Division Information

Engineer:	David Thompson	
Control Engineer:	Chris Laplante	
Review Date:	11/06/2014	
Application Date:	06/21/2013	

Facility Identifiers

Permit No.		13WE2323	
AIRs	County #	123	Weld
	Facility #	9A73	
Facility Type:	exploration and production facility		

☑ Located in the 8-hour non-attainment area?

○ True Minor

◉ Synthetic Minor for: ☑ VOC ☐ NOx ☐ CO

Administrative Information

Company Name:		Noble Energy, Inc.
Source Name:		Wells Ranch Sec 14 Econode
Source Location:		SWSW Sec 14, T6N R63W
SIC:		1311
Mailing Address	Address 1:	Noble Energy, Inc.
	Address 2:	1625 Broadway, Suite 2200
	, State Zip:	Denver, CO 80202
Person To Contact	Name:	Taryn Phillips
	Phone:	303-228-4362
	Fax:	000-000-0000
	Email:	tphillips@nobleenergyinc.com

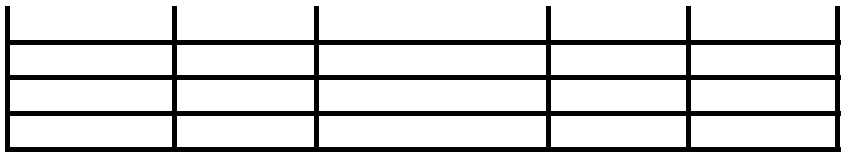
Requested Action

Self Certification Required?	Yes
Issuance Number:	1

Source Description:

Oil and gas exploration and production facility known as the Wells Ranch Sec 14 Econode, located in the SWSW Sec 14, T6N R63W, Weld County, Colorado.

Point	Name	Type	Control	Action
008	PW	Water Tanks	Flare	Newly reported source
009	TLO	Loadout	Flare	Newly reported source
010	Flare	Separator Venting	Flare	Newly reported source



008 **Six (6) 500 bbl and two (2) 60 bbl produced water storage tanks**

Emissions Calculations

Requsted Throughput	300000	bbl

Control	Flare
Efficiency	95.00%

Emissions Summary Table

Pollutant	Emission Factor		Uncontrolled Emissions		Controlled Emissions		Source
VOC	0.262	lb/bbl	39.3	tpy	1.965	tpy	CDPHE
Benzene	0.007	lb/bbl	2100	lb/yr	105	lb/yr	CDPHE
n-Hexane	0.022	lb/bbl	6600	lb/yr	330	lb/yr	CDPHE

Regulatory Review

Section II.A.1 - Except as provided in paragraphs 2 through 6 below, no owner or operator of a source shall allow or cause the emission into the atmosphere of any air pollutant which is in excess of 20% opacity. This standard is based on 24 consecutive opacity readings taken at 15-second intervals for six minutes. The approved reference test method for visible emissions measurement is EPA Method 9 (40 CFR, Part 60, Appendix A (July, 1992)) in all subsections of Section II. A and B of this regulation.

Section II.A.5 - Smokeless Flare or Flares for the Combustion of Waste Gases No owner or operator of a smokeless flare or other flare for the combustion of waste gases shall allow or cause emissions into the atmosphere of any air pollutant which is in excess of 30% opacity for a period or periods aggregating more than six minutes in any sixty consecutive minutes.

Regulation 2 – Odor

Section I.A - No person, wherever located, shall cause or allow the emission of odorous air contaminants from any single source such as to result in detectable odors which are measured in excess of the following limits: For areas used predominantly for residential or commercial purposes it is a violation if odors are detected after the odorous air has been diluted with seven (7) or more volumes of odor free air.

