

# DEP Webinar

## GP-5, Air Emissions Inventory

Feb. 21, 2013

**Dial-in number for Audio:** 1-877-668-4493

**Access code:** 646 835 256

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# AGENDA

1. Review of GP-5, Exemption 38
2. Review of Air Emissions Inventory Results
3. Questions

**Note:** WebEx Technical Support is available at 866-229-3239

## GP-5 – General Information

- GP-5 is a General Plan Approval and/or General Operating Permit for the sources located at natural gas compression and/or processing facilities.
- The notice of availability of the proposed GP-5 was published in the *Pennsylvania Bulletin* on March 3, 2012.
- Comment period ended on May 23, 2012.

## GP-5 – General Information

- GP-5 was issued on Feb. 1, 2013. DEP also has prepared the technical support document, comments/response document, FACT sheet, application and instructions.
- You may access these documents at:  
<http://www.dep.state.pa.us/dep/deputate/airwaste/aq/permits/gp.htm>

## Who can use the GP-5 authorization?

- An owner or operator may obtain an authorization to use the GP-5 to construct and operate the source(s).
- The GP-5 is applicable only to sources located at a non-major facility (non-Title V facility).
- The owner or operator must demonstrate to DEP that the source would comply with **all** the terms and conditions of the GP-5.
- The terms and conditions cannot be modified during the authorization.

# Previous GP-5 vs. Revised GP-5?

## Applicability of sources

Previous GP-5	Revised GP-5
NG-fired engines $\geq 100$ HP to $< 1500$ HP	All size NG-fired engines located at a non-major facility
Glycol Dehydrator	Glycol Dehydrator and associated equipment (excluding re-boiler)
	<ul style="list-style-type: none"><li>- Natural gas-fired simple cycle turbines.</li><li>- Centrifugal compressors.</li><li>- Natural gas fractionation process units (such as De-propanizer, De-ethanizer, De-butanizer).</li><li>- Storage vessels/tanks.</li><li>- Pneumatic controllers.</li><li>- Sweetening Units.</li><li>- Equipment leaks.</li></ul>

# Previous GP-5 vs. Revised GP-5

## Emissions limits of engines

Previous GP-5		Revised GP-5							
Lean-Burn or Rich-Burn Engines $\geq 100$ HP to $< 1500$ HP (g/bhp-hr)		Lean-Burn (g/bhp-hr)			% Reduction from Previous GP-5	Rich-Burn (g/bhp-hr)			% Reduction from Previous GP-5
		$\leq 100$ HP	$> 100$ HP to $\leq 500$ HP	$> 500$ HP		$\leq 100$ HP	$> 100$ HP to $\leq 500$ HP	$> 500$ HP	
NOx	2.0	2.0	1.0	0.50	75%	2.0	0.25	0.20	90%
CO	2.0	2.0	2.0	47 ppmvd or 93% control	80%	2.0	0.30	0.30	85%
VOCs	2.0	-	0.70*	0.25*	87.5%	-	0.20*	0.20*	90%
HCHO	None	-	-	0.05		-	-	2.7 ppmvd or 76% control	

\* NMNEHC (as propane excluding HCHO)

# Previous GP-5 vs. Revised GP-5

## Inclusion of gas turbines

Revised GP-5			
Pollutant	Simple Cycle Gas Turbine (ppmvd @ 15% O <sub>2</sub> )		
	≥ 1,000 HP to <5,000 HP	≥ 5,000 HP to ≤15,000 HP	>15,000 HP
NOx	25	15	15
CO	25	25	10 ppmvd or 93% control
VOCs	9*	9*	5 ppmvd* or 50% control
PM	0.03 lb/MMBtu	0.03 lb/MMBtu	0.03 lb/MMBtu

\* NMNEHC (as propane excluding HCHO)



