

**Region 6 Compliance Assurance and Enforcement Division
INSPECTION REPORT**

Inspection Date(s):	05/22/2018		
Media:	Water		
Regulatory Program(s)	CWA – NPDES (Brine)		
Company Name:	Wolf Energy, Inc.		
Facility Name:	Marmaduke Lease		
Facility Physical Location:	31.681490 N, -103.640479 W		
(city, state, zip code)	Pecos, Texas 79772		
Mailing address:	1304 N. Big Springs St.		
(city, state, zip code)	Midland, Texas 79701		
County/Parish:	Reeves County		
Facility Contact:	Larry Wollschlager	Owner	
	(432) 685 - 0531		
FRS Number:	N/A		
Identification/Permit Number:	TXU011227		
Media Number:	N/A		
NAICS:	211111		
SIC:	1311		
Personnel participating in inspection:			
Carol Johnson	US Environmental Protection Agency	Inspector	(214) 665-8471
Jeanne Eckhart	US Environmental Protection Agency	Inspector	(214) 665-8174
Joey Hendrix	Texas Parks and Wildlife Department	Game Warden	(915) 834-7050
Bartley McIntosh	Texas Commission on Environmental Quality	Environmental Investigator	(432) 570-1359
Vickie Foster, R.S.	Texas Commission on Environmental Quality	Environmental Investigator	(432) 570-1359
EPA Lead Inspector Signature/Date			
	Jeanne Eckhart		Date
Supervisor Signature/Date			7/27/2018
	Guy Tidmore		Date

Section I – INTRODUCTION

PURPOSE OF THE INSPECTION

EPA Region 6 inspectors Carol Johnson and Jeanne Eckhart arrived at the Wolf Energy, Inc./ Marmaduke Lease at 9:24 AM on 05/22/2018 for an unannounced inspection. There were no representatives of Wolf Energy, Inc. present during the inspection. EPA inspector, Jeanne Eckhart notified Mr. Larry Wollschlager, Owner of Wolf Energy, Inc. by phone of the inspection and concerns, including an active leak from the site, on 05/24/2018 at approximately 4:30 PM. EPA received a complaint from the Texas Parks and Wildlife Department with concerns of a fish kill and an ongoing leak along the Pecos River near Mentone, Texas, which initiated this inspection. The scope of the inspection was to evaluate the compliance of the facility with the Clean Water Act, Section 301, and associated regulations, and to assess unauthorized discharges of produced water, or brine, to waters of the United States. Additionally, EPA conducted a joint inspection with the Texas Commission on Environmental Quality (TCEQ) Inspectors, Vickie Foster and Bartley McIntosh, and the Texas Parks and Wildlife Department (TPWD) Game Warden, Joey Hendrix. EPA additionally notified the Texas Railroad Commission (RRC) of the inspection on 05/17/2018 at approximately 4:00PM and left a phone message with notification of the upcoming inspection.

FACILITY DESCRIPTION

The facility was known as the Wolf Energy, Inc./Marmaduke Lease, RRC Operator Number: 935534 and RRC Pit No. P008642, located in a remote area in Reeves County, Texas near Mentone, Texas. (See Photo No. 1 in Appendix 1). The site had two storage tanks, an injection well and associated equipment, and flow lines related to the oil and gas production occurring at the oil field. The facility had an active leak occurring during the inspection from the tall storage tank that stored produced water. The leak was occurring from an overflow line at the top of the tank that hung down by the side of the tank. The discharge was located at latitude 31.681468 N and longitude -103.640878 W. During the inspection, gas production at this facility was not observed. The facility was unmanned and observed operation practices during the inspection were inadequate due to the active leak from one of the storage tanks.

The facility was located near the TCEQ stream segment number 2311, known as the Upper Pecos River, which has a designated use as a Primary Contact Recreation Use and High Aquatic Life Use. The facility was located near Horseshoe Draw which flows to the Pecos River approximately 0.6 miles downstream. The Pecos River in stream segment number 2311 has a Total Dissolved Solids (TDS) water quality criteria of 15,000 milligrams per Liter (mg/L). For reference purposes, this area has an identified high content of salts in the water. EPA typically observes background levels of freshwater environments below 1,000 mg/L TDS and aquatic life can be negatively affected when levels are above these observed background levels. Lower levels than 1,000 mg/L can also negatively affect aquatic life.

