

EXHIBITS OF CNX GAS COMPANY LLC

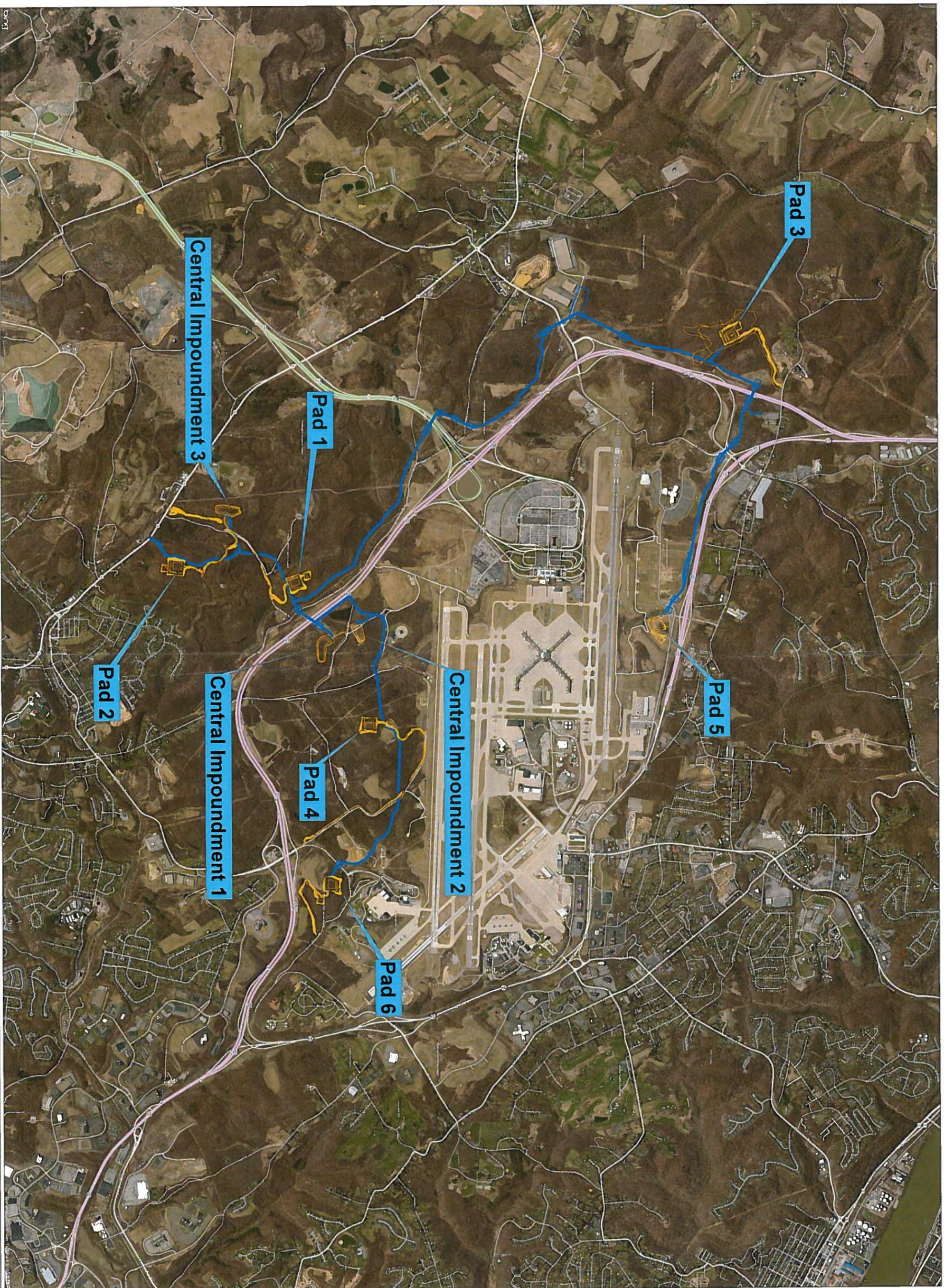
CONDITIONAL USE HEARING BEFORE THE  
FINDLAY TOWNSHIP BOARD OF SUPERVISORS

FEBRUARY 20, 2014

## TABLE OF CONTENTS

Exhibit 1	Aerial of Site
Exhibit 2	Project Overview
Exhibit 3	Center for Sustainable Shale Development Performance Standards
Exhibit 4	Photographs of Site Trailers
Exhibit 5	Compliance Comments Regarding the Zoning Ordinance Requirements
Exhibit 6	Supplemental Compliance Comments
Exhibit 7	Memorandum Regarding Air Quality and Monitoring
Exhibit 8	Allegheny County Health Department Press Release
Exhibit 9	Resume of John J. Keeling
Exhibit 10	Report of Predicted Noise

# EXHIBIT 1



— Pads and Impoundments  
— ACAA Pipeline Alignment



Project Name: ACAA  
 Project Number: 11020211  
 Project Date: 5/1/2021  
 Project Location: Adams Lane  
 Project Status: In Progress  
 Project Manager: [Name]  
 Project Engineer: [Name]

ACAA

# EXHIBIT 2



### PIA Project Overview

CNX Gas Company LLC (CNX) is proposing to construct, drill and produce Marcellus and Upper Devonian shale wells in Findlay Township, Allegheny County. The sites included in the submitted applications are referenced as ACAA 1, 2, 3, 4, 5 & 6 well and tank pads (Table 1), ACAA CI1 and CI2 centralized impoundments, and FI3 freshwater impoundment (Table 2) and associated natural gas and water pipelines. These sites will be located upon property owned by the County of Allegheny, which transferred all airport operations and leased its property to the ACAA, which in turn entered into an oil and gas lease with CNX. The property is zoned Heavy Industrial under the Township Zoning Ordinance.

Figure 1 - Clearing & grubbing for a pad and access road. Mulched vegetation is used to create silt socks for erosion and sediment control.

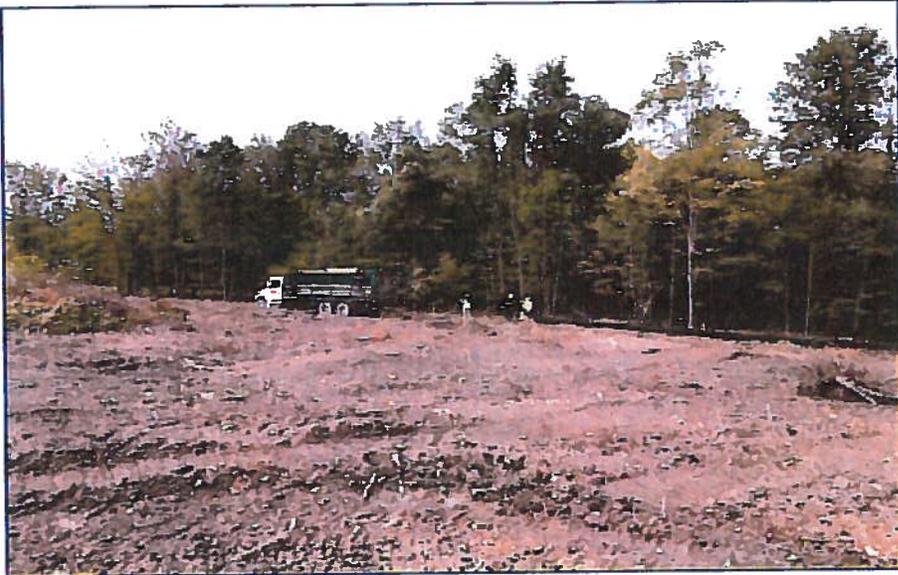


Figure 2— Nearing construction completion for a pad and access road.

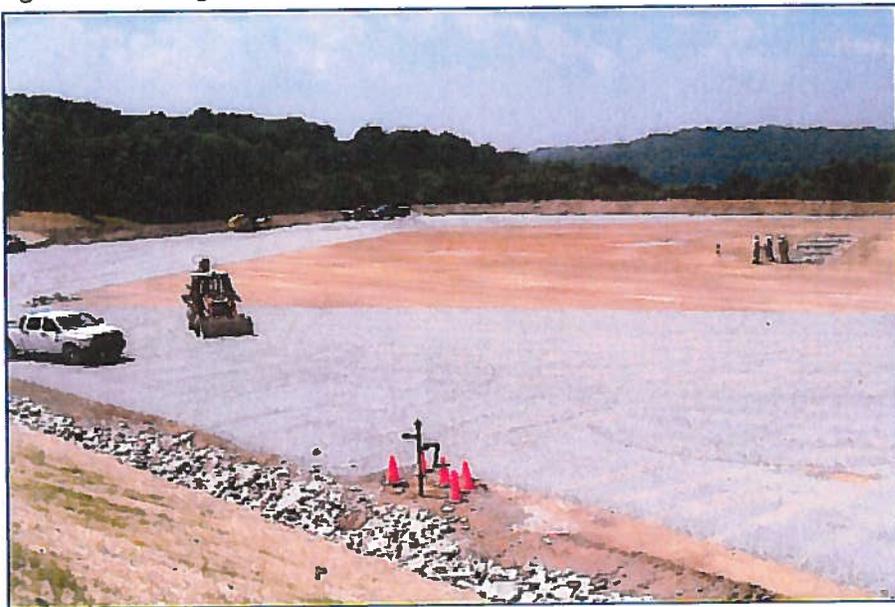


Figure 3 – Construction of impoundment and access road. Hydroseed applied to embankment.

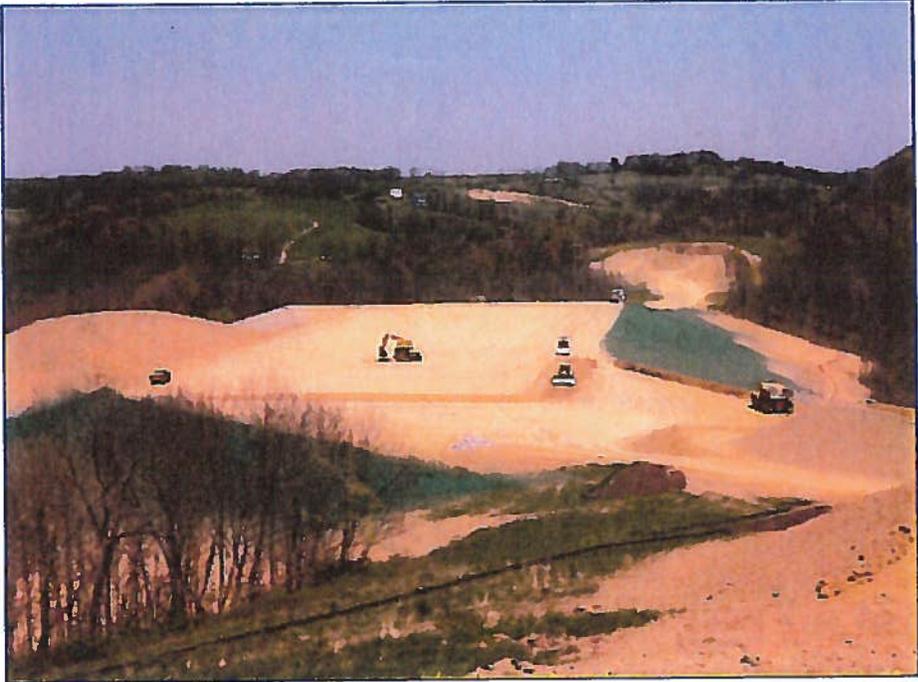


Figure 4– Recently completed construction of impoundment w/liner.



Figure 5 – Typical drilling operations



Figure 6 – Night time drilling operations w/lighting

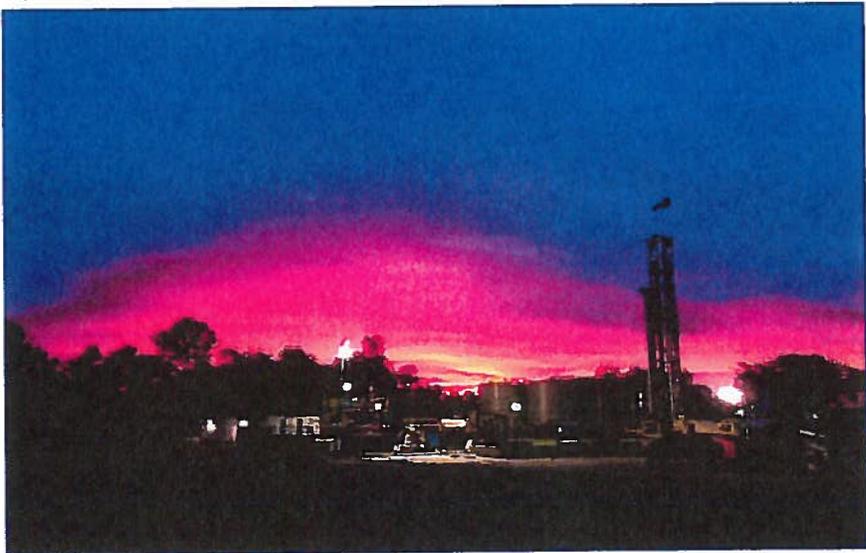


Figure 7 – Completions phase



Figure 8 – Operational impoundment w/access road.

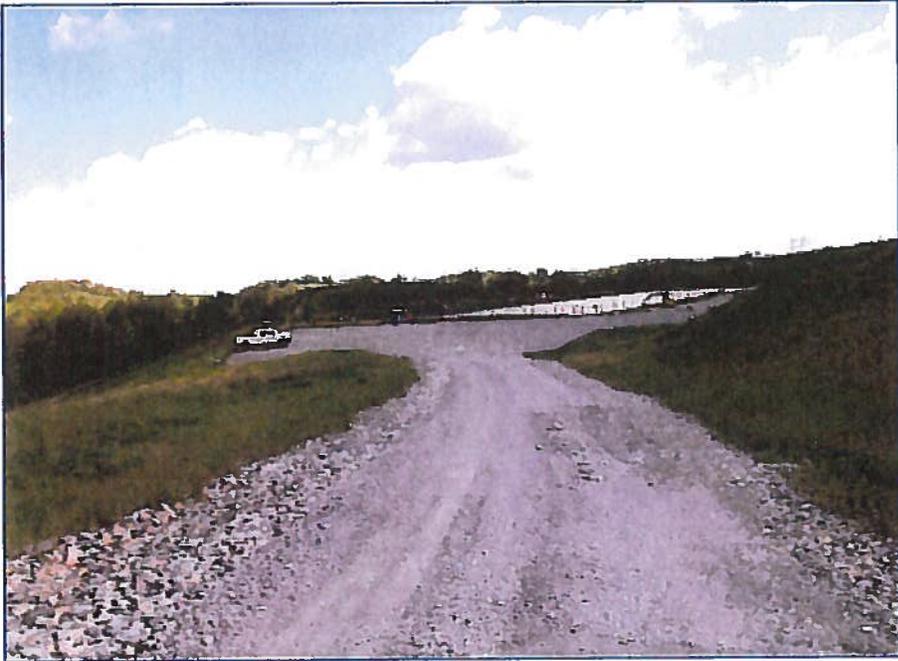


Figure 9 – Well pad in production.



Figure 10 – Reclaimed impoundment.



Table 1: Planned Pad Development

Pad Sequence	Disturbance Total (acres)	Access	Number of wells	Distance from pad/well to closest residence'	Construction Start - Finish	Vertical Start - Finish	Horizontal Start - Finish	Frac Start- Finish
2	37.4	Rt 30	6	1180 / 1590	March 2014 – July 2014	July 2014 – September 2014	November 2014 – February 2015	May 2015 – July 2015
1	22.15	Rt 30	8	3870 / 4190	March 2014 – July 2014	August 2014 – November 2014	March 2015 – August 2015	October 2015 – January 2016
4	31.9	McLaren Road and private airport roads	12	5760 / 6200	June 2014 – September 2014	December 2014 – May 2015	September 2015 – April 2016	July 2016 – November 2016
6	19.03	McLaren Road	13	1700 / 2000	April 2015 – August 2015	June 2015 – December 2015	May 2016 – December 2016	April 2017 – August 2017
3	19.25	Hookstown Grade Road	14	1520 / 1800	April 2015 – August 2015	December 2015 – July 2016	January 2017 – September 2017	January 2018 – June 2018
5	3.3 (within Findlay Township) 11.7 (total estimated)	Halverson Drive	7*	1430 / 1700	June 2015 – August 2015	July 2016 – October 2016	October 2017 – February 2018	June 2018 – August 2018

Table 2: Planned Impoundment Development

Impoundment Sequence	Disturbance Total (acres)	Access	Distance to closest residence'	Construction Start -Finish	Storage Start- Finish
CI 1	38.1		4010	March 2014 – September 2014	
FI 3	19.5	McLaren Road and private airport roads	1080	March 2014 – September 2014	September 2014 – August 2018
CI 2	11		5830	March 2015 – August 2015	

# EXHIBIT 3

# PERFORMANCE STANDARDS

AUGUST 19, 2013

## GEOGRAPHIC SCOPE AND APPLICABILITY OF CSSD PERFORMANCE STANDARDS

These standards apply to unconventional exploration, development, and gathering activities including site construction, drilling, hydraulic fracturing and production in the Appalachian Basin. These regional standards consider geology, topography, population density, infrastructure, surface water, ground water and other issues of particular concern in the Appalachian Basin. Accordingly, until such time as the scope of these standards may be amended, these standards and the CSSD evaluation and certification process will be limited to Operators' unconventional activities in the Appalachian Basin.

## **WATER PERFORMANCE STANDARDS**

The goal of the water standards is that there be zero contamination of fresh groundwater<sup>1</sup> and surface waters.

## **WASTEWATER PERFORMANCE STANDARDS**

### **PERFORMANCE STANDARD NO. 1**

1. Operators shall maintain zero discharge of wastewater (including drilling, flowback and produced waters) to Waters of the Commonwealth of Pennsylvania and other states until such time as CSSD adopts a standard for treating shale wastewater to allow for safe discharge. Such standard will be adopted by September 1, 2014.

*Note: This standard does not apply to nor prohibit disposal of wastewater by deep well injection.*

### **PERFORMANCE STANDARD NO. 2**

1. Operators shall maintain a plan to recycle flowback and produced water, for usage in drilling or fracturing a well, to the maximum extent possible.
2. By September 24, 2014 or date of an Operator's initial application for certification (whichever is later), Operators must recycle a minimum of 90% of the flowback and produced water, by volume, from its wells in all core operating areas in which an Operator is a net water user.
3. CSSD will consider a recycling standard for a net water producer within one year. Operators will maximize the use of recycled water to the extent possible during this time.

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<sup>1</sup> "Fresh groundwater" is "water in that portion of the generally recognized hydrologic cycle which occupies the pore spaces and fractures of saturated subsurface materials."

## **PITS/IMPOUNDMENTS PERFORMANCE STANDARDS**

### **PERFORMANCE STANDARD NO. 3**

1. Any new pits designed shall be double-lined and equipped with leak detection.
2. Operators, by March 20, 2014 or initial date of application for certification (whichever is later), shall contain drilling fluid, when using oil-containing drilling fluids to drill a well, in a closed loop system at the well pad (e.g. no ground pits).
3. Operators, by March 20, 2015 or initial date of application for certification (whichever is later), shall contain drilling fluid and flowback water in a closed loop system at the well pad, eliminating the use of pits for all wells.<sup>2</sup>

### **PERFORMANCE STANDARD NO. 4**

1. When utilizing centralized impoundments for the storage of flowback and/or produced waters, Operators shall ensure that free hydrocarbons are removed from the water prior to storage and that new impoundments are double-lined with an impermeable material, equipped with leak detection and take measures to reasonably prevent hazards to wildlife. Total hydrocarbons should be substantially removed.
2. Additionally, CSSD will facilitate research designed to determine the extent of hydrocarbon emissions from these waters so that by September 1, 2014, a decision can be made as to whether, and to what extent, this standard should be amended.

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<sup>2</sup> For guidance document:

Pit – any in-ground impression constructed on a well site that is used for the storage and disposal of residual waste from the development of a natural gas well.

Centralized Impoundment – any in-ground impression constructed off of the well site which is used to store and aggregate flowback water for use in the hydraulic fracturing process.

## **GROUNDWATER PROTECTION PERFORMANCE STANDARDS**

### **PERFORMANCE STANDARD NO. 5**

1. Operators shall establish an Area of Review (AOR), prior to drilling a well, which encompasses both the vertical and horizontal legs of the planned well. Within the AOR, the Operator must conduct a comprehensive characterization of subsurface geology, including a risk analysis that demonstrates the presence of an adequate confining layer above the production zone that will prevent adverse migration of hydraulic fracturing fluids. As part of the risk analysis, and before proceeding with hydraulic fracturing, the Operator must also conduct a thorough investigation of any active or abandoned wellbores within such area of review or other geologic vulnerabilities (e.g., faults) that penetrate the confining layer and adequately address identified risks.

