

	DEPARTMENT OF ENVIRONMENTAL QUALITY Air Quality Bureau Oil & Gas Services Section GUIDANCE STATEMENT	Effective Date: 8/07/2018
		Authored By: Eileen Steilman
		Approved By: Dave Aguirre <i>DA</i>
		Manual Section: Section 1 General Procedures, 1-6a
Title: Maximum Production Determination for Calculating Potential to Emit at Oil or Gas Well Facilities. Applicability: All Montana Oil or Gas Well Facilities Title, Date & Author of Superseded Guidance or Policy Statement (if any): None		

PURPOSE

The purpose of this guidance statement is to provide clarification regarding maximum production rate determination of oil, natural gas, and produced water for use in calculating the potential to emit (PTE) for oil or gas well facilities as defined in 75-2-103, Montana Code Annotated (MCA). This guidance was developed to provide additional information and support to *Guidance Statement, Section 1 General Procedures, 1-6 Oil or Gas Well Facilities and Calculating Potential to Emit (PTE)*.

BACKGROUND

As the oil and gas exploration and production sector has continued to grow and new federal regulations have been finalized, industry has requested clarification from Montana Department of Environmental Quality (DEQ) Air Quality Bureau (AQB) regarding maximum production rate determinations for use in PTE calculations and emission control requirement determinations. This guidance addresses use of a decline curve for new wells and identifies the preferred method to determine the maximum production rate for both new and existing wells.

In general, an oil or gas well facility that has a PTE greater than 25-tons per year (tpy) of any regulated airborne pollutant is required to submit an application for a Montana air quality permit (MAQP) within 60 days after the initial well completion date for the facility as per Administrative Rules of Montana (ARM) 17.8.1602(3). A registration eligible oil or gas well facility may register the facility in lieu of submitting an application for an MAQP as per ARM 17.8.1702(1). To determine applicability to Montana’s air quality rules, the owner/operator of an oil or gas well facility must determine the facility’s PTE. PTE is defined in ARM Subchapters 16 & 17 as follows:

"Potential to emit means the maximum capacity of a facility or emitting unit, ***within physical and operational design***, to emit a pollutant. Any physical or operational limitation on the capacity of the facility or emitting unit to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, is treated as part of its design only if the limitation or the effect it would have on emissions is federally enforceable. Secondary emissions are not considered in determining potential to emit.” (ARM 17.8.1601(4) and 1701(2))

The maximum capacity of a facility is typically based on the maximum operational design or achievable capacity (whichever is higher) of an emission source operating continuously at 8760 hours per year. However, the oil and gas production sector has inherent physical limitations regarding wellhead production that should be taken into consideration. In general, most oil and gas wells are physically incapable of maintaining initial production rates for an extended time. Production typically declines at a rate over time that can be mathematically predicted and represented as a curve that gradually decreases over time. If these physical limitations and/or operational design features are not considered, the potential emissions may be overestimated, and the facility could unnecessarily be subject to Major Source Title V requirements. Therefore, DEQ is allowing the use of a “0.6 decline curve” for new wells when determining the projected first year production rates.

For existing oil or gas well facilities, the maximum production rate will be determined by identifying the maximum calendar year total production within the past 5-year period for permitting thresholds determination and the maximum calendar year total production within the past 3-year period for emission control requirements evaluations. This maximum calendar year total will then be multiplied by an adjustment factor of 1.2 for PTE purposes. The 3 to 5-year evaluation period provides a long enough time frame to establish reliable production trends that are not skewed based on short term increases in well pressure or production reductions due to economic decisions or maintenance and repair activities. The longer evaluation period for permitting thresholds will further ensure that maximum production of the facility has declined to an appropriate level that the facility should not be subject to any DEQ air quality oversight.

The maximum production rate for both new and existing wells must be calculated for each well at a facility to determine the applicable permitting or registration program as well as properly assessing the requirements for each emitting unit. The calculation procedures and examples are provided in Attachment 1.

For new wells only, the projected first year production, with use of a decline curve, can be utilized to determine the maximum production rate for PTE calculations. The owner/operator of the facility is responsible for monitoring the actual production to ensure the projected decline is achieved. If the projected decline is not achieved, the owner/operator should re-evaluate the facility wide PTE to determine if an emission control threshold or the Major Source Title V threshold is exceeded, and install compliant emission control equipment or file the necessary operating permit application/documentation, as appropriate.

