UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

In Reply Refer To: 3AP20

FEB 20 2018

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Clayton Murral, Regulatory Supervisor
Southwestern Energy
179 Innovation Drive
Jane Lew, WV 26378

Dear Mr. Murral:

Enclosed is the Air Compliance Inspection Report for the United States Environmental Protection Agency's ("EPA") September 20-21, 2017 inspection of Southwestern Energy' ("SWN") oil and natural gas production facilities, located in West Virginia. Enclosed with the report are copies of the FLIR camera videos obtained by EPA during the inspection. Please take note of the Areas of Concern on Page 6 of the report.

If you have questions or comments regarding this report, please contact Mr. Bruce Augustine of the Air Protection Division at (215) 814-2131.

Sincerely,

Zelma Maldonado, Associate Director
Office of Air Enforcement & Compliance Assistance

cc: Christopher Williams, USEPA Air Enforcement Division, Washington, D.C.
James Robertson, WVDEP

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Inspection Date(s):	09/20/2017 and 09/21/2017
Regulatory Program(s):	SIP, NSPS
Company Name:	Southwestern Energy
Facility Name:	Multiple Sites – OCC-A, Alice Edge, Carl Rotter, Betty Shafer, Brian Dytko, Chad Glauser, and Roy Ferrell
Facility Physical Location:	179 Innovation Drive, Jane Lew, WV 26378 Sites: Ohio County, WV
Mailing Address:	179 Innovation Drive, Jane Lew, WV 26378
County/Parish:	Ohio and Marshall Counties
Facility Contact:	
AFS Number:	Multiple Sites
Permit Number:	Multiple Sites
NAICS:	211111 Crude Petroleum and Natural Gas Extraction
SIC:	1311

Attendees:

Facility Representatives:

Clayton Murral, Regulatory Supervisor
Christian Allison, Senior Staff Production Engineer
Franklin Brabham, Senior Regulatory Technician

EPA Inspectors:

Stephen Rieck, USEPA Region 4, 404-562-9177
Nikki Radford, USEPA Region 4, 404-562-9099

EPA Inspector Signature/Date	**Bruce Augustine**	2/13/18 **Date**
Supervisor Signature/Date	**Zelma Maldonado**	2/14/18 **Date**

I. Introduction

The Environmental Protection Agency (EPA) conducted a series of inspections of natural gas production and storage facilities operating within West Virginia that extract natural gas and natural gas liquids from the Marcellus Shale formation. EPA selected Southwestern Energy (SWN) for on-site inspections as a part of the initiative.

On September 19, 2017, Christopher Williams, USEPA OECA, notified Carla Suszkowski from SWN, by phone of the CAA inspection. During the call, Mr. Williams indicated that inspectors Stephen Rieck and Nikki Radford would be in contact with her to setup a time and place for an opening meeting. After getting in touch, Nikki Radford sent Ms. Suszkowski an email providing the facilities that EPA planned to visit (see Attachment 1). Bruce Augustine, USEPA Region 3, notified the West Virginia Department of Environmental Protection ("WVDEP") of the inspections during the week of September 4, 2017.

A. Summary of the Facility-

SWN's multi-well production facilities have storage tanks and other equipment that process the natural gas and liquids, including produced water and hydrocarbons, from multiple wells. The facilities have gas processing units (GPUs) that operate as separators, heater-treaters, and flares or combustors for control. The tanks contain liquid condensates and produced water.

B. Inspection Opening Conference-

On September 20, 2017, Nikki Radford and Stephen Rieck met with Clayton Murral, Christian Allison, and Franklin Brabham of SWN. The inspection team presented credentials and described the purpose of the inspection.

The inspection objective was to perform an emissions survey and compliance evaluation of production facilities owned by SWN. Through Forward Looking Infrared (FLIR) camera optical gas imaging (OGI) and photoionization detection (PID), the inspection team surveyed the extent of excess Volatile Organic Carbon (VOC) emissions from storage tanks, valves, combustors, GPUs, and other process equipment.

The team discussed safety protocols and identified emergency muster points at each site.