Section II – OBSERVATIONS

On May 22, 2018, at approximately 9:24 AM, we arrived at the Wolf Energy, Inc. / Marmaduke Lease in Reeves County, Texas, which had two storage tanks associated with oil and gas production operations, and stored produced water, or brine, on site. Additionally, on site there was an injection well (See Photo No. 2 in Appendix 1). This inspection was conducted in a response to a referral from TPWD. During the inspection, we observed an open line coming from the north side of the tallest storage tank, which was the line that was reported to be leaking. We observed salt crystals on the surface in multiple areas around the storage tanks and equipment, and the surface had no vegetation away from the storage tank area. Additionally, the tanks did not have secondary containment areas and were heavily corroded. Also, there were some drums on site with unknown labeling and no containment area (See Photo Nos. 3 – 4 in Appendix 1). We observed an active injection well injecting at the time of the inspection. The area around the injection well was cratered and a metal grate (like a cattle guard) was being used as a walkway across the crater to see the pressure gauge at the wellhead. At the time of the inspection, the pressure gauge read between 450 psi and 500 psi (See Photo Nos. 5 – 6 in Appendix 1). The flow line resting on the top portion of the bolted inspection door on the tallest storage tank was leaking during the inspection. We observed a thick and wide-spread amount of salts on the surface that occurred along the flow path and on the site. The tank had heavy corrosion on the inspection port area, and salts were dripping off from the tank, indicating that this leak has been ongoing for a long period of time. Other parts and equipment around this leak were heavily corroded and the area was completely saturated. There was no vegetation and the surface was completely saturated during the inspection. There was equipment on site that was not in use and laying around the facility (See Photo Nos. 7 – 9 in Appendix 1).

We observed that the active discharge occurring on the site flowed north and then west off site towards Horseshoe Draw. The flow path had erosion, with visible salt crystals that were white and thick along the flow path. There was no vegetation and the surface was completely saturated during the inspection. There were some small ponded areas with fluids in them along the flow path. A Total Dissolved Solids (TDS) reading from a successfully calibrated YSI Pro 30 Conductivity Meter was taken at the first shallow pool of fluids approximately 20 feet along the flow path north from the point of discharge. The TDS reading was 69,632 milligrams per liter (mg/L) at 24.1 degrees Celsius (C). We observed the soil was so saturated that we were sinking while walking near the flow path during the inspection. This was indicative that this leak has been ongoing for a long time. We observed active flow and erosion along the flow path (See Photo Nos. 10 – 16 in Appendix 1).

DOWNSTREAM OBSERVATIONS

The produced water along the flow path flowed from the site into Horseshoe Draw. A reading of 128,634 mg/L TDS was taken at the point of entry from the flow path into Horseshoe Draw. We observed that the fluids were a rusty discoloration and had some oil sludge in the bottom of the draw. Vegetation at the point of entry was dead. No aquatic life was observed (See Photo Nos. 17- 18 in Appendix 1). At approximately 175 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw, we observed dead vegetation and oil sludge. There were fluids in Horseshoe Draw during