# Previous GP-5 vs. Revised GP-5

## Glycol Dehydrators

<b>Previous GP-5</b>	<b>Revised GP-5</b>
Glycol Dehydrator	Glycol Dehydrators and associated equipment including Gas-Condensate-Glycol (GCG) separators (Flash Tanks)
VOCs > 10 tpy are required to control 85% of VOC emissions.	New large glycol dehydrators are required to comply with the applicable 40 CFR Part 63, Subpart HH, visible emissions and malodors requirements.
	Each new small glycol dehydrator which has a total uncontrolled PTE VOC emission rate in excess of 5 tpy are required to control 95% of VOC emissions, work practice, testing, visible emissions, and malodors requirements.
	Each new small glycol dehydrator which has a total uncontrolled PTE VOC emission rate equal to or less than 5 tpy are required to comply with visible emissions, and malodors requirements.

# Synthetic Minor Permit Limits

The emissions from all sources located at a facility shall not equal or exceed any of the following on a 12-month rolling sum basis:

- NO<sub>x</sub>, CO, SO<sub>x</sub>, PM<sub>10</sub> or PM<sub>2.5</sub> – 100 tons.
- VOCs – 50 tons.
- Any individual HAP – 10 tons.
- Total HAPs – 25 tons.
- Greenhouse gases, expressed as carbon dioxide equivalent (CO<sub>2</sub>e) – 100,000 tons.

## How the synthetic minor permit works?

- Compliance with synthetic minor permit limits are based on the facility's actual emissions, rather than aggregating the individual potential-to-emit (PTE) of sources at the facility.
- The facility wide actual emissions must not exceed any of the major facility thresholds on a 12- month rolling basis.
- Individual sources cannot exceed any source specific emission limitation included in the GP-5.
- Encourages installations of cleaner sources.

# What if the facility exceeds minor source threshold?

- If a GP-5 facility becomes a major facility by virtue of exceeding a major source threshold, the major source permit requirements such as New Source Review (NSR) and Prevention of Significant Deterioration (PSD) will apply to the facility as though construction had not yet commenced on the source.
- If the facility becomes a major facility due to installation of an additional source, a Plan Approval is required for the installation of this source and a Title V permit will be required for the operation of the facility. Based on the emission increases, NSR requirements may be applicable.

# Wellheads (Proposed Exemption)

- The revised GP-5 is not applicable to wellheads.
- Wellheads and associated equipment are addressed in the proposed Exemption Category #38 as specified in the Permit Exemption list.
- This is only an exemption from permitting and not an exemption from effectively controlling emissions from a well pad.

# Proposed Exemption List

- DEP has authority to determine sources or classes of sources that could be exempted from the permitting requirements in accordance with Section 127.14.
- The entire permit exemption list revisions were proposed on Feb. 26, 2011.
- DEP is re-proposing exemption criteria for oil and gas exploration, development, production facilities & associated equipment (Category No.38).
- Comments must be submitted to DEP by March 19, 2013.

# Oil and Gas Exploration, Development, Production Facilities (Exemption List, Category)

Importantly, this is only an exemption from permitting and not from effectively controlling emissions from a well pad. By implementation of these measures required by the criteria, VOC and HAP emissions will be controlled to levels that are equal to or better than New Source Performance Standards (NSPS) and Best Available Technology levels. Exemption criteria include monitoring requirements better than NSPS.

# Oil and Gas Exploration, Development, Production Facilities (Exemption List, Category)

- Although a source may be exempt from permit requirements, it is subject to all applicable state and federal regulations such as 25 Pa. Code Article III and federal requirements such as NSPS and NESHAPs.
- Sources not meeting the exemption requirements may submit a Request for Determination (RFD) form to DEP. If the RFD is not approved, a plan approval application should be submitted.



# Federal NSPS Subpart OOOO

- Promulgated by EPA for the Oil and Gas Sector on Aug. 16, 2012.
- Regulates emissions of volatile organic compounds (VOC) from the Oil and Gas Industry including natural gas wells and storage tanks.
- After Jan. 1, 2015, natural gas wells that are hydraulically fractured must employ reduced emission completion (Green Completion) technology.
- Does not include Leak Detection and Repair (LDAR) requirements for the wellheads.

