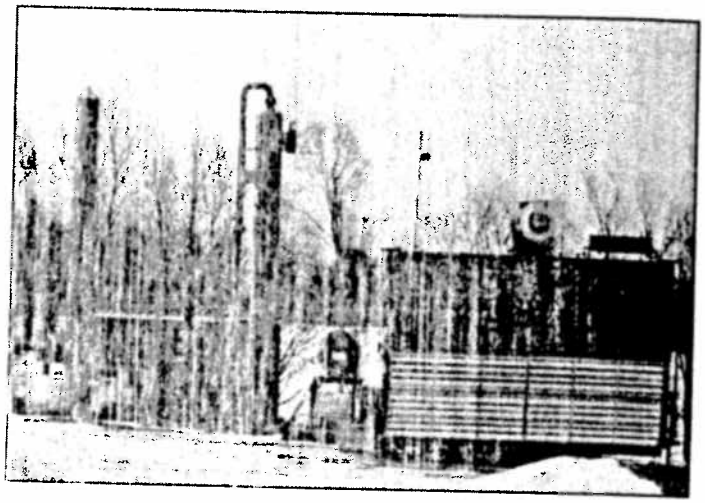
The best option to avoid delays and environmental impact is to look for potential drilling sites where construction will not have any impacts to streams, wetlands or other waters of the state.

For information on Ohio EPA's 401 WQC requirements, visit www.epa.ohio.gov/dsw/401/index.aspx.

For information on U.S. Army Corp 404 permits, visit www.usace.army.mil/CECW/Pages/reg_permit.aspx.

Air Permits for Emission Sources

For units or activities that emit air pollutants, Ohio EPA may require a permit-to-install and operate (PTIO). The terms and conditions of a PTIO usually include emission limits, operating conditions, monitoring and recordkeeping requirements.



A drill site may have several emission sources, including

- Diesel or gas-powered engines/generators
- Gas/water/oil separators
- Produced water storage tanks
- Gas-fired wellhead compressors
- Tri-ethylene glycol (TEG) dehydrators
- Emissions from material handling, truck transportation, etc.
- Tank truck loading operations

A PTIO is required for all emission sources, unless specifically exempt under the Ohio Administrative Code (OAC). Current exemptions include:

1) "De minimis" exemption (OAC rule 3745-15-05): Applies to sources that emit less than 10 pounds per day of any air contaminant and less than one ton (2,000 pounds) per year of any hazardous air pollutant or combination of hazardous air pollutants.

2) Permanent rule exemption (OAC rule 3745-31-03(A)(1)): This rule includes a list of more than 45 sources that are exempt from permitting. Examples include small boilers, detergent-based parts washers, small storage tanks and other sources having minimal air emissions or meeting certain size criteria.

   If you are claiming a permanent rule exemption, you are not required to provide notification to Ohio EPA.

   If you are claiming a de minimis exemption, you are not required to provide notification, but it is recommended that you contact your local Ohio EPA district office or Local Air Agency (LAA) about the source. They can review your de minimis calculations and put information in the file about your exemption to assist future/new inspectors that may be reviewing your site information.

3) Permit-by-rule exemption (OAC rule 3745-31-03(A)(4)): A permit-by-rule (PBR) exemption covers 11 categories of small emission sources. Under the PBR, you are not required to get a permit for the source, but must follow all the requirements in the rules, including meeting emission limits and operational restrictions, and keeping records. You must also file a one-page PBR notification to Ohio EPA.

The first step in getting an air permit is to discuss the equipment you plan to install with the air pollution permit writer located at the Ohio EPA district office or Local Air Agency (LAA) having jurisdiction over the area where your drill site will be located. This discussion is important so that you know what equipment needs an air permit, what applications must be submitted and how long it will take to receive a permit. You can submit your permit application electronically through Ohio EPA's eBusiness Center, or by hard copy directly to your district office/LAA.

For more information on Ohio EPA's air permitting process, exemptions and electronic copies of application forms, visit the Ohio EPA, Division of Air Pollution Control (DAPC) website at www.epa.ohio.gov/dapc/permits/permits.aspx. Ohio EPA's eBusiness Center is at https://ebiz.epa.ohio.gov/.

Managing Brine/Flowback Water from Drilling Operations

Brine, including flowback water, picks up minerals from the shale formation including iron, calcium, magnesium, barium, sulfur, suspended solids and a significant concentration of soluble salts. It may also contain low levels of naturally occurring radioactive elements such as radium, carried up from the shale. It also contains total dissolved solids (TDS), including chlorides, sodium and sulfates. High levels of TDS in streams, rivers and lakes can impair water quality and kill aquatic life.

Total Dissolved Solids (TDS)

Total dissolved solids in brine/flowback water include minerals, metals and soluble salts such as sodium, chlorides and sulfates.

TDS in the form of soluble salts in brine/ flowback water from shale drilling can reach

Lagoons or pits used on-site for temporary storage of flowback water as it is being either recycled or collected prior to off-site shipment and disposal are regulated by ODNR, DMRM. Ohio does not authorize long-term storage of flowback water in on-site lagoons and recommends the use of tanks as an alternative, particularly at drilling sites in close proximity to drinking water resource or where ground water is susceptible to contamination.

EXPLORE OPTIONS TO RECYCLE FLOWBACK WATER

In some situations, flowback water can be recycled and reused at the drill site. Having multiple drill sites in close proximity makes it more cost-effective to reuse flowback water.

ODNR, DMRM has the exclusive authority for brine disposal in Ohio. Ohio prohibits the direct discharge of brine/flowback water into waters of the state. In addition, disposal of brine at municipal wastewater sewage plants (also called publicly owned treatment works or POTW) in Ohio is NOT authorized.

Brine, including flowback water, disposed of in Ohio must be sent to an ODNR-permitted Class II injection well. Where feasible, recycling and reusing flowback water is strongly encouraged. Some materials may be suitable for road surface application, under authorization from ODNR. For more information on brine management options, contact ODNR, DMRM.

Using Best Management Practices to Control Storm Water Run-off and Erosion

Oil and gas exploration and production sites are not required to obtain a permit from EPA for storm water management under the federal Clean Water Act (CWA). The CWA provisions, do, however, remain enforceable at a site if there is a discharge of any reportable quantities of materials or if a discharge from the site contributes to a violation of a water quality standard. For more information on the federal storm water exemption, see U.S. EPA's website at http://cfpub.epa.gov/npdes/stormwater/oilgas.cfm.

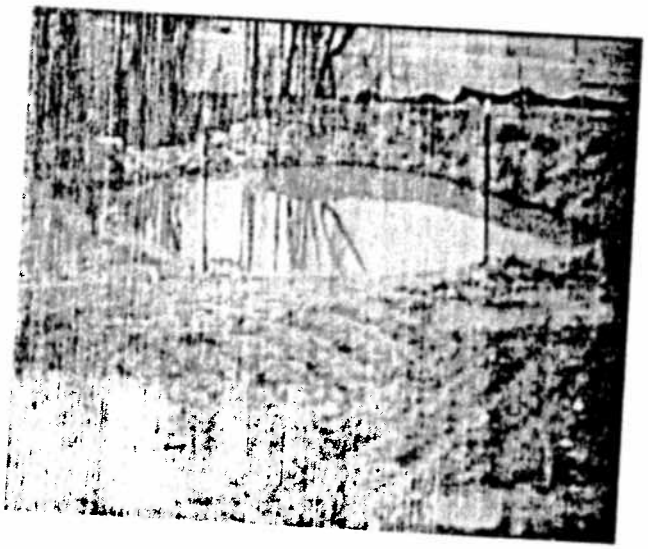
Although a storm water permit from Ohio EPA is not required, ODNR requires drillers to implement best management practices (BMPs) for sediment/erosion control as part of their drilling authorization permit. For more information, see ODNR's Rainwater and Land Development Manual at http://www.dnr.state.oh.us/water/rainwater/default/tabid/9186/Default.aspx

Ohio EPA also encourages oil and gas field operators to use BMPs to minimize discharges of pollutants in storm water, including sediment, both during and after construction, to help protect surface water during storms. Some examples of BMPs include:

- Installing perimeter controls, sediment basins/traps and a stabilized construction entrance as the first step in construction.