II. Process Overview

Natural gas and associated liquids extracted from the well and are sent to gas processing units (GPUs). The GPUs separate the material into gas, condensates and water. The separated gas is sent to the sales line and the separated water is sent to produced water tanks. The condensates are further separated in the heater treater and vapor recovery towers. The tanks are controlled with sealed tank hatches and pressure relief devices. Vapor emissions that gather in the headspace of the tanks are sent to a combustor for destruction.

III. Plant Tour/Walkthrough

On September 20-21, 2017, the EPA inspection team, accompanied by SWN staff, performed inspections of several facilities owned and operated by SWN located in Ohio and Marshal Counties. In general, the inspection team inspected the GPUs, storage tanks, and enclosed combustor at each well site. Emissions sources at each of the well sites were surveyed using the following equipment:

- OGI infrared (IR) camera manufactured by FLIR, Model GF320 was operated by Nikki Radford.
- Photoionization Detector (PID) manufactured by Ion Science called the "PhoCheck TIGER" was operated by Steve Rieck. NOTE: PIDs measure VOC concentrations and do not measure concentrations of methane or ethane.
- QRAE III personal safety monitors were operated by both Nikki Radford and Steve Rieck.

The following is a summary of information obtained, observations, and the emissions survey results from each inspected facility. OGI video files are included in Attachment 2:

Site Name(s)	OCC-A
Lat/Long	40.0894 / -80.6003
Date/Time	09/20/17 at 1:20 am
Equipment	2 wells, 2 GPUS, 6 tanks, 1 combustor, 1 compressor
OGI Files	MOV_0333 – emissions from compressor vent
Notes	No emissions noted from tanks or combustor. Combustor operating with pilot light. Wellsite has a high production rate and constant truck unloading may prevent vapor buildup in tanks.

Site Name(s)	Alice Edge
Lat/Long	39.7397 / -80.4944
Date/Time	09/20/17 at 2:21 pm
Equipment	11 wells, 11 GPUS, 16 tanks, 1 combustor, 3 heater treaters, 2 compressors
OGI Files	MOV_0334 – "Quick release" GPU Vent
Notes	Production: 200 mmcf gas/day 700 bbls oil/day 650 - 800 bbls produced water/day Level controllers installed on GPU's route gas to external vent instead of allowing to cumulate in the GPU box as seen at other facilities. Again no emissions noted from tanks or combustor. Trucks were onsite and unloading which can reduce pressure in tanks and VRU.

Site Name(s)	Carl Rotter
Lat/Long	40.0988 / -80.5394
Date/Time	09/20/17 at 3:18 pm
Equipment	1 wells, 1 GPUS, 4 tanks, 1 combustor, 1 heater treater, 2 compressors.
OGI Files	MOV_0335 - leak off flange on EDI compressor., MOV_0336 – emissions off of emergency hatch on tank
Notes	Production: 500 mmcf gas/day Emissions noted on tank and on compressor. Both emission points were tagged for repair by Mr. Brabham.

Site Name(s)	Betty Schafer
Lat/Long	39.9927 / -80.6389
Date/Time	09/21/17 at 9:28 am
Equipment	2 wells, 2 GPUS, 8 tanks, 1 combustor, 1 heater treater, 2 compressors.
OGI Files	MOV_0337 – Emissions on thief hatch of #6 produced water tank
Notes	Production: 2 mmcf gas/day 60 bbls oil/day 40 bbls produced water/day Emissions noted on #6 water tank and #1 water tank. Hatches were tagged for repair by Mr. Brabham.

Site Name(s)	Brian Dytko
Lat/Long	40.0285 / -80.6107
Date/Time	09/21/17 at 10:28 am
Equipment	4 wells, 4 GPUS, 12 tanks, 1 combustor, 1 heater treater, 2 compressors.
OGI Files	No video taken
Notes	Production: 2.5 mmcf gas/day 200 bbls oil/day 100 bbls produced water/day Some emissions noted on produced water tank #1. Combustor operating pilot light only.