### **PERFORMANCE STANDARD NO. 6**

1. Operators shall develop and implement a plan for monitoring existing water sources, including aquifers and surface waters (as defined in the CSSD Guidance for Auditors document) within a 2,500 foot radius of the wellhead (or greater distance, if a need is clearly indicated by geologic characterization), and demonstrate that water quality and chemistry measured during a pre-drilling assessment are not impacted by operations.
2. Operators must conduct periodic monitoring for at least one year following completion of the well. Such monitoring must be extended if results indicate potential adverse impacts on water quality or chemistry by operations.
3. In the event that monitoring establishes a possible link between an Operator's activities and contamination of a water source, the Operator shall develop and implement an investigative plan and, if a positive link is established, implement a corrective action plan.
4. The testing and monitoring plan should provide for additional monitoring in the event a well is re-stimulated.

## **PERFORMANCE STANDARD NO. 7**

1. Operators shall design and install casing and cement to completely isolate the well and all drilling and produced fluids from surface waters and aquifers, to preserve the geological seal that separates fracture network development from aquifers, and prevent vertical movement of fluids in the annulus.
2. Operators will not use diesel fuel in their hydraulic fracturing fluids.
3. Operators will publically disclose the chemical constituents intentionally used in well stimulation fluids. Disclosures will include: information identifying the well, the Operator and the dates of the well stimulation; the type and total volume of the base fluid; the type and amount of any proppant; all chemical additive products used in a well stimulation, including the name under which the product is marketed or sold, the vendor, and a descriptor of additive's purpose or purposes (e.g. biocide, breaker, corrosion inhibitor, etc.); the common name and Chemical Abstracts Service registry number for each chemical ingredient used in a stimulation fluid; the actual or maximum concentration of each chemical ingredient, expressed as a percent by mass of the total stimulation fluid. Chemical ingredients should be disclosed in a manner that does not link them to their respective chemical additive products. Disclosure of the above information will be offered to the relevant state agency and will also be posted on [FracFocus.org](http://FracFocus.org). If an Operator, service company or vendor claims that the identity of a chemical ingredient is entitled to trade secret protection, the Operator will include in its disclosures a notation that trade secret protection has been asserted and will instead disclose the relevant chemical family name. Operators will implement measures consistent with state law to assist medical professionals in quickly obtaining trade secret information from the Operator, service company or vendor holding the trade secret that may be needed for clinical diagnosis or treatment purposes.
4. CSSD will develop a standard relating to the public disclosure of chemicals other than well stimulation fluids by September 1, 2013.
5. Operators will also work toward use of more environmentally neutral additives for hydraulic fracturing fluid. Mechanical integrity tests shall be performed when refracturing an existing well.

## PERFORMANCE STANDARD NO. 8

1. Operators shall design each well pad to minimize the risk that drilling related fluids and wastes come in contact with surface waters and fresh groundwater<sup>3</sup>.
2. In preparation for any spill or release event, Operators shall prior to commencement of drilling, develop and implement an emergency response plan, ensure local responders have appropriate training in the event of an emergency, and work with the local governing body, in which the well is located, to verify that local responders have appropriate equipment to respond to an emergency at a well.
3. In addition, in the event of spill or release, beyond the well pad, Operators shall immediately provide notification to the local governing body and any affected landowner.

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<sup>3</sup> Fresh groundwater is defined as water in that portion of the generally recognized hydrologic cycle which occupies the pore spaces and fractures of saturated subsurface materials.

## AIR PERFORMANCE STANDARDS

### PERFORMANCE STANDARD NO. 9

1. Beginning on January 1, 2014, in accordance with the conditions set forth in Paragraphs 3 and 4 below, an Operator must direct all pipeline-quality gas during well completion of development wells<sup>4</sup>, and re-completion or workover of any well into a pipeline for sales.
2. Any gas not captured and put in the sales pipeline may not be vented<sup>5</sup> and must be flared in accordance with Standard No. 10 below.
3. Acceptable reasons for sending gas to a flare and not directing gas into the sales line include:
  - a) Low content of flammable gas. Such low-flammability gas must be directed through a flare, past a continuous flame, to insure combustion begins when gas composition becomes flammable;
  - b) For safety reasons.
4. Circumstances unacceptable for sending gas to flare, instead of directing it into a sales line, are:
  - a) Beginning on January 1, 2014, a lack of a pipeline connection except for wells that are designated as either exploratory or extension wells using SEC definitions (however, companies should minimize flaring and maximize the use of reduced emissions completions on exploratory or extension wells, where possible);
  - b) Inadequate water disposal capacity;
  - c) Undersized flow back equipment, lack of flow back equipment or lack of equipment operating personnel.
5. Any upset or unexpected condition that leads to flaring of gas, instead of directing it into a sales line, must be documented and records maintained by the Operator, including a description of the condition, the location, date, and quantity of gas flared.

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<sup>4</sup> Development wells are wells that are not exploratory or extension wells, as those terms are defined and restricted in Paragraph 6.

<sup>5</sup> For purposes of this standard, venting does not include the de minimis fugitive emissions from gas busters (i.e. that may occur from separator vessels during the initial cleanup period of the well). Immediately upon detection of gas in the flowback, Operators must divert the flowback into reduced emission completion ("REC") equipment.

6. Using the SEC definitions, an exploratory well is a well drilled to find a new field or to find a new reservoir in a field previously found to be productive of oil or gas in another reservoir. An extension well is a well drilled to extend the limits of a known reservoir. Wells with these designations must be consistent with Operator reporting of such designations to the SEC, if applicable.

#### PERFORMANCE STANDARD NO. 10

1. When flaring is permitted during well completion, re-completions or workovers of any well, pursuant to Standard No. 9 above, Operators must adhere to the following requirements.
  - a) Operators must either use raised/elevated flares or an engineered combustion device with a reliable continuous ignition source, which have at least a 98% destruction efficiency<sup>6</sup> of methane. No pit flaring is permitted.
  - b) Flaring may not be used for more than 14-days on any development well (for the life of the well). Flaring may not be used for more than 30-days on any exploratory or extension wells (for the life of the well), including initial or recompletion production tests, unless operation requires an extension.<sup>7</sup> If flaring continues beyond 30-days for an exploratory or extension well, Operators must document the extent of additional flaring and reasons requiring flaring beyond the 30-days.
  - c) Flares shall be designed for and operated with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours.

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<sup>6</sup> Certification of the 98% destruction efficiency may be obtained through either of the following options: (1) a manufacturer's certification and where operation is in accordance with the manufacturer's specifications and parameters; or (2) where the flares are designed and operated in accordance with the following: (a) meet specifications for minimum heating values of waste gas, maximum tip velocity, and pilot flame monitoring found in 40 CFR § 60.18; (b) if necessary to ensure adequate combustion, sufficient gas shall be added to make the gases combustible; (c) an infrared monitor is considered equivalent to a thermocouple for flame monitoring purposes; (d) an automatic ignition system may be used in lieu of a continuous pilot; (e) flares must be lit at all times when gas streams are present; (f) fuel for all flares shall be sweet gas or liquid petroleum gas except where only field gas is available and it is not sweetened at the sites; and (g) flares shall be designed for and operated with no visible emissions, except for periods not to exceed at total of five minutes during any two consecutive hours.

<sup>7</sup> For performance standard 10, the 30-day time limit for flaring was based on West Virginia's rules which allow 30-days of temporary flaring before a permit is required. W. Va. CSR § 45-6-6.1a. Additionally, because all states that have developed a flaring time-limit allow flaring to continue longer than the time limit with approval, certain exceptions to the 30-day time limit were provided in performance standard 10 for emergency and upset conditions and well purging and evaluation tests. These exceptions were based on Wyoming's rules. WOGCC Rules and Regulations, Chapter 3, Section 40. Pennsylvania currently has no regulations addressing flaring directly.

## PERFORMANCE STANDARD NO. 11

1. The following standard applies only to nonroad dedicated diesel horizontal drilling rig engines at the wellpad. CSSD encourages and supports the conversion of drilling rig engines to either dual-fuel, electricity or natural gas. The following emissions standards apply to the nonroad dedicated diesel drilling rig engines.
  - a) By March 20, 2013, Operator and contractor nonroad engines shall achieve horse power-hour weighted average<sup>8</sup> site emissions equivalent to U.S. EPA Tier 2 nonroad diesel engine standards or better.
  - b) By March 20, 2015, 25% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>9</sup>
  - c) By September 24, 2015, 75% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>10</sup>
  - d) By September 24, 2016, 95% of Operator or contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>11</sup>
  - e) All nonroad equipment must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

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<sup>8</sup> Weighted average emissions are based on an annual weighted average using the certified emissions level of each engine (g/bhp-hr), the rated power of each engine (HP), and the run time (hrs) of each engine over the course of the year.

<sup>9</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>10</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>11</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

2. The following standard applies only to dedicated diesel fracturing pump engines at the wellpad. CSSD encourages and supports the conversion of fracturing pump engines to either dual-fuel, electricity or natural gas.
  - a) If the fracturing pump is a nonroad dedicated diesel engine powered solely by diesel fuel, then the following emissions standards apply:
    - (i) By March 20, 2014, Operator and contractor nonroad engines shall achieve horse power-hour weighted average<sup>12</sup> site emissions equivalent to U.S. EPA Tier 2 nonroad diesel engine standards or better.
    - (ii) By September 24, 2015, 25% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>13</sup>
    - (iii) By September 24, 2016, 75% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>14</sup>
    - (iv) By September 24, 2017, 95% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>15</sup>

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<sup>12</sup> Weighted average emissions are based on an annual weighted average using the certified level of each engine (g/bhp-hr), the rated power of each engine (HP), and the run time (hrs) of each engine over the course of the year.

<sup>13</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>14</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>15</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

- (v) These engines must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.
- b) If the fracturing pump is powered by a dedicated diesel heavy-duty vehicle engine, then the following emissions standards apply:
- (i) By March 20, 2013, 50% of the heavy-duty vehicle engines used to power fracturing pumps must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions.<sup>16</sup>
  - (ii) By September 24, 2014, 80% of the heavy duty vehicle engines used to power fracturing pumps, must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions.<sup>17</sup>
  - (iii) These engines must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.
3. By March 20, 2014, CSSD will develop a standard and implementation date for all other engines located at the wellpad.

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<sup>16</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>17</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

### **PERFORMANCE STANDARD NO. 12**

The following standard is only applicable to compressor engines dedicated to unconventional activities.

1. By March 20, 2014, existing compressor engines greater than 100 horsepower may not emit more than 1.5 grams of NO<sub>x</sub> per horsepower-hour.
2. Any new, purchased, replacement, reconstructed, or relocated lean-burn engines greater than 100 horsepower may not emit more than 0.5 g/hp-hr for NO<sub>x</sub>; 2.0 g/hp-hr for CO; 0.7 g/hp-hr for VOCs.
3. Any new, purchased, replacement, reconstructed, or relocated rich-burn engines greater than 100 horsepower may not emit more than 0.3 g/hp-hr for NO<sub>x</sub>; 2.0 g/hp-hr for CO; 0.7 g/hp-hr for VOCs.

*Note: This standard will be updated to reflect any future determinations from regulatory agencies with regard to the NO<sub>x</sub> limitation.*

### **PERFORMANCE STANDARD NO. 13**

1. By October 15, 2013, all (existing or new) individual storage vessels at the wellpad with VOC emissions equal to or greater than 6 tpy must install controls to achieve at least a 95% reduction in VOC emissions.

### **PERFORMANCE STANDARD NO. 14**

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

1. Change rod packing at all reciprocating compressors (both existing and new), including those at the wellhead, either every 26,000 hours of operation or after 36 months.
2. By October 15, 2013, pneumatic controllers (both existing and new) must be low – bleed, with a natural gas bleed rate limit of 6.0 scfh or less, or zero bleed when electricity (3-phase electrical power) is on-site.
3. New centrifugal compressors may not contain wet oil seals. Operators must replace worn out wet seals on existing centrifugal compressors with dry seals.

4. By March 20, 2014 or date of an Operator's initial application for certification (whichever is later), Operators will implement a directed inspection and maintenance program (DI&M) for equipment leaks from all existing and new valves, pump seals, flanges, compressor seals, pressure relief valves, open-ended lines, tanks and other process and operation components that result in fugitive emissions. Process components subject to DI&M are monitored by a weekly visual, auditory, and olfactory check, and once a year by a mechanical or instrument check to detect leaks. Once significant leaks are detected, they are required to be repaired in a timely manner.
5. Eliminate VOC emissions associated with the prevention of well-bore freeze-up (only de minimis emissions are permitted).
6. Existing and new compressors are required to be pressurized when they are off-line for operational reasons in order to reduce blowdown emissions.

#### **PERFORMANCE STANDARD NO. 15**

1. By March 20, 2014, 80% of all trucks used to transport fresh water or well flowback water must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions.<sup>18</sup>
2. By September 24, 2015, 95% all trucks used to transport fresh water or well flowback water must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter emissions.<sup>19</sup>
3. All on-road vehicles and equipment must limit unnecessary idling to 5 minutes, or abide by applicable local or state laws if they are more stringent.
4. All on-road and non-road vehicles and equipment must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

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<sup>18</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>19</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

# EXHIBIT 4







# EXHIBIT 5

**CNX GAS COMPANY LLC  
FINDLAY TOWNSHIP**

**MARCELLUS AND UPPER DEVONIAN SHALE GAS WELLS  
ACAA PADS 1, 2, 3, 4, 5 & 6 AND ACAA CA1, CI2 & CI3**

**COMPLIANCE COMMENTS**

**February 20, 2014**

Section 2. Definitions.

As used in this Ordinance, the following terms shall be interpreted or defined as follows:

**Oil and Gas Development or Development.** The well site preparation, well site construction, drilling, hydraulic fracturing, and/or site restoration associated with an Oil and Gas well of any depth; water and other fluid storage, impoundment and transportation used for such activities; and the installation and use of all associated equipment, including tanks, meters, and other equipment and structures whether permanent or temporary; and the site preparation, construction, installation, maintenance and repair of Oil and Gas pipelines and associated equipment and other equipment and activities associated with the exploration for, production and transportation of Oil and Gas other than Natural Gas Compressor Stations and Natural Gas Processing Plants or facilities performing the equivalent functions that operate as midstream facilities. This definition does not include purely subsurface activity as a result of fracking.

**Township.** Township of Findlay, Allegheny County, Pennsylvania.

**Oil and Gas.** Crude oil, natural gas, methane gas, coal bed methane gas, propane, butane and/or any other constituents or similar substances that are produced by drilling a well of any depth into, through, and below the surface of the earth.

**Operator.** Any person, partnership, company, corporation and its subcontractors and agents who have an interest in real estate for the purpose of exploring or drilling for, producing, or transporting Oil or Gas.

**Protected Structure.** Any occupied residence, commercial business, school, religious institution or other public building located within 1,000 feet of the surface location of a well that may be impacted by noise generated from drilling or hydraulic fracturing activity at a Well Site. The term shall not include any structure owned by an Oil and Gas lessor who has signed a lease with the Operator granting surface rights to drill the subject well or whose owner or occupants have signed a waiver relieving the Operator from implementation of the measures established in paragraph 15 of this Ordinance for the owners' or occupants' benefit.

**Well Site.** A graded pad designed and constructed for the drilling of one or more Oil and Gas wells.

**Natural Gas Compressor Station.** A facility designed and constructed to compress natural gas that originates from an Oil and Gas well or collection of such wells operating as a midstream facility for delivery of Oil and Gas to a transmission pipeline, distribution pipeline, Natural Gas Processing Plant or underground storage field, including one or more natural gas compressors, associated buildings, pipes, valves, tanks and other equipment.

**Natural Gas Processing Plant.** A facility designed and constructed to remove materials such as ethane, propane, butane, and other constituents or similar substances from natural gas to allow such natural gas to be of such quality as is required or appropriate for transmission or distribution to commercial markets but not including facilities or equipment that are/is designed and constructed primarily to remove water, water vapor, oil or naturally occurring liquids from natural gas.

### Section 3. Zoning.

The Township of Findlay hereby declares that Oil and Gas Development may be permitted by Conditional Use in the Agricultural, Business Park, Light Industrial and Heavy Industrial **Zoning Districts** in the Township where said Development meets the following specific criteria in addition to all other applicable criteria in the Zoning Ordinance:

117.604.69.1 Operator shall comply with any generally applicable bonding and permitting requirements for Township roads. Any existing Township roads, damaged or worsened in condition by the Operator as determined by the Township, shall be repaired by the Operator as required by the Township. Funds for such repairs shall be held either in escrow, bond or letter of credit on an estimate determined by the Township after inspection by the Township of existing conditions of roads, which may be affected by the Operator. If no repairs are necessary, all funds earmarked for existing road/drainage repairs shall be returned to the Operator.

**Compliance Comment:** [CNX will comply with this requirement.](#)

117.604.69.2 Operator shall take the necessary safeguards to ensure that the Township roads utilized remain free of dirt, mud and debris resulting from Development activities and/or shall ensure such roads are immediately swept or cleaned if dirt, mud and debris occur.

**Compliance Comment:** [CNX will have crews on stand-by to clean up debris.](#)

117.604.69.3 Operator shall take all necessary precautions to ensure the safety of persons in areas established for road crossing and/or adjacent to roadways (for example, persons waiting for public or school transportation). Where necessary and permitted, during periods of anticipated heavy or frequent truck traffic associated with Development, Operator will provide flagmen to ensure the safety of children at or near schools or school bus stops and include adequate signs and/or other warning measures for truck traffic and vehicular traffic.

**Compliance Comment:** CNX will install sign(s) for heavy traffic to travel at a slower speed during school bus hours along Hookstown Grade Road. If bus stops are identified along permitted Township routes, CNX will provide flagmen during rig moves. CNX will limit heavy truck traffic during the hours of school traffic.

117.604.69.4 Operator shall not clear brush or trees by way of burning, and shall chip, grind or remove all tree stumps from properties it clears for Development purposes. However, Operator shall be permitted to, consistent with any outdoor burning laws, ordinance(s) or regulations, including those of Allegheny County, burn any brush, trees, or stumps that have been removed from the ground and collected into a pile or piles on the properties where the Operator is engaging in Development.

**Compliance Comment:** CNX and all contractors will not burn at any locations. CNX will add this requirement to its ACAA site specific hazard training for its contractors.

117.604.69.5 Prior to Development, Operator shall provide to the Township's Police Department and the Imperial Volunteer Fire Department ("First Responders") and to the Township Manager, a copy of its Preparedness, Prevention and Contingency ("PPC") Plan. If the PPC requires the availability and/or utilization of special equipment or supplies particular to the hazards or conditions addressed in the PPC, the Township may require that Operator reimburse the Township for the cost of procurement of such special equipment or supplies.

**Compliance Comment:** The ACAA will be First Responders for all CNX locations. A minimum of 250 pounds of BC fire extinguishing agent shall be available at each pad. All motor vehicles and construction equipment that could pose a fire hazard shall be equipped with an appropriately sized ABC fire extinguisher. (For example, 20 lb. ABC fire extinguishers are required on drill rigs.) Appropriately sized ABC fire extinguishers shall be made readily available for use with all other

equipment (generators, compressors, etc.). The PPC plans for unconventional drilling are site specific and will be provided prior to the commencement of site development, in order to be able to include the pertinent permit numbers and chemicals to be used.

- 117.604.69.6 Before drilling, the Operator shall ascertain whether the Township's First Responders have secured adequate training and information to deal with any potential dangerous conditions that may result due to Development activities. First Responders shall have on-site orientation and be provided adequate awareness information. Upon request from the Township, Operator will, prior to drilling of an Oil and Gas well, make available with at least thirty (30) days' notice, at its sole cost and expense, an appropriate site orientation and training session for First Responders. Such site orientation and training session shall be made available at least annually during the period when the Operator anticipates drilling activities in the Township.

**Compliance Comment:** CNX will conduct Well Control Incident Management Effective Strategies & Tactics for Municipal Responders Training at the Airport Training Center. Course content may include: causes of blowouts, rigs and their components, tactics for first on scene, suburban interface risks, response methodology, well control scene management, firefighting and well control management as well as review of case histories. The Township Police Department and the Imperial Volunteer Fire Department (“Township First Responders”) will be invited to attend this training, which will be conducted over three days in order to accommodate the three shift changes of ACAA First Responders. Once CNX has activities on location(s), site orientations will be made available to ACAA First Responders and Township First Responders for the various phases of operations.