- Isolating drainage from the site to eliminate storm water run-on through the site.

- Using a stabilized entrance or wheel wash station to minimizing mud on streets/roads from vehicle drag out.



- Containing and properly disposing of all drilling fluids, including fluids associated with setting the casing and plugging operations.

- Inspecting the site on a regular basis and after a rainfall to determine if additional measures are needed to stabilize the site (e.g., additional stone or temporary cover such as seed and mulch).

[illegible] a sediment basin/trap can be more [illegible] economical than a silt fence in controlling [illegible]-off because of less maintenance.

Use of Water from a Public Water System and other Water Withdrawals

Between 4 and 6 million gallons of fresh water (called pro[illegible]) are used to hydraulically fracture a Marcellus or Utica shale gas well. Production water usually comes f[illegible]kes, rivers and wells. In some instances, a public water system may serve as the source of productio[illegible].

If you intend to pump water from a public water supply system to your drill site, you are required to have proper containment devices at the point of connection to protect the public water system in accordance with Ohio EPA's requirements in OAC 3745-95. At a minimum, this includes a reduced pressure principle backflow assembly at the service connection. An approved air gap separation shou[illegible] be maintained at the drill sight. If an air gap isolation is not maintained at the drill pad, an air gap separation will b[illegible] at the service connection.

For more information on Ohio EPA's backflow prevention and cross-connection control regulations, see the Division of Drinking and Ground Waters (DDAGW) factsheet at www.epa.ohio.gov/portals/28/documents/engineering/Cross-connection%20flier.pdf.

Any operation with the capacity to withdraw water at a quantity greater than 100,000 gallons per day from waters of the state must register with ODNR, Division of Soil and Water Resources in accordance with ORC 1521.16. Depending on the location and type of withdrawal other requirements may apply. For more information, see ODNR's website at www.dnr.state.oh.us/tabid/4262/Default.aspx.

Managing Drill Cuttings

Oil and gas exploration and production wastes, including drill cuttings and muds, are exempt from regulation as hazardous waste under Subtitle C of the Resource Conservation and Recovery Act (RCRA). However, federal law does not exempt these wastes from being considered a solid waste under Subtitle D of RCRA and under state law, particularly for cuttings that are shipped off the drill site for disposal.

Ohio Environmental Protection Agency

Drilling for Natural Gas in the Marcellus and Utica Shales: Environmental Regulatory Basics

DRAFT Fact Sheet, June 2011 (Revised)

Introduction

This fact sheet provides a basic overview of natural gas drilling in the Marcellus and Utica Shale regions of Ohio and the potential environmental issues associated with these activities. It also summarizes the regulatory authority of the Ohio Environmental Protection Agency (Ohio EPA) and Ohio Department of Natural Resources (ODNR), Division of Mineral Resources Management (DMRM) over drilling activity and wastewater management.

Where are the Marcellus and Utica Shale Deposits?

Together, the Marcellus and Utica Shale regions extend across New York, Pennsylvania, Maryland, West Virginia, eastern Ohio and portions of Kentucky and Tennessee. The deposits sit between 7,000 and 12,000 feet below ground, with the Marcellus Shale at more shallow depths than the Utica.

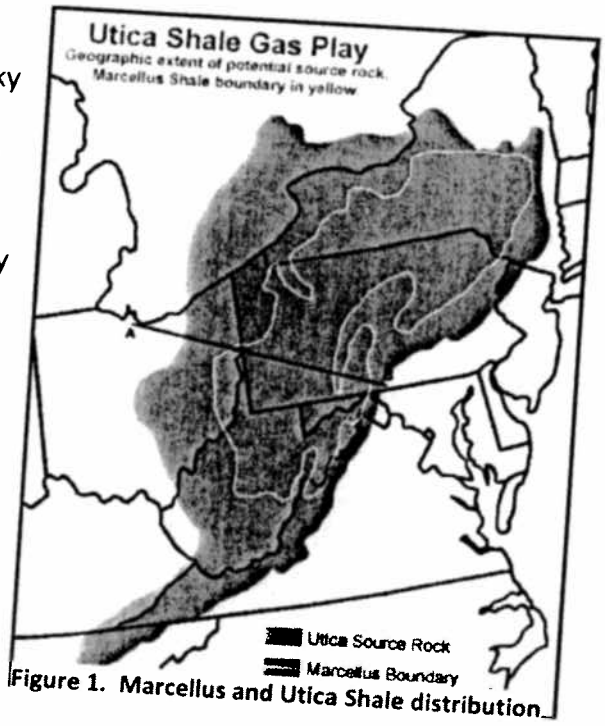


Figure 1. Marcellus and Utica Shale distribution

Both are important geologic formations because they hold large reserves of natural gas. Researchers estimate the Marcellus Shale alone could contain as much as 363 trillion cubic feet of natural gas, enough to satisfy U.S. energy demands for about 14 years.

Most drilling is now occurring in the Marcellus Shale region of Pennsylvania, with growing interest in West Virginia and New York. Because the Marcellus Shale is much thinner on its western edge, Ohio is experiencing far less Marcellus Shale drilling than other states. However, Ohio will likely see a significant increase in future drilling, as much of the state sits over the Utica Shale formation, which experts also predict holds large natural gas reserves and potentially oil.

How is natural gas extracted from a shale formation?

Natural gas is extracted from the shale through a two-step process of horizontal drilling and hydraulic fracturing. To start, a production well is drilled thousands of feet downward and then gradually angled out horizontally through the shale deposit. The well is drilled horizontally to maximize the ability to capture natural gas once the shale is hydraulically fractured.

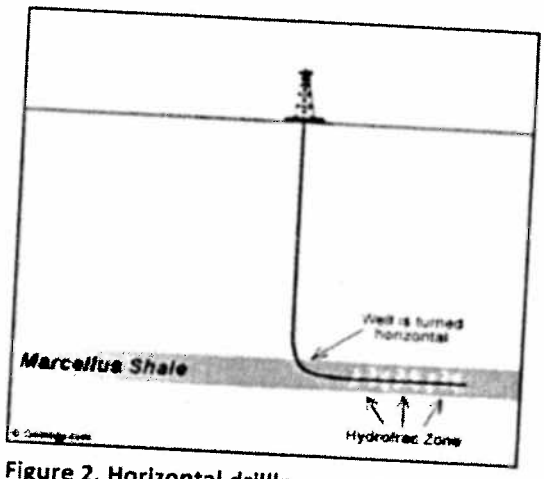


Figure 2. Horizontal drilling process. Graphic reprinted with permission of www.Geology.com

After the well is drilled, a mixture of water, sand and chemical additives is injected at very high pressure to fracture the shale. This part of the process, called hydraulic fracturing (or "fracing") is a technique used in the oil and gas industry since the 1950s. The sand (called a "proppant") keeps the fractured shale open and serves as a conduit for extracting the natural gas. The chemical additives reduce potential problems in drilling and gas production, such as bacterial build-up and the formation of scale, mineral deposits and rust.

It can take up to four million gallons of fresh water to hydraulically fracture a single well. The water used in the fracturing process usually comes from a stream, river, reservoir or lake close to the drill site, or in some cases, from a local municipal water plant.

