



Gas Capture Plan COGCC Rule 903

State 10-67-28-1H Facility

Prepared for:

Ben Turner

Edge Energy II, LLC

Prepared by:

Neel Duncan – Managing Director

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IPT Well Solutions

09 March 2023

Diana Burn
Engineering Manager
Colorado Oil and Gas Conservation Commission
1120 Lincoln Street Suite 800
Denver, Colorado 80203

Re: Rule 903 Gas Utilization Plans
Edge Energy II LLC (#10671)
State 10-67-28-1H Facility ID 419849
API # 05-123-32368

Dear Diana:

Attached is the Rule 903 gas utilization plans for the above referenced facility. I have reviewed it and believe it comports with the rules, and the spirit of the rules which is to eliminate methane emissions.

This well is far enough from gas gathering lines to make it uneconomical to reach tie-in points, the nearest of which is approximately 7 miles away. More importantly, this well will not produce more gas than it needs on location for pumpjacks, heater treaters, and pilot ignition systems. The gas balance for this well is as follows using my own independent research and estimate of production.

Well	Oil (BOPM)	GOR	Gas MMscf/month	Nameplate Usage MMscf/month	Gas Deficit MMscf
State 10-67 #28-1H	93	1710	0.16	0.43	0.26

The table shows that this location runs a deficit in terms of gas produced versus gas required to run the equipment. This deficit is managed by controlling separator temperature and supplementing pumpjacks with propane when required.

The BTU of the produced gas in this report has been updated to an estimate of 1300 BTU for gas balance calculations which is consistent with the gas produced from horizontal Niobrara wells in this area. This value differs from the BTU reported in the most recent gas analysis performed in 2019, which is only an instantaneous value.

There will be no flaring or venting at any of these sites. Please call if you have any questions.

Kind regards,

Neel L. Duncan
Cell: 303-947-9402

Gas Capture Plan

Purpose

COGCC's Rule 903e requires that operators describe the proposed usage of any "waste" gas from oil and gas facilities for any beneficial use when gas is produced from location but unable to be connected to a pipeline. Edge Energy II, LLC is proposing the following plan for the subject location State 10-67-28-1H, which describes the location of the facility, nearest pipeline, reasoning, and plan for the beneficial use of the produced gas from the location.

Required Elements

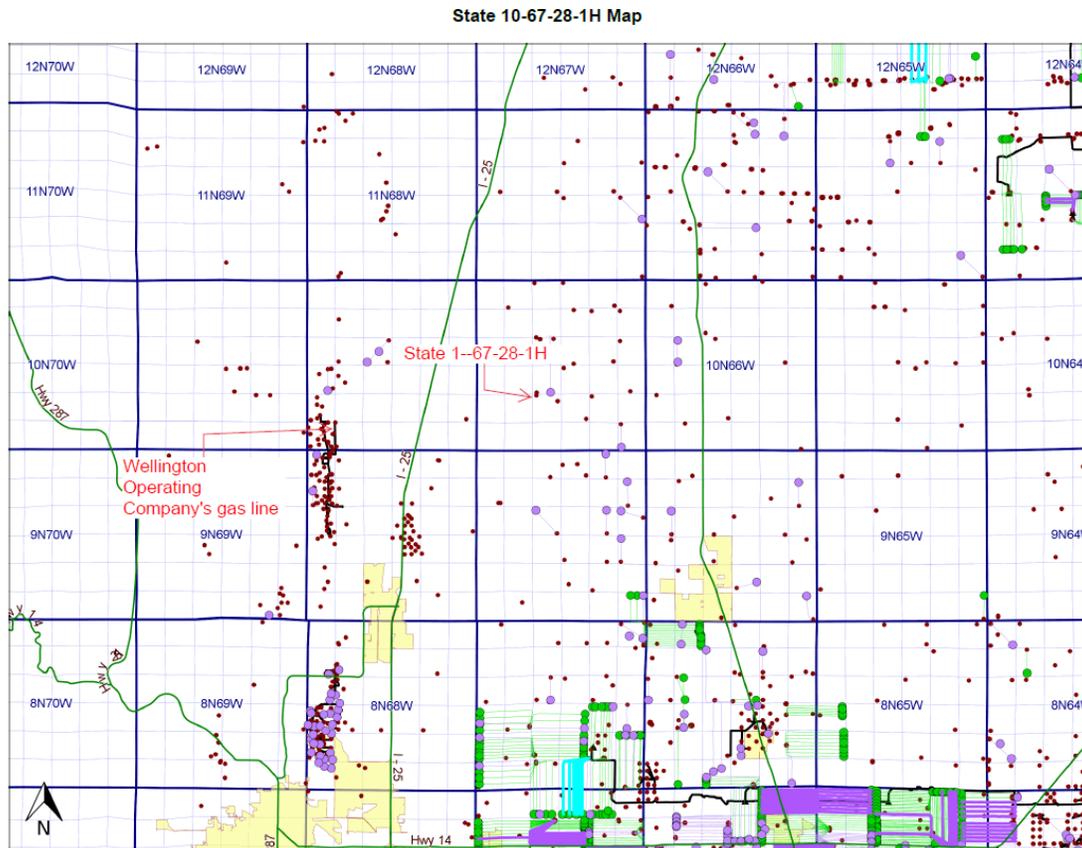
- 1) 903(e)(1)(B)(i) – Description and map of the location of the closest or contracted natural gas gathering system or point of sale.