Site Name(s)	Chad Glauser
Lat/Long	40.027 / -80.6107
Date/Time	09/21/17 at 11:06 am
Equipment	5 wells, 5 GPUS, 6 tanks, 1 combustor, 1 heater treater, 1 low pressure tower.
OGI Files	MOV_0338 – Emissions on thief hatch of #3 produced water tank., -0339 - light VOC plume from combustor.
Notes	Production: 4.8 mmcf gas/day 68 bbls oil/day 23 bbls produced water/day Emission leaks appeared to be intermittent, possibly due to timing of vapor dumps to combustor. Combustor operating with pilot light.

Site Name(s)	Roy Ferrell
Lat/Long	40.0414 / -80.61.07
Date/Time	09/21/17 at 1:05 pm
Equipment	10 wells, 10 GPUS, 16 tanks, 1 combustor, 2 heater treater, 2 compressors.
OGI Files	MOV_0340 – Emissions on thief hatch of #1 produced water tank.
Notes	Production: 21 mmcf gas/day 400 bbls oil/day 200 bbls produced water/day A number of tanks were already tagged for repair (tag date 9/14/19). Tanks were scheduled for repair on 9/26/17.

IV. Records Review

No paper records were collected during the on-site inspections or at the closing conference.

V. Closing Conference

After inspecting the Roy Ferrell site, the inspection team held a closing conference with the company at approximately 1:53 pm. The team thanked SWN staff for their help. The team then discussed the findings throughout the day, including an overview of all sites visited and emissions noted from the facility. SWN did not make any CBI claims on the material discussed or obtained during the inspection.

VI. Conclusions/Areas of Concern

The inspection team visited a total of seven production facilities, comprising of 60 tanks, 35 wells, and 35 GPUs. Few to no emissions were noted at OCC-A and Alice Edge well sites, even though these sites had the some of the largest production. This is likely due to almost constant trunk unloading which can prevent vapor buildup in the tank headspace and vapor collection system.

When emissions were noted on tanks they were mostly on the produced water tanks instead of the oil tanks. This is consistent with other facilities visited. The team discussed this with SWN staff. One reason they offered was that the salt from the brine interacts with the aluminum on the thief hatch. Another reason is that the set point for the pressure relief devices is set lower on some of the water tanks. Finally, SWN uses the water tanks as blowdowns for the rest of the process. These blowdown events will create strong internal tank pressure events that could negatively impact the mechanical integrity of the device. Mr. Brabham conducts regular monitoring and maintenance with all tanks and associated equipment.

The GPUs use gas-actuated level controllers, which created a source of emissions on virtually every GPU. This has been seen at well-sites nationally. However, SWN uses a GPU model that collects gas in the level controller routes it to a single vent outside of the GPU box. According to SWN, this prevents buildup of explosive material inside the GPU.

VII. List of Attachments

1. Email from Nikki Radford (EPA) to Carla Suszkowski (SWN) notifying SWN of EPA's plans to inspect certain facilities.
2. OGI Video Files

Attachment 1

augustine, bruce

From: Radford, Nicole
Sent: Tuesday, February 13, 2018 9:14 AM
To: augustine, bruce
Subject: FW: Well-sites for Inspection

From: Radford, Nicole
Sent: Wednesday, September 20, 2017 9:08 AM
To: carla_suszkowski@swn.com
Cc: Rieck, Stephen <rieck.stephen@epa.gov>; Williams, Christopher <Williams.Christopher@epa.gov>
Subject: Well-sites for Inspection

Hi Carla –

Again, thanks for your time this morning. Below is the list of well sites we'd like to inspect today and tomorrow. We'll defer to you on what the best order would be and where we can meet.

Well Name	API Number	County
Betty Jane Schafer-Life Estate	47-051-01777-00	Marshall
Alice Mae Edge	47-069-00179-00	Ohio
Carl J & Grace A Rotter	47-069-00171-00	Ohio
The Board of Comm County of Ohio	47-069-00137-00	Ohio
Brian J Dytko	47-069-00115-00	Ohio
Chad Glauser	47-069-00110-00	Ohio
Roy E Ferrell	47-069-00111-00	Ohio

Thanks,
Nikki
Cell: 219-448-0467

Nikki Radford MPA/MSES
Environmental Scientist
US EPA Region 4
Air Enforcement and Toxics Branch
Phone: 404-562-9099
Email: radford.nicole@epa.gov

Attachment 2