- 117.604.69.7 Operator shall demonstrate its plans to take the necessary safeguards to ensure appropriate dust control measures are in place.

**Compliance Comment:** CNX will apply fresh water to dirt roads, will pave roads and/or will apply dust palliatives.

- 117.604.69.8 Operator shall demonstrate its plans to take the necessary safeguards to ensure appropriate odor control measures are in place.

**Compliance Comment:** If necessary, CNX will either aerate impoundments or will conduct on-site pit treatments.

117.604.69.9 The Operator must demonstrate its plans for the storage or elimination of residual water/fluids from its operations. Operator must show that it will take all necessary safeguards to ensure that public and private sewer and water systems will not be contaminated as a result of any of its operations.

**Compliance Comment:** CNX's connection to the municipal water system will meet the Findlay Township Municipal Authority's specifications. The connection will consist of a freshwater-only discharge connection to the meter pit, which includes a double check backflow preventer assembly, and will discharge to open air into an impoundment or a tank. This line will never come into contact with flowback or recycled water. CNX will comply with all applicable Commonwealth of Pennsylvania testing requirements with regard to any private water wells.

117.604.69.10 Recognizing that the specific location of equipment and facilities is an important and integral part of Oil and Gas Development, as part of the planning process, Operator shall strive to consider location of its temporary and permanent operations, where prudent and possible, so as to minimize interference with Township residents' enjoyment of their property and future Township development activities.

**Compliance Comment:** CNX will comply with this requirement.

117.604.69.11 Recognizing that adequate and appropriate lighting is essential to the safety of those involved in the Development of Oil and Gas, the Operator shall take steps, to the extent practicable, to direct site lighting downward and inward toward the drillsite, wellhead, or other area being developed so as to attempt to minimize glare on public roads and adjacent buildings within three hundred (300) feet of the drillsite, wellhead, or other area being developed.

**Compliance Comment:** CNX will add wording to the site specific hazard training to require proper setup of light plants to focus light inward and downward in accordance with this requirement. With the exception of Pad 5, there are no buildings or public roads within 300 feet of any drillsite, wellhead, or other area being developed.

117.604.69.12 At least thirty days (30 days) prior to drilling an Oil and Gas well or multiple Oil and Gas wells at a location, the Operator shall provide the following information to each resident within one thousand (1,000) feet of the planned surface location of the well(s):

- a. A copy of the well survey plat showing the location(s) of the planned well(s),

- b. A general description of the planned operations at the planned well(s) and associated equipment used in the Development of the well(s),
- c. The contact information for the Operator, and
- d. The availability of the Operator to hold a meeting with such residents to present Operator's plans for the well(s) and to allow for questions and answers. The meeting(s) shall be held prior to Well Site construction.

**Compliance Comment:** There are no residents within one thousand (1,000) feet of the planned surface location of any proposed wells. Therefore notification is not required.

117.604.69.13 The Operator shall provide:

- a. A map showing the planned access route to the Well Sites on public roads,

**Compliance Comment:** Access routes are shown in CNX's application materials.

- b. Information on the status of road bonding,

**Compliance Comment:** Applications have been filed for Excess Maintenance Agreements for both CNX Gas Company LLC & CONE Gathering LLC with the Pennsylvania Department of Transportation ("PennDOT"), and bonding will be posted in accordance with the requirements of those agreements and PennDOT regulations. Township routes will be bonded where required.

- c. The Operator's Erosion & Sedimentation Plan,

**Compliance Comment:** Included in CNX's application materials.

- d. The well survey plat showing the planned surface location(s) of the well(s), and

**Compliance Comment:** Included in CNX's application materials.

- e. The contact information for the Operator.

**Compliance Comment:** Jonathan Madill, Supervisor Gas Permitting CPA- Environmental Phone: 724-464-2961 email: jonathanmadill@consolenergy.com

- f. Written authorization from the property owner(s) who has legal or equitable title in and to the surface of the proposed Development.

**Compliance Comment:** CNX has entered into a lease with the ACAA.

- g. Copy of Federal Aviation Administration (FAA) form 7460 showing that there is no interference with air traffic.

**Compliance Comment:** The ACAA has filed Form 7460-1 for each well pad.

117.604.69.14 At least twenty (20) days prior to commencement of drilling, the Operator shall provide to the Township Manager a copy of the drilling permit issued by the Pennsylvania Department of Environmental Protection (“DEP”).

**Compliance Comment:** CNX will comply with this requirement.

117.604.69.15 In addition to the requirements in subsections 1-14 above, for any Oil and Gas well where the planned surface location of the well will be within one thousand (1,000) feet of a Protected Structure, the Operator shall:

- a. Install temporary safety fencing, at least six (6) feet in height, around drilling and hydraulic fracturing equipment and install permanent fall protection fencing meeting OSHA requirements around any pits that contain or could contain water or other liquids.
- b. Install warning signs providing notice of the potential dangers at the Well Site.
- c. Provide at least one security guard at all times (24 hours/day, 7 days/week) when a drilling rig or hydraulic fracturing equipment is on the Well Site.

**Compliance Comment:** This section is not applicable because there are no proposed wells within 1000 feet of any Protected Structure. However, under the terms of the ACAA-CNX Lease, fencing at least eight feet high will be installed, depending on the visibility from surrounding areas. CNX will install warning signs at appropriate locations on the Property, and will provide at least one security guard at all times during drilling and fracturing activities.

117.604.69.16 Prior to the commencement of drilling activities, no construction activities involving excavation of, alteration to, or repair work on any access road or Well Site shall be performed during the hours of 10:00 p.m. to 6:00 a.m.

**Compliance Comment:** CNX will comply with this requirement.

117.604.69.17 The Township recognizes and acknowledges that Oil and Gas Development is accompanied by inherent noise. However, the Operator shall take the following steps to minimize, to the extent practicable, the noise resulting from the Development:

- a. Prior to drilling of an Oil and Gas well, the Operator shall establish a continuous seventy-two (72)-hour ambient noise level at the nearest Protected Structure property line or one hundred (100) feet from the nearest Protected Structure (as measured to the closest exterior point of the building), whichever is closer to the Protected Structure or, alternatively, and in lieu of establishing the above seventy-two (72)-hour ambient noise level, the Operator may assume and use, for the purposes of compliance with this ordinance, a default ambient noise level of 55 dBA. The sound level meter used in conducting any evaluation shall meet the American National Standard Institute's standard for sound meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.
- b. The Operator shall provide documentation of any established, seventy-two (72)-hour evaluation relied upon to establish an ambient noise level greater than 55 dBA to the Township Manager within three (3) business days of such a request from the Zoning Officer.
- c. The noise generated during construction, drilling and hydraulic fracturing activities when measured at the nearest Protected Structure property line or one hundred (100) feet from the nearest Protected Structure (as measured to the closest exterior point of the building), whichever is closer to the Protected Structure, shall not exceed the average ambient noise level (as determined by the seventy-two (72) hour evaluation) or default level, whichever is higher:
  - i. during drilling activities by more than seven (7) decibels during the hours of 6:00 a.m. to 10:00 p.m.;
  - ii. during drilling activities by more than five (5) decibels during the hours of 10:00 p.m. to 6:00 a.m.; or
  - iii. by more than ten (10) decibels during construction, hydraulic fracturing operations.

The Operator shall inform the Township Manager of which level (average ambient noise level or default level) is being used.

- d. Adjustments to the forgoing noise limits may be permitted in accordance with the following:

Permitted Increase (dBA)	Duration of Increase (minutes)*
5.....	15
10.....	5
15.....	1
20.....	1

Cumulative minutes during any one hour.

- e. If a complaint is received by the Township from any person, whether a resident or otherwise using the Protected Structure as defined herein for any lawful purpose, regarding noise generated during construction, drilling or hydraulic fracturing activities, the Operator shall, within twenty-four (24) hours of receipt of the complaint from the Township, continuously monitor for a forty-eight (48) hour period at a point which is the closer to the complainant's building of:
  - i. the complainant's Protected Structure property line nearest to the wellsite or equipment generating the noise, or
  - ii. one hundred (100) feet from the Protected Structure.
- f. If the Operator engages in any noise testing as required by this Ordinance, it will provide preliminary data to the Township no later than five (5) business days following completion of the noise testing. Once the monitoring is complete, Operator will meet with Township's representatives and affected residents to discuss whether possible noise abatement measures are warranted, if the permitted levels set forth herein were exceeded.

**Compliance Comment:** Subsections 117.604.69.17a.-f. are not applicable because there are no proposed wells within 1000 feet of any Protected Structure. However, CNX is sensitive to concerns regarding noise and will implement strategies to minimize noise impacts on nearby properties. CNX also is willing to develop a protocol with the Township to respond to any noise complaints that may be received.

CNX has undertaken a detailed noise study which establishes that the noise limits of these subsections would be met even if applicable. A copy of that study is being submitted along with these compliance comments.

- g. Exhaust from any internal combustion engine or compressor used in connection with the drilling of any well or for use on any production equipment or used in Development shall not be discharged into the open air unless it is equipped with (i) an exhaust muffler or (ii) an exhaust box. The exhaust muffler or exhaust box shall be constructed of non-combustible materials designed and installed to suppress noise and disruptive vibrations. Moreover, all such equipment with an exhaust muffler or exhaust box shall be maintained in good operating condition according to manufacturer's specifications.

**Compliance Comment:** CNX will comply with this requirement.

h. All workover operations shall be restricted to the hours of 6:00 a.m. to 10:00 p.m., except in the extent of an emergency, as reasonably determined by the Operator. "Workover operations" shall mean work performed in a well after its completion in an effort to secure production where there has been none, restore production that has ceased, or increase production.

**Compliance Comment:** CNX will comply with this requirement.

i. The noise restrictions contained in this Paragraph 17 shall also apply to Natural Gas Compressor Stations and Natural Gas Processing Plants.

**Compliance Comment:** This subsection is not applicable as CNX is not proposing any such facilities.

117.604.69.18 Geophysical Exploration. Explosives Prohibited. No geophysical work employing underground explosives shall be authorized or permitted within the Township boundaries in connection with this use. Other geophysical exploration systems employing thumper, vibroseis, or other techniques not employing explosives shall be permitted upon a separate application described in Ordinance # 369 (Chapter 68).

**Compliance Comment:** CNX contracted with Precision Geophysical, Inc., which completed seismic testing in the Township in early November, using thumper trucks and vibroseis. All required permits for this activity were obtained from the Township. No explosives were used.

117.604.69.19 No temporary housing for workers is permitted.

**Compliance Comment:** Consistent with past Township practice, CNX requests a waiver of this requirement. Given the relative isolation of the proposed well pads, it will be to the benefit of CNX, its contractors and workers and the general public to permit well pad personnel to remain on site.

117.604.69.20 The Board of Supervisors may attach additional conditions in order to protect the public's health, safety, and welfare. These conditions may include but are not limited to increased setbacks.

**Compliance Comment:** Given the significant distances between any of CNX's proposed activities and any nearby properties or residences, no additional setbacks are necessary.

# EXHIBIT 6

**CNX GAS COMPANY LLC  
FINDLAY TOWNSHIP**

**MARCELLUS AND UPPER DEVONIAN SHALE GAS WELLS  
ACAA PADS 1, 2, 3, 4, 5 & 6 AND ACAA CA1, CI2 & CI3**

**SUPPLEMENTAL COMPLIANCE COMMENTS**

**February 20, 2014**

**117.603. General Requirements and Standards for all Conditional uses.** The Supervisors shall grant a conditional use only if it finds adequate evidence that any proposed development will meet all of the following general requirements as well as any specific requirements and standards listed in Section 117.604. The Supervisors shall among other things require that any proposed use and location be:

117.603.1. In accordance with the Comprehensive Plan and is consistent with the spirit, purposes, and the intent of this Ordinance;

**Compliance Comment:** CNX will comply with this requirement. With regard to existing land use patterns set forth in the Comprehensive Plan, Pads 1, 2, 3, 4, 6 and Impoundments 1, 2, and 3 are located in an area designated as “airport property” and Pad 5 is located in a “commercial” area. All of the pads and impoundments are located in areas zoned as HI Heavy Industry where oil and gas development is permitted by conditional use. CNX has shown that it will comply with all of the requirements for oil and gas development set forth in the Zoning Ordinance and, most critically, the specific conditional use requirements for oil and gas development in Section 117.604.69.

117.603.2. In the best interests of the Township, the convenience of the community, the public welfare, and be a substantial improvement to the property in the immediate vicinity;

**Compliance Comment:** CNX will comply with this requirement. CNX has shown that it will comply with all of the requirements for oil and gas development set forth in the Zoning Ordinance and, most critically, the specific conditional use requirements for oil and gas development in Section 117.604.69. CNX’s development of the oil and gas resources on the property will result in significant well fees being paid annually to Allegheny County, Findlay Township and surrounding communities. Revenues received by the ACAA pursuant to the lease with CNX can be used to reduce the costs of operation of and enhance service at Pittsburgh International Airport. CNX estimates that its activities on site will result in approximately 1.65 million labor hours, \$50 million in salaries and 790 jobs created.

117.603.3. Suitable for the property in question, and designed, constructed, operated, and maintained so as to be in harmony with and appropriate in appearance to the existing or intended character of the general vicinity;

**Compliance Comment:** CNX will comply with this requirement. As set forth above, the proposed development complies with all applicable Zoning Ordinance requirements. Additionally, the facilities are located in the HI Heavy Industry district and are located more than 1,000 feet from any inhabited area.

117.603.4. In conformance with all applicable requirements of this Ordinance, including but not limited to all of the provisions of Articles III, IV and V and all of the Township Ordinances;

**Compliance Comment:** CNX will comply with this requirement. Article III sets for the general district regulations, Article IV sets forth the uses permitted in each district, and Article V sets for the requirements for used located in overlay districts.

117.603.5. Suitable in terms of effects on highway traffic and safety with adequate access arrangements to protect streets from undue congestion and hazard.

**Compliance Comment:** CNX will comply with this requirement. CNX has committed to protecting streets from undue congestion and hazard by complying with road permitting/bonding requirements and procedures (Section 117.604.69.1); keeping roads free from dirt and debris (Section 117.604.69.2); installing signage along Hookstown Grade Road lowering speeds during school bus hours, limiting heavy truck traffic during school bus hours, and providing flagmen near school bus stops where necessary (Section 117.604.69.3); and providing a map of planned access routes (Section 117.604.69.13(a)). CNX projects that its operations, even during construction, will have a negligible impact on traffic volumes.

# EXHIBIT 7

**BEFORE THE FINDLAY TOWNSHIP BOARD OF SUPERVISORS**

IN RE: )  
Conditional Use Application of )  
CNX Gas Company LLC )

**HEARING MEMORANDUM**

**I. Introduction**

Currently pending before the Findlay Township (the "Township") Board of Supervisors is the application of CNX Gas Company LLC ("CNX") for conditional use approval of six natural gas well pads, three impoundments, and related facilities (the "Project") on Pittsburgh International Airport property operated by the Allegheny County Airport Authority (the "Property"). At its meeting on December 17, 2013, the Township Planning Commission reviewed CNX's conditional use application for the first four well pads and two impoundments and recommended approval with the condition that third-party air quality monitoring be provided for the residential area closest to the proposed well pads. CNX requests that the Board of Supervisors approve the conditional use without the condition recommended by the Planning Commission. The off-Property monitoring proposed by the Planning Commission is unnecessary, particularly in light of the monitoring that will be conducted by the Allegheny County Health Department and the many existing requirements that CNX will satisfy in order to minimize the Project's impact on local air quality. Furthermore, the Township lacks the legal authority to require CNX to perform off-Property air quality monitoring as part of its conditional use approval.

**II. Existing Federal, State, and County Air Programs Will Adequately Address Air Quality Concerns**

CNX is already obligated under federal, state and Allegheny County laws, regulations and ordinances to control and minimize air emissions from the Project, perform air quality monitoring, and report emissions data. The existing regulatory regime for controlling air pollutant emissions involves multiple government agencies, each of which is specifically authorized by law to implement a comprehensive air quality program. At the federal level, the Clean Air Act establishes a comprehensive air program that is administered by the U.S. Environmental Protection Agency ("U.S. EPA"). In Pennsylvania, as in many states, U.S. EPA has granted approval for the Department of Environmental Protection ("DEP") to administer aspects of the federal air program. DEP also implements a state air program established by the Pennsylvania Air Pollution Control Act ("APCA"). Pursuant to the APCA, a local government, such as a county, city, town, township or borough, may enact an ordinance with respect to air pollution, so long as the ordinance is at least as stringent as the APCA, the Federal Clean Air Act, and

related regulations, and the local government obtains approval from DEP and U.S. EPA. *See generally* 42 U.S.C. § 7410; 35 P.S. § 4012(a); 25 Pa. Code § 133.3(a).

Currently, there are only two approved local air pollution control programs in Pennsylvania: one in Allegheny County and the other in Philadelphia County. In all other areas of the Commonwealth, DEP and U.S. EPA have exclusive authority to regulate industrial sources of air emissions, including those relating to natural gas development. Within Allegheny County, the Allegheny County Health Department (“ACHD”) administers a comprehensive air quality program that monitors and analyzes air quality data collected around the County, issues installation and operating permits to sources of air pollution, performs inspections, and enforces air pollution control regulations. The ACHD air quality program employs a staff of approximately 45 employees, including technical analysts, engineers, and atmospheric modelers.

In light of this existing regulatory regime, CNX will comply with several federal, state and county air program requirements for the Project. For example, CNX will comply with applicable U.S. EPA regulations under 40 C.F.R. § 60, Subpart OOOO, which directs operators to use a process known as “reduced emissions completion” when preparing a well for production, and also imposes other requirements. CNX will also monitor and control emissions from the Project in order to satisfy the requirements of a state air permit exemption administered by DEP. In general, an air permit is not required for categories of sources that DEP determines are of minor significance. *See* 35 P.S. § 4006.1; 25 Pa. Code § 127.14(a)(8). DEP has assessed the impacts of air emissions from natural gas development sites and determined that such emissions are of minor significance. DEP thus exempts “[o]il and gas exploration, development, and production facilities and associated equipment and operations” from air permitting requirements. *See* DEP Doc. No. 275-2101-003, “Air Quality Permit Exemptions,” Exemption Category No. 38 (amended August 10, 2013). This exemption has been incorporated into the ACHD air permitting regulations. *See generally* ACHD Regulations, Article XXI, Section 2102.04(a)(5)(L). For this reason, CNX was not required to obtain an air permit for the Project. As a condition of permit exemption No. 38, however, CNX must comply with monitoring and emission control requirements. One such requirement obligates CNX to minimize fugitive emissions from the Project by implementing a Leak Detection and Repair (“LDAR”) program within 60 days after the well is put into production, and annually thereafter. This means that CNX will monitor and repair within 15 days leaks of fugitive emissions from valves, flanges, connectors, storage vessels/tanks, and compressor seals associated with the Project. *See id.* at page 9. Other conditions of exemption No. 38 include specific limits on emissions of volatile organic compounds (“VOCs”) and nitrogen oxides (“NOx”) that will apply for the entire Project. *See id.* at pages 10 and 11. In general, the requirements of exemption No. 38 that CNX must satisfy are more stringent than the federal requirements at Subpart OOOO.

Finally, CNX will be subject to new notification and reporting requirements under the recently-revised ACHD air quality regulations. On December 17, 2013, the Allegheny County Council voted to amend the ACHD regulations to require unconventional well operators to notify ACHD in writing no less than 24 hours prior to each of the following activities: initial well site construction, drilling, hydraulic fracturing, and flaring or venting during well completion (except where immediate flaring is necessary to ensure site safety). ACHD Regulations, Article XXI, Section 2105.110(b). Operators also must report to ACHD within two hours certain equipment breakdowns that have a substantial likelihood of causing unauthorized emissions. *See id.* at Section 2105.110(c). CNX will keep ACHD informed of activities for the Project pursuant to these requirements, which became effective on January 7, 2014.

### **III. CNX's Voluntary Use of Electric Engines and Adherence to the Center for Sustainable Shale Development's Air Performance Standards Will Further Reduce Air Emissions**

In December 2013, CNX publicly announced its plan to use electric engines to power nearly all drilling equipment for the Project in an effort to further reduce emissions. The use of electric engines is not required by law. Traditionally, operators rely mostly on diesel-fueled engines to power equipment used to construct and develop a well site. The combustion of diesel fuel, gasoline or even natural gas in equipment engines naturally results in emissions of NO<sub>x</sub>, VOCs and other compounds. CNX's use of electric engines will significantly reduce these emissions from the Project. The costs associated with using electric engines are greater than with traditional engines, largely because ancillary devices must be installed to provide electricity, but CNX is willing to take on this increased cost burden as part of its commitment to minimizing emissions from the Project.