What happens to water after hydraulic fracturing is complete?

Most of the water used to fracture the shale remains trapped thousands of feet underground after it is injected. However, internal pressure in the geologic formation forces some of the water (around 15-20 percent of the total volume injected) back to the surface through the well bore.

Most of this brine, also called "flowback" or "frac" water comes back to the surface within seven to ten days after it is pumped into the well. It is stored temporarily in lagoons or tanks before it is shipped off-site for disposal. It is usually transported off-site by truck, although some companies are exploring rail transportation as an option.


Figure 3. An on-site lagoon is one option for temporary storage of drill cuttings/fluids and flowback water.

Brine is sent to facilities that have permits to inject fluids into deep injection wells (called Class II wells) thousands of feet underground.

Because of disposal costs, some drilling companies are recycling and reusing flowback water from one drill site to another. Having multiple drill sites in close proximity makes it more cost-effective to reuse flowback water. The concentration of iron, bacteria, suspended solids and other contaminants in flowback water is another factor in determining whether it can be reused.

Figure 4. As an alternative to a lagoon, some drill sites use a series of frac tanks to collect flowback water.

How is drilling in the Marcellus and Utica Shales regulated in Ohio?

ODNR, DMRM has primary regulatory authority over oil and gas drilling activity in Ohio, including rules for well construction, siting, design and operation. ODNR, DMRM regulates disposal of brine[1] and drilling fluids from oil and gas drilling/production. ODNR regulates Class II underground injection wells used for disposal of waste fluids from oil and gas drilling/production operations and transporters hauling these fluids in Ohio.

Figure 5. Frac tanks are hauled by trailer to a disposal location. Photo reprinted with permission of www.marcellus-shale.us

Ohio EPA's water quality certification requirements help reduce impacts to wetlands, streams, rivers or other waters of the state from the construction of a drill site. Ohio EPA also regulates sources of air emissions, and may require air permits for some of the sources at the drill site. Finally, any materials meeting the definition of solid waste sent off-site for disposal must be properly managed, either at a solid waste landfill, or beneficially reused, as authorized by Ohio EPA's Division of Waste and Materials Management (DWMW).

[1] "Brine" includes all saline geological formation water resulting from, obtained from, or produced in connection with the exploration, drilling, or production of oil or gas, including saline water resulting from, obtained from, or produced in connection with well stimulation or plugging of a well. (R.C. 1509.01(U))

Table 1. Summary of ODNR, DMRM and Ohio EPA regulatory authority over drilling and management of flowback water

	Ohio Department of Natural Resources	Ohio Environmental Protection Agency
Drilling in the shale deposits	✓ Issues permits for drilling oil/gas wells in Ohio. ✓ Sets requirements for proper location, design and construction requirements for wells. ✓ Inspects and oversees drilling activity. ✓ Requires controls and procedures to prevent discharges and releases. ✓ Requires that wells no longer used for production are properly plugged. ✓ Requires registration for facility owners with the capacity to withdraw water at a quantity greater than 100,000 gallons per day.	✓ Requires drillers obtain authorization for construction activity where there is an impact to a wetland, stream, river or other water of the state. ✓ Requires drillers obtain a permit-to-install and operate (PTIO) for units or activities that have emissions of air pollutants.
Wastewater and drill cutting management at drill sites	✓ Sets design requirements for on-site pits/lagoons used to store drill cuttings and brine/flowback water. ✓ Requires proper closure of on-site pits/lagoons after drilling is completed. ✓ Sets standards for managing drill cuttings and sediments left on-site.	✓ Requires proper management of drill cuttings or sediments that are considered solid waste and shipped off-site for disposal.
Brine/flowback water disposal	✓ Regulates the disposal of brine and oversees operation of Class II wells used to inject oil/gas-related waste fluids. ✓ Reviews specifications and issues permits for Class II wells. ✓ Sets design/construction requirements for Class II underground injection wells. ✓ Responds to questions/concerns from citizens regard safety of drinking water from private wells from oil/natural gas drilling.	
Brine/flowback water hauling	✓ Registers transporters hauling brine and oil/gas drilling-related wastewater in Ohio.	
Pumping water to the drill site from a public water supply system		✓ Requires proper containment devices at the point of connection to protect the public water system.

What are the environmental concerns with drilling and hydraulic fracturing?

With growing media coverage of shale drilling, citizens are becoming more aware and concerned about potential impacts of drilling activity on them, the environment and their communities.

Because Ohio has a significant number of Class II underground injection control wells with permits to dispose of flowback water, many drilling companies have been transporting flowback water into Ohio for deep-well disposal.

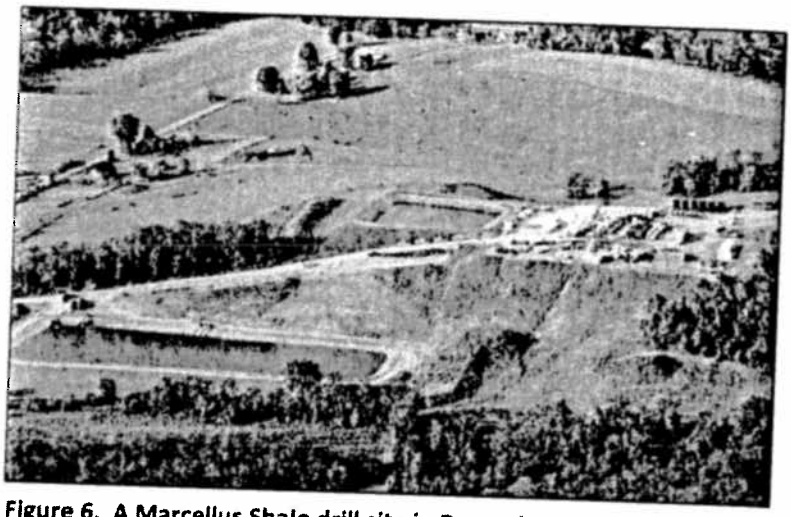


Figure 6. A Marcellus Shale drill site in Pennsylvania. Photo reprinted with permission of www.marcellus-shale.us.

Brine, including flowback water, picks up minerals from the shale formation including iron, calcium, magnesium, barium, sulfur, suspended solids and a significant concentration of soluble salts. It may also contain low levels of naturally occurring radioactive elements such as radium, carried up from the shale. It also contains total dissolved solids (TDS), including chlorides, sodium and sulfates. High levels of TDS in streams, rivers and lakes can impair water quality and kill aquatic life.

ODNR, DMRM has the exclusive authority for brine disposal in Ohio. Ohio prohibits the direct discharge of brine/flowback water into waters of the state. In addition, disposal of brine at municipal wastewater sewage plants (also called publicly owned treatment works or POTW) in Ohio is NOT authorized.

Brine, including flowback water, disposed of in Ohio must be sent to an ODNR-permitted Class II injection well. Where feasible, recycling and reusing flowback water is strongly encouraged. Some materials may be suitable for road surface application, under authorization from ODNR. For more information on brine management options, contact ODNR, DMRM.

Total Dissolved Solids (TDS)

A general term for organic and inorganic particles suspended in a liquid which easily pass through a small membrane filter system.

Total dissolved solids in brine/flowback water include minerals, metals and soluble salts such as sodium, chlorides and sulfates.

TDS in the form of soluble salts in brine/ flowback water from shale drilling can reach concentrations as high as 200,000 mg/l. As a point of comparison, the salinity of seawater from concentrated salts is about 35,000 mg/l.

Who regulates issues such as truck traffic and road maintenance at a drill site?