the inspection. A TDS reading of 121,062 mg/L was taken at this location (See Photo Nos. 19 – 21 in Appendix 1). At approximately 250 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw, we observed dead vegetation, oil sludge and brine in the draw. Also, there was a flow line near the draw at this location, which is associated with the Marmaduke Lease (See Photo No. 22 in Appendix 1). At approximately 350 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw, we observed dead vegetation, settled oil sludge and brine in the draw. The fluids in the draw were a rusty discoloration; a reading of 120,810 mg/L TDS was taken at this location. We observed a sheen on the fluid surface in the draw during the inspection at this location (See Photo Nos. 23 – 25 in Appendix 1). At approximately 540 feet downstream along Horseshoe Draw from the point of entry into the draw, we observed some dead vegetation, clear bed and bank, and some riparian vegetation. The draw had fluids in it and had a rusty discoloration with oil sludge. A TDS reading of 121,545 mg/L was taken at this location (See Photo Nos. 26 – 28 in Appendix 1). At approximately 750 feet downstream along Horseshoe Draw from the point of entry, we observed some dead vegetation, clear bed and bank, and some riparian vegetation. The draw had fluids in it and had a rusty discoloration with oil sludge. A TDS reading was taken and the levels of TDS at this location were over the meter's capabilities to read Conductivity, Specific Conductance, salinity, and TDS (See Photo Nos. 29 – 30 in Appendix 1). At approximately 0.23 miles downstream along Horseshoe Draw from the point of entry, we observed bed, bank, and riparian vegetation. The fluids in the draw were discolored and had oil sludge in them throughout the draw to this point downstream from the point of entry. A TDS reading was taken and the levels of TDS at this location were over the meter's capabilities to read Conductivity, Specific Conductance, salinity, and TDS (See Photo Nos. 31 – 33 in Appendix 1). At approximately 0.48 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw, a TDS reading of 7,044 mg/L TDS was taken. We observed banks and riparian vegetation in the draw at this location (See Photo No. 34 in Appendix 1). At approximately 0.51 miles downstream along Horseshoe Draw from the point of entry, we observed bed and riparian vegetation in the draw. There was water in the draw at the time of the inspection. A TDS reading of 6,666 mg/L TDS was taken at this location (See Photo Nos. 35 – 37 in Appendix 1). At approximately 0.67 miles downstream along Horseshoe Draw from the point of entry, we observed banks and riparian vegetation in the draw. At this location Horseshoe Draw merges with the Pecos River. Both waterbodies were flowing at the time of the inspection. A TDS reading of 6,421 mg/L was taken at the confluence (See Photo Nos. 38 – 41 in Appendix 1). At approximately 1.14 miles downstream from the point of entry of produced water into the draw, we observed banks and riparian vegetation in the draw. The Pecos River was flowing strongly during the inspection. A TDS reading of 6,400 mg/L was taken at this location (See Photo No. 42 in Appendix 1).

UPSTREAM OBSERVATIONS

At approximately 300 feet upstream on the Pecos River from the confluence of Horseshoe Draw and the Pecos River we observed riparian vegetation, bed, bank, and a strong flow in the Pecos River. A TDS reading of 6,279 mg/L was taken at this location (See Photo Nos. 43 – 44 in Appendix 1). At approximately 1 mile upstream from the confluence of the Horseshoe Draw and Pecos River, the Pecos River was over 150 feet and approximately 5 feet deep. A TDS reading of 6,416 mg/L was taken at this location. (See Photo Nos. 45 – 47 in Appendix 1). At approximately 2 miles upstream from the confluence of the

Horseshoe Draw and Pecos River, the Pecos River had been dammed up at this location and the river had eroded through prior to the inspection. A TDS reading of 6,323 mg/L was taken at this location (See Photo Nos. 48 – 50 in Appendix 1).

Section III – AREAS OF CONCERN

The concerns during this inspection were:

- An active leak was occurring during the inspection and flowed offsite into Horseshoe Draw and then to the Pecos River over ½ a mile downstream.
- We did not observe secondary containment on site and tanks and equipment were heavily corroded.
- We observed a saturated flow path with a thick residue of salt crystals along the flow path.
- We observed elevated levels of TDS in Horseshoe Draw and downstream water bodies.
- We observed dead vegetation along Horseshoe Draw.
- We observed contaminated soil at the facility, including south of the tank storage tanks.
- We observed a dam upstream along the Pecos River.

Section IV – FOLLOW UP

No information was received by EPA after exiting the Facility on 05/22/2018. EPA has referred the upstream concerns along the Pecos River to EPA wetlands enforcement and to US Army Corps of Engineers. Additionally, EPA will refer this facility to the EPA Region 6 SPCC program.