As a founding member of the Center for Sustainable Shale Development ("CSSD"), CNX has collaborated with energy companies, environmental and public health organizations, and other stakeholders to develop environmental "Performance Standards" for shale gas development that exceed applicable regulatory requirements. Companies operating in the Appalachian Basin may voluntarily apply to the CSSD for certification that their operations meet the CSSD Performance Standards, which include measures that go above and beyond air regulatory requirements. (The current CSSD Performance Standards are attached to this memorandum as Exhibit 1.) As part of the certification process, independent auditors conduct site visits, collect data, and evaluate the company's performance. CNX is committed to implementing the CSSD Performance Standards for the Project and will formally apply for CSSD certification this year.

#### **IV. Emissions Information and Air Quality Studies are Already Available or Forthcoming**

##### **A. Off-Property Monitoring**

On January 20, 2014, ACHD announced that it will conduct air monitoring in the vicinity of the Property in response to a request from County Executive Rich Fitzgerald. According to the ACHD news release, ACHD plans to begin monitoring before CNX's operations commence and continue monitoring for at least a year after production begins. County Executive Fitzgerald stated in the news release that although the County is "extremely confident" that CNX will develop and operate the Project in a "safe and environmentally responsible manner," he asked ACHD to perform monitoring to alleviate concerns expressed by residents who live near the Property.<sup>1</sup> These same residents prompted the Township Planning Commission to recommend that third-party monitoring be performed in the residential area closest to the well pads. Now that ACHD will monitor off-Property air quality, the Planning Commission's recommendation is either moot and/or will be satisfied.

##### **B. On-Property Monitoring**

Regarding on-Property monitoring, CNX will collect information regarding actual emissions for the Project in order to prepare the annual emission report that is required to be submitted to DEP. *See* 58 Pa.C.S. § 3227; 25 Pa. Code § 135. This report will identify and quantify the actual air contaminant emissions from Project sources and describe the methods used to calculate emissions. Reported data will be publicly available on DEP's website. CNX already submits emissions data from its active well sites across the Commonwealth to DEP. The most recent annual emissions report filed with DEP provided 2012 emissions data that are representative of CNX well site operations, generally. Activities for the Project are expected to result in even lower emissions than other CNX projects because CNX will (1) perform reduced emission completions, pursuant to federal regulations under Subpart OOOO; (2) operate under the recently-amended and more stringent conditions of permit exemption No. 38;<sup>2</sup> (3) voluntarily use electric engines to power equipment for the Project; and (4) voluntarily implement the CSSD Performance Standards relating to air quality, as discussed in Section III.

##### **C. DEP Air Monitoring Studies**

In addition to the emissions data that is submitted to DEP annually by operators, the agency has been collecting data for years to examine possible air quality impacts of

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<sup>1</sup> ACHD News Release, "Health Department to Begin Air Monitoring Near Airport Project," January 20, 2014, available at [http://www.alleghenycounty.us/ACHD\\_AirMonitoringNearAirport.aspx](http://www.alleghenycounty.us/ACHD_AirMonitoringNearAirport.aspx).

<sup>2</sup> In August 2013, DEP amended the conditions that an operator must satisfy in order to qualify for permit exemption No. 38, making the conditions for unconventional wells, such as Marcellus Shale wells, more stringent. *See* 43 Pa. Bull. 4661 (August 10, 2013).

oil and gas development in the Commonwealth. In April 2010, DEP launched a series of three short-term air monitoring projects to study ambient air near activities associated with oil and gas development. The first study focused on oil and gas activities in the southwestern region of the Commonwealth, namely Greene and Washington Counties. In a report issued for the first study in November 2010, DEP concluded that the results of the study “did not identify concentrations of any compound that would likely trigger air-related health issues associated with Marcellus Shale drilling activities.”<sup>3</sup> DEP later studied air quality impacts associated with oil and gas operations in the north-central and northeastern regions of the Commonwealth and reached the same conclusion.<sup>4</sup> Currently, DEP is engaged in a similar long-term air monitoring project in the southwestern region (Washington County). DEP expects to release a final report for the long-term study this spring.<sup>5</sup>

#### V. Findlay Township Lacks Authority to Impose Air Quality-Related Conditions

If the Township wishes to regulate air emissions from industrial sources located within its borders, it cannot do so on a piecemeal basis by attaching conditions to a particular project approval. Instead, the Township must obtain permission from DEP and U.S. EPA to implement a *comprehensive* air pollution control program that would apply to all uses in the Township. Unless and until the Township complies with this requirement, it lacks the legal authority to regulate air quality and therefore cannot require CNX to perform off-Property monitoring or satisfy other air quality-related conditions.

In Pennsylvania, a local government that intends to regulate air quality must seek DEP approval through a formal application process. See 25 Pa. Code § 133.3(a). The application must include a plan for a comprehensive air pollution control program. See 25 Pa. Code § 133.3(b)(3). This means that the local government is in an “all or nothing” situation: it can either develop a comprehensive air program affecting *all* uses in its jurisdiction or decline to regulate air quality at all, in which case DEP will continue to implement the statewide air program. Even if DEP grants approval of a local air pollution control program, U.S. EPA must also approve the

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<sup>3</sup> DEP, “Southwestern Pennsylvania Marcellus Shale Short-Term Ambient Air Sampling Report,” at iii, November 1, 2010, available at

[http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/Marcellus\\_SW\\_11-01-10.pdf](http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/Marcellus_SW_11-01-10.pdf).

<sup>4</sup> See DEP, “Northcentral Pennsylvania Marcellus Shale Short-Term Ambient Air Sampling Report,” May 6, 2011, available at

[http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/Marcellus\\_NC\\_05-06-11.pdf](http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/docs/Marcellus_NC_05-06-11.pdf); DEP, “Northeastern Pennsylvania Marcellus Shale Short-Term Ambient Air Sampling Report,” January 12, 2011, available at [http://files.dep.state.pa.us/RegionalResources/NERO/NEROPortalFiles/Marcellus\\_NE\\_01-12-11.pdf](http://files.dep.state.pa.us/RegionalResources/NERO/NEROPortalFiles/Marcellus_NE_01-12-11.pdf).

<sup>5</sup> DEP News Release, “DEP Provides Update on Long-Term Marcellus Air Sampling, Releases Technical Support Document,” August 1, 2013, available at

[http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/rls-DEP-AQStudyUpdate-073013\\_FINAL\\_DRAFT.pdf](http://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/rls-DEP-AQStudyUpdate-073013_FINAL_DRAFT.pdf).

program by granting an amendment to the State Implementation Plan.<sup>6</sup> *See generally* 42 U.S.C. § 7410. DEP will review an approved local program on an annual basis and may suspend or rescind its approval if the local government is not effectively administering the program. *See* 25 Pa. Code §§ 133.8 and 133.9. As indicated in Section II above, only two local governments in the Commonwealth have obtained approval for an air program: Allegheny County and Philadelphia County.

Pennsylvania courts recognize that local governments have limited authority to impose environmental conditions on conditional use approvals. In 2010, the Commonwealth Court rejected the air quality-related conditions that an Allegheny County municipality had attached to a conditional use approval associated with a ready-mix concrete plant. In *HHI Trucking & Supply, Inc. v. Borough of Oakmont*, the Borough of Oakmont granted the conditional use but required, among other conditions, that the applicant (1) equip all of its diesel vehicles accessing the plant site with particulate filters, (2) restrict the idling time of all on-site vehicles and equipment to 15 minutes or less at all times, and (3) hire a third-party expert to conduct annual air quality studies to demonstrate compliance with ACHD standards and submit related reports to the Borough Manager. 990 A.2d 152, 158 (Pa. Commw. Ct. 2010). The applicant appealed the conditions, which were rejected by the Allegheny County Court of Common Pleas. The Commonwealth Court affirmed, finding that the conditions were unreasonable in part because the applicant had already satisfied all DEP and ACHD air quality standards. *See id.* at 157, 162. In its decision, the Commonwealth Court also acknowledged the limited scope of a municipality's authority to attach environmental conditions to a conditional use approval. *See id.* at 160 & n.8 (describing the jurisdiction of a zoning hearing board as being limited to enforcement of the zoning ordinance, in contrast with the authority of other governmental agencies to enforce environmental protection statutes). According to the Commonwealth Court, the municipality's authority is so limited in order to prevent inconsistent results—the Court pointed out, for example, that the Borough would have allowed the applicant to idle trucks for no more than 15 minutes, whereas the existing ACHD regulation limited idling time of such trucks to 5 minutes. *See id.* at 160 n.8. In *HHI*, the Commonwealth Court clearly appreciated the fact that the standards already being enforced by DEP and ACHD were sufficient to protect air quality.

## VI. Conclusion

Federal, state, and Allegheny County laws, regulations and ordinances already establish extensive air quality standards that CNX must meet in order to protect public health and the environment in the Township. These standards are developed and enforced by teams of agency officials with special technical expertise. To comply with these existing requirements, CNX will, among other things, collect

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<sup>6</sup> The Federal Clean Air Act requires each state to have a State Implementation Plan or "SIP" that identifies how the state will attain or maintain the air quality levels set by the National Ambient Air Quality Standards under the Clean Air Act. The SIP is formally adopted by the state and approved by U.S. EPA to ensure consistency with the Clean Air Act.

emissions data from the Project and report that data to DEP, which will make the information publicly available. To further reduce any air emissions from the Project, CNX will voluntarily use electric engines to power nearly all drilling equipment, despite the increased cost burden associated with electric engines. CNX will also voluntarily implement the CSSD Performance Standards that go above and beyond applicable air regulatory requirements.

In response to citizen concerns, Allegheny County officials have specifically directed ACHD to monitor air quality in a residential area located off-Property. As a result, the Planning Commission's recommendation with regard to off-Property monitoring is either moot and/or will be satisfied. Meanwhile, DEP has already analyzed air quality data associated with oil and gas operations around the Commonwealth, including the southwestern region. DEP determined that emissions from well sites are relatively minor and also found that Marcellus Shale development is unlikely to trigger air-related health issues.

The Township currently has no legal authority to require CNX to perform off-Property air monitoring. Under the existing regulatory regime, the Township cannot regulate air emissions from oil and gas development activities unless and until DEP and U.S. EPA approve a comprehensive air pollution control program for the Township.

In light of the above considerations, CNX requests that the Board of Supervisors decline to include any air quality-related conditions with its approval of CNX's conditional use application.

**Exhibit 1**

**Center for Sustainable Shale Development  
Performance Standards**

Current as of August 19, 2013

# PERFORMANCE STANDARDS

AUGUST 19, 2013

## GEOGRAPHIC SCOPE AND APPLICABILITY OF CSSD PERFORMANCE STANDARDS

These standards apply to unconventional exploration, development, and gathering activities including site construction, drilling, hydraulic fracturing and production in the Appalachian Basin. These regional standards consider geology, topography, population density, infrastructure, surface water, ground water and other issues of particular concern in the Appalachian Basin. Accordingly, until such time as the scope of these standards may be amended, these standards and the CSSD evaluation and certification process will be limited to Operators' unconventional activities in the Appalachian Basin.

## WATER PERFORMANCE STANDARDS

The goal of the water standards is that there be zero contamination of fresh groundwater<sup>1</sup> and surface waters.

## WASTEWATER PERFORMANCE STANDARDS

### PERFORMANCE STANDARD NO. 1

1. Operators shall maintain zero discharge of wastewater (including drilling, flowback and produced waters) to Waters of the Commonwealth of Pennsylvania and other states until such time as CSSD adopts a standard for treating shale wastewater to allow for safe discharge. Such standard will be adopted by September 1, 2014.

*Note: This standard does not apply to nor prohibit disposal of wastewater by deep well injection.*

### PERFORMANCE STANDARD NO. 2

1. Operators shall maintain a plan to recycle flowback and produced water, for usage in drilling or fracturing a well, to the maximum extent possible.
2. By September 24, 2014 or date of an Operator's initial application for certification (whichever is later), Operators must recycle a minimum of 90% of the flowback and produced water, by volume, from its wells in all core operating areas in which an Operator is a net water user.
3. CSSD will consider a recycling standard for a net water producer within one year. Operators will maximize the use of recycled water to the extent possible during this time.

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<sup>1</sup> "Fresh groundwater" is "water in that portion of the generally recognized hydrologic cycle which occupies the pore spaces and fractures of saturated subsurface materials."

## **PITS/IMPOUNDMENTS PERFORMANCE STANDARDS**

### **PERFORMANCE STANDARD NO. 3**

1. Any new pits designed shall be double-lined and equipped with leak detection.
2. Operators, by March 20, 2014 or initial date of application for certification (whichever is later), shall contain drilling fluid, when using oil-containing drilling fluids to drill a well, in a closed loop system at the well pad (e.g. no ground pits).
3. Operators, by March 20, 2015 or initial date of application for certification (whichever is later), shall contain drilling fluid and flowback water in a closed loop system at the well pad, eliminating the use of pits for all wells.<sup>2</sup>

### **PERFORMANCE STANDARD NO. 4**

1. When utilizing centralized impoundments for the storage of flowback and/or produced waters, Operators shall ensure that free hydrocarbons are removed from the water prior to storage and that new impoundments are double-lined with an impermeable material, equipped with leak detection and take measures to reasonably prevent hazards to wildlife. Total hydrocarbons should be substantially removed.
2. Additionally, CSSD will facilitate research designed to determine the extent of hydrocarbon emissions from these waters so that by September 1, 2014, a decision can be made as to whether, and to what extent, this standard should be amended.

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<sup>2</sup> For guidance document:

Pit – any in-ground impression constructed on a well site that is used for the storage and disposal of residual waste from the development of a natural gas well.

Centralized Impoundment – any in-ground impression constructed off of the well site which is used to store and aggregate flowback water for use in the hydraulic fracturing process.

## **GROUNDWATER PROTECTION PERFORMANCE STANDARDS**

### **PERFORMANCE STANDARD NO. 5**

1. Operators shall establish an Area of Review (AOR), prior to drilling a well, which encompasses both the vertical and horizontal legs of the planned well. Within the AOR, the Operator must conduct a comprehensive characterization of subsurface geology, including a risk analysis that demonstrates the presence of an adequate confining layer above the production zone that will prevent adverse migration of hydraulic fracturing fluids. As part of the risk analysis, and before proceeding with hydraulic fracturing, the Operator must also conduct a thorough investigation of any active or abandoned wellbores within such area of review or other geologic vulnerabilities (e.g., faults) that penetrate the confining layer and adequately address identified risks.

### **PERFORMANCE STANDARD NO. 6**

1. Operators shall develop and implement a plan for monitoring existing water sources, including aquifers and surface waters (as defined in the CSSD Guidance for Auditors document) within a 2,500 foot radius of the wellhead (or greater distance, if a need is clearly indicated by geologic characterization), and demonstrate that water quality and chemistry measured during a pre-drilling assessment are not impacted by operations.
2. Operators must conduct periodic monitoring for at least one year following completion of the well. Such monitoring must be extended if results indicate potential adverse impacts on water quality or chemistry by operations.
3. In the event that monitoring establishes a possible link between an Operator's activities and contamination of a water source, the Operator shall develop and implement an investigative plan and, if a positive link is established, implement a corrective action plan.
4. The testing and monitoring plan should provide for additional monitoring in the event a well is re-stimulated.

## PERFORMANCE STANDARD NO. 7

1. Operators shall design and install casing and cement to completely isolate the well and all drilling and produced fluids from surface waters and aquifers, to preserve the geological seal that separates fracture network development from aquifers, and prevent vertical movement of fluids in the annulus.
2. Operators will not use diesel fuel in their hydraulic fracturing fluids.
3. Operators will publically disclose the chemical constituents intentionally used in well stimulation fluids. Disclosures will include: information identifying the well, the Operator and the dates of the well stimulation; the type and total volume of the base fluid; the type and amount of any proppant; all chemical additive products used in a well stimulation, including the name under which the product is marketed or sold, the vendor, and a descriptor of additive's purpose or purposes (e.g. biocide, breaker, corrosion inhibitor, etc.); the common name and Chemical Abstracts Service registry number for each chemical ingredient used in a stimulation fluid; the actual or maximum concentration of each chemical ingredient, expressed as a percent by mass of the total stimulation fluid. Chemical ingredients should be disclosed in a manner that does not link them to their respective chemical additive products. Disclosure of the above information will be offered to the relevant state agency and will also be posted on [FracFocus.org](http://FracFocus.org). If an Operator, service company or vendor claims that the identity of a chemical ingredient is entitled to trade secret protection, the Operator will include in its disclosures a notation that trade secret protection has been asserted and will instead disclose the relevant chemical family name. Operators will implement measures consistent with state law to assist medical professionals in quickly obtaining trade secret information from the Operator, service company or vendor holding the trade secret that may be needed for clinical diagnosis or treatment purposes.
4. CSSD will develop a standard relating to the public disclosure of chemicals other than well stimulation fluids by September 1, 2013.
5. Operators will also work toward use of more environmentally neutral additives for hydraulic fracturing fluid. Mechanical integrity tests shall be performed when refracturing an existing well.

## PERFORMANCE STANDARD NO. 8

1. Operators shall design each well pad to minimize the risk that drilling related fluids and wastes come in contact with surface waters and fresh groundwater<sup>3</sup>.
2. In preparation for any spill or release event, Operators shall prior to commencement of drilling, develop and implement an emergency response plan, ensure local responders have appropriate training in the event of an emergency, and work with the local governing body, in which the well is located, to verify that local responders have appropriate equipment to respond to an emergency at a well.
3. In addition, in the event of spill or release, beyond the well pad, Operators shall immediately provide notification to the local governing body and any affected landowner.

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<sup>3</sup> Fresh groundwater is defined as water in that portion of the generally recognized hydrologic cycle which occupies the pore spaces and fractures of saturated subsurface materials.

## AIR PERFORMANCE STANDARDS

### PERFORMANCE STANDARD NO. 9

1. Beginning on January 1, 2014, in accordance with the conditions set forth in Paragraphs 3 and 4 below, an Operator must direct all pipeline-quality gas during well completion of development wells<sup>4</sup>, and re-completion or workover of any well into a pipeline for sales.
2. Any gas not captured and put in the sales pipeline may not be vented<sup>5</sup> and must be flared in accordance with Standard No. 10 below.
3. Acceptable reasons for sending gas to a flare and not directing gas into the sales line include:
  - a) Low content of flammable gas. Such low-flammability gas must be directed through a flare, past a continuous flame, to insure combustion begins when gas composition becomes flammable;
  - b) For safety reasons.
4. Circumstances unacceptable for sending gas to flare, instead of directing it into a sales line, are:
  - a) Beginning on January 1, 2014, a lack of a pipeline connection except for wells that are designated as either exploratory or extension wells using SEC definitions (however, companies should minimize flaring and maximize the use of reduced emissions completions on exploratory or extension wells, where possible);
  - b) Inadequate water disposal capacity;
  - c) Undersized flow back equipment, lack of flow back equipment or lack of equipment operating personnel.
5. Any upset or unexpected condition that leads to flaring of gas, instead of directing it into a sales line, must be documented and records maintained by the Operator, including a description of the condition, the location, date, and quantity of gas flared.

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<sup>4</sup> Development wells are wells that are not exploratory or extension wells, as those terms are defined and restricted in Paragraph 6.

<sup>5</sup> For purposes of this standard, venting does not include the de minimis fugitive emissions from gas busters (i.e. that may occur from separator vessels during the initial cleanup period of the well). Immediately upon detection of gas in the flowback, Operators must divert the flowback into reduced emission completion ("REC") equipment.

6. Using the SEC definitions, an exploratory well is a well drilled to find a new field or to find a new reservoir in a field previously found to be productive of oil or gas in another reservoir. An extension well is a well drilled to extend the limits of a known reservoir. Wells with these designations must be consistent with Operator reporting of such designations to the SEC, if applicable.

#### PERFORMANCE STANDARD NO. 10

1. When flaring is permitted during well completion, re-completions or workovers of any well, pursuant to Standard No. 9 above, Operators must adhere to the following requirements.
  - a) Operators must either use raised/elevated flares or an engineered combustion device with a reliable continuous ignition source, which have at least a 98% destruction efficiency<sup>6</sup> of methane. No pit flaring is permitted.
  - b) Flaring may not be used for more than 14-days on any development well (for the life of the well). Flaring may not be used for more than 30-days on any exploratory or extension wells (for the life of the well), including initial or recompletion production tests, unless operation requires an extension.<sup>7</sup> If flaring continues beyond 30-days for an exploratory or extension well, Operators must document the extent of additional flaring and reasons requiring flaring beyond the 30-days.
  - c) Flares shall be designed for and operated with no visible emissions, except for periods not to exceed a total of five minutes during any two consecutive hours.

