

## Allowable Rate of Production: Gas Wells

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Directive PNG011

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November 2015

Revision 1.0

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### Governing Legislation:

Act: *The Oil and Gas Conservation Act*

Regulation: *The Oil and Gas Conservation Regulations, 2012*

Order: 494/15

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**Record of Change**

<b>Revision</b>	<b>Date</b>	<b>Description</b>
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## 1. Introduction

The Saskatchewan Ministry of Energy and Resources (ER) regulates the production of gas wells in the province in order to ensure equitable distribution of the resources and to maximize the ultimate recovery from a pool. ER achieves these objectives by assigning production limits for gas wells in the province.

This Directive outlines how ER assigns production limits for gas wells, how they calculate the production limit for specific well types/locations, and how operators are to deal with underproduction and overproduction.

Other requirements that are pertinent to this topic may be found in the *Directive PNG007: Off-Target Well Requirements*.

Questions concerning the requirements in this document may be directed to the ER Service Desk at 1-855-219-9373 or email at [ER.servicedesk@gov.sk.ca](mailto:ER.servicedesk@gov.sk.ca).

### 1.1 Governing Legislation

The requirements outlined in this Directive are based on *The Oil and Gas Conservation Act* (OGCA) and *The Oil and Gas Conservation Regulations, 2012* (OGCR). In particular, section 17 of the OGCA provides ER with the authority to regulate the production rate of gas. Licensees should consult these documents in conjunction with this Directive.

It is the responsibility of all operators, as specified in the legislation, to be aware of ER requirements and to ensure compliance with all requirements prior to and during the productive life of a well.

### 1.2 Definitions

**Absolute open flow potential:** means the rate at which a gas well would produce against zero sandface backpressure as determined from a gas well test.

**Daily allowable (DA):** means the daily allowable rate of production authorized by ER for a well completion, if an operator has applied for a rate above the minimum allowable.

**Drainage unit:** means the area allocated to one or more well completions for the purpose of drilling and producing oil or gas.

**Gas well test:** is a 4-point isochronal or modified isochronal test, or any other approved test.

**Good production practice (GPP):** means production of gas from a well at a rate not governed by a defined allowable rate of production, but limited to what can be produced on the basis of technical parameters without adversely and significantly affecting the ultimate recovery of gas or the opportunity for other owners to obtain their share of production from the pool.

**Minimum allowable:** is a daily rate of production automatically assigned by ER to an on-target or off-target well that is not within an assigned pool where GPP rates have been granted. The minimum daily allowable for gas wells is 10 000 cubic metres per day (m<sup>3</sup>/d).

**Monthly allowable:** means the product of the DA or the minimum allowable multiplied by the number of calendar days in the month.

**Monthly production limit:** means the product of the DA or the minimum allowable multiplied by the number of calendar days in the month that the well has produced.

**Off-target:** means a gas well not completed within the prescribed target area of the drainage unit (see Directive PNG007 for more information on target areas and drainage units).

**On-target:** means a gas well completed within the prescribed target area of the drainage unit.

**Overproduction:** means the production from a gas well in excess of the monthly allowable or monthly production limit in a given month.

**Underproduction:** means the production from a gas well less than the monthly allowable or monthly production limit in a given month.

## 2. Allowable Rates of Production

### 2.1 Minimum Allowable

For gas wells that are completed on-target or off-target, ER assigns a minimum daily allowable rate of production of 10 000 m<sup>3</sup>/d, with the exception of wells that are within a defined pool where GPP has been granted (see *Guideline PNG021: Determining Drainage Units and Target Areas*, available at <http://publications.gov.sk.ca/documents/310/85288-Guideline PNG021-Determining Drainage Units and Target Areas March21,2017.pdf> to determine the location of defined pools). The minimum allowable is applied automatically to the gas well.

### 2.2 Daily Allowable

If an operator wishes to apply for a daily production rate that is more than the minimum allowable, they need to submit an application in the Integrated Resource Information System (IRIS). The form to use is called an *Application for Daily Allowable* and, once such an application is received, ER will calculate a suitable daily allowable production rate based on the conditions outlined in subsection 2.3, below.

### 2.3 Calculation of Daily Allowable

When ER receives an application for a daily production rate above the minimum allowable, a suitable production rate is determined as follows:

- For an on-target gas well, the daily allowable will be equal to the absolute open flow potential of the well multiplied by 20 per cent.