Section V – LIST OF APPENDICES

Appendix 1 – Photo Log – 50 photos taken 05/22/2018

Appendix 1

Photograph Log

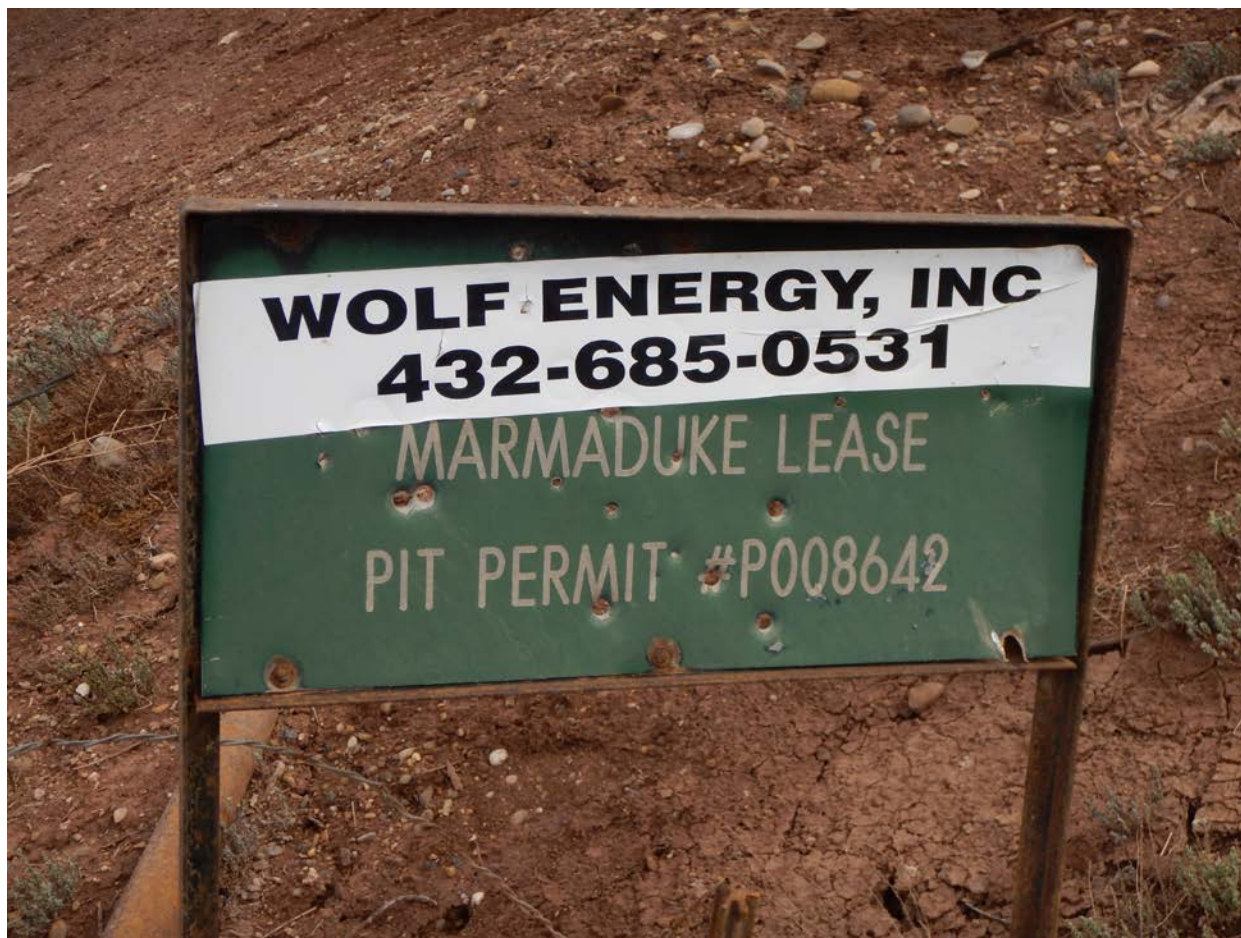


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3478.JPG

Date of Photograph: 05/22/2018

Latitude: 31.681495 N

Longitude: -103.640833 W

Orientation: N

Map Datum: WGS-84

Time of Photo: 09:28 AM

Photographer: Carol Johnson

Description: This image shows the sign for Wolf Energy, Inc. / Marmaduke Lease, which is the facility that the inspection was conducted at. The facility was located near Horseshoe Draw, which flows to the Pecos River.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3477.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681495 N
Longitude: -103.640833 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 09:27 AM
Photographer: Carol Johnson
Description: This image shows the Wolf Energy, Inc. / Marmaduke Lease, which consists of an oil and gas storage facility that has two storage tanks, an injection well and associated oil field production equipment. An open line coming from the north side of the tallest storage tank was the line that was leaking actively during the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3499.JPG

Date of Photograph: 05/22/2018

Latitude: 31.681266 N

Longitude: -103.640632 W

Orientation: N

Map Datum: WGS-84

Time of Photo: 09:45 AM

Photographer: Carol Johnson