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<sup>6</sup> Certification of the 98% destruction efficiency may be obtained through either of the following options: (1) a manufacturer's certification and where operation is in accordance with the manufacturer's specifications and parameters; or (2) where the flares are designed and operated in accordance with the following: (a) meet specifications for minimum heating values of waste gas, maximum tip velocity, and pilot flame monitoring found in 40 CFR § 60.18; (b) if necessary to ensure adequate combustion, sufficient gas shall be added to make the gases combustible; (c) an infrared monitor is considered equivalent to a thermocouple for flame monitoring purposes; (d) an automatic ignition system may be used in lieu of a continuous pilot; (e) flares must be lit at all times when gas streams are present; (f) fuel for all flares shall be sweet gas or liquid petroleum gas except where only field gas is available and it is not sweetened at the sites; and (g) flares shall be designed for and operated with no visible emissions, except for periods not to exceed at total of five minutes during any two consecutive hours.

<sup>7</sup> For performance standard 10, the 30-day time limit for flaring was based on West Virginia's rules which allow 30-days of temporary flaring before a permit is required. W. Va. CSR § 45-6-6.1a. Additionally, because all states that have developed a flaring time-limit allow flaring to continue longer than the time limit with approval, certain exceptions to the 30-day time limit were provided in performance standard 10 for emergency and upset conditions and well purging and evaluation tests. These exceptions were based on Wyoming's rules. WOGCC Rules and Regulations, Chapter 3, Section 40. Pennsylvania currently has no regulations addressing flaring directly.

## PERFORMANCE STANDARD NO. 11

1. The following standard applies only to nonroad dedicated diesel horizontal drilling rig engines at the wellpad. CSSD encourages and supports the conversion of drilling rig engines to either dual-fuel, electricity or natural gas. The following emissions standards apply to the nonroad dedicated diesel drilling rig engines.
  - a) By March 20, 2013, Operator and contractor nonroad engines shall achieve horse power-hour weighted average<sup>8</sup> site emissions equivalent to U.S. EPA Tier 2 nonroad diesel engine standards or better.
  - b) By March 20, 2015, 25% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>9</sup>
  - c) By September 24, 2015, 75% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>10</sup>
  - d) By September 24, 2016, 95% of Operator or contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>11</sup>
  - e) All nonroad equipment must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

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<sup>8</sup> Weighted average emissions are based on an annual weighted average using the certified emissions level of each engine (g/bhp-hr), the rated power of each engine (HP), and the run time (hrs) of each engine over the course of the year.

<sup>9</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>10</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>11</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

2. The following standard applies only to dedicated diesel fracturing pump engines at the wellpad. CSSD encourages and supports the conversion of fracturing pump engines to either dual-fuel, electricity or natural gas.
  - a) If the fracturing pump is a nonroad dedicated diesel engine powered solely by diesel fuel, then the following emissions standards apply:
    - (i) By March 20, 2014, Operator and contractor nonroad engines shall achieve horse power-hour weighted average<sup>12</sup> site emissions equivalent to U.S. EPA Tier 2 nonroad diesel engine standards or better.
    - (ii) By September 24, 2015, 25% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>13</sup>
    - (iii) By September 24, 2016, 75% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>14</sup>
    - (iv) By September 24, 2017, 95% of all Operator and contractor engine utilization (hp) shall comply with U.S. EPA Tier 4 emissions standards for particulate matter (PM).<sup>15</sup>

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<sup>12</sup> Weighted average emissions are based on an annual weighted average using the certified level of each engine (g/bhp-hr), the rated power of each engine (HP), and the run time (hrs) of each engine over the course of the year.

<sup>13</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>14</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>15</sup> Meeting U.S. EPA Tier 4 emissions standards for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

- (v) These engines must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.
- b) If the fracturing pump is powered by a dedicated diesel heavy-duty vehicle engine, then the following emissions standards apply:
- (i) By March 20, 2013, 50% of the heavy-duty vehicle engines used to power fracturing pumps must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions.<sup>16</sup>
  - (ii) By September 24, 2014, 80% of the heavy duty vehicle engines used to power fracturing pumps, must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions.<sup>17</sup>
  - (iii) These engines must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.
3. By March 20, 2014, CSSD will develop a standard and implementation date for all other engines located at the wellpad.

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<sup>16</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>17</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

### PERFORMANCE STANDARD NO. 12

The following standard is only applicable to compressor engines dedicated to unconventional activities.

1. By March 20, 2014, existing compressor engines greater than 100 horsepower may not emit more than 1.5 grams of NO<sub>x</sub> per horsepower-hour.
2. Any new, purchased, replacement, reconstructed, or relocated lean-burn engines greater than 100 horsepower may not emit more than 0.5 g/hp-hr for NO<sub>x</sub>; 2.0 g/hp-hr for CO; 0.7 g/hp-hr for VOCs.
3. Any new, purchased, replacement, reconstructed, or relocated rich-burn engines greater than 100 horsepower may not emit more than 0.3 g/hp-hr for NO<sub>x</sub>; 2.0 g/hp-hr for CO; 0.7 g/hp-hr for VOCs.

*Note: This standard will be updated to reflect any future determinations from regulatory agencies with regard to the NO<sub>x</sub> limitation.*

### PERFORMANCE STANDARD NO. 13

1. By October 15, 2013, all (existing or new) individual storage vessels at the wellpad with VOC emissions equal to or greater than 6 tpy must install controls to achieve at least a 95% reduction in VOC emissions.

### PERFORMANCE STANDARD NO. 14

This standard is applicable to new and existing equipment dedicated to unconventional activities unless stated otherwise.

1. Change rod packing at all reciprocating compressors (both existing and new), including those at the wellhead, either every 26,000 hours of operation or after 36 months.
2. By October 15, 2013, pneumatic controllers (both existing and new) must be low – bleed, with a natural gas bleed rate limit of 6.0 scfh or less, or zero bleed when electricity (3-phase electrical power) is on-site.
3. New centrifugal compressors may not contain wet oil seals. Operators must replace worn out wet seals on existing centrifugal compressors with dry seals.

4. By March 20, 2014 or date of an Operator's initial application for certification (whichever is later), Operators will implement a directed inspection and maintenance program (DI&M) for equipment leaks from all existing and new valves, pump seals, flanges, compressor seals, pressure relief valves, open-ended lines, tanks and other process and operation components that result in fugitive emissions. Process components subject to DI&M are monitored by a weekly visual, auditory, and olfactory check, and once a year by a mechanical or instrument check to detect leaks. Once significant leaks are detected, they are required to be repaired in a timely manner.
5. Eliminate VOC emissions associated with the prevention of well-bore freeze-up (only de minimis emissions are permitted).
6. Existing and new compressors are required to be pressurized when they are off-line for operational reasons in order to reduce blowdown emissions.

#### **PERFORMANCE STANDARD NO. 15**

1. By March 20, 2014, 80% of all trucks used to transport fresh water or well flowback water must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions.<sup>18</sup>
2. By September 24, 2015, 95% all trucks used to transport fresh water or well flowback water must meet U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter emissions.<sup>19</sup>
3. All on-road vehicles and equipment must limit unnecessary idling to 5 minutes, or abide by applicable local or state laws if they are more stringent.
4. All on-road and non-road vehicles and equipment must use Ultra-Low Sulfur Diesel fuel (15 ppm of sulfur) at all times.

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<sup>18</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

<sup>19</sup> Meeting U.S. EPA's Final Emission Standards for 2007 and Later Model Year Highway Heavy-Duty Vehicles and Engines for particulate matter (PM) emissions may be accomplished by retrofitting with technology on the current Verified Retrofit Technologies List for U.S. EPA or the California Air Resources Board (CARB), which is capable of achieving at least an 85% reduction in PM emissions, and which is installed and operated according to the conditions of the U.S. EPA or CARB verification protocols.

# EXHIBIT 8

Monday, January 20, 2014

## Health Department to Begin Air Monitoring Near Airport Project

**PITTSBURGH** – The Allegheny County Health Department announced today that it will begin an air monitoring study in a community near to the Marcellus Shale natural gas production project at Pittsburgh International Airport. The monitoring is being done following a request from County Executive Rich Fitzgerald, after discussions about homeowners' concerns with State Senator Matt Smith and State Representative Mark Mustio.

"This project represents the first large-scale development of a wet gas field in Allegheny County. At the request of County Executive Fitzgerald, we will conduct an air monitoring study in a community near to the project to make certain there are no unforeseen problems," said Jim Thompson, Deputy Director of Environmental Health.

The monitoring will also verify that public health is not adversely affected. The Health Department will begin monitoring before operations commence to establish baseline concentrations, and will then continue for at least a year after production begins.

"We are extremely confident that our partner in this project, CONSOL Energy, will conduct the drilling and extraction in a safe and environmentally responsible manner," said County Executive Fitzgerald. "That being said, this is also the first project of this size in Allegheny County and we want to ensure that this is done in a health-conscious way. Senator Smith has certainly heard concerns from his residents, and I believed that his recommendation for monitoring was a proactive way to ensure the air quality in the area of the project."

The Marcellus Shale natural gas production project at Pittsburgh International Airport provides a significant economic opportunity to Allegheny County. It adds to the supply of inexpensive natural gas and co-product natural gas liquids which will attract the construction of local facilities that utilize these feed stocks. CONSOL expects that construction of the well sites, centralized impoundments and pipelines will begin in the second quarter of 2014. Drilling activity is expected to begin in July 2014 with two vertical rigs. Once horizontal rig operations begin, the county will be reduced to one. Approximately 17 miles of gas lines and 12 miles of water line will be utilized to deliver gas to market and provide water for well completions.

"Representative Mustio and I have had ongoing conversations with residents and have worked to make sure that they are being heard throughout the process and that their concerns are being addressed," said Senator Smith. "I thank County Executive Fitzgerald for his commitment to work with all parties in an interactive manner to make sure energy exploration in Allegheny County is done in the most responsible way."

In February of 2013, County Council approved an ordinance authorizing the lease of minerals at the Pittsburgh International Airport and permitted drilling and other necessary operations to extract oil, gas, natural gas liquids and other materials. CONSOL Energy, Inc. will pay an estimated \$500 million over the next 20 years for the right to drill for shale gas on the 9,263 acres surrounding the airport. CONSOL also plans to invest another \$500 million in drilling-related infrastructure and other costs.

# EXHIBIT 9

## **PROFESSIONAL RESUME**

**JOHN J. KEELING, PE, CIH, CSP, QEP**

### **EDUCATION**

B.S. Civil Engineering, University of Kentucky  
Statistical Process Control (Deming's Concept)\  
Quality Management (Juran Concept)

### **REGISTRATIONS/CERTIFICATIONS**

Registered Professional Engineer (PE), State of West Virginia, Commonwealth of Kentucky, State of Maryland

Certified Industrial Hygienist (CIH), American Board of Industrial Hygiene

Certified Safety Professional (CSP), Board of Certified Safety Professionals

Qualified Environmental Professional (QEP), Institute of Professional Environmental Practice

### **PROFESSIONAL ORGANIZATIONS**

Professional Member, American Society of Safety Engineers

Full Member, American Industrial Hygiene Association

Member, Air and Waste Management Association

Chairman, Harrison County SARA Title III Local Emergency Planning Committee

### **EXPERIENCE AND BACKGROUND**

Mr. Keeling's professional work experience includes employment with the following:

- Kentucky Department of Transportation
- Union Carbide Corporation
- MSES Consultants, Inc.

His work for these organizations began in 1974 as a Highway Design Engineer. Career changes at Union Carbide Corporation included Engineering to Working Conditions and Project Community Impact Studies. In 1990, he joined MSES Consultants, Inc. as Vice President with a primary responsibility involving noise impact assessments for client personnel and assessment/noise attenuation design for client facilities operating near residential communities.



JOHN J. KEELING  
PAGE TWO

Mr. Keeling has worked on working condition improvement projects; pre and post construction/operation Sound Level Studies, served as team leader on numerous process safety reviews; and served as Team Leader for a variety of MSES projects requiring Civil Engineering and Industrial Hygiene expertise.

Other key notes in Mr. Keeling's experience and qualifications with respect to noise assessment/attenuation include the following:

Highway Construction noise attenuation at Bardstown, Kentucky

Air Pollution Control Device noise assessment/attenuation projects at various Union Carbide Corporation facilities in WV, TN, CA, OH, and NY.

Working Conditions noise assessments/attenuation projects at various Union Carbide Corporation facilities in WV, TN, CA, OH, and NY.

Working Conditions and Community noise assessments associated with Saw Mills and Dry Kilns for various hardwood suppliers in WV, PA, VA, and NC.

Community noise assessments of compressor station operations for various Natural Gas Clients in WV, PA, VA, and KY.

Community noise assessments for Natural Gas Clients of shale gas well drilling and hydraulic fracturing in WV, PA, and OH.

# EXHIBIT 10

**REPORT OF PREDICTED NOISE**  
**ASSOCIATED WITH NATURAL GAS PAD 2**  
**ACTIVITY**

PREPARED FOR:

**ALLEGHENY COUNTY AIRPORT AUTHORITY**  
**PROPERTY ENVIRONMENTAL ASSESSMENT**

PREPARED BY:

**MSES consultants, inc.**  
**609 West Main Street**  
**Clarksburg, WV 26301**  
**304-624-9700**

## Table of Contents

Report of Predicted Noise.....

Summary .....

Appendices..... --

Figures..... --

### List of Appendices

<u>Appendix</u>	<u>Description</u>
A	Background Noise Study ACAA Property
B	Noise Study at Active Drilling & Hydraulic Fracturing locations
C	Noise Calculations

### List of Figures

<u>Figure</u>	<u>Description</u>
A1	Vertical Drilling Impact on Pinion Drive
A2	Hydraulic Fracturing Impact on Pinion Drive
A3	Horizontal Drilling Impact on Pinion Drive
B1	Vertical Drilling Impact on Engelman Drive
B2	Hydraulic Fracturing Impact on Engelman Drive
B3	Horizontal Drilling Impact on Engelman Drive
C1	Vertical Drilling Impact on Tamarack Drive
C2	Hydraulic Fracturing Impact on Tamarack Drive
C3	Horizontal Drilling Impact on Tamarack Drive

## REPORT OF PREDICTED NOISE

MSES consultants, inc. (MSES) had previously performed noise measurements and provided reports with respect to noise for the proposed Natural Gas Pad construction, drilling, and Hydraulic Fracturing anticipated to be conducted at the Allegheny County Airport Authority Property (ACAA).

The two (2) previous reports are described below:

1. Background noise study at Pads 1 & 2 as well as nearest property line locations. (See Appendix A for Executive Summary and Data Excerpts).
2. Drilling and Hydraulic Fracturing study at various locations in Pennsylvania and West Virginia. (See Appendix B for Executive Summary and Data Excerpts).

The data for these studies was obtained from direct measurements at the various representative locations. After completion and distribution of these reports, MSES was requested to predict noise levels at various locations in the Imperial Pointe Residential Development which is located near Pad #2.

The specific locations and distances from the center of Pad #2 are provided below:

<u>Location</u>	<u>Distance from Center of Pad #2</u>
Residence off Pinion Drive cul-de-sac closest to Pad #2	1,650 feet
Edge of Pinion Drive cul-de-sac	1,960 feet
Residence off Engelman Drive cul-de-sac closed to Pad #2	1,710 feet
Edge of Engelman Drive cul-de-sac	1,820 feet
Residence off Cedar Drive cul-de-sac closest to Pad #2	1,870 feet
Intersection of Tamarack Drive and Birch Street	2,330 feet

Since direct measurements for noise at the drilling and hydraulic fracturing locations was not possible beyond 1,200 feet due to topography and property access restrictions, MSES used the available data to calculate noise levels at the distance in excess of 1,200 feet from the center of the pad.

The calculations are provided in Appendix C.



The following table provides the calculated noise levels from Pad #2 activities that will be experienced at various locations in the residential area of Imperial Pointe. These calculated noise levels do not include the non-natural gas operations within the community such as traffic & lawn mowing that will result in elevated noise levels depending on the proximity of the noise source.

Location	Distance from Center of Pad (ft.)	Typical Noise (dBA)		
		Vertical Drilling	Horizontal Drilling	Hydraulic Fracturing
Residence off Pinion Drive cul-de-sac closest to Pad #2	1,650 feet	40.2	35.2	47.3
Edge of Pinion Drive cul-de-sac	1,960 feet	38.7	33.7	45.8
Residence off Engelman Drive cul-de-sac closed to Pad #2	1,710 feet	39.8	34.8	46.9
Edge of Engelman Drive cul-de-sac	1,820 feet	39.3	34.8	46.9
Residence off Cedar Drive cul-de-sac closest to Pad #2	1,870 feet	39.1	32.1	44.2
Intersection of Tamarack Drive and Birch Street	2,330 feet	37.1	32.1	44.2

In addition to the distance between Pad #2 and the Imperial Pointe community which results in noise attenuation there are other man made as well as natural noise attenuation conditions which are listed below:

- 14 foot high soil stockpile on pad which acts as a barrier
- Trees/brush between Pad #2 and Imperial Pointe.
- Ridgeline between Pad #2 and Imperial Pointe.
- Use of electricity from the power grid versus diesel fueled on-site generators for most activities requiring electricity.

These conditions will results in noise levels within the Imperial Pointe community that are less than the calculated noise levels.

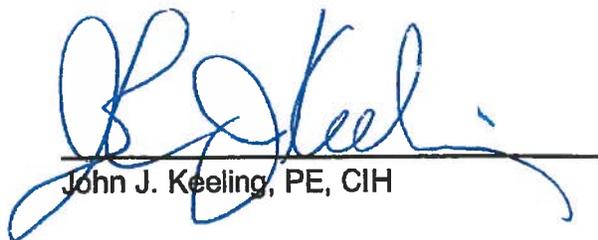
The following figures provided in the figures section of this reports contain both a plan view of Pad #2 versus the residential area, but also a profile which depicts the elevation differences and vegetated area.

Figure	Description
A1	Vertical Drilling Impact on Pinion Drive
A2	Hydraulic Fracturing Impact on Pinion Drive
A3	Horizontal Drilling Impact on Pinion Drive
B1	Vertical Drilling Impact on Engelman Drive
B2	Hydraulic Fracturing Impact on Engelman Drive
B3	Horizontal Drilling Impact on Engelman Drive
C1	Vertical Drilling Impact on Tamarack Drive
C2	Hydraulic Fracturing Impact on Tamarack Drive
C3	Horizontal Drilling Impact on Tamarack Drive

These figures also provide the approximate anticipated noise levels rounded up to the next full decibel.

### SUMMARY

MSES utilized noise levels measured at Natural Gas Development Operations similar to those planned for the ACAA Project. In addition, background noise levels near the Imperial Pointe residential area were measured. Based upon the analysis of data presented in this report, there will be essentially no routine operation noise impact on the Imperial Pointe community with the exception of infrequent impact noise that may be noticeable when outside with no residential noise sources (lawn work, traffic, etc.) in operation.

  
 John J. Keeling, PE, CIH

  
 Allen R. Cutlip, CIH

# APPENDICES

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# APPENDIX A

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Background Noise Study ACAA Property



**AMBIENT SOUND STUDY  
ALLEGHENY COUNTY AIRPORT AUTHORITY  
PITTSBURGH INTERNATIONAL AIRPORT  
UNDEVELOPED PROPERTY  
ADJACENT TO THE VILLAGE OF IMPERIAL**

**II. EXECUTIVE SUMMARY**

MSES consultant, inc. (MSES) was retained by Consol Energy to perform an Ambient Sound Study at a portion of the Allegheny County Airport Authority Pittsburgh International Airport (Airport) undeveloped property located northwest of the Village of Imperial which is a part of the Findlay Township. This study was performed to establish a continuous seventy-two (72) hour ambient noise level at the nearest protected structure property line as described in Section 117.604.69.14 of the Findlay Township Zoning Code. This portion of the zoning code deals exclusively with oil and gas well pad construction, drilling, and well development.

Consol Energy is in the process of obtaining permits/acceptances that will allow for pad construction, well drilling, well development, and well production at various locations on the Airport property.

This sound study was for the property associated with Consol Energy's Pad #1 and Pad #2. The attached Figure is an aerial photograph of the subject area. Pad #1 is located just south of I-376 and is not near residential property. One (1) ambient noise measurement location near Clinton Enlow Road was utilized to establish ambient noise levels for that area.