Attachment 1

New Well

Permit applications and registration submittals for a new facility must be submitted within 60 days of initial well completion, as defined in MCA [75-2-211\(2\)\(b\)](#). The 60-day timeframe allows oil or gas well facilities time to collect site specific production data used to determine maximum production rates and facility wide PTE. Within the 60-day timeframe, the initial daily production rate must be determined. Please note, the total production must be divided by the actual days of production, not the total number of days in the given time frame when determining the initial daily production rate.

Procedure:

Step 1. Within 60 days of initial well completion calculate the initial daily production.

Step 2. Calculate the projected first year production rate by multiplying the initial daily production rate by 0.6 (60% decline curve).

Step 3. Calculate the PTE maximum production rate by multiplying the first-year projected production rate by the adjustment factor of 1.2.

If the expected decline factor is lower than 60%, then the lower factor should be used. Higher decline factors may be used after supporting documentation is provided to and approved by DEQ.

Example: During the first 45 days after initial well completion, the well produced 3000 barrels (Bbl) of Oil, 2500 thousand standard cubic feet (Mscf) of natural gas, and 5000 Bbl of produced water. The well was producing 30 days of the 45-day evaluation time frame.

Step 1: (Initial Daily Production)

Initial daily oil production = $3000 \text{ Bbl} / 30 \text{ days} = 100 \text{ Bbl/day}$

Initial daily natural gas production = $2500 \text{ Mscf} / 30 \text{ days} = 83 \text{ Mscf/day}$

Initial daily produced water production = $5000 \text{ Bbl} / 30 \text{ days} = 167 \text{ Bbl/day}$

Step 2: (Projected First Year Production Rate)

Projected first year oil production rate = $100 \text{ Bbl/day} \times 0.6 = 60 \text{ Bbl/day}$

Projected first year natural gas production rate = $83 \text{ Mscf/day} \times 0.6 = 50 \text{ Mscf/day}$

Projected first year produced water production rate = $167 \text{ Bbl/day} \times 0.6 = 100 \text{ Bbl/day}$

Step 3: (First Year Maximum Production Rate)

First year maximum oil production rate = $60 \text{ Bbl/day} \times 1.2 = 72 \text{ Bbl/day}$

First year maximum natural gas production rate = $50 \text{ Mscf/day} \times 1.2 = 60 \text{ Mscf/day}$

First year maximum produced water production rate = $100 \text{ Bbl/day} \times 1.2 = 120 \text{ Bbl/day}$

Attachment 1

Existing Well

The maximum production rate for existing wells will be determined by identifying the maximum calendar year total within the previous 5-year period for permitting thresholds or the maximum calendar year total within the previous 3-year period for emission control thresholds. If there is less than the required timeframe of production data, use the highest calendar year total actual production during the total time of production. The resulting maximum calendar year total will be multiplied by the adjustment factor of 1.2 to determine the maximum production rate for PTE calculations.

Procedure:

Step 1. Identify the maximum calendar year total for previous 3 to 5 years.

Step 2. Calculate the maximum annual production by multiplying the maximum calendar year total by the adjustment rate of 1.2

Step 3. Calculate the maximum daily production rate by dividing the maximum annual production by 365 days.

Example: The maximum calendar year total production identified over the 5-year time frame was 20,425 Bbl of Oil, 17,860 Mscf of natural gas, and 38,397 Bbl of produced water.

Step 1: (Identify Maximum Calendar Year Total)

Maximum calendar year total oil production = 20425 Bbl/yr

Maximum calendar year total natural gas production = 17860 Mscf/yr

Maximum calendar year total produced water production = 38397 Bbl/yr

Step 2: (Calculate Maximum Annual Production)

Maximum annual oil production = 20425 Bbl/yr \times 1.2 = 24510 Bbl/yr

Maximum annual natural gas production = 17860 Mscf/yr \times 1.2 = 21432 Mscf/yr

Maximum annual produced water production = 38397 Bbl/yr \times 1.2 = 46076 Bbl/yr

Step 3: (Calculate Maximum Daily Production Rate)

Maximum daily oil production rate = 24510 Bbl/yr / 365 days/yr = 67 Bbl/day

Maximum daily natural gas production rate = 21432 Mscf/day / 365 days/yr = 59 Mscf/day

Maximum daily produced water production rate = 46076 Bbl/yr / 365 days/yr = 126 Bbl/day