# Unconventional and Conventional Wells (Category No. 38)

- An unconventional wellhead and associated equipment can be permitted using a Plan Approval or be exempted from permitting provided it meets the criteria specified in Category #38 of the Permit exemption list.
- Inherently low emitting conventional wellheads and associated equipment will be exempted without any specific conditions consistent with current practice.

# Storage Vessels/Tanks Exemption and Control (Category No. 38)

- EPA's final NSPS Subpart OOOO rules require the owner or operator to reduce VOC emissions by 95 % if VOCs emissions from each storage vessel is above six tpy.
- The proposed exemption requires the owner or operator to reduce VOC emissions by 95% if aggregated VOCs emissions from storage vessels/storage tanks are above 2.7 tpy.

# VOCs and HAPs Exemption Criteria

(Category No. 38)

- Sources emitting VOCs emissions are exempted if the combined uncontrolled VOC emissions at a facility are less than 2.7 tons on a 12-month rolling basis.
- If the VOCs include HAPs, combined HAP emissions must be less than 1000 lbs. of a single HAP or one ton of a combination of HAPs in any consecutive 12-month period.

# Flare Exemption Criteria

(Category No. 38)

Flares are exempted from the permitting requirements if following are met:

- Flare used at a wellhead that is subject to 40 CFR Part 60 Subpart OOOO requirements. Enclosed flares are not required.
- Flares used at exploration wells drilled to determine whether oil and/or gas exists.
- Enclosed flares used for other operations at a wellhead or facility.

# Flare Exemption Criteria

(Category No. 38)

Flares are exempted from the permitting requirements if following are met:

- Unenclosed flares used for repair, rework or re-completion at a wellhead.
- Flare operations required for emergency or safety purposes provided DEP is notified within 24 hours.

# NOx Exemption Criteria

(Category No. 38)

- EPA's NSPS Subpart OOOO rules does not address NOx emissions from engines.
- The proposed exemption requires a permit if all engines, except non-road engines, that emit combined NOx emissions of more than 100 lbs/hr, 1000 lbs/day, 2.75 tons per ozone season and 6.6 tpy on a 12-month rolling basis.
- States are precluded from establishing emission standards for non-road engines as defined in 40 CFR Part 89.

# Leak Detection and Repair Requirements (Category No. 38)

- Leak detection and repair (LDAR) requirements for the entire wellhead and associated equipment rather than just storage vessels/storage tanks
- Emissions for safety reasons or prevention of gas migration, from equipment designed to vent such as pneumatic controllers or to protect well integrity are not considered leaks.



# Leak Detection and Repair Requirements (Category No. 38)

- The owner or operator shall conduct leak detection within 60 days after the completion of the well using forward looking Infrared (FLIR), a gas leak detector as previously defined or any other DEP-approved monitoring device or process.
- After initial evaluation, leak detection shall be conducted on an annual basis.

# Leak Detection and Repair Requirements

(Category No. 38)

- If a leak is detected, the owner or operator of the facility shall quantify and repair the leak to operate with no detectable organic emissions consistent with 40 CFR Part 60 Subpart OOOO, or be less than a concentration of 2.5% methane as expeditiously as practicable, but no later than thirty (30) days after the leak is detected.
- DEP may grant an extension upon request for LDAR deadlines.

# Leak Detection and Repair Requirements

(Category No. 38)

- LDAR will ensure that necessary maintenance is performed to minimize fugitive VOC and methane emissions from the entire well pad on a continuing basis.

# ▶ Emissions Inventory Development

- Reporting requirement notifications were sent to the owner/operators of unconventional natural gas development facilities.
- Source and emissions reports for calendar year 2011 mandated in 25 Pa. Code Chapter 135.
- Additional notifications were sent in January 2012.
- Notice of requirement published in the Pennsylvania Bulletin on January 28, 2012.