Pad #2 is located in an interior portion of undeveloped Airport property with the closest residential property identified as the Imperial Pointe Housing Development which is located in the Village of Imperial.



MSES performed sound measurements as specified in the Findlay Township Code at Pad #2, near the property lines of the three (3) closest residential structures, and near Route 30.

The measurements were performed during the time period of June 17 through June 20, 2013. During the sound measurement period, there were no oil and gas, commercial, or other activities conducted at the subject site.

The primary sound sources during the measurement period were representative of typical residential activity, high elevation aircraft, wildlife, and weather related (wind, rain, thunder) activity typically occurring during summer months.

The following provides information about Pad #1 and the associated sound measurement located:

<b>Measurement Location</b>	<b>Noise Sources</b>	<b>Typical Background Levels</b>	<b>Range of Variation</b>
Pad 1 -1A	Highway Activity/Storms	Not Measured <sup>(1)</sup>	Not Measured <sup>(1)</sup>
Clinton Enlow Road Near Pad 1	Highway Activity/Storms	Day Time 57 dBA Night Time 55 dBA	Day 47- 76 dBA Night 40-76 dBA

<sup>(1)</sup> Measurement Points were not assessable.

Daytime periods referenced in the table are from 6:00 am to 10:00 pm with the other period considered as nighttime. The "Typical Background Levels" column of the table is representative of non-storm periods.

The predominant noise source in the Pad 1 area is highway noise. During the measurement periods there were periods of significant wind, thunder, and rainfall which were experienced and resulted in some of the elevated noise measurements listed in the "Range of Variation" Column of the table.

The following provides information about Pad #2 and the associated sound measurement locations:

<b>Measurement Location</b>	<b>Noise Sources</b>	<b>Typical Background Levels (dBA)</b>	<b>Range of Variation (dBA)</b>
Pad 2 - 2A	High Altitude Aircraft/ Wildlife/Storms	Day - 49 Night - 43	Day - 45 to 60 Night - 40 to 60
Imperial Pointe - 2B	Residential/ Wildlife/Storms	Day - 50 Night - 43	Day - 45 to 60 Night - 40 to 60
Imperial Pointe - 2C	Residential/ Wildlife/Storms	Day - 50 Night - 43	Day - 45 to 60 Night - 40 to 60
Imperial Pointe - 2D	Residential/ Wildlife/Storms	Day - 50 Night - 43	Day - 45 to 60 Night - 40 to 60
Route 30 - 2F	Highway/Storms	Day - 55 Night - 54	Day - 48 to 78 Night - 44 to 76

Day Time periods referenced in the table are from 6:00 am to 10:00 pm with the other period considered as Night Time.

A slightly lower sound level at the Pad 2 location during day time hours is attributed to the lack of residential related sound. The "Typical Background Levels" column of the table is representative of non-storm periods. During the measurement periods there were periods of significant wind, thunder, and rainfall which were experienced and resulted in some of the elevated noise measurements listed in the "Range of Variation" Column of the table.

The following table provides a summary for each sound measurement location showing the measured sound level ranges and the percent of the measurement period during which those sound levels occurred.

**PERCENT OF TIME FOR MEASURED SOUND RANGE BY LOCATION**

<b>Sound Level Range (dBA)</b>	<b>Pad 1 (%)</b>	<b>Clinton Enlow Road (%)</b>	<b>Pad 2 (%)</b>	<b>Imperial Pointe Location 2B (%)</b>	<b>Imperial Pointe Location 2C (%)</b>	<b>Imperial Pointe Location 2D (%)</b>	<b>Route 30 (%)</b>
<b>&gt;80</b>	Not Available <sup>(1)</sup>	0.1	0	0.1	0	.1	0
<b>70 to 80</b>	Not Available <sup>(1)</sup>	0.1	0.1	0.1	0.1	.1	0.1
<b>65 to 69.9</b>	Not Available <sup>(1)</sup>	0.1	0.1	0.1	0.1	.1	0.1
<b>60 to 64.9</b>	Not Available <sup>(1)</sup>	3.4	0.4	0.3	0.3	0.2	0.5
<b>55 to 59.9</b>	Not Available <sup>(1)</sup>	32.8	1.2	1.8	2.3	0.9	4.3
<b>50 to 54.9</b>	Not Available <sup>(1)</sup>	43.0	8.7	8.1	8.1	2.6	26.8
<b>45 to 49.9</b>	Not Available <sup>(1)</sup>	13.4	33.9	55.1	33.1	21.3	43.6
<b>40 to 44.9</b>	Not Available <sup>(1)</sup>	5.6	55.6	34.4	56	74.7	24.6
<b>&lt;40</b>	Not Available <sup>(1)</sup>	1.5	0	0	0	0	0
<b>Total</b>	Not Available <sup>(1)</sup>	100	100	100	100	100	100

<sup>(1)</sup> Instrument Failure

Based on the above summary it can be demonstrated that for the locations remote from highways, the majority of the time the sound levels were in the 40 to 49.9 dBA range.

The primary variation in the measurement near the residential property is in the 40 to 44.9 dBA category and the 45 to 49.9 dBA category, which is impacted by activities such as yard work, cooling system operations, and fans.

# APPENDIX B

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Noise Study at Active Drilling &  
Hydraulic Fracturing locations



**AMBIENT SOUND STUDY  
DRILLING AND HYDRAULIC FRACTURING  
NATURAL GAS WELL PAD SITES IN PA and WV**

**II. EXECUTIVE SUMMARY**

MSES consultants, inc. (MSES) was retained by Consol Energy to perform a sound survey of Natural Gas (NG) drilling and hydraulic fracturing activities in order to establish baseline sound levels at various distances from the well pad.

MSES utilized Quest NoisePro DLX sound level recording dosimeters which have a measurement range of 40 to 110 decibels (dB). In addition, a Cassella Type I Sound level meter Model # CEL-490 B1 with a measurement range of 30 to 140 dB was used for measurement of instantaneous sound levels. All sound level measurements were collected on the "A" scale setting with slow response.

This study was commissioned to provide information to determine compliance with the Findlay Township of Allegheny County, PA Zoning Ordinance concerning Oil & Gas Development (117.604.69).

The following table provides the listing of survey locations, survey dates, and NG Pad activity during the survey, and measurement location distance from the approximate center of the pads.

Survey Location	Survey Dates	Pad Activity During Survey	Measurement Points Direction and Distance to Center of Pad
Kuhns #3 Pad Westmoreland Co., PA	3/7/13	Horizontal Drilling (removal of drill steel)	N – 500' and 750'
Kuhns #3 Pad Westmoreland Co., PA	5/29 – 31/13	Hydraulic Fracturing	N – 500', 750', 1,000', 1,200' S – 500', 750'
NV 58 Pad Washington Co., PA	6/5 – 7/13	Vertical Drilling	N – 500' SE – 500', 750'
NV 56 Pad Washington Co., PA	6/10/13	Horizontal Drilling (Drilling)	E – 500' NE – 1,200'
Philippi #13 Pad Philippi, WV	6/25 – 26/13	Horizontal Drilling (Drilling)	W – 500', 750', 1,000', 1,200' E – 1,200'

The studies at each of the locations except for the March 7, 2013 Kuhns #3 Pad measured sound levels from 46 to 72 hours of operation time. The activity conducted at each survey location was documented so that the sound level measurements could be interpreted with respect to pad operations, area background (highway, non-natural gas equipment, wildlife), and weather related (wind, rain, thunder).

The sound measurements collected by the dosimeters were recorded once every fifteen (15) seconds during the entire survey period. This resulted in a total of 5,670 individual measurements at a specific fixed location over a 24 hour period.

In addition, the sound levels were sorted to determine the duration of time at any single measurement location for ranges of sound levels.

The following is a brief summary by study location/activity at set distanced from the approximate center of the pad.

Pad Name	Pad Activity	Typical Pad Sound Levels (dBA) at Distance Intervals from Approximate Center of Pad (Excluding Non-NG Development Interferences <sup>(1)</sup> )			
		500 ft.	750 ft.	1,000 ft.	1,200 ft.
Kuhns #3	Removing of drill steel at end of horizontal drilling	55	47	Not Measured <sup>(1)</sup>	Not Measured <sup>(1)</sup>
Kuhns #3	Hydraulic Fracturing	71 (highest of 2 measurements)	59 (highest of 2 measurements)	51	52
NV 58	Vertical Drilling	59	47	Not Measured <sup>(1)</sup>	Not Measured <sup>(1)</sup>
NV 56	Horizontal Drilling	56	Not Measured <sup>(1)</sup>	Not Measured <sup>(1)</sup>	50 (highest of 2 measurements)
Philippi	Horizontal Drilling	51	42	39	41

<sup>(1)</sup> Measurement Points were not assessable.

The pad activity that generates the highest sound levels is Hydraulic Fracturing. The primary noise sources during Hydraulic Fracturing are pumps, generators which produce electricity, and truck traffic. The actual drilling activities (vertical or horizontal) at a distance in excess of 1,000 feet from the approximate center of the pad are near background sound levels for most residential areas. The primary noise sources for drilling are the generators which produce electricity, air compressors, and release of air pressure.

The following table provides a summary for each sound measurement location showing the measured sound level ranges and the percent of the measurement period during which those sound levels occurred.

**PERCENT OF TIME FOR MEASURED SOUND RANGE BY LOCATION**

<b>Sound Level Range (dBA)</b>	<b>Kuhn's #3 Pad Hydraulic Fracturing at 1200' (%)</b>	<b>NV 58 Pad Vertical Drilling at 750' (%)</b>	<b>Philippi #13 Pad Horizontal Drilling at 1200' (%)</b>
<b>&gt;80</b>	0.1	0.1	0.2
<b>70 to 80</b>	0.6	0.6	1.8
<b>65.0 to 69.9</b>	4.2	1.1	1.9
<b>60 to 64.9</b>	5.0	3.9	1.8
<b>55 to 59.9</b>	15.1	3.7	1.5
<b>50 to 54.9</b>	21.2	11.6	2.6
<b>45 to 49.9</b>	44.2	67.8	24.9
<b>40 to 44.9</b>	9.6	11.2	65.3
<b>&lt;40</b>	0	0	0
<b>Total</b>	100	100	100

Based on the above summary it can be demonstrated that for the locations remote from highways, the majority of the time the sound levels were in the 45 to 50 dBA range.

The noise levels at all the pads studied were found to be less than 55 dBA at 1000 feet or more from the center of the pad. All activities sound levels are well below the Findlay Township Ordinance default level of 55 dBA for background sound levels at residential property lines. When considering the Airport Authority Property, the nearest residential area (Imperial Pointe) has residential property lines as close as approximately 1,200 feet to the proposed well pad location.

# APPENDIX C

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## Noise Calculations



**Appendix C**  
**Calculated Noise Levels**  
**For Various Distances From Proposed Well Pad 2 Location**  
**Imperial Point Residential Community**

**Introduction**

A noise study was performed by MSES to measure noise levels associated with natural gas drilling activities including vertical drilling, horizontal drilling, and hydraulic fracturing. The noise study was conducted at various natural gas well sites in Pennsylvania and West Virginia. Whenever possible, noise measurements of the drilling activities were collected at 500, 750, 1000, and 1200 feet from the approximate center of the drilling rig. Topography and other factors prevented the collection of noise measurements at all of these distances for each drilling activity.

**Calculation of Noise Levels Within Imperial Point Residential Community**

In order to determine the impact of the noise levels measured for the drilling activities at selected locations within the Imperial Point residential community, noise levels were calculated using the following formula:

$$dB2 = dB1 - 20 * LOG (R2/R1) \text{ where}$$

dB1 = dB level at know distance from source

dB2 = dB level at another distance from source

R1 = known distance from source for known decibel level dB1

R2 = second distance from source for which noise level estimate (dB2) is desired

For purposes of calculating potential noise sources within the residential community, MSES elected to use the noise level readings obtained at 750 feet from the approximate center of the drilling rig for each of the drilling activities.

The noise level calculations for each of the drilling activities are provided in Attachments 1 through 3 of this appendix.

**Results of Calculated Noise Levels**

Table 1.0 provides a summary of the calculated noise levels for the selected locations within the Imperial Point residential community for each of the drilling activities.

**Table 1.0 – Results of Calculated Noise Levels**

Location	Calculated Noise Levels for Drilling Activities (dBA)		
	Vertical Drilling	Horizontal Drilling	Hydraulic Fracturing
Nearest Dwelling – Pinion Drive	40.2	35.2	47.3
Edge of Pinion Drive Cul de Sac	38.7	33.7	45.8
Nearest Dwelling – Cedar Drive	39.1	34.1	46.2
Tamarack Drive	37.1	32.1	44.2
Nearest Dwelling – Engelman Drive	39.8	34.8	46.9
Edge of Engelman Drive Cul de Sac	39.3	34.3	46.4

The noise levels provided in the above table are calculated from noise levels measured at 750 feet from the approximate center of the drilling rig for each of the drilling activities.

**Attachment 1**  
**Noise Calculations for Vertical Drilling Activities**

**A. Nearest Dwelling – Pinion Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 47 - 20 \log (1650/750) \\ &= 47 - 20 \log (2.2) \\ &= 47 - 6.85 \\ &= 40.2 \text{ dBA} \end{aligned}$$

**B. Edge of Pinion Drive Cul de Sac**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 47 - 20 \log (1960/750) \\ &= 47 - 20 \log (2.6) \\ &= 47 - 8.3 \\ &= 38.7 \text{ dBA} \end{aligned}$$

**C. Nearest Dwelling – Cedar Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 47 - 20 \log (1870/750) \\ &= 47 - 20 \log (2.5) \\ &= 47 - 7.95 \\ &= 39.1 \text{ dBA} \end{aligned}$$

**D. Tamarack Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 47 - 20 \log (2330/750) \\ &= 47 - 20 \log (3.11) \\ &= 47 - 9.86 \\ &= 37.1 \text{ dBA} \end{aligned}$$

**E. Nearest Dwelling – Engelman Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 47 - 20 \log (1710/750) \\ &= 47 - 20 \log (2.28) \\ &= 47 - 7.16 \\ &= 39.8 \text{ dBA} \end{aligned}$$

**F. Engelman Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 47 - 20 \log (1820/750) \\ &= 47 - 20 \log (2.43) \\ &= 47 - 7.71 \\ &= 39.3 \text{ dBA} \end{aligned}$$

**Attachment 2**  
**Noise Calculations for Horizontal Drilling Activities**

**A. Nearest Dwelling – Pinion Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 42 - 20 \log (1650/750) \\ &= 42 - 20 \log (2.2) \\ &= 42 - 6.85 \\ &= 35.2 \text{ dBA} \end{aligned}$$

**B. Edge of Pinion Drive Cul de Sac**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 42 - 20 \log (1960/750) \\ &= 42 - 20 \log (2.6) \\ &= 42 - 8.3 \\ &= 33.7 \text{ dBA} \end{aligned}$$

**C. Nearest Dwelling – Cedar Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 42 - 20 \log (1870/750) \\ &= 42 - 20 \log (2.5) \\ &= 42 - 7.95 \\ &= 34.1 \text{ dBA} \end{aligned}$$

**D. Tamarack Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 42 - 20 \log (2330/750) \\ &= 42 - 20 \log (3.11) \\ &= 42 - 9.86 \\ &= 32.1 \text{ dBA} \end{aligned}$$

**E. Nearest Dwelling – Engelman Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 42 - 20 \log (1710/750) \\ &= 42 - 20 \log (2.28) \\ &= 42 - 7.16 \\ &= 34.8 \text{ dBA} \end{aligned}$$

**F. Engelman Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 42 - 20 \log (1820/750) \\ &= 42 - 20 \log (2.43) \\ &= 42 - 7.71 \\ &= 34.3 \text{ dBA} \end{aligned}$$



*MSES*

**Attachment 3**  
**Noise Calculations for Hydraulic Fracturing Activities**

**A. Nearest Dwelling – Pinion Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 54.1 - 20 \log (1650/750) \\ &= 54.1 - 20 \log (2.2) \\ &= 54.1 - 6.85 \\ &= 47.3 \text{ dBA} \end{aligned}$$

**B. Edge of Pinion Drive Cul de Sac**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 54.1 - 20 \log (1960/750) \\ &= 54.1 - 20 \log (2.6) \\ &= 54.1 - 8.3 \\ &= 45.8 \text{ dBA} \end{aligned}$$

**C. Nearest Dwelling – Cedar Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 54.1 - 20 \log (1870/750) \\ &= 54.1 - 20 \log (2.5) \\ &= 54.1 - 7.95 \\ &= 46.2 \text{ dBA} \end{aligned}$$

**D. Tamarack Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 54.1 - 20 \log (2330/750) \\ &= 54.1 - 20 \log (3.11) \\ &= 54.1 - 9.86 \\ &= 44.2 \text{ dBA} \end{aligned}$$

**E. Nearest Dwelling – Engelman Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 54.1 - 20 \log (1710/750) \\ &= 54.1 - 20 \log (2.28) \\ &= 54.1 - 7.16 \\ &= 46.9 \text{ dBA} \end{aligned}$$

**F. Engelman Drive**

$$\begin{aligned} \text{dB2} &= \text{dB1} - 20 \log (R2/R1) \\ &= 54.1 - 20 \log (1820/750) \\ &= 54.1 - 20 \log (2.43) \\ &= 54.1 - 7.71 \\ &= 46.4 \text{ dBA} \end{aligned}$$

# FIGURES

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# FIGURE A1

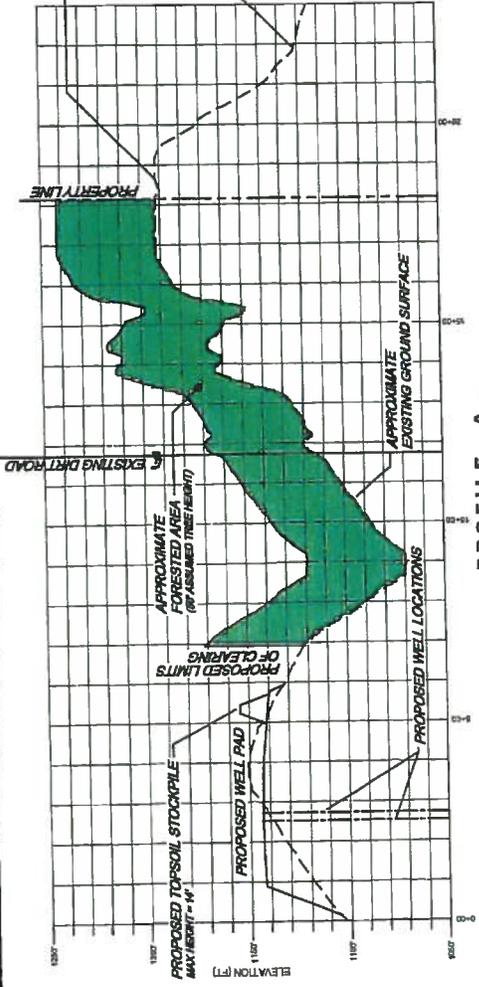
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Vertical Drilling Impact on Pinion Drive

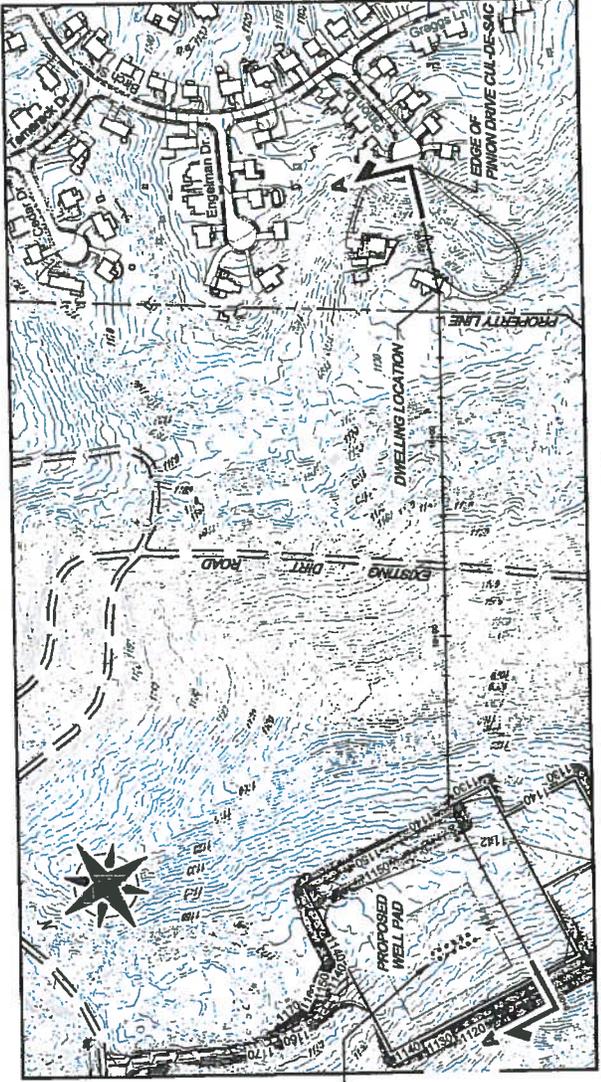


**DWELLING LOCATION**  
 41 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Ordinance Limit at Night  
 1650'± FROM & WELL PROPOSED LOCATIONS  
 TO DWELLING LOCATION