- For an off-target gas well, the daily allowable will be equal to the absolute open flow potential of the well multiplied by 20 per cent, with the product of that calculation multiplied by the off-target penalty (see Directive PNG007 for more details on off-target penalties). If the off-target penalty has been waived by ER, the daily allowable will be the absolute open flow potential of the well multiplied by 20 per cent.

The method for determining an off-target penalty is explained in section 35 of the OGCR. Some examples of the calculation are also shown in Appendix 2 of this Directive.

How to apply for a waiver of off-target penalty is explained within Directive PNG007.

## **2.4 Modification to the Calculation of the Daily Allowable**

Notwithstanding subsections 2.1 and 2.2, above, if ER deems that the method of determining the daily allowable rate of production results in an inequitable distribution of the resource among the operators or mineral rights owners, the daily allowable rate of production may be determined by some other method by ER.

## **2.5 Daily Allowable Effect on Ultimate Recovery**

If the ultimate recovery of gas is being adversely affected from a pool, ER may modify the gas well daily allowable rate of production for all producers to a value that is appropriate for the pool.

## **3. Effective Date of Daily Allowable**

### **3.1 Minimum Allowable**

The effective date for a gas well to produce at a rate equal to the minimum allowable, as specified in subsection 2.1 above, is the date of first production from that well.

### **3.2 Daily Allowable Above the Minimum**

The effective date of a daily allowable rate of production above the minimum rate, as specified in subsection 2.2, is based on the date that ER receives an application for an increased daily rate of production.

- If an application for an increased daily rate of production is received by ER **prior to** the date of first production from a well, then the effective date of the daily allowable is the date of first production from that well.
- If an application for an increased daily rate of production is received by ER **after** the date of first production from a well, then the effective date of the daily allowable is the first day of the first calendar month following the date of receipt of the application.

## **4. Good Production Practice**

### **4.1 GPP Authorized in a Defined Pool**

If a gas well is producing from an established defined pool that has been granted GPP rates of daily production, then the producer must follow those production guidelines, unless otherwise instructed by ER. No application for a daily allowable rate of production is necessary for these types of wells.

#### **4.2 Good Production Practice Authorized to Individual Gas Well**

Any individual gas well that was granted GPP before the date this Directive came into effect will still be authorized to produce at that production rate, unless otherwise instructed by ER.

#### **5. Underproduction**

Where there is underproduction from a gas well in any given month, the amount of underproduction cannot be added to the monthly allowable in any succeeding month to reduce overproduction.

#### **6. Overproduction**

All overproduction from a gas well is cumulative until such time as the overproduction is corrected.

##### **6.1 Correction of Overproduction**

The operator of a gas well is responsible for keeping a record of current and cumulative overproduction and, without notification from ER, will take measures to correct any overproduction as soon as possible by underproducing the well.

##### **6.2 Failure to Correct Overproduction**

If ER determines that the operator of a gas well has failed to correct the overproduction or continues to exceed the monthly allowable or the monthly production limit, the gas well may be ordered shut in or sealed.

Appendix 1: Example of a Completed Application Form: *Daily Allowable for Gas*



APPLICATION FOR DAILY ALLOWABLE

Petroleum and Natural Gas Division

**Part I - GENERAL INFORMATION**

**BOTTOM HOLE LOCATION**      **SURFACE LOCATION**

LSD	SEC	TWP	RGE	M
7	21	0	32	21
				3

LSD	SEC	TWP	RGE	M
7	21	0	32	21
				3

**CENCE NUMBER**  
01A234

Pool Name:       Pool Code:

Pay Interval:       Contact Intervals:

**Assigned Area:**  
Legal description of Drainage Unit (D.U.):

Number of Legal Subdivisions in D.U.:       Total Number of hectares in D.U.:

Have you mineral leases for entire D.U.:  yes  no      Pooling agreements for entire D.U.:  N.A.  yes  no

**Test Data:**  
Date:         Type:  4-Point Isochron  4-Point Modified Isochron Other:

mm    dd    yyyy

Absolute Open Flow Capacity:   $10^3 \text{ m}^3/\text{d}$       Daily Allowable Applied for:   $10^3 \text{ m}^3/\text{d}$

**Part II - REQUIRED ATTACHMENTS**

- Portion of well logs showing pool, pay, and contact intervals
- Gas Well Test in accordance to Section 79 of *The Oil and Gas Conservation Regulations, 2012*

**Part III - APPLICANT INFORMATION AND DECLARATION**

Applicant Name:  Mr.  Ms.       John Smith

Telephone:  ext.       Email Address:

Company Name:       ABC Petroleum Inc.