# Emissions Inventory Development

- Sources and activities subject to reporting requirement include:
  - Compressor Stations
  - Dehydration Units
  - Drill Rigs
  - Fugitive Sources
    - Connectors
    - Flanges
    - Pump Lines
    - Pump Seals
    - Valves
  - Heaters
  - Pneumatic Pumps
  - Stationary Engines
  - Tanks
    - Pressurized Vessels
    - Impoundments
  - Venting
  - Blowdown Systems
  - Well Heads
  - Well Completions

# Comparison of Criteria Emissions

- Emissions from point sources have decreased since the last complete emissions inventory was developed for 2008. The following table shows the emissions (tons per year) from all point sources has decreased since 2008. The SOx emissions have decreased as a result of the installation of control equipment on the electric generating units as well as the conversion to natural gas.

Category	Year	CO	NOx	PM10	SOx	VOC
All Point Sources	2008	94,409	235,485	30,719	864,789	24,671
All Point Sources	2011	85,990	192,275	22,588	353,480	20,363
Difference		(8,419)	(43,210)	(8,131)	(511,309)	(4,308)
Unconventional Gas	2011	6,852	16,542	577	122	2,820

# Monetized Benefits of Net Emission Reductions

- In the Regulatory Impact Analysis for the Mercury and Air Toxics (MATS) rule, the EPA used **benefit-per-ton (BPT)** factors to quantify the changes in PM<sub>2.5</sub>-related health impacts and monetized benefits based on changes in SO<sub>2</sub> and direct PM<sub>2.5</sub> emissions.
- The BPT of SO<sub>2</sub> removed ranges from \$29,000 to \$73,000
- Net SO<sub>2</sub> Emission Reduction of 511,309 tons equates to \$14.8 to \$37.3 billion of annual monetized health benefits

# Emissions Summary by County

- Top ten counties for pollutant emissions from the unconventional natural gas sector for 2011 in tons per year:

County Emissions	CO	NOx	PM-10	PM-2.5	SOx	VOC	Benzene	Ethyl Benzene	Formaldehyde	n-Hexane	Toluene	Xylenes	2,2,4-Trimethyl pentane
Bradford	1,531	2,629	92	84	30	318	1.2	0.9	28.6	0.9	1.1	1.5	0.0
Susquehanna	864	2,440	59	57	17	313	1.3	1.0	12.6	7.7	0.9	6.5	0.1
Washington	712	1,838	61	60	8	510	3.0	0.3	52.5	14.7	4.6	6.2	0.8
Greene	751	1,746	82	55	8	227	3.6	1.1	23.3	3.3	8.4	3.4	0.4
Tioga	566	1,545	48	46	9	165	0.8	0.0	31.7	1.7	0.5	0.3	0.2
Lycoming	347	1,565	53	52	13	163	0.9	0.1	4.8	2.2	1.6	0.3	0.3
Westmoreland	367	742	21	21	4	145	3.0	0.8	23.3	1.9	7.3	2.5	0.2
Butler	185	527	21	22	1	268	1.2	0.1	7.9	9.2	1.5	2.1	0.8
Wyoming	205	633	20	20	3	36	0.4	0.0	0.4	0.2	0.2	0.2	0.0
Fayette	186	442	15	15	7	164	1.2	0.1	23.7	3.1	2.0	0.7	0.2



# Supplemental Emissions Information

- Additional information and data on air emissions from unconventional gas production and processing activities in Pennsylvania can be found at the following PA DEP website:

<http://www.portal.state.pa.us/portal/server.pt/community/air/6000>

# ➤ New Requirements for 2012 Inventory

- Expansion of Natural Gas Emissions Inventory for 2012.
  - Reporting will be required for **conventional** gas processing plants and compressor stations.
    - Conventional well development/production are not required to report.
  - Reporting of greenhouse gas (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O) emissions will be required for:
    - Unconventional gas well operations
    - Unconventional gas processing plants and compressor stations
    - Conventional gas processing plants and compressor stations



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# QUESTIONS

Please type your questions into the chat window.