There is usually a short-term, but significant level of activity at a drill site. For example, moving drilling equipment on and off site, and hauling production water, brine and drill cuttings from the site can create significant truck traffic. Issues such as truck traffic are not covered under Ohio EPA's or ODNR, DMRM's regulations. Check with your community officials on local regulations.

Will drilling for natural gas contaminate my drinking water well?

The Ohio EPA, ODNR, DMRM and other technical experts familiar with hydraulic fracturing do not have data showing a risk of groundwater contamination from brine migrating thousands of feet from the Marcellus or Utica Shale fractures up into drinking water aquifers much closer (hundreds of feet) to the earth's surface.

There is the potential, although unlikely, for contamination of drinking water wells because of problems occurring closer to the surface. Gas and oil can migrate from a production well into an aquifer if a well casing is damaged, leaking or poorly constructed. Natural gas can also enter aquifers from old, abandoned oil and gas wells that are unplugged or poorly plugged. A new water well that is drilled can penetrate gas-rich organic shales or coal seams at shallow depths, allowing gas to enter the well. Buried organic deposits from old swamps or landfills may also release natural gas into soils overlying aquifers.

It's important to know that there have been thousands of oil and gas production wells drilled throughout Ohio with no significant adverse impacts to local wells or drinking water supplies throughout the state's long history of oil and gas drilling. If you do, however, suspect any problems with your drinking water well during as a result of any oil/gas drilling activities in your area, contact the Ohio Department of Natural Resources, Division of Mineral Resources Management at (614) 265-6633.

What about leasing rights if someone wants to drill on my property?

The process of drilling a well begins with a lease agreement between the producing company and one or more landowners that make up a drilling unit. It is important for a landowner approached for a mineral rights lease to be aware of all the conditions of the lease that allow the producer to drill on their land.

Ohio EPA's and ODNR, DMRM's regulations DO NOT cover private property lease agreements, and we cannot provide homeowners with any specific guidance on this topic. As a starting point for general information on leases, see ODNR's website, "Landowners and Leasing for Oil and Gas in Ohio," at www.ohiodnr.com/oil/oil_landowner/tabid/17732/Default.aspx.

Where can I get more information?

Ohio Department of Natural Resources, Division of Mineral Resources Management, Oil and Gas website: www.ohiodnr.com/mineral/oil/tabid/10371/default.aspx.

Ohio Environmental Protection Agency, Marcellus Shale website: http://www.epa.state.oh.us/shale.aspx.

UTICA/Marcellus Shale Meeting
OEPA/ODNR/ODH
Wednesday, May 4
1:30 – 4:00 p.m.
Ohio DNR Fountain Square, Building H, 2nd floor conference room

AGENDA

3701-43

Welcome/Introductions — All

Drilling Activity/Updates

- Activity in the Marcellus/Utica – permitting and drilling activity update — ODNR — 5 drilled Utica.
- SB 165 rules (update)

Wastewater Management

- State (OEPA/ODNR) position on POTW management of flowback water — B. Hall, OEPA
    - Current statutory provision
    - Communication strategy
  (POTWs) red flag reverse decision to accept waste water
- Permit/POTW updates — until 2012 100,000 g/day
- Fact sheet for municipal wastewater plants
- Coordination with ODH on radiological sampling protocol — Pennsylvania policy; increase in injection wells

Permitting Collaboration/Updates

- Ohio EPA/ODNR meeting re. permit conditions to protect GW and other sensitive environments — M. Eggert, OEPA; M. McCormac, ODNR

401/404 — shale drilling site sample collection; radiological

- Development of General Permit/401 authorization — T. Harcarik

  stream & wetlands impacts

Air

- OEPA evaluation of air sources/permitting options — DAPC

  + 12 months need air permit

Waste

- Soil Remediation, Inc.
- Determination drill cuttings/OEPA-ODH Coordination — OEPA/NEDO; J. Goicochea, A. Shear

Outreach/Education

- Media Relations Update
- Legislative outreach/community meetings — ODNR/ODH/OEPA — Geology Department
- Fact sheet updates (final/draft) — Job & Family Services; Marietta College
    - Drillers – OEPA regulations
    - Water sampling/analysis fact sheet for citizens — "Water sample taking" course

Other Items/Next Meeting — July 12th 1:30 at OEPA (4 ODNR fact sheets) — All — 1 or 2 weeks

Great Lakes compact . . . withdrawal . . . diversion of wastewater

HIGHLIGHTS OF THE 2011 MARCELLUS WATER/GAS INITIATIVE MEETING IN CANONSBURG, PA

- Marcellus natural gas production is at 2.5 bcf per day (3.5 bcf by the end of the year) and expected to reach 10 bcf per day in the next ten years
- In PA, WV, and eastern Ohio – 150 drilling rigs running
- Chesapeake has 30 rigs; Range 11-12 rigs, and Talisman has 11 rigs running
- Range Resources daily production is 200 mmcf and Talisman is 400 mmcf
- Average horizontals ranging from 3000 to 5000 feet
- Road bonding and repair costing an average of $100,000 per well
- Wells may be re-fractured every three years → Declines running quicker the first
- Lot of recycling of both frac fluids and production fluids supposedly taking place – some onsite with trailer mounted systems and other hauled offsite for recycling
- Hauling solids to landfill
- Bacteria is the biggest challenge in treating the fluids
- Range has 23 large impoundments ranging from 100,000 to 325,000 barrels, can do 35 to 40 frac stages from an impoundment
- Range is building a permanent fresh water line to the Ohio River – will be capable of moving 70 barrels per minute
- Using impoundments for recycling - bird netting over impoundments, French drains underneath and monitor wells, aeration of the water
- Testing water lines for 8 hours at 100 to 200 psi – pumping through water lines at 50 to 100 psi; using poly or yellow line pipe for water lines
- All connected by pipelines – keep water moving in pipelines 24/7 and have people walking pipelines 24 hours per day
- Using scale inhibitor, friction reducer, and biocides to treat fluids
- Some looking at treating AMD water for use – must use from existing permitted mine operation – if you touch AMD from AML sites you take responsibility for reclamation
- ORSANCO – now only do water quality issues related to pollution, but is moving into water quantity management
- EQT has 500,000 acres in Marcellus; has 7 of the top 20 gas wells; uses municipal water, surface water and water wells – recycling 95% of flowback since June of 2009 – uses biocide, scale inhibitor, and filtration
- On frac jobs breaking down formation between 7000 to 9000 psi
- Typical drilling pads are 300' x 350'
- Range doing full disclosure of chemicals on frac job – put on their website
- Marcellus drilling statistics in PA – 2007 = 27 wells; 2008 = 163 wells; 2009 = 785 wells; 2010 = 1445 wells; 2011 (through March 31) = 399 wells

Tracy

Ohio | Environmental Protection Agency
John R. Kasich, Governor
Mary Taylor, Lt. Governor
Scott J. Nally, Director

April 21, 2011

The Honorable Benjamin L. Cardin
509 Hart Senate Office Building
Washington, D.C. 20510-2004

Dear Senator Cardin:

Thank you for your recent letter asking several questions relating to the hydraulic fracturing of marcellus and utica shale deposits in Ohio. Ohio DNR is the lead agency on permitting for oil and gas mining within our state; however Ohio EPA does have a small role in certain areas. Below are responses for specific questions that pertain to our authority.

1) Ohio EPA permits activities related to oil and gas mining in our state. Activities under our authority are waste water discharges into surface waters (answered in item 2) and any impacts to wetlands in the mining area which may need a US Army Corps of Engineers 404 permit and additionally, certification under Ohio EPA's 401 program. Types of activities that would require Section 401 water quality certification typically include construction of the drill pad site, flowback and fresh water ponds, berms, dikes, access roads and utility lines. Ohio EPA's Division of Surface has not received any applications seeking Section 401 water quality certification for proposed impacts to streams and wetlands at these sites.