009 **Truck Condensate Loadout**

Calculations

L = 12.46*S*P*M/T (AP-42: Chapter 5.2, Equation 1)

L = loading losses in lb per 1000 gallons loaded

Factor	Meaning	Value	Units	Source
S	Saturation Factor	0.6		AP-42
P	True Vapor Pressure	6.9	psia	Sales Oil Analysis
M	Molecular Weight of Vap	62	lb/lb-mole	AP-42
T	Liquid Temperature	520	deg. R	Field Data

L 6.15 lb/10^3 gal

2.58E-01 lb/bbl

Annual requested Throughput 2000000 BBL/yr

84000000 gal/yr

Annual requested VOC emissions 516638 lb/yr

258.32 tpy

Control: Flare

Efficiency: 95.00%

NCRPs

Component	Mass Fraction
Benzene	0.0090
n-hexane	0.0160
Toluene	0.0130
Xylenes	0.0050

Source: Pressurized oil analysis

Emissions Summary Table

Pollutant	Emission Factor		Uncontrolled Emissions	Controlled Emissions	Source
VOC	0.2583	lb/bbl	258.32 tpy	12.92 tpy	AP-42
Benzene	0.0023	lb/bbl	4649.74 lb/yr	232.49 lb/yr	AP-42
n-Hexane	0.0041	lb/bbl	8266.20 lb/yr	413.31 lb/yr	AP-42
Toluene	0.0034	lb/bbl	6716.29 lb/yr	335.81 lb/yr	AP-42
Xylenes	0.0013	lb/bbl	2583.19 lb/yr	129.16 lb/yr	AP-42

Regulatory Review

Regulation 7- Volatile Organic Compounds

This facility is not considered a bulk plant (in Reg. 7) because it does not distribute gasoline.

010	Separator controlled by a 40' flare stack. Flare has a minimum combustion efficiency of 95%. The flare is/is not enclosed.

Equipment Description

This source vents natural gas from: a well head separator
Emissions from this source are: routed to a flare

Natural gas venting from a well head separator. Emissions from this source are routed to a flare.

Calculations

Emission Calculation Method

EPA Emission Inventory Improvement Program Publication: Volume II, Chapter 10 - Displacement Equation (10.4-3)

Ex = Q * MW * Xx / C

Ex = emissions of pollutant x
Q = Volumetric flow rate/volume of gas processed
MW = Molecular weight of gas = SG of gas * MW of air
Xx = mass fraction of x in gas
C = molar volume of ideal gas (379 scf/lb-mol) at 60F and 1 atm

Throughput (Q)	85	MMscf/yr	9703.196347	scf/hr
MW	22.17	lb/lb-mol	0.232876712	MMscf/d

	mole %	MW	lbx/lbmol	mass fraction	lb/hr	lb/yr	tpy
Helium	0.00	4.0026	0.000	0.000	0.00	0.00	0.00
CO2	0.00	44.01	0.000	0.000	0.00	0.00	0.00
N2	0.00	28.013	0.000	0.000	0.00	0.00	0.00
methane	0.00	16.041	0.000	0.000	0.00	0.00	0.00
ethane	0.00	30.063	0.000	0.000	0.00	0.00	0.00
propane	0.00	44.092	0.000	0.000	0.00	0.00	0.00
isobutane	0.00	58.118	0.000	0.000	0.00	0.00	0.00
n-butane	0.00	58.118	0.000	0.000	0.00	0.00	0.00
isopentane	0.00	72.114	0.000	0.000	0.00	0.00	0.00
n-pentane	0.00	72.114	0.000	0.000	0.00	0.00	0.00
cyclopentane	0.00	70.13	0.000	0.000	0.00	0.00	0.00
n-Hexane	0.00	86.18	0.000	0.000	0.00	0.00	0.00
cyclohexane	0.00	84.16	0.000	0.000	0.00	0.00	0.00
Other hexanes	0.00	86.18	0.000	0.000	0.00	0.00	0.00
heptanes	0.00	100.21	0.000	0.000	0.00	0.00	0.00
methylcyclohexane	0.00	98.19	0.000	0.000	0.00	0.00	0.00
224-TMP	0.00	114.23	0.000	0.000	0.00	0.00	0.00
Benzene	0.00	78.12	0.000	0.000	0.00	0.00	0.00
Toluene	0.00	92.15	0.000	0.000	0.00	0.00	0.00
Ethylbenzene	0.00	106.17	0.000	0.000	0.00	0.00	0.00
Xylenes	0.00	106.17	0.000	0.000	0.00	0.00	0.00
C8+ Heavies	0.00	137.4837288	0.000	0.000	0.00	0.00	0.00
			VOC mass fracl	0.000	Total VOC (Uncontrolled)		0.00