Description: This image shows the Wolf Energy, Inc. / Marmaduke Lease, which consists of an oil and gas storage facility that has two storage tanks, an injection well and associated oil field production equipment. We observed salt crystals on the surface in multiple areas around the storage tanks and equipment and the surface had not vegetation away from the storage tank area. Additionally, the tanks did not have secondary containment areas and were heavily corroded.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3501.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681266 N
Longitude: -103.640632 W
Orientation: NE
Map Datum: WGS-84
Time of Photo: 09:46 AM
Photographer: Carol Johnson
Description:

This image shows the Wolf Energy, Inc. / Marmaduke Lease, which consists of an oil and gas storage facility that has two storage tanks, an injection well and associated oil field production equipment. We observed salt crystals on the surface, no vegetation, no secondary containment, and heavily corroded tanks. Also, there were some drums on site with unknown labeling and no containment area.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3503.JPG

Date of Photograph: 05/22/2018

Latitude: 31.681303 N

Longitude: -103.641041 W

Orientation: N

Map Datum: WGS-84

Time of Photo: 09:47 AM

Photographer: Carol Johnson

Description: This image shows the injection well on site near the storage tanks. The area around the injection well was cratered and a metal grate (like a cattle guard) was being used as a walkway across the crater to see the pressure gauge at the wellhead. The flow path from the active leak can be seen in the background of this photo to the north.