2) Currently Ohio has only one permitted discharge of "fracing" water to surface water. The City of Warren (Trumbull County) wastewater treatment plant is authorized to take up to 100,000 gallons per day of wastewater at a concentration of 50,000 mg/L Total Dissolved Solids (TDS), based on the assumptive total maximum daily load (TMDL) of the receiving waters. The waste water must also be pretreated prior to discharge to Warren. I understand Ohio DNR provided information on the volume and types of underground injection in their response.

3) Ohio EPA is currently involved in three separate enforcement actions resulting from the unauthorized placement of fill in either streams or wetlands associated with horizontal drilling sites. Two actions are the result of the direct placement of fill into streams and/or wetlands without proper 404 or 401 permit authorizations. The third action is a result of an unintentional fill as overburden removed from a steep hillside to construct a drilling pad was improperly stabilized and slumped into an adjacent stream. These actions are not specifically related to the hydraulic fracturing, however as previously stated, they have occurred at sites that are using horizontal drilling techniques.

In the spring of 2010, the Division started receiving a number of calls from landowners who were being approached by land persons seek subsequently, the Utica Shale beneath their property for oil and natural gas exploration.

Marcellus Shale - Ohio Activity to date
(as of 4/30/2011)

Vertical Permits Issued: 67
Vertical Wells Drilled: 44
Horizontal Permits: 10
Horizontal Wells Drilled: 5

Recent* Utica Shale - Ohio Activity to date
(as of 4/30/2011)

Vertical Permits Issued: 19
Vertical Wells Drilled: 9
Horizontal Permits: 7
Horizontal Wells Drilled: 5

**permits issued since December, 2009*

Rebecca Fugitt

From: Gene Phillips
Sent: Wednesday, May 04, 2011 1:00 PM
To: Rebecca Fugitt
Subject: FW: 1:30 - Meeting with Ohio Environmental Council

FYI

From: Elizabeth Bradley
Sent: Wednesday, May 04, 2011 12:58 PM
To: Gene Phillips
Subject: RE: 1:30 - Meeting with Ohio Environmental Council

Sure will –

Their e-mail to Dr. Wymyslo said they wanted to talk "about environmental health issues and to discuss specifically their concerns about the human health risks from the development of deep-shale hydrofracturing in Ohio...appreciate hearing from you about your perspectives on these issues...."

Elizabeth F. Bradley
Executive Assistant to the Director
Ohio Department of Health
(614) 466-2253
(614) 644-0085 - fax
Elizabeth.Bradley@odh.ohio.gov

From: Gene Phillips
Sent: Wednesday, May 04, 2011 12:56 PM
To: Elizabeth Bradley
Subject: RE: 1:30 - Meeting with Ohio Environmental Council

Thanks Elizabeth! Can you shoot me an email when you receive the call from security? Also, do we yet know why they want to meet?

Thanks much!!

From: Elizabeth Bradley
Sent: Wednesday, May 04, 2011 11:21 AM
To: Gene Phillips; Rebecca Fugitt; Michael Snee
Subject: 1:30 - Meeting with Ohio Environmental Council

Good morning,

I finally received the names of those coming to this meeting. There will be a total of 7 persons coming to this meeting from Ohio Environmental Council. Their names are:

Ellen Mee, Director of Environmental Health Policy, Ohio Environmental Council
Pat Marida
Matt Trokan

Lorraine McOsker
Denise Woods
Janet Reeves
Dena Sico

I have submitted their names to the guards. The guards will give me a call, and I will meet them on the 35 – 7th floor, and take them over to the conference room – 7C. I reserved the room from 1:00 – 2:30 p.m.

Thank you,

Elizabeth F. Bradley
Executive Assistant to the Director
Office of the Director
Ohio Department of Health
246 N. High St,. 7th floor
Columbus, OH 43215
(614) 466-2253
(614) 644-0085 - fax
Elizabeth.Bradley@odh.ohio.gov

Marcellus Shale Meeting
OEPA/ODNR/ODH
Wednesday, May 4
1:30 – 4:00 p.m.
Ohio DNR
AGENDA

Welcome/Introductions	All
Public Outreach/Education	
• Media Relations Update	ODNR/OEPA
• Legislative outreach/community meetings	ODNR
• Additional fact sheets, web updates, etc.	
Drilling Activity/Updates	
• Ohio Drilling activity in the Marcellus/Utica – Permitting and drilling activity update	ODNR
• Draft factsheet for drillers – OEPA regulations	L. Stevenson
Permitting Collaboration/Updates	
• Ohio EPA/ODNR meeting re. permit conditions to protect GW and other sensitive environments	M. Eggert/R. Simmers
401/404	
• Development of General Permit/401 authorization	T. Harcarik
Wastewater	
• Permit/POTW Update Warren, E. Liverpool, Steubenville	B. Hall/P. Novak
• Fact sheet for municipal wastewater plants/haulers (final)	
Drinking Water	
• Draft fact sheet/water sampling and analysis	M. Eggert
Air	
• OEPA evaluation of air sources/permitting options	DAPC
Waste	
• Soil Remediation, Inc.	OEPA/NEDO
• Determination drill cuttings/OEPA-ODH Coordination	J. Goicochea, A. Shear
Rules Update	
• SB 165/Rules workgroup activity	ODNR/ODH/OEPA
• Other rule activity	
Next Steps	All

Rebecca Fugitt

From: Laurie Stevenson [laurie.stevenson@epa.state.oh.us]
Sent: Friday, April 29, 2011 9:35 AM
To: Chris.Perry@dnr.state.oh.us; Heidi Hetzel-Evans; john.husted@dnr.state.oh.us; mike.hallfrisch@dnr.state.oh.us; mike.mccormac@dnr.state.oh.us; rick.simmers@dnr.state.oh.us; ted.lozier@dnr.state.oh.us; thomas.tugend@dnr.state.oh.us; tom.tomastik@dnr.state.oh.us; Aaron Shear; Benjamin Cirker; Brian Hall; Brian Nickel; Chuck Lowe; Dan Underwood; Donna Kniss; Eric Adams; Eric Nygaard; Erm Gomes; Fred Snell; Joe Goicochea; Keith Riley; Kristopher Weiss; Lee Burkleca; Lindsay Taliaferro; Michael Eggert; Mike Baker; Mike Hopkins; Mike Settles; Misty Parsons; Nancy Rice; Rich Blasick; Ryan Laake; Steve Saines; Steve Williams; Stivo DiFranco; Tom Harcarik; Tracy Freeman; Virginia Wilson; Chuck McCracken; Michael Snee; Rebecca Fugitt; robert.owen@odh.ohio.gov; Stephen Helmer
Subject: Agenda for our inter-agency shale team meeting on 5/4
Attachments: Marcellus Shale5-4-11Agenda.DOC

Hello everyone. I'm late in getting a proposed agenda out for our meeting next week on Weds., May 4th at ODNR (1:30-4:00). Sorry about that! If you have any edits/updates to the agenda, please pass them along and I'll shoot out a final copy on Monday.

Can someone from the ODNR side confirm the room location for us? I believe we're at your offices this time.

Again, apologies for the late notice...hopefully everyone had this date on their calendars from our last meeting. OEPA districts, I do not know that we can successfully organize a video conference option for this meeting. I will check with our ITS on options and will provide more details on Monday. I will get a bridge line and confirm the call-in number.