The subject location is known as State 10-67-28-1H, location ID#: 419849.

The subject well is the State 10-67-28-1H, API#: 05-123-32368

This well is approximately 7 miles East of the nearest gas gathering line, Wellington Operating Company's gas gathering line.

The subject facility's location and proximity to gas gathering lines can be evaluated visually from the map below.



- 2) 903(e)(1)(B)(ii) – Name of the company operating the closest or contracted natural gas gathering system.

The owner/operator of the nearest gas gathering line is Wellington Operating Company.

- 3) 903(e)(1)(B)(iii) – The Operator’s plan for connecting their facility to a natural gas gathering system or otherwise putting gas to beneficial use.

There are no nearby gas gathering lines available to this well’s location and due to its low production, no plans exist for building one. Edge Energy II proposes that the use of any produced gas from this well be put to beneficial use at this location, to operate on-site equipment. The well can produce up to 0.16 MMscf of natural gas per month. To operate on-site facilities, approximately 5.15 MMscf/ year (0.43 MMscf/ month) of natural gas would be needed.

This location operates on a closed loop between wellhead, separators, and fuel intakes for equipment. As such, this location will not participate in any venting or flaring activities, and all gas will be captured and utilized to power on-site equipment. At the location there is one heater treater, and one combustor pilot, which is connected to water and oil tanks, and one pumpjack engine.

The following calculations and parameters are based on burner nameplate specifications of the on-site equipment, and a site-specific gas analysis is attached to this report in Appendix B. This location can use up to 0.43 MMcf of produced gas each month. Based on the historic production of this well, the location may produce 0.16 MMscf of gas per month. Comparing the calculated fuel consumption of this location and the forecasted produced gas, this facility will be able to utilize all the produced gas to power its on-site equipment.

Location Fuel Usage Estimates and Calculations

Heater Fuel Usage Parameters	
Heater Count	1 heater
Hours Operated	8760 hours/year
Designed Heat Input Rate	0.5 MMBTU/hr/heater
Natural Gas Heat Content	1300 BTU/SCF

$$\text{Fuel Consumption} = \frac{\text{Heater Count} * \text{Designed Heat Input Rate} * \text{Hours Operated}}{\text{Natural Gas Heat Content}}$$

Fuel Consumption = 3.37 MMscf/year

Combustor Pilot Fuel Usage Calculation

Combustor Pilot Fuel Usage Parameters	
Pilot Count	1 pilot
Hours Operated	8760 hours/year
Designed Heat Input Rate	0.03 MMBTU/hr/pilot
Natural Gas Heat Content	1300 BTU/SCF

$$\text{Fuel Consumption} = \frac{\text{Pilot Count} * \text{Designed Heat Input Rate} * \text{Hours Operated}}{\text{Natural Gas Heat Content}}$$

Fuel Consumption = 0.20 MMscf/year

Engine #1 Fuel Usage Parameters	
Engine Count	1 engine
Hours Operated	8760 hours/year
Horsepower	25 hp
Natural Gas Heat Content	1300 BTU/SCF
Brake Specific Fuel Consumption	9400 BTU/hp-hr

$$\text{Fuel Consumption} = \frac{\text{Engine Count} * \text{HP} * \text{Brake Specific Fuel Consumption} * \text{Hours Operated}}{\text{Natural Gas Heat Content}}$$

Fuel Consumption = 1.58 MMscf/year

In total, the site will use a total of 5.15 MMscf/year, or 0.43 MMscf/month to power equipment.