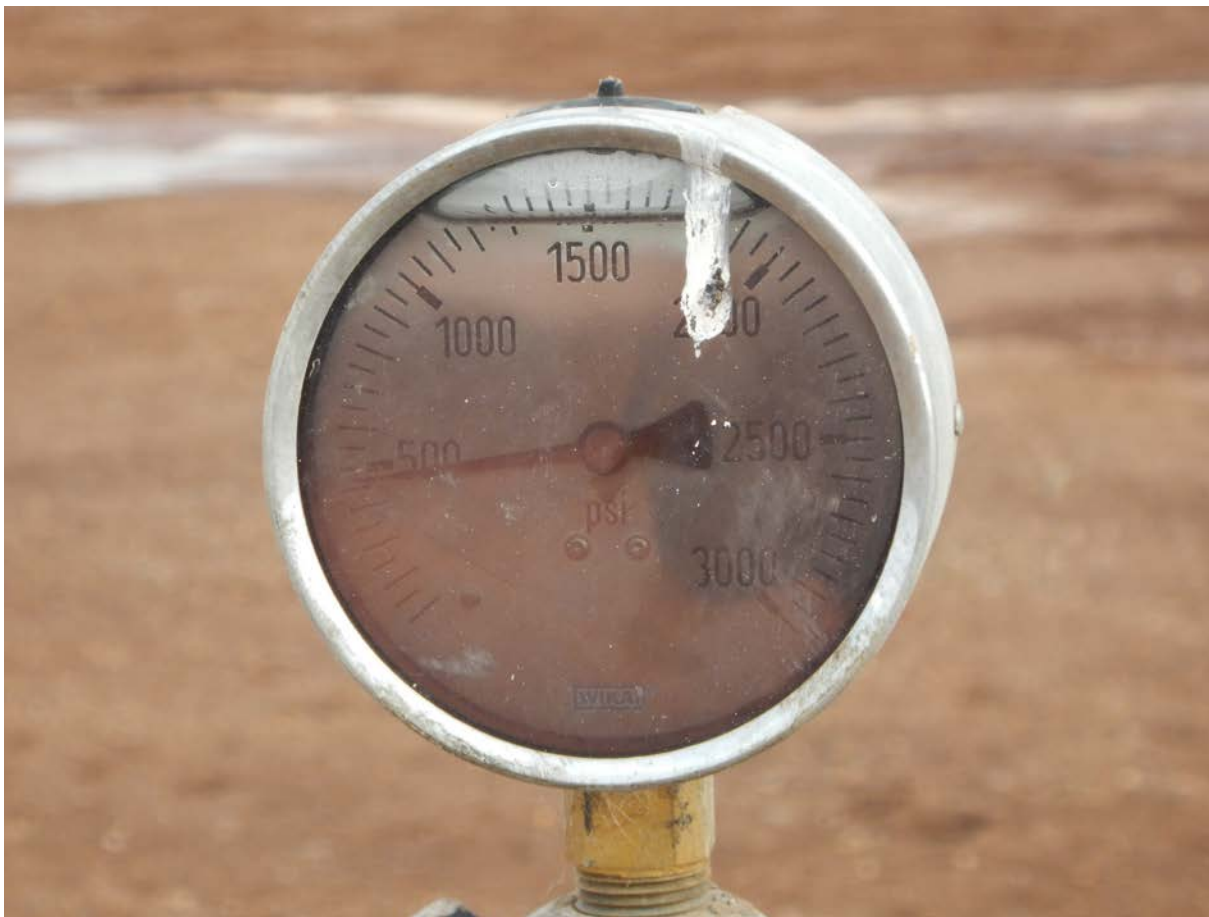


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3505.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681303 N
Longitude: -103.641041 W
Orientation: N
Map Datum: WGS-84
Time of Photo: 09:48 AM
Photographer: Carol Johnson
Description:

This image shows the injection well pressure gauge at the well head. At the time of the inspection the pressure gauge read between 450 psi and 500 psi.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3486.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681468N
Longitude: -103.640878 W
Orientation: NW
Map Datum: WGS-84
Time of Photo: 09:33 AM
Photographer: Carol Johnson
Description:

This image shows the point of discharge at the Marmaduke Lease. The line resting on the top portion of the bolted inspection door on the storage tank was leaking during the inspection. We observed a thick and wide spread amount of salts on the surface that occurred along the flow path and on the site. There was no vegetation and the surface was completely saturated during the inspection. There was equipment on site that was not in use and laying around the facility inactive.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3480.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681468N
Longitude: -103.640878 W
Orientation: NW
Map Datum: WGS-84
Time of Photo: 09:30 AM
Photographer: Carol Johnson
Description:

This image shows the point of discharge at the Marmaduke Lease. The line resting on the top portion of the bolted inspection door on the storage tank was leaking during the inspection. We observed visible salt crystals on the flow path. The tank had heavy corrosion on the inspection port area, and salts were dripping off from the tank indicating that this leak has been ongoing for a long period of time. Other parts and equipment around this leak were heavily corroded and the area was completely saturated.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3479.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681468N
Longitude: -103.640878 W
Orientation: NW
Map Datum: WGS-84
Time of Photo: 09:29 AM
Photographer: Carol Johnson
Description:

This image shows the point of discharge at the Marmaduke Lease. The line resting on the top portion of the bolted inspection door on the storage tank was leaking during the inspection. The tank had heavy corrosion on the inspection port area. Other parts and equipment around this leak were heavily corroded and the area was completely saturated.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3482.JPG

Date of Photograph: 05/22/2018

Latitude: 31.681468N

Longitude: -103.640878 W

Orientation: S

Map Datum: WGS-84

Time of Photo: 09:31 AM

Photographer: Carol Johnson

Description: This image shows the point of discharge at the Marmaduke Lease. The line resting on the top portion of the bolted inspection door on the storage tank was leaking during the inspection. We observed a thick and wide spread amount of salts on the surface that occurred along the flow path and on the site. There was no vegetation and the surface was completely saturated during the inspection. There was equipment on site that was not in use and laying around the facility inactive. The flow path can be seen flowing north in this photo from the point of discharge.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 11