Thanks,
Laurie

Marcellus-Utica Shale Development and Hydrofacturing

Bureau of Environmental Health
Activities and Recommendations
4/29/11

Activities:

- Program staff has attended multi-agency coordination meetings on oil/gas shale development to provide comments, coordination and input related to potential impacts to private water systems. The multi-agency meetings are held approximately every other month and the next meeting is scheduled for May 4.

- Program scheduled and held a statewide live meeting presentation for local health district staff on February 10, 2010 that provided a basic overview of oil and gas drilling regulations, and current status of activities related to Marcellus/Utica shale development. The presentation was given by Tom Tomastick with the Division of Mineral Resources Management, ODNR. The powerpoint presentation was also emailed out to all local health districts. The same presentation was given at the Midwest Workshop for local health districts on March 23

- Staff has been coordinating with Ohio EPA, Division of Drinking and Ground Waters, and Division of Mineral Resource Management, ODNR to develop a water sampling fact sheet to provide guidance to homeowners who wish to obtain background water quality samples from their private water system prior to oil and gas drilling. This fact sheet has been completed and is under review by all state agencies and will be discussed at the May 4 joint agency meeting.

- Staff has been providing technical assistance on proposed private water systems sampling to several local health districts who are currently working with individual homeowners and homeowner leasing associations. Staff has indicated to local health districts that a water sampling fact sheet is in development.

- Staff has been coordinating with Bureau of Radiation Protection on our activities, and the state agency coordinating group.

Recommendations:

- Based on our understanding of Marcellus/Utica shale gas development, the process of hydrofracturing, and the current regulatory requirements of ODNR and Ohio EPA, BEH does not believe there is a risk for ground water contamination provided proper drilling and site management processes and rules are followed.

- During our discussions with Ohio EPA and ODNR during the development of the water sampling fact sheet, we discussed at length how something could go wrong and how ground water contamination could occur. The area of greatest risk is within about 300 feet of active drilling due to improper surface management of fluids and cuttings, or improper grouting of surface casing through potable water bearing zones (aquifers).

- The hydrofracturing process occurs over 8,000 feet beneath the surface and fracking pressures are highly unlikely to cause fracturing of water bearing geologic formations nearer the surface, and cause subsequent migration of fracking fluids to freshwater aquifers. The deepest known water well in Ohio is about 700 feet in depth, and the large majority (over 95%) of all drilled water wells are less than 400 feet in depth, with most being less than 200 feet deep.

- There has been a lot of discussion about disclosure of the constituents in hydrofracturing fluids. ODNR has stated that their can be wide variety in the composition of the fracking fluids based on the subsurface drilling conditions they may encounter and that it would be difficult to get detailed fracking fluid information because it might change on site. BEH has some concerns about this response, because if the fracking fluid mixture does change on site, we would assume that the drilling company is tracking those changes, and would disclose all modifications to the regulatory agency.

- Concern has also been raised about the safety of the return hydrofracturing fluids and their proper capture and disposal. ODNR has stated that their rule requirements provide for tight control of the fluids onsite and if all requirements are followed, there should be no releases to the environment.

- BEH staff recommends that well owners within 500 feet of all active oil and gas drilling (not just Marcellus/Utica wells) collect several background water quality samples seasonally. We would recommend sampling of at least Tier 2 parameters. While the risk is minimal due to the protective regulations, accidents can happen and the relatively low cost of sampling is worth it.

- Well owners greater than 500 feet from active oil and gas drilling, but located in areas that will experience hydrofracturing, may wish to sample for at least Tier 1 parameters. This is a low cost sample set ($100) and provides peace of mind and good information on the general quality of ground water.

Website Information:

Ohio Department of Natural Resources, Division of Mineral Resources Management:
http://www.ohiodnr.com/mineral/oil/tabid/10371/Default.aspx

Ohio Department of Natural Resources, Division of Geological Survey:
http://www.dnr.state.oh.us/geosurvey/tabid/23014/Default.aspx

Ohio EPA, Division of Drinking and Ground Waters
http://www.epa.state.oh.us/shale.aspx

Rebecca Fugitt

Subject: 8:15 - Meet re: OEC and deep shale hydrofracturing
Location: Director's Office

Start: Fri 4/29/2011 8:15 AM
End: Fri 4/29/2011 8:45 AM

Recurrence: (none)

Meeting Status: Accepted

Organizer: Ted Wymyslo
Required Attendees: Gene Phillips; Rebecca Fugitt; Michael Snee
Optional Attendees: Elizabeth Bradley

Organizer/Contact:
Elizabeth Bradley
(614)466-2253

When: Friday, April 29, 2011, 8:15 a.m.

Where: Director's Office

What: Brief discussion/meeting – Director received invitation from Ohio Environmental Council to meet and talk "about environmental health issues and to discuss specifically their concerns about the human health risks from the development of deep-shale hydrofracturing in Ohio...appreciate hearing from you about your perspectives on these issues...." Dr. Wymyslo is not able to attend but may wish to send senior staff to their meeting on May 4.

Invitees:
Dr. Wymyslo
Gene Phillips
Rebecca Fugitt
Michael Snee

OEPA / DNR / ODH - Water Sapling Fact Sheet 3f

Closely regulated Industry

Intro -

Concern

Most concern close to drill si few hundred?

Very Low risk

Chances of failure is small

Parameters to be sampled -

Current water quality → variability in natural background WQ

- Water sample is a snapshot in time.
- What does your result mean?

What should well be sampled for

Costs can be variable -

Natural infl the and recharg

Tier 1 Use an OEPA certified lab - link to website

Tier 2 lab has to be certified for all parameters

Age of well - depth - formation geology will affect WQ

You are interested in Determine variability Recommend sampling 2-3 over the course 2-3 seasons

Tier 1 - remove Bromide - ODNR - Urban drilling

Sulfate Chlorides TDS

Barium Calcium Iron

Strontium

Tier 2 - Everything else

Dissolved Methane

Tier 3 - BTEX Methane = recent presence - contact local h.e dept gas company.

What do my sample results mean?

Link to well log site
OEPA WQ Table
- Who to Contact -
  Close to an O&G well
How far away should I be to collect Sample

- 1/4 mile - 2500 ft

Are there health based standards related to my water sample results?

- Health based - fact sheets → US EPA Health Assessment Section

Who should I contact if I have questions?

Oil & Gas Drilling — General Water Quality LHD / ODH or OEPA

DMRM

Odor / Color → bacteria & well construction

2000 - 6000 Elevated chlorides > 250

TDS —

Barium > 10 mg/L

Strontium

(Map?)

* Check Marcellus Map

Check Sharepoint

Marcellus Shale Mtg

3-17-11

Media
Columbiana - ODNR Meetings requested
Caroll
Cadiz -
Tuscarawas
Mahoning
Stark
Portage

Pipelines - Dispatch article, etc.

Legislative - none to date
Grendell - ban on injection well
Few villages / cities → resolution on banning hydrofracking

Fact sheet -
Water Sampling calls from residents → ODNR - MRM has urban sampling fact sheet

Disposal @ POTW's → Div. Surface Water - close to finalizing and posting on web.

DMRM
- Gov office has asked for Div. to range of public comm
- Met w/ Director - have laundry list of fact sheets
- 2 pages on 1 topic each → 8-10 subjects
- Modify MRM website
- been given charge of educating public
- maybe also more general fact sheet for drillers on reg. requirements

history of O&G
Hydraulic frac
How wells constructed
Process permits
Health / EPA / DNR roles fact sheet for public / drillers.