Company Address:       123 Test St., Regina, SK

By signing below, I hereby certify that the application form and required attachments are complete and accurate. Furthermore, I acknowledge that the Ministry of the Economy may reject the application and that I may be required to provide additional information.

Signature of Applicant: \_\_\_\_\_      Date:

mm    dd    yyyy

**Part IV - SUBMISSION OF APPLICATION**

Submit the application electronically, in PDF file format, via the Ministry of the Economy's Integrated Resource Information System (IRIS) at [www.saskatchewan.ca/IRIS](http://www.saskatchewan.ca/IRIS). IRIS is an online business system that supports the development and regulation of Saskatchewan's energy and resources industry. Through IRIS, the oil and gas industry completes regularly performed business activities and regulatory tasks with the province online.

(for ministry use only)

**Test Data:**  
Date:         Type:  4-Point Isochronal  4-Point Modified Isochronal Other:

mm    dd    yyyy

Absolute Open Flow Capacity:   $10^3 \text{ m}^3/\text{d}$       First Production Date:

mm    dd    yyyy

**Daily Allowable Calculation:**  AOF N20: NOTW Penalty Factor  AOF N20: Other:

Remarks:

Pool Name:       Pool Code:

Effective Date:         Date of Issue:         Authorized DA:   $10^3 \text{ m}^3/\text{d}$

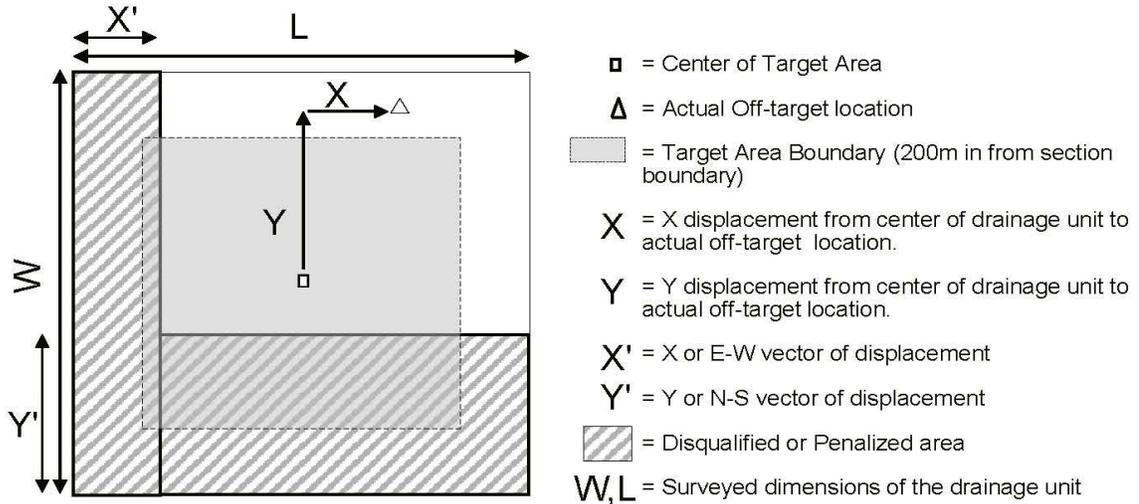
mm    dd    yyyy      mm    dd    yyyy

Reviewed by:       Authorized by:

Appendix 2: Example Calculations for Daily Allowable for Gas Wells Subject to Off-Target Penalties



Off Target Gas Well  
Calculation of Penalized Allowable  
(Based on a 1 Section Gas Drainage Unit )



**GAS:**

Penalized Daily Allowable = Sandface AOF x 20% x Penalty Factor

\* note: minimum allowable assigned is  $10 \times 10^3 \text{m}^3$

where: Penalty Factor = ((Qualified or Unpenalized Area) / Total Area))