**EDGE OF PINION DRIVE CUL-DE-SAC**  
 39 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Ordinance Limit at Night  
 1980'± FROM & WELL PROPOSED LOCATIONS  
 TO EDGE PINION DRIVE CUL-DE-SAC



**PROFILE A**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 60'



**PLAN VIEW**  
 SCALE: 1"=300'

**CONSOL ENERGY**

Calculated Predominant Noise Levels for Residential Area  
 From Vertical Drilling at Pad 2  
 ACAA Pad 2 vs. Imperial Pointe Pinion Drive

Drawn by	SARC	1213	AS SHOWN
Engineer	JJK	1213	
Checked by	JJK	1213	
Drawn			

Prepared by **HSES consultants, inc.**

**FIGURE A1**

# FIGURE A2

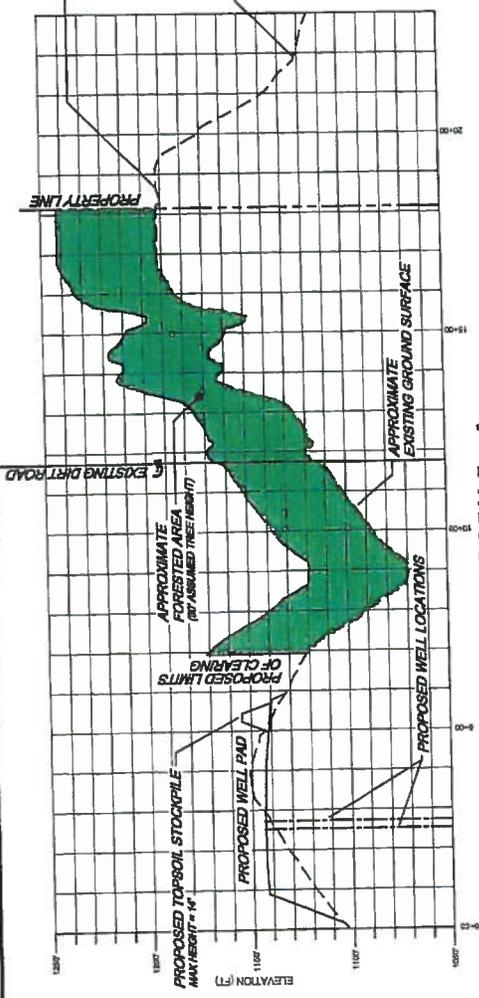
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Hydraulic Fracturing Impact on Pinion Drive

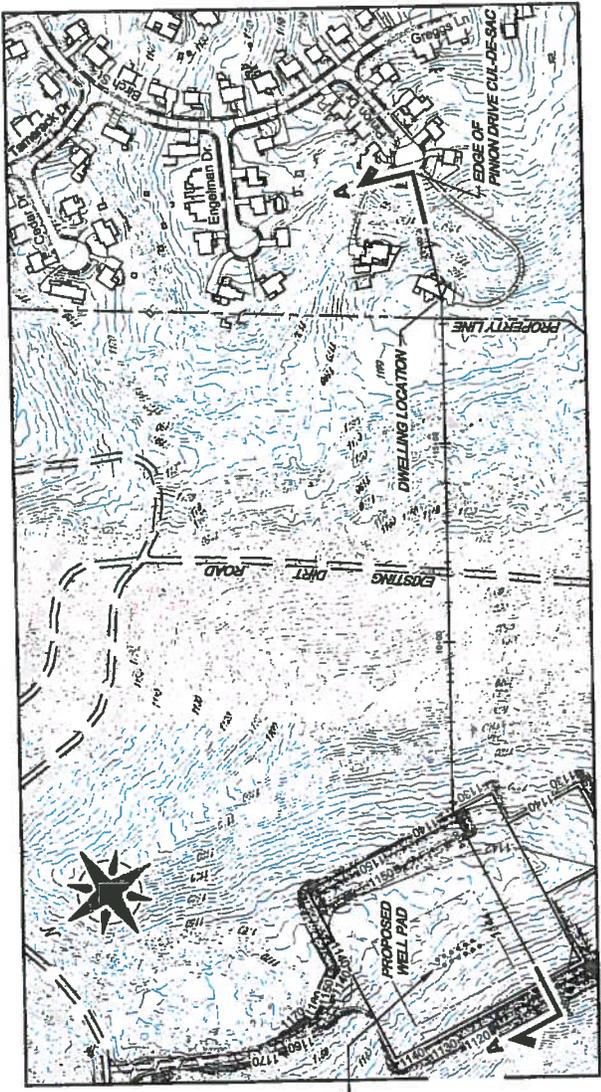


**DWELLING LOCATION**  
 48 dBA from Pad 2  
 45 dBA from Community  
 65 dBA Ordinance Limit at Night  
 1650': FROM & WELL PROPOSED LOCATIONS  
 TO DWELLING LOCATION

**EDGE OF PINION DRIVE CUL-DE-SAC**  
 46 dBA from Pad 2  
 45 dBA from Community  
 65 dBA Ordinance Limit at Night  
 1980': FROM & WELL PROPOSED LOCATIONS  
 TO EDGE PINION DRIVE CUL-DE-SAC



**PROFILE A**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 80'



**PLAN VIEW**  
 SCALE: 1" = 300'

**CONSOL ENERGY**

Calculated Predominant Noise Levels for Residential Area  
 From Hydraulic Fracturing at Pad 2  
 ACAA Pad 2 vs. Imperial Pointe Pinion Drive

Drawn by	BATC	12/13	AS SHOWN
Engineer	JJK	12/13	
Checked by	JJK	12/13	
Prepared by	<b>MSES consultants, inc.</b>		

**FIGURE A2**

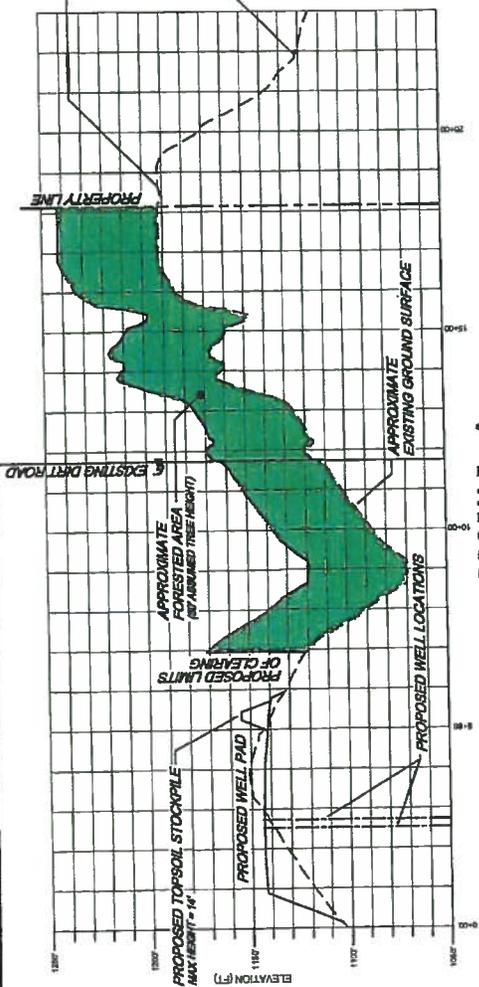
# FIGURE A3

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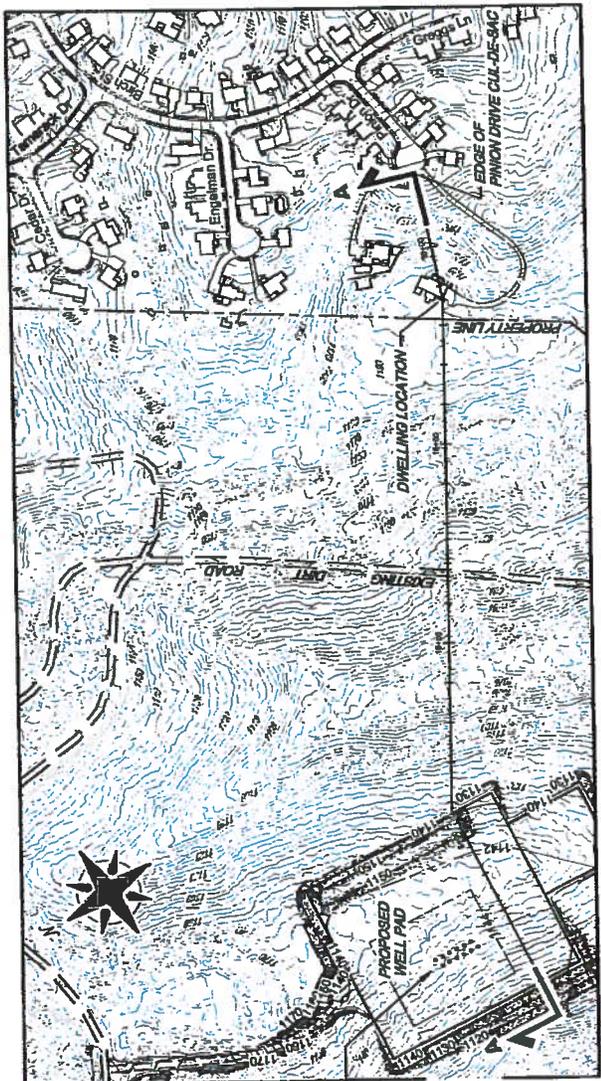
Horizontal Drilling Impact on Pinion Drive

**DWELLING LOCATION**  
 38 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Chirpiness Limit at Night  
 1650'± FROM 1 WELL PROPOSED LOCATIONS  
 TO DWELLING LOCATION

**EDGE OF PINON DRIVE CUL-DE-SAC**  
 34 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Chirpiness Limit at Night  
 1660'± FROM 1 WELL PROPOSED LOCATIONS  
 TO EDGE PINON DRIVE CUL-DE-SAC



**PROFILE A**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 80'



**PLAN VIEW**  
 SCALE: 1"=300'

**CONSOL ENERGY**

Calculated Predominant Noise Levels for Residential Area  
 From Horizontal Drilling at Pad 2  
 ACAA Pad 2 vs. Imperial Pointe Pinion Drive

Drawn by	BATC	12/13	Sheet	AS SHOWN
Engineer	JJK	12/13		
Checked by	JJK	12/13	Date	

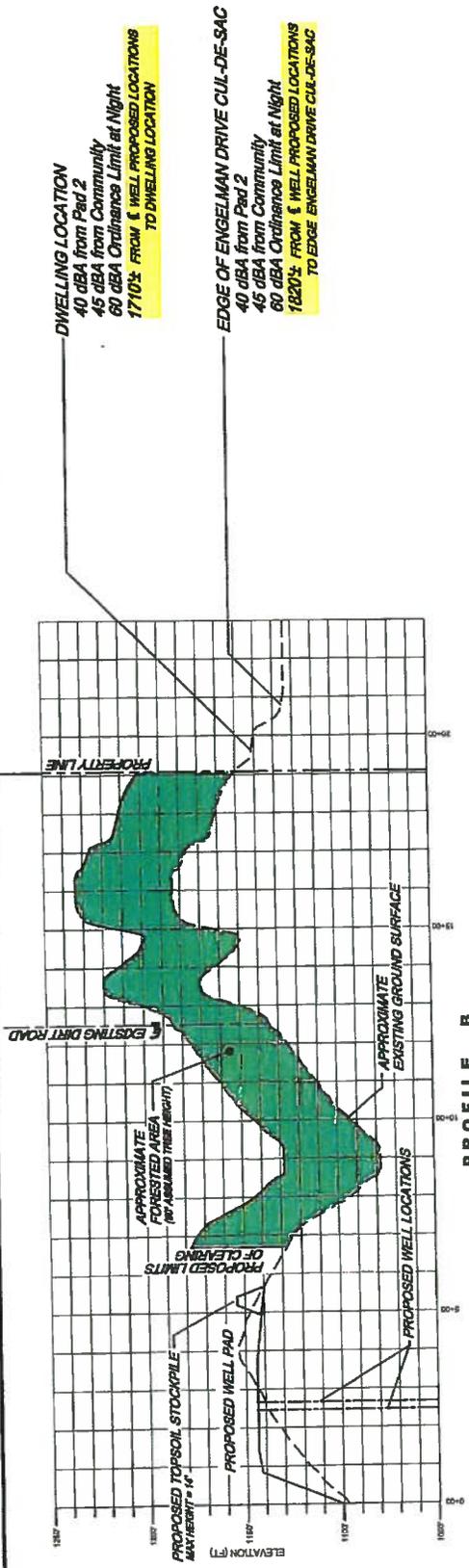
Prepared by **MSES consultants, inc.**

**FIGURE A3**

# FIGURE B1

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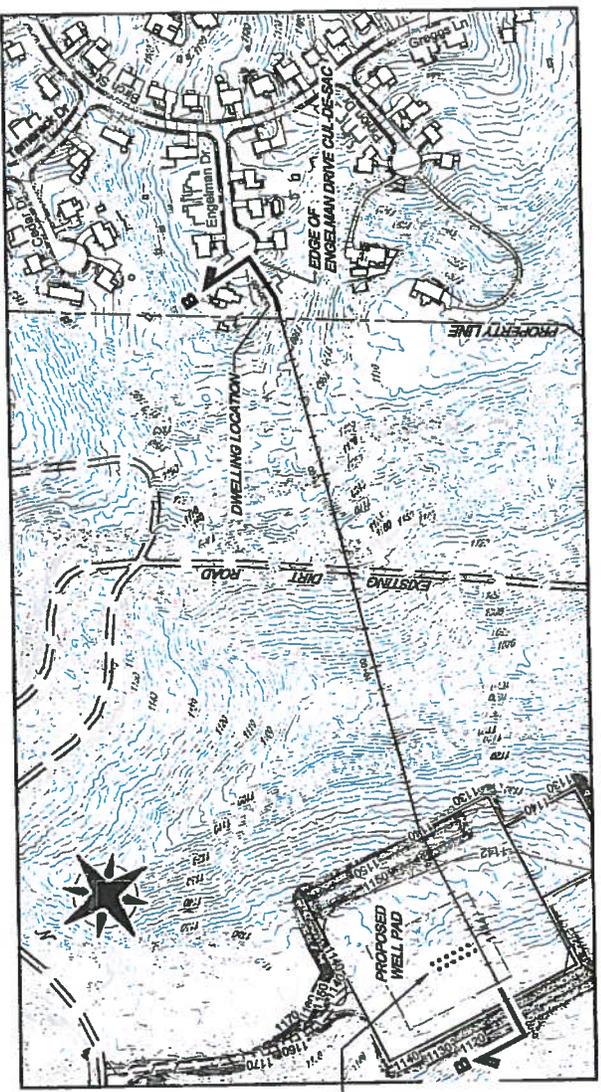
Vertical Drilling Impact on Engelman Drive



**PROFILE B**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 80'

**DWELLING LOCATION**  
 40 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Ordinance Limit at Night  
 1710% FROM & WELL PROPOSED LOCATIONS TO DWELLING LOCATION

**EDGE OF ENGELMAN DRIVE CUL-DE-SAC**  
 40 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Ordinance Limit at Night  
 1820% FROM & WELL PROPOSED LOCATIONS TO EDGE ENGELMAN DRIVE CUL-DE-SAC



**PLAN VIEW**  
 SCALE: 1"=300'

**CONSOL ENERGY**

Calculated Predominant Noise Levels for Residential Area  
 From Vertical Drilling at Pad 2  
 ACAA Pad 2 vs. Imperial Pointe Engelman Drive

Drawn by	SAK	12/13	AS SHOWN
Engineer	JKK	12/13	
Checked by	JKK	12/13	Date

Prepared by **MSES consultants, inc.**

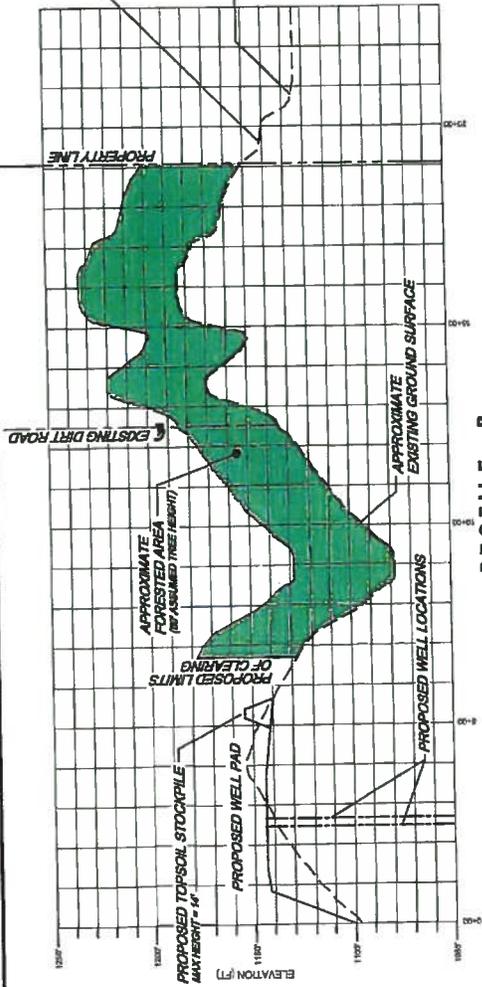
**FIGURE B1**

# FIGURE B2

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Hydraulic Fracturing Impact on  
Engelman Drive

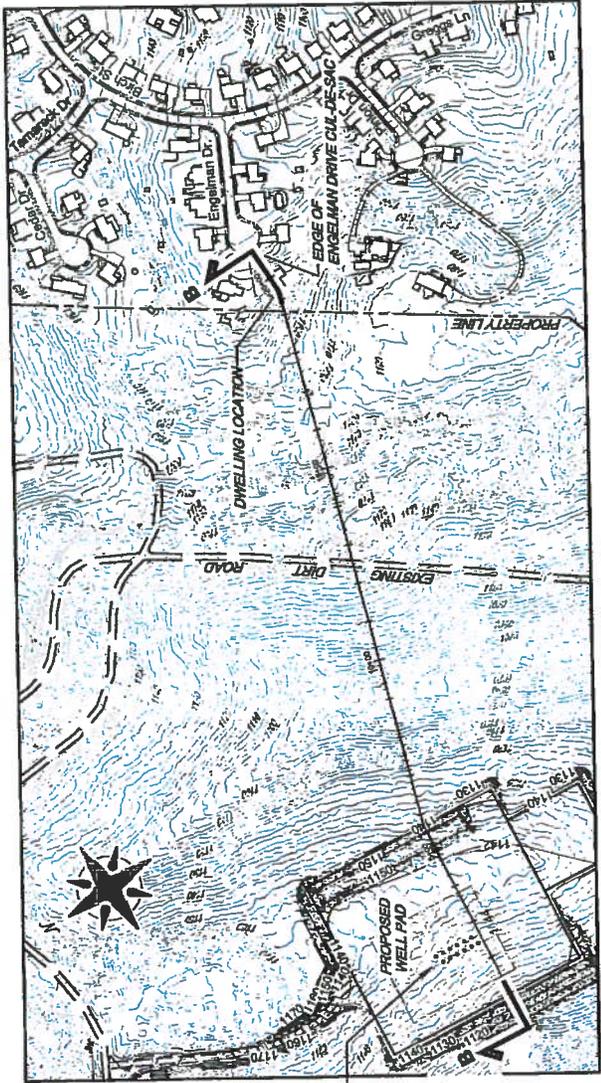




**DWELLING LOCATION**  
 48 dBA from Pad 2  
 45 dBA from Community  
 65 dBA Ordinance Limit at Night  
 1710± FROM & WELL PROPOSED LOCATIONS TO DWELLING LOCATION

**EDGE OF ENGELMAN DRIVE CUL-DE-SAC**  
 47 dBA from Pad 2  
 45 dBA from Community  
 65 dBA Ordinance Limit at Night  
 1820± FROM & WELL PROPOSED LOCATIONS TO EDGE ENGELMAN DRIVE CUL-DE-SAC