Drilling Updates
- OEPA staff drilled
- DMRM → has tables on website w/ updated permits issued for Marcellus / other drilling
  - 5 horiz Utica permits issued
  1 horiz Utica well drilled
  Belmont / Monroe - have thickest Marcellus deposits

✱ Geo Survey - Powerpoint w/ maps & thickness
Lacy W → put out numbers

DMRM MSDS - sheets on frac chemicals

Permitting Collaboration
- identification of sensitive settings by OEPA → to ODNR
- coordination btwn 2 agencies

Sharing Permit Application
- ID process for quicker route of notification to OEPA that drilling is being proposed
  MRM updates list daily → has an email list

401/404
- Concern over #'s of applications btwn sites / pipelines
- Chesapeake - trying to keep sites just below thresh 1000 ft acres
- depending on pad size → may be automatic permit

Wastewater - DSW

- not as much pressure for flowback water to come back to POTW's
- 3 have applications
  Warren, E Liverpool, Steubenville - 200,000 gpd → 100,000 gpd
  ↓ going to public notice shortly
- Rules → exempt from PTI for drilling operations

Drinking Water

* Fact sheet → to reference → need to include
  - ↳ info on health based stds

Concern about improper disposal

* + Conf call - Mar 29 → Get ODNR/OEPA on call for information on who to contact if take water samples & see elevated constituents

Also rad protection

Waste

RCRA Subtitle C - waste taken from site by 3rd party
1993 - USEPA Clarification → waste from O&G production
- Contracts from landfill operators on drill cuttings - OEPA reviewing to see if regulated solid waste
- Teams reviewing → earthen materials → upper drilling materials when going to frac/drill fluids
  vs. Contaminated soil →

Tomastik, Tom

From: Stephanie Timmermeyer [stephanie.timmermeyer@chk.com]
Sent: Wednesday, March 16, 2011 4:31 PM
To: Tomastik, Tom
Subject: FW: Baseline sampling parameters.

As we discussed . . .

From: Eric Gillespie
Sent: Friday, February 18, 2011 3:31 PM
To: Stephanie Timmermeyer
Subject: Baseline sampling parameters.

- pH and Temperature (SM 4500 H+B)
- Specific Conductance (SM2510B)
- Turbidity (EPA Method 180.1)
- Chloride and Sulfate (IC 300)
- Carbonate and Bicarbonate (SM 2320B)
- Methylene Blue Active Substances (MBAS) (SM 5540C)
- Total Dissolved Solids (TDS) (SM 2540C)
- Total Suspended Solids (TSS) (SM2540D)
- Metals Na, Ca, Mg, K, Ba, Fe, and Mn (SW 846 Method 6010)
- Benzene Toluene Ethyl benzene and Xylenes (BTEX) (8260B-low level)
- Oil & Grease (N-Hexane Extractable Material (HEM)) (EPA Method 1664)
- Light gas (methane, ethane, propane – RSK 175M)
- RCRA 8 metals (6010/7470)
- Total Sulfur (6010)

Thank you,
Eric Gillespie
Regulatory Affairs Specialist
Chesapeake Energy Corporation
414 Summers Street
Charleston, WV 25301
Office: (304)353-5260
Mobile: (304) 380-1165
Fax: (304) 353-5231
E-mail: Eric.Gillespie@chk.com

Chesapeake

Russell Smith

From: Lori Barnes [LBarnes@columbiana-health.org]
Sent: Thursday, March 17, 2011 10:52 AM
To: Russell Smith
Subject: RE: Pre-Oil and Gas water sampling

http://www.columbiana-health.org/privatewater.html

From: Lori Barnes
Sent: Thursday, March 17, 2011 10:51 AM
To: 'Russell Smith'
Subject: RE: Pre-Oil and Gas water sampling

Hi Russell,
I've attached our private water monitoring program website. Our office didn't limit sampling to just oil and gas related constructed activities but have included most of the parameters suggested by ODNR, Penn State University, and OEPA. I also attended a conference in Pittsburgh in which academia talked about the health effects of shale gas extraction. We recommended that the homeowner had this testing done prior to construction activities so they have something to compare to if they do experience a problem afterwards. These tests are not required but we have tested 3 wells so far. Also, our staff is wondering if the new permit applications will be mailed to the health districts before the April 1st effective date. Also if you or Rebecca can give us some guidelines on testing for methane in drinking water.
Thanks
Lori

From: Russell Smith [mailto:Russell.Smith@odh.ohio.gov]
Sent: Thursday, March 17, 2011 9:09 AM
To: Lori Barnes
Subject: Pre-Oil and Gas water sampling

Hi Lori,

When you get the chance could you please e-mail your guidelines for Pre-Oil and Gas water sampling?

Thanks
Russ Smith

Inter-Agency Marcellus Shale Team Meeting Notes
February 10, 2010

Introductions - Participating Agencies (OEPA, ODNR, ODH)

New Administration Updates/Focus on Shale Gas

ODNR Issues: Resources to respond to drilling industry as it comes to Ohio; increased level of drilling

OEPA Issues: Focusing on developing streamlined regulatory/permitting tools such as general permits for air and 401.

Drilling Activity Update

Handout with current stats on drilling from ODNR. We have the first Utica horizontal well drilled (Harrison Cty), horizontally drilled, but not yet fractured. Ohio Buckeye (Buhl Site)

Going to Carroll County for coring. May do some drilling at this location.

ODNR will be posting updated lists on their Web site with map of sites.

Marcellus Wells. Two fraced (one last week). Jefferson County. Marquette Exploration. First true Marcellus well. 17-stage frac. Total depth reached in October 09. Previous well in 06 by Phillips Exploration (4-stage frac). Does ODNR get notification of frac job.

Pipeline Update

Three pipeline proposals in Ohio. Two from Monroe County going into existing lines. Requiring individual 401 WQCs. Have met with consultants. Shut down during winter, for field work/assessment. Expecting individual apps. Probably summer of next year. 404 Permits will be required. Rockies Express received Nationwide Permit. Kinder Morgan – application sent application back due to technical deficiencies by OPSB.

Permit Conditions/ODNR

We have been sharing/exchanging information. OEPA is trying to get a better understanding of permitting process, conditions and safety measures built into the process to protect resources. How do these link together and how will the agencies share information (e.g. applications coming in for sensitive areas)? If drilling is proposed for sensitive areas, how will we work together and communicate to our constituents. 1 and 5-year time of travel information received from OEPA. ODNR Will compare incoming applications against these data layers to flag high priority sites that will need a level of collaboration. Will need to insure public understands adequate level of safety.

How do we create an environment where information is exchanged openly between agencies? ODNR response - all incoming applications posted on-line already , so we can get access to this

We need regulatory checklist for drillers. We need to cross-refer companies between ODNR/OEPA.

Potential air emission sources: Natural gas combustion, flares and generators (portable or stationary)

Do we know the universe of drillers now? Marcellus Shale Coalition (mailing list). 44. Maybe targeted outreach to drillers.

Wastewater Update

Chesapeake does not plan to take flowback water to POTWs.

City of Warren – authorized to take 100,000 gpd. E Liverpool PTI for metals precip. No NPDES mod from E. Liverpool.

Steubenville, Patriot PTI. Received NPDES from Steubenville. IDP from Patriot. Concerns about drinking water intake that might drive discharge limits. Proposing 300,000 gpd which will be more than 10% than capacity in low flow conditions. Working with DDAGW/DSW on permit conditions.

Phoenix proposal – PTI (T. Tugen/R. Blasick). Want to take flowback and production water. Treatment and take back out to site for reuse. Some interest in processing to road application. Were we considering reaching out to townships? ODNR sent a mass mailing to brine haulers reminding them they cannot road apply brine, in June of last year.

Harrison Cty. Consol Coal has an active prep site for treatment plant. Want to collect brine and do treatment on-site. Harrison Cty Engineer. Want to store in large silos.