Unpenalized Area =  $(L - X') \times (W - Y')$

Total Area =  $W * L$  or the area of drainage unit

**SAMPLE PENALTY FACTOR CALCULATION:**

Off target well co-ordinates: 510.0 m West and 100.0 m South

If  $L=1609.2$  m and  $W=1609.2$  m, then  $X'=294.6$  m and  $Y'=704.6$  m

Penalty Factor =  $[(1609.2 - 294.6) \times (1609.2 - 704.6)] / (1609.2 \times 1609.2)$

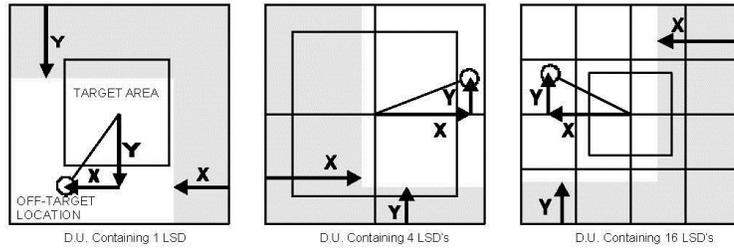
Penalty Factor =  $(1314.6 \times 904.6) / 2589524.6 = 0.459$

**Appendix 3: Examples of Establishing Net Productive Area for Off-Target Wells**

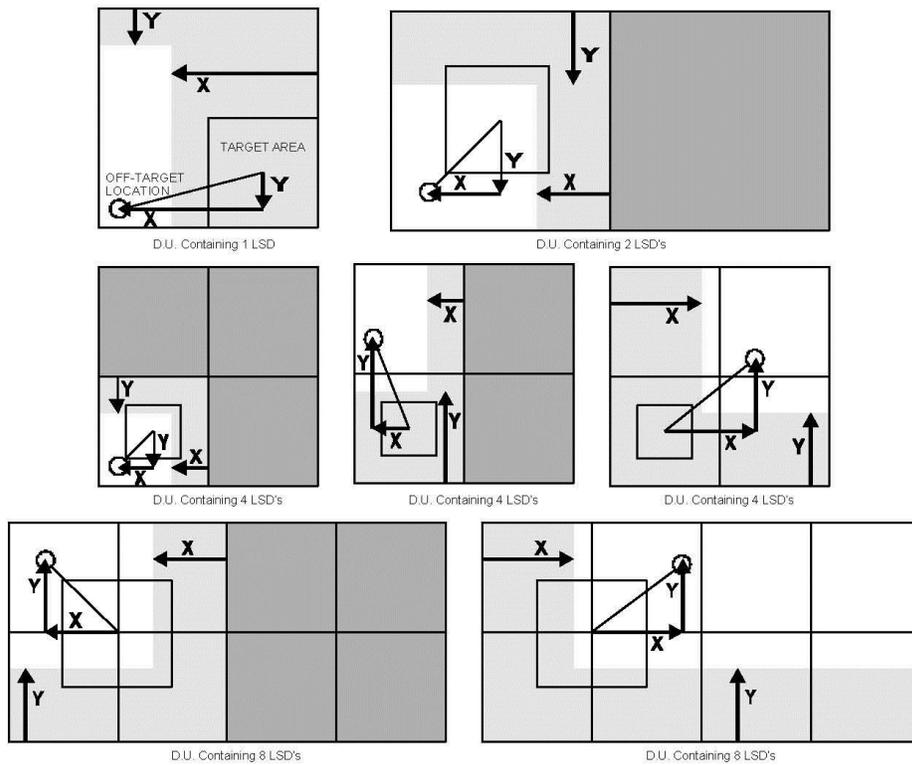
OIL AND GAS CONSERVATION

**Illustration of Principle for Establishing Net Productive Area for Off-target Wells**

(Section 30 of THE OIL AND GAS CONSERVATION REGULATIONS, 1985)



**1. Drainage Units with Target Areas centered on the Drainage Unit**



**2. Drainage Units with Target Areas not centered on the Drainage Unit**

Note: The Net Productive Area equals the unshaded area in each case

- Any legal subdivisions that do not form a part of the target area and are located in a position that is in the opposite direction of a vector of displacement are removed from the drainage unit
- Area removed from drainage unit by virtue of N-S/E-W vectors of displacement