**PROFILE B**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 60'



**PLAN VIEW**  
 SCALE: 1" = 300'

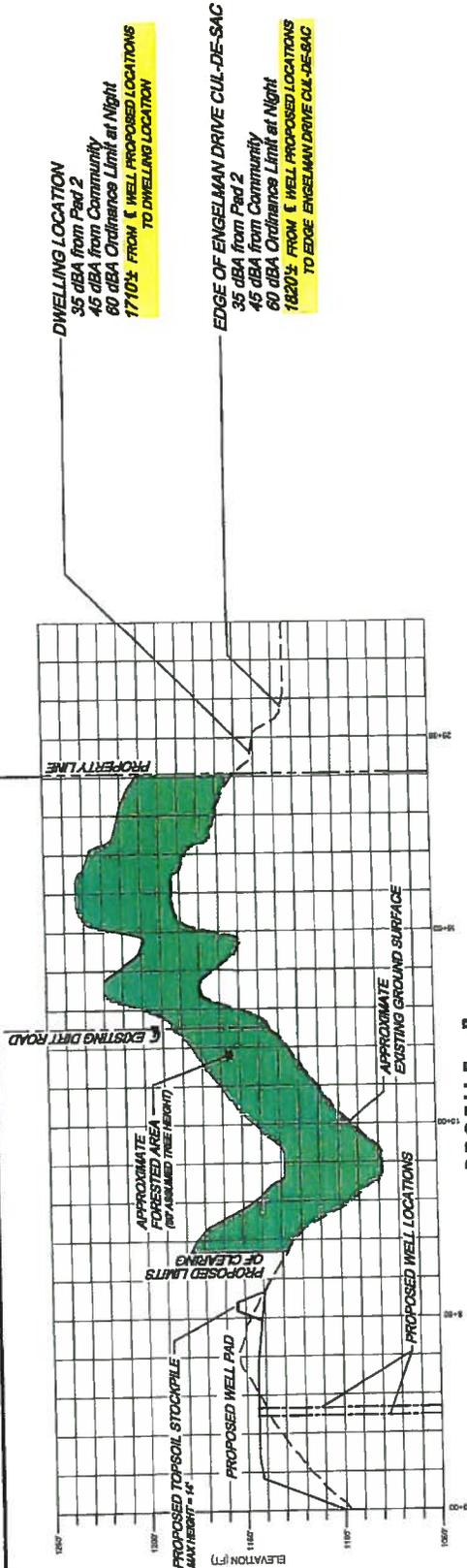
<b>CONSOL ENERGY</b>	
Calculated Predominant Noise Levels for Residential Area From Hydraulic Fracturing at Pad 2 ACAA Pad 2 vs. Imperial Pointe Engelman Drive	
Drawn by: SABC	12/13
Engineer: JJK	12/13
Checked by: JJK	Date
Scale: AS SHOWN	
Prepared by: <b>MSES consultants, inc.</b>	
<b>FIGURE B2</b>	

# FIGURE B3

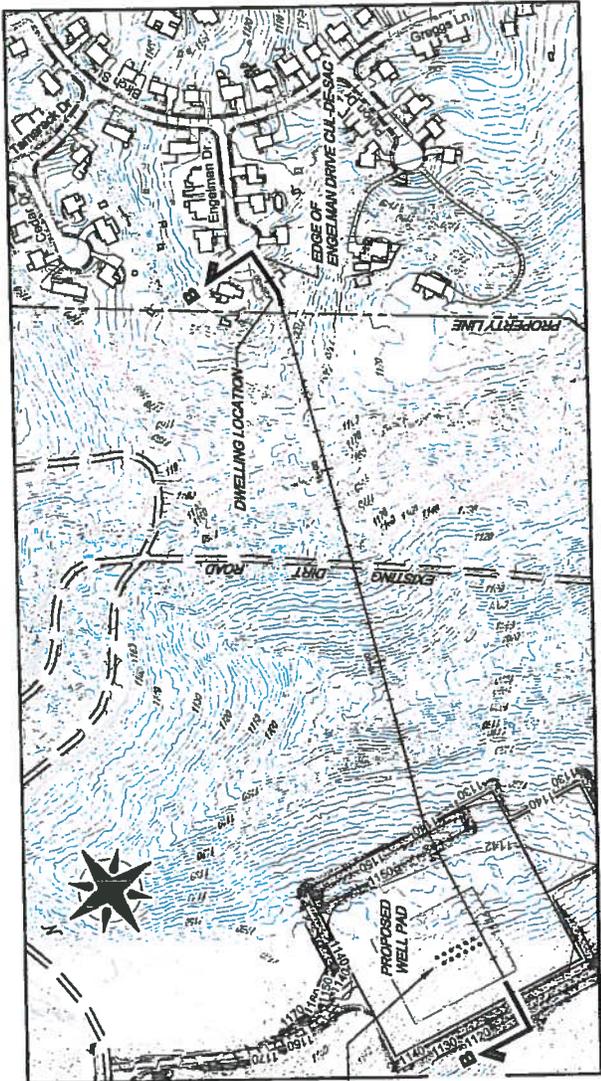
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Horizontal Drilling Impact on  
Engelman Drive





**PROFILE B**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 60'



**PLAN VIEW**  
 SCALE: 1" = 300'

**DWELLING LOCATION**  
 35 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Ordinance Limit at Night  
 1710± FROM ( WELL PROPOSED LOCATIONS TO DWELLING LOCATION)

**EDGE OF ENGELMAN DRIVE CUL-DE-SAC**  
 35 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Ordinance Limit at Night  
 1820± FROM ( WELL PROPOSED LOCATIONS TO EDGE ENGELMAN DRIVE CUL-DE-SAC)

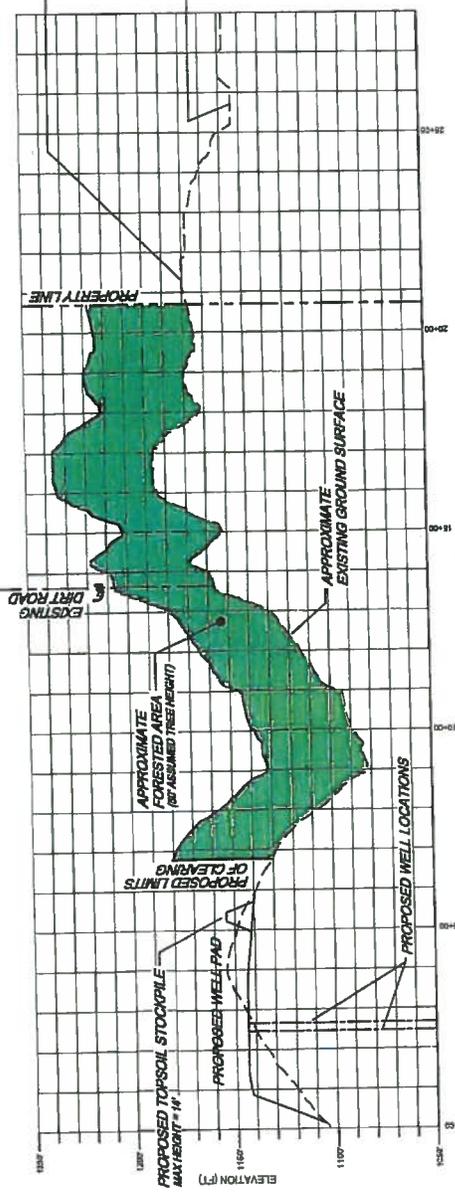
<b>CONSOL ENERGY</b>	
Calculated Predominant Noise Levels for Residential Area From Horizontal Drilling at Pad 2	
ACAA Pad 2 vs. Imperial Pointe Engelman Drive	
Drawn by	AS SHOWN
Checked by	12/13
Scale	12/13
Date	12/13
Prepared by <b>ASES consultants, inc.</b>	
<b>FIGURE B3</b>	

# FIGURE C1

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Vertical Drilling Impact on Tamarack Drive

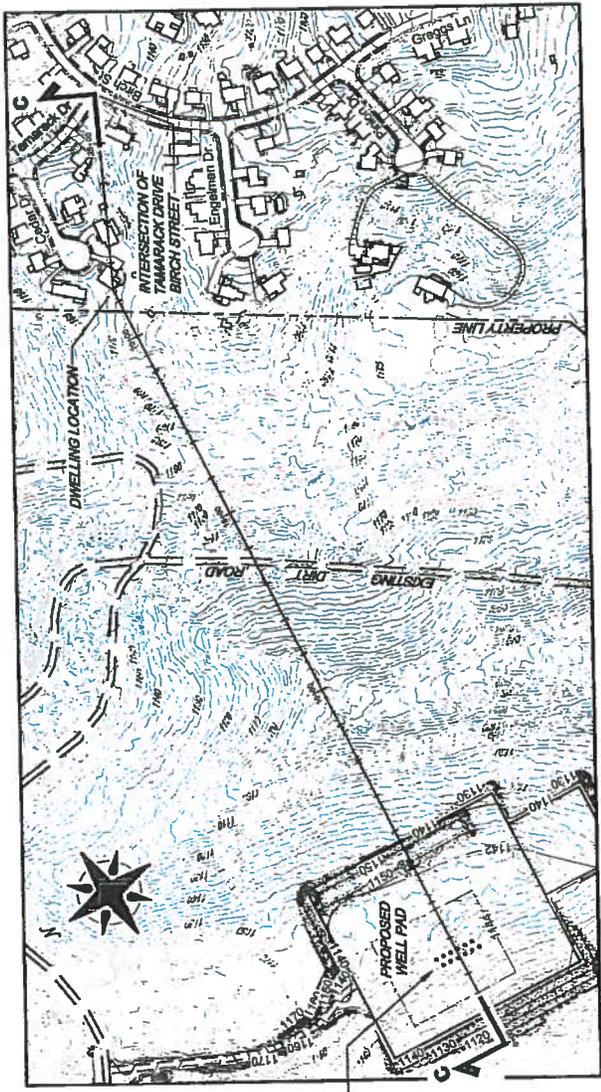




**DWELLING LOCATION**  
 40 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Craterline Limit at Night  
 1870% FROM  $\xi$  WELL PROPOSED LOCATIONS TO DWELLING LOCATION

$\xi$  TAMARACK DRIVE  
 30 dBA from Pad 2  
 45 dBA from Community  
 60 dBA Craterline Limit at Night  
 2330% FROM  $\xi$  WELL PROPOSED LOCATIONS TO  $\xi$  TAMARACK DRIVE

**PROFILE C**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 60'



**PLAN VIEW**  
 SCALE: 1" = 300'

**CONSOL ENERGY**

Calculated Predominant Noise Levels for Residential Area  
 From Vertical Drilling at Pad 2  
 ACAA Pad 2 vs. Imperial Pointe Tamarack Drive

Drawn by	SABC	12/13	AS SHOWN
Engineer	JJK	12/13	
Checked by	JJK	12/13	
Prepared by	<b>MSES consultants, inc.</b>		

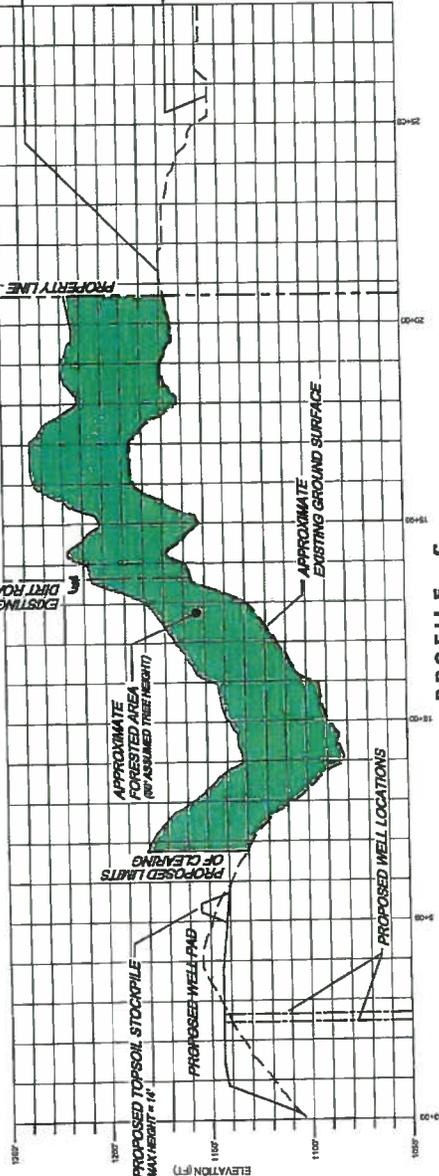
**FIGURE C1**

# FIGURE C2

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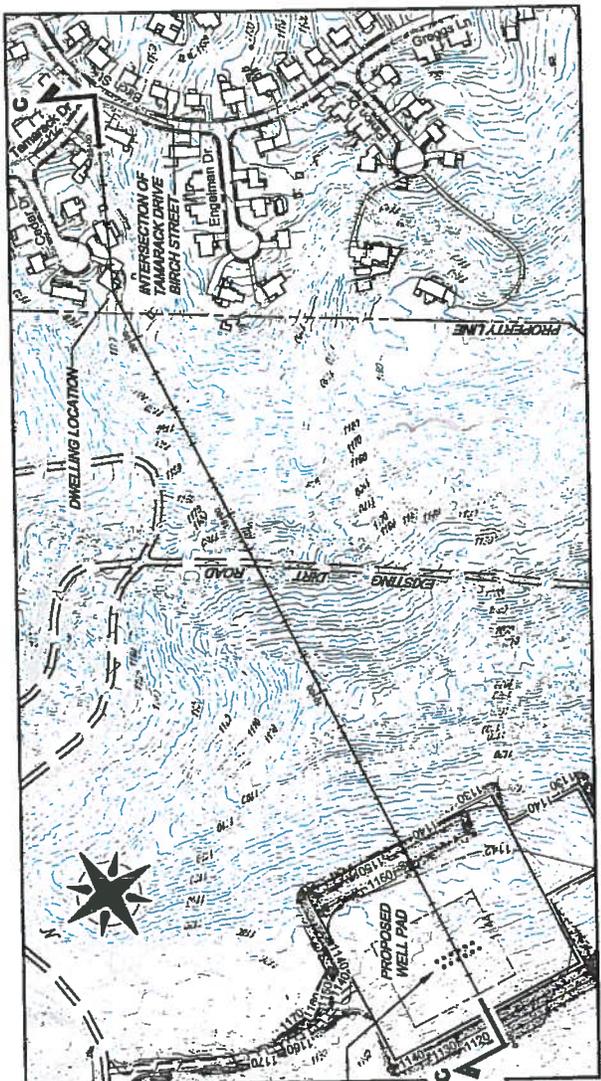
Hydraulic Fracturing Impact on  
Tamarack Drive





**DWELLING LOCATION**  
 47 dBA from Pad 2  
 45 dBA from Community  
 65 dBA Ordinance Limit at Night  
 1870'± FROM & WELL PROPOSED LOCATIONS  
 TO DWELLING LOCATION

**€ TAMARACK DRIVE**  
 46 dBA from Pad 2  
 45 dBA from Community  
 65 dBA Ordinance Limit at Night  
 2330'± FROM & WELL PROPOSED LOCATIONS  
 TO € TAMARACK DRIVE



**CONSOL ENERGY**

Calculated Predominant Noise Levels for Residential Area  
 From Hydraulic Fracturing at Pad 2  
 ACAA Pad 2 vs. Imperial Pointe Tamarack Drive

Drawn by	BANC	12/13	Scale	AS SHOWN
Engineer	JJK	12/13		
Checked by	JJK	12/13		
				Date

Prepared by **MSES consultants, inc.**

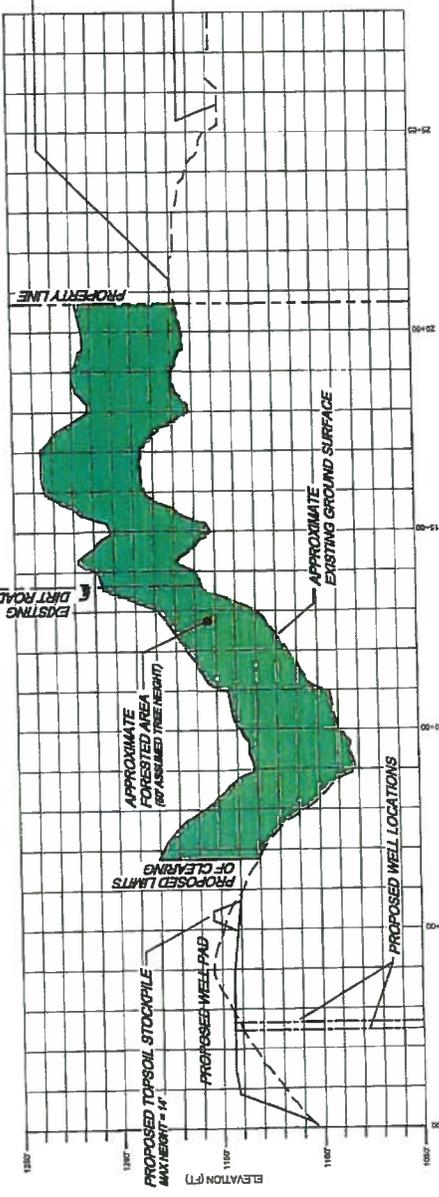
**FIGURE C2**

# FIGURE C3

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Horizontal Drilling Impact on  
Tamarack Drive

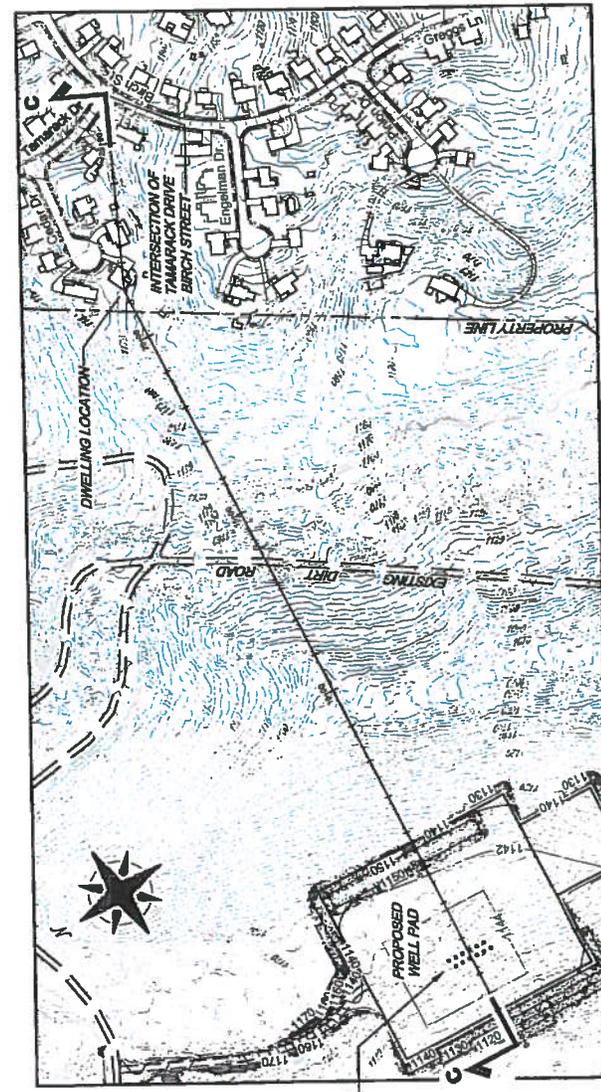




**PROFILE C**  
 HORIZONTAL SCALE: 1" = 300'  
 VERTICAL SCALE: 1" = 60'

**DWELLING LOCATION**  
 35 dbA from Pad 2  
 45 dbA from Community  
 60 dbA Ordinance Limit at Night  
 1870% FROM  $\xi$  WELL PROPOSED LOCATIONS TO DWELLING LOCATION

**$\xi$  TAMARACK DRIVE**  
 33 dbA from Pad 2  
 45 dbA from Community  
 60 dbA Ordinance Limit at Night  
 2330% FROM  $\xi$  WELL PROPOSED LOCATIONS TO  $\xi$  TAMARACK DRIVE



**PLAN VIEW**  
 SCALE: 1" = 300'

**CONSOL ENERGY**

Calculated Predominant Noise Levels for Residential Area  
 From Horizontal Drilling at Pad 2  
 ACAA, Pad 2 vs. Imperial Pointe Tamarack Drive

Drawn by	SAR	12/13	Scale	AS SHOWN
Engineer	JJC	12/13		
Checked by	JJC	12/13		
				Date

Prepared by **MSES consultants, inc.**

**FIGURE C3**