Cit y of Warren wants to sell discharge water to companies for frac water. Issues? Would it trigger Class I injection. Possible issues with contaminants. With other fresh water resources available, this may not be viable/ideal options.

Patriot - potential class II injection well. Location across from Warren treatment plant. Patriot has talked with T. Tomastik about locating a well right by Warren plant.

Q. RCRA Exemption for brines/flowback materials handled by third-party entities.

Drinking Water

Increasing requests from citizens about water safety. Russ Smith ODH. They are getting requests for third-party sampling/training. What is the company's obligation to test? ODNR – private well investigation. Oil and gas drilling. ODNR is investigatory.

Water Sampling Inquiries

It's important for citizens to understand regulatory oversight of ODNR, ODH and responsibilities of drilling companies relative to drinking water. There's some mistrust by local SWCD over information that's obtained strictly by drilling companies. Some want to be involved in going into homes for sampling. Example: Trumbull County Health Department being mandated to collect samples. Baseline sampling prior to construction. We need to re-establish communication and clarify responsibilities.

ODH is going to do some training in April with ODNR/Soil and Water.

It's a statewide issue. R Simmers. N. Canton. PWS interest and domestic supplies. Penn State – sample packet to test for some ions. $65. Disclaimers (not defensible, etc.) Need to do it right from front to end and use qualified labs testing for correct parameters.

Guidance for homeowners on water testing should address what is a certified lab, parameters, etc. We need a fact sheet between ODH and ODNR (and possibly OEPA) to get correct information out there. Question about baseline screening parameters. These should include: barium, iron, chlorides.

TENORM Rules (ODH)

Review will be helpful of draft to make sure ODH is not overlapping agencies in regulatory areas or conflicting with existing regulations. The rules are not oil/gas specific, but may be helpful in terms of addressing radiological issues that might come up within industry.

SEDO had questions for ODH about radiological parameters in Warren permit. More discussion to occur outside of meeting.

Public Outreach/Education

Water fact sheet: T. Tomastik has drafted something basic for homeowners.

There's probably a need for more education for drinking water operators (M. Baker).

OEPA has a fact sheet for municipal wastewater plants that want to take low salinity frac water. It's draft and should be done soon. (P. Novak) We'll also be drafting a fact sheet for drilling companies outlining regulatory basics (L. Stevenson).

Other Items

Agencies receive questions about leasing information. Strictly between company and landowner. ODNR Has provided homeowners with basic information. May be an association available to respond to questions. Idea on referring people to another group to field questions (OSU Extension, for example). In early stages of developing this relationship. PA has a good template.

Public meetings attended by hundreds of people. Newspapers are following up. Upcoming Dispatch article might have wastewater angle.

NY freelancer contacting Ohio (M. Settles). Dispatch has requested many documents. Youngstown Feb. sweeps series on M. Shale.

Ohio University – environmental magazine.

Is there a way to notify public officials of drilling activity – R. Blasick.

STRONGER – Information distributed by T. Tugend.

Next Meeting

March 17, Ohio EPA Offices. 1:30-4:00

Rebecca Fugitt

From: Laurie Stevenson [laurie.stevenson@epa.state.oh.us]
Sent: Monday, March 07, 2011 5:58 PM
To: Chris.Perry@dnr.state.oh.us; Heidi Hetzel-Evans; john.husted@dnr.state.oh.us; mike.hallfrisch@dnr.state.oh.us; mike.mccormac@dnr.state.oh.us; rick.simmers@dnr.state.oh.us; ted.lozier@dnr.state.oh.us; thomas.tugend@dnr.state.oh.us; tom.tomastik@dnr.state.oh.us; Aaron Shear; Benjamin Cirker; Brian Hall; Chuck Lowe; Dan Underwood; Donna Kniss; Eric Adams; Eric Nygaard; Erm Gomes; Fred Snell; Joe Goicochea; Keith Riley; Kristopher Weiss; Lee Burkleca; Lindsay Taliaferro; Michael Eggert; Mike Baker; Mike Hopkins; Mike Settles; Misty Parsons; Nancy Rice; Rich Blasick; Steve Saines; Steve Williams; Stivo DiFranco; Tom Harcarik; Tracy Freeman; Virginia Wilson; Chuck McCracken; Michael Snee; Rebecca Fugitt; robert.owen@odh.ohio.gov; Stephen Helmer
Subject: Draft agenda for 3/17 team meeting
Attachments: Marcellus Shale 3-17 Draft Agenda.DOC

Hello everyone. Attached is the draft agenda for our next meeting on 3/17, scheduled from 1:30-4:00 here at Ohio EPA (Center for Excellence, 6th floor).

OEPA districts, I'm planning to try video conferencing from here again and will pass along details later for this and/or call-in bridge line option.
Please give me your additions/changes on the agenda by COB this Thursday and I'll get the final out on Friday.

Also, I'm running late on the notes from our last meeting...will get these out with the final agenda. Sorry about that.

Thanks,
Laurie

Marcellus Shale Meeting
OEPA/ODNR/ODH
Thursday, March 17
1:30 – 4:00 p.m.
Ohio EPA, Center for Excellence
DRAFT AGENDA

Welcome/Introductions	All
Drilling Activity/Updates	
• Ohio Drilling activity in the Marcellus/Utica – Permitting and drilling activity update	ODNR
• Visit to Chesapeake drill sites/debrief	OEPA
Permitting Collaboration/Updates	
• Ohio EPA/ODNR meeting re. permit conditions to protect GW and other sensitive environments	J. Husted/M. Baker/M. Eggert
• Sharing permit application and permits for Marcellus or Utica drilling	
401/404	
• Development of General Permit/401 authorization	T. Harcarik
• Discussions with U.S. Army Corps	
Wastewater	
• Permit/POTW Update Warren, E. Liverpool, Steubenville	P. Novak
• Fact sheet for municipal wastewater plants/haulers	
Drinking Water	
• Draft fact sheet/water sampling and analysis	M. Eggert
Air	
• OEPA evaluation of air sources/permitting options	DAPC
Waste	
• RCRA exemption for mining operations/scope	J. Goicochea, A. Shear
Rules	
• SB 165/Rules workgroup activity	ODNR
• TENORM Rules - update	ODH
• OEPA rule proposal – exemption of pits/lagoons from DSW PTIs	P. Novak
Public Outreach/Education	C. Butler
• Media Relations Update	
• Legislative outreach	
• Additional fact sheets, web updates, etc.	
Next Steps	All

Rebecca Fugitt

From: McCormac, Mike [Mike.McCormac@dnr.state.oh.us]
Sent: Wednesday, December 15, 2010 8:24 AM
To: Laurie Stevenson; Perry, Chris; Hetzel-Evans, Heidi; Husted, John; Simmers, Rick; Tomastik, Tom; Aaron Shear; Bill Skowronski; Brian Hall; Charlotte Hickcox; Chuck Lowe; Dan Underwood; Donna Kniss; Eric Adams; Eric Nygaard; Erm Gomes; Fred Snell; Joe Goicochea; Keith Riley; Kristopher Weiss; Lindsay Taliaferro; Michael Eggert; Mike Baker; Mike Settles; Nancy Rice; Rich Blasick; Steve Saines; Steve Williams; Stivo DiFranco; Tom Harcarik; Tracy Freeman; Virginia Wilson; Chuck McCracken; Michael Snee; Rebecca Fugitt; Robert Owen; Stephen Helmer; Tugend, Thomas; Craig Butler
Cc: McCormac, Mike
Subject: Oil and Gas Permit Geologic Data Review
Attachments: Oil and Gas Permit Geologic Data Review.doc

All,

As a follow-up to last weeks meeting, here is a list of current and future data layers that will be used in the permit review process.

Mike