Notes

Mole %, MW, and mass fractions from Critter Creek 2-03H gas analysis.
Emissions are based on 8760 hours of operation per year.
I calculated the average MW of C8+ based on the average MW on the analysis for the gas.

Flaring Information

Equipment Description

Flare to combust produced gas until pipeline is available at this wellhead facility.

Manufacturer	Tornado	
Model	40' Flare Stack	
Serial Number	12345678	
Gas Heating Value	1299	Btu/scf
Throughput	110415	MMBtu/yr

VRU Information

Equipment Description

Engine to recompress gas to sales line.

Make	
Model	
Requested Control	100.00%
Annual Bypass Tim	50.00%
Backup	Flare

Overall Control	95.00%

Combustion emission factor source:		AP-42: Chapter 13.5	
0.07	lb NOX/MMBtu	0.37	lb CO/MMBtu

Emissions Summary Table

Pollutant	Uncontrolled Emission Factor		Controlled Emission Factor	Uncontrolled Emissions	Controlled Emissions	Source
VOC	0.00	lb/MMscf	0.00 lb/MMscf	619.40 tpy	31.00 tpy	Gas Analysis
Nox	0.07	lb/MMBTU	0.07 lb/MMBTU	3.75 tpy	3.75 tpy	AP-42
CO	0.37	lb/MMBTU	0.37 lb/MMBTU	20.43 tpy	20.43 tpy	AP-42
Benzene	0.00	lb/MMscf	0.00 lb/MMscf	0.00 lb/yr	0.00 lb/yr	Gas Analysis
n-Hexane	0.00	lb/MMscf	0.00 lb/MMscf	0.00 lb/yr	0.00 lb/yr	Gas Analysis
Toluene	0.00	lb/MMscf	0.00 lb/MMscf	0.00 lb/yr	0.00 lb/yr	Gas Analysis
Xylenes	0.00	lb/MMscf	0.00 lb/MMscf	0.00 lb/yr	0.00 lb/yr	Gas Analysis
Ethylbenzene	0.00	lb/MMscf	0.00 lb/MMscf	0.00 lb/yr	0.00 lb/yr	Gas Analysis

Regulatory Applicability

AQCC Regulation 1

This source is subject to the opacity requirements for flares in Section II.A.5:'No owner or operator of a smokeless flare or other flare for the combustion of waste gases shall allow or cause emissions into the atmosphere of any air pollutant which is in excess of 30% opacity.'

AQCC Regulation 2

Section I.A applies to all emission sources. "No person, wherever located, shall cause or allow the emission of odorous air contaminants from any single source such as to result in detectable odors which are measured in excess of the following limits: For areas used predominantly for residential or commercial purposes it is a violation if odors are detected after the odorous air has been diluted with seven (7) or more volumes of odor free air."

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
AIR POLLUTION CONTROL DIVISION
FACILITY EMISSION SUMMARY

Noble Energy, Inc.
Wells Ranch Sec 14 Econode
123/9A73 **SWSW Sec 14, T6N R63W**
Weld County

POINT	Permit	Description	PTE - WITH ENFORCEABLE CONTROLS NOx	VOC	Fug VOC	CO	Reportable HAPs	Total HAPs	PTE - UNCONTROLLED NOx	VOC	Fug VOC	CO	Reportable HAPs	Total HAPs	REMARKS
008	13WE2323	Water Tanks		2.0						39.3					
009	13WE2323	Loadout		11.6						232.1					
010	13WE2323	Separator Venting	3.8	31.0		20.4			3.8	619.4		20.4			
		Total	**3.8**	**44.6**	**0.0**	**20.4**	**0.0**	**0.0**	**3.8**	**890.8**	**0.0**	**20.4**	**0.0**	**0.0**	
		Total Permitted	**3.8**	**44.6**	**0.0**	**20.4**	**0.0**	**0.0**							