- 4) 903(e)(1)(B)(iv) – Wildcat well or productivity test requirements.

This well will not undergo any productivity testing due to the fact that it is not a wildcat well.

- 5) 903(e)(1)(B)(v) – Any anticipated safety risks that will require the Operator to allow gas to escape, rather than being captured or combusted during drilling operations, pursuant to Rule 903.b.(2).

There are no current or planned future drilling activities at this location.

- 6) 903(e)(1)(B)(vi) – A description of operational best practices that will be used to minimize Venting during active and planned maintenance allowed pursuant to Rule 903.d.(1).B.

No venting will occur during normal operations of this gas capture plan due to the closed-loop nature of the design. Because of this, during maintenance operations gas valves will be isolated to avoid unnecessary venting until the maintenance work is completed and the well is returned to service.

7) *903(e)(1)(B)(vii) – Procedures the Operator will employ to reduce the frequency of Well liquids unloading events.*

This well primarily produces oil, with low gas production. Due to the low volumes of gas production, liquid unloading is not expected to occur.

8) *903(e)(1)(B)(viii) – Anticipated volumes of liquids and gas production and a description of how separation equipment will be sized to optimize gas capture.*

This well has been on and off production since 2011 and has on recent average produced 146 bbls of water, 134 bbls of oil, and 0.16 MMscf of natural gas per month. Separator volumes have been selected and proven to adequately address these volumes of production from this single well in the years since it was initially produced.

Section 3, which addresses rule *903(e)(1)(B)(iii)* has calculated the facility's average fuel consumption and compared it with this well's gas production. The volume of gas produced and the fuel consumption demanded from operating the facility is in a deficit, meaning the location equipment will require more gas to run than the well produces, so the entirety of produced gas from this well can be utilized (and supplemented with propane) to run facility equipment.

Please find in the Appendices of this report:

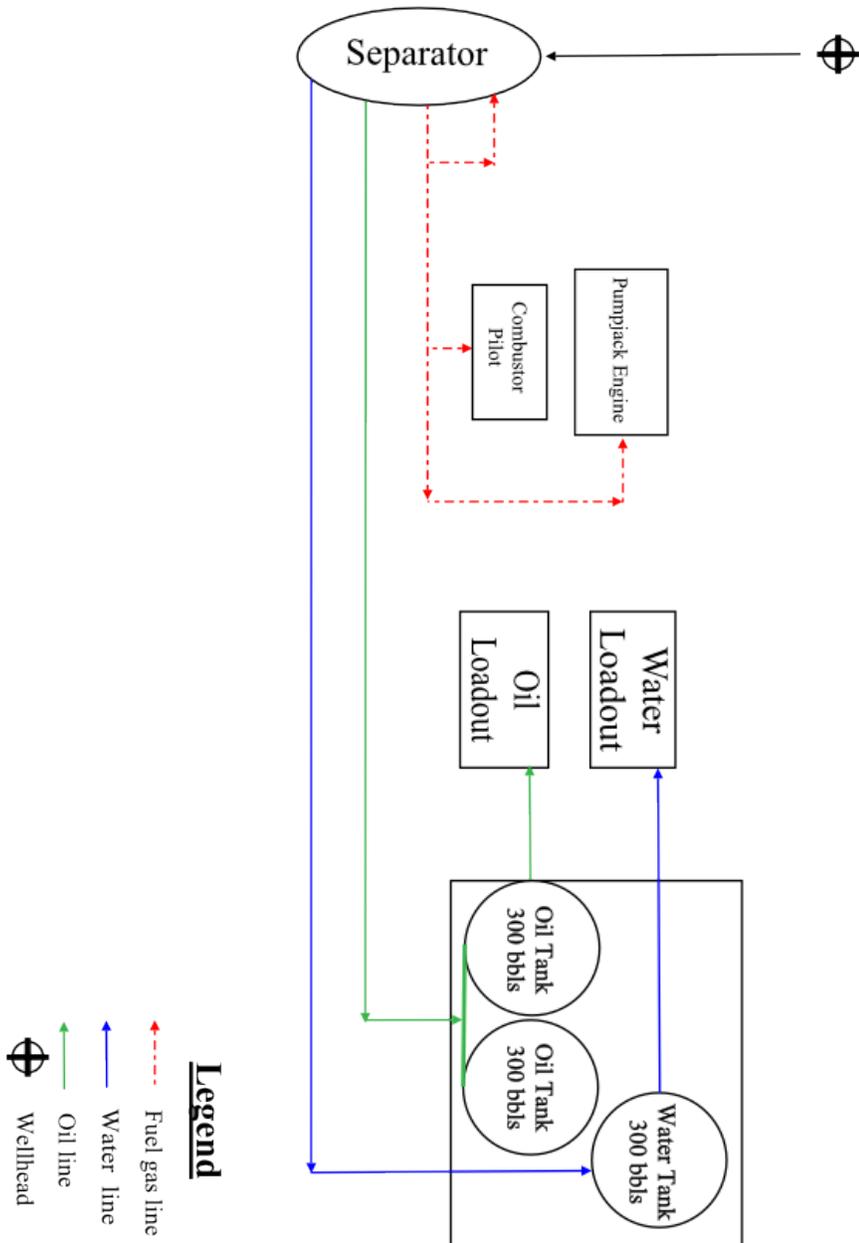
Appendix A: Process Flow Diagram

Appendix B: Site-Specific Gas Analysis

APPENDIX

Appendix A

Process Flow Diagram
 State 10-67-28-1H
 Edge Energy II, LLC



Legend

- - - Fuel gas line
- Water line
- Oil line
- Wellhead

Drawing not to scale. All lines are for illustration only and are not meant to indicate physical location. The combustor pilot remains lit at all times and relies on gas for a fuel source, however, it does not vent produced gas to the atmosphere at any time.

Appendix B



Certificate of Analysis
 Number: 2500-21080159-001A

Greeley Laboratory
 2881 S. 31st Ave
 Unit 6-8
 Greeley, CO 80631

Ben Turner
 Edge Energy

Aug. 30, 2021

Station Name: State 10-67-28 1H
 Method: GPA 2286
 Cylinder No: 2500-00928
 Analyzed: 08/26/2021 06:51:31 by RHJ

Sampled By: Dan Lara
 Sample Of: Gas Spot
 Sample Date: 08/18/2021 10:30
 Sample Conditions: 15 psig, @ 85 °F

Analytical Data

Components	Mol. %	Wt. %	GPM at 14.73 psia
Hydrogen Sulfide	0.0007	0.0009	
Nitrogen	1.3208	1.4332	
Carbon Dioxide	3.2223	5.4930	
Methane	67.5961	42.0040	
Ethane	8.0486	9.3742	2.1635
Propane	10.3411	17.6627	2.8636
Iso-Butane	1.3665	3.0764	0.4494
n-Butane	4.7805	10.7625	1.5148
Iso-Pentane	1.0385	2.9022	0.3818
n-Pentane	1.0557	2.9503	0.3847
i-Hexanes	0.3327	1.1100	0.1380
n-Hexane	0.2398	0.7995	0.0990
Benzene	0.0383	0.1159	0.0108
Cyclohexane	0.0536	0.1748	0.0183
i-Heptanes	0.3260	1.1550	0.1292
n-Heptane	0.0503	0.1954	0.0234
Toluene	0.0216	0.0770	0.0073
i-Octanes	0.1173	0.4884	0.0542
n-Octane	0.0147	0.0651	0.0075
2,2,4-Trimethylpentane	0.0033	0.0144	0.0017
Ethylbenzene	0.0076	0.0314	0.0029
Xylenes	0.0042	0.0170	0.0016
i-Nonanes	0.0124	0.0607	0.0068
n-Nonane	0.0040	0.0199	0.0023
Decane Plus	0.0034	0.0161	0.0017
	100.0000	100.0000	8.2625

Calculated Physical Properties	Total	C10+
Calculated Molecular Weight	25.82	127.71
GPA 2172 Calculation:		
Calculated Gross BTU per ft³ @ 14.73 psia & 60°F		
Real Gas Dry BTU	1441.2	6771.5
Water Sat. Gas Base BTU	1416.1	6618.1
Relative Density Real Gas	0.8959	4.4094
Compressibility Factor	0.9946	

Comments: H2S Field Content 7 ppm

Data reviewed by: Ryleigh Jacobs, Laboratory Analyst

Quality Assurance: The above analyses are performed in accordance with ASTM, UOP, GPA guidelines for quality assurance, unless otherwise stated.