123/9A73

Noble Energy, Inc.
Wells Ranch Sec 14 Econode
SWSW Sec 14, T6N R63W
Weld County

HAPs lb/yr

Controlled			Formaldehyde	Acetaldehyde	Benzene	Acrolein	Toluene	Ethylbenzene	Xylenes	n-Hexane	224 TMP	MeOH	DEA	Total (lb/yr)	Total (TPY)	Reportable (TPY)
008	13WE2323	Water Tanks			105					330				435.0	0.2	0.2
009	13WE2323	Loadout			209		301.7		116.1	371.4				998.1	0.5	0.5
010	13WE2323	Separator Venting			0		0	0	0	0				0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
		TOTAL	0.0	0.0	0.2	0.0	0.2	0.0	0.1	0.4	0.0	0.0	0.0	1433.1	0.7	0.7

*Red text indicates emissions below de minimus levels

HAPs lb/yr

Uncontrolled			Formaldehyde	Acetaldehyde	Benzene	Acrolein	Toluene	Ethylbenzene	Xylenes	n-Hexane	224 TMP	MeOH	DEA	Total (lb/yr)	Total (TPY)	Reportable (TPY)
008	13WE2323	Water Tanks			2100					6600				8,700.0	4.4	4.4
009	13WE2323	Loadout			4178		6034.9		2321.1	7427.6				19,961.6	10.0	10.0
010	13WE2323	Separator Venting			0		0	0	0	0				0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
														0.0	0.0	0.0
		TOTAL	0.0	0.0	3.1	0.0	3.0	0.0	1.2	7.0	0.0	0.0	0.0	28661.6	14.3	14.3

*Red text indicates emissions below de minimus levels

AIRS (County/Plant) 123/9A73
Permit No. 13WE2323
Date 11/6/2014

Point #	SCC	Pollutant or CAS		Uncontrolled Emission Factor
008	40400315	VOC		6.238 lb/1000 ga
008	40400315	Benzene		0.167 lb/1000 ga
008	40400315	n-Hexane		0.524 lb/1000 ga
009	40600132	VOC		5.527 lb/1000 ga
009	40600132	Benzene		0.05 lb/1000 ga
009	40600132	n-Hexane		0.089 lb/1000 ga
009	40600132	Toluene		0.072 lb/1000 ga
009	40600132	Xylenes		0.028 lb/1000 ga
010	31000205	VOC		0 lb/MMscf
010	31000205	NOx		0.068 lb/MMBTU
010	31000205	CO		0.37 lb/MMBTU
010	31000205	Benzene		0 lb/MMscf
010	31000205	n-Hexane		0 lb/MMscf
010	31000205	Toluene		0 lb/MMscf
010	31000205	Ethylbenzene		0 lb/MMscf
010	31000205	Xylenes		0 lb/MMscf

Emisison Factor Source	Controlled Actual Emissions (tpy)*	Controlled Requested Emissions (tpy)*	PTE (tpy)*	Ctrl. Eff%	NCRP = reportable ?
CDPHE		2	39.3	95%	Yes
CDPHE		105	2100	95%	Yes
CDPHE		330	6600	95%	Yes
AP-42		11.6	232.1	95%	Yes
AP-42		208.9	4178	95%	Yes
AP-42		371.4	7427.6	95%	Yes
AP-42		301.7	6034.9	95%	Yes
AP-42		116.1	2321.1	95%	Yes
Gas Analysis		31	619.4	95%	Yes
AP-42		3.8	3.8	0%	Yes
AP-42		20.4	20.4	0%	Yes
Gas Analysis		0	0		No
Gas Analysis		0	0		No
Gas Analysis		0	0		No
Gas Analysis		0	0		No
Gas Analysis		0	0		No