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3483.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681468N
Longitude: -103.640878 W
Orientation: N
Map Datum: WGS-84
Time of Photo: 09:31 AM
Photographer: Carol Johnson
Description:

This image shows the flow path just north of the point of discharge. The flow path had erosion, visible salt crystals that were white and thick along the flow path. There was no vegetation and the surface was completely saturated during the inspection. There were some small ponded areas with fluids in them along the flow path.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3484.JPG

Date of Photograph: 05/22/2018

Latitude: 31.681468N

Longitude: -103.640878 W

Orientation: W

Map Datum: WGS-84

Time of Photo: 09:32 AM

Photographer: Carol Johnson

Description: This image shows a Total Dissolved Solids (TDS) reading from a successfully calibrated YSI Pro 30 Conductivity Meter at the first shallow pool of fluids approximately 20 feet along the flow path north from the point of discharge. The TDS reading was 69,632 milligrams per liter (mg/L) at 24.1 degrees Celsius (C).



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3490.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681468N
Longitude: -103.640878 W
Orientation: SW
Map Datum: WGS-84
Time of Photo: 09:34 AM
Photographer: Carol Johnson
Description:

This image shows the flow path that flows north from the point of discharge and then west towards Horseshoe Draw. The entire flow path was saturated and we observed no vegetation along the flow path. We observed a thick amount of salt crystals along the flow path and erosion, which indicated that this leak had been ongoing for a long-time period.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3491.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681468N
Longitude: -103.640878 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 09:34 AM
Photographer: Carol Johnson
Description:

This image shows the flow path that is going west and flowing towards Horseshoe Draw. We observed that the flow path was saturated and there were large areas along the path that had salt crystals. We observed a large dead area in the surface with no vegetation. We observed the soil was so saturated that we were sinking while walking near the flow path during the inspection. This is indicative that this leak has been ongoing for a long time.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3494.JPG
Date of Photograph: 05/22/2018
Latitude: 31.68146892 N
Longitude: -103.641201 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 09:36 AM
Photographer: Carol Johnson
Description:

This image shows the flow path that is going west and flowing towards Horseshoe Draw. We observed that the flow path was saturated and there were large areas along the path that had salt crystals. We observed a large dead area in the surface with no vegetation. We observed active flow along the flow path.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 16

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3506.JPG

Date of Photograph: 05/22/2018

Latitude: 31.681450 N

Longitude: -103.641428 W

Orientation: W

Map Datum: WGS-84

Time of Photo: 09:49 AM

Photographer: Carol Johnson

Description: This image shows the flow path that is going west and flowing towards Horseshoe Draw. We observed that the flow path was saturated and there were large areas along the path that had salt crystals. We observed a large dead area in the surface with no vegetation. We observed active flow along the flow path.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 17

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3507.JPG

Date of Photograph: 05/22/2018

Latitude: 31.681450 N

Longitude: -103.641428 W

Orientation: W

Map Datum: WGS-84

Time of Photo: 09:50 AM

Photographer: Carol Johnson

Description: This image shows the flow path that is going west and flowing towards Horseshoe Draw. We observed that the flow path was saturated and there were large areas along the path that had salt crystals. The flow path was active and this photo shows the point of entry into Horseshoe Draw.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 18

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3511.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681450 N
Longitude: -103.641428 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 09:50 AM
Photographer: Carol Johnson

Description: This image shows at the point of entry from the active flow path into Horseshoe Draw. A reading of 128,634 mg/L TDS was taken at this location. We observed that the fluids were a rusty discoloration and had some oil sludge in the bottom of the draw. Vegetation at the point of entry was dead. No aquatic life was observed.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 19

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3513.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681056 N
Longitude: -103.641550 W
Orientation: N
Map Datum: WGS-84
Time of Photo: 09:54 AM
Photographer: Carol Johnson
Description:

This image shows approximately 175 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. This photo shows upstream along the draw and fluids from the active leak have contaminated the draw and saturated the soil along the draw. There were fluids in Horseshoe Draw during the inspection. We observed dead vegetation as well at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 20

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3514.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681056 N
Longitude: -103.641550 W
Orientation: SE
Map Datum: WGS-84
Time of Photo: 09:55 AM
Photographer: Carol Johnson
Description:

This image shows approximately 175 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. This photo shows downstream along the draw and fluids from the active leak contaminated the draw and saturated the soil along the draw. There were fluids in Horseshoe Draw during the inspection at this location. We observed dead vegetation and oil sludge as well at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 21

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3516.JPG
Date of Photograph: 05/22/2018
Latitude: 31.681056 N
Longitude: -103.641550 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 09:56 AM
Photographer: Carol Johnson
Description: This image shows approximately 175 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. A TDS reading of 121,062 mg/L was taken at this location in Horseshoe Draw.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 22

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3518.JPG
Date of Photograph: 05/22/2018
Latitude: 31.680856 N
Longitude: -103.641342 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 09:59 AM
Photographer: Carol Johnson
Description: This image shows approximately 250 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed dead vegetation, oil sludge and brine in the draw at this location. Also, a flow line was near the draw here associated with the Marmaduke Lease.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 23

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3520.JPG

Date of Photograph: 05/22/2018

Latitude: 31.680677 N

Longitude: -103.641104 W

Orientation: NW

Map Datum: WGS-84

Time of Photo: 10:01 AM

Photographer: Carol Johnson

Description: This image shows approximately 350 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed dead vegetation, settled oil sludge and brine in the draw at this location. The fluids in the draw were a rusty discoloration.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 24

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3521.JPG
Date of Photograph: 05/22/2018
Latitude: 31.680677 N
Longitude: -103.641104 W
Orientation: NW
Map Datum: WGS-84
Time of Photo: 10:02 AM
Photographer: Carol Johnson
Description: This image shows approximately 350 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. A reading of 120,810 mg/L TDS was taken at this location in Horseshoe Draw.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 25

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3522.JPG

Date of Photograph: 05/22/2018

Latitude: 31.680677 N

Longitude: -103.641104 W

Orientation: S

Map Datum: WGS-84

Time of Photo: 10:03 AM

Photographer: Carol Johnson

Description: This image shows approximately 350 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed a rusty discolored water in the draw that had a sheen on the surface. Evidence of oil sludge in the draw was apparent at this location by visual observation.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 26

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3526.JPG
Date of Photograph: 05/22/2018
Latitude: 31.680214 N
Longitude: -103.640843 W
Orientation: NW
Map Datum: WGS-84
Time of Photo: 10:07 AM
Photographer: Carol Johnson
Description:

This image shows approximately 540 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed some dead vegetation here. We observed clear bed and bank in the draw here as well with some riparian vegetation.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 27

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3527.JPG

Date of Photograph: 05/22/2018

Latitude: 31.680214 N

Longitude: -103.640843 W

Orientation: NW

Map Datum: WGS-84

Time of Photo: 10:07 AM

Photographer: Carol Johnson

Description: This image shows approximately 540 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed some dead vegetation here. We observed clear bed and bank in the draw here as well with some riparian vegetation. The draw had fluids in it and had a rusty discoloration with oil sludge.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 28

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3528.JPG
Date of Photograph: 05/22/2018
Latitude: 31.680214 N
Longitude: -103.640843 W
Orientation: SW
Map Datum: WGS-84
Time of Photo: 10:09 AM
Photographer: Carol Johnson
Description: This image shows approximately 540 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. A TDS reading of 121,545 m/L was taken at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 29

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3530.JPG
Date of Photograph: 05/22/2018
Latitude: 31.679776 N
Longitude: -103.640520 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 10:13 AM
Photographer: Carol Johnson
Description:

This image shows approximately 750 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed some dead vegetation here. We observed clear bed and bank in the draw here as well with some riparian vegetation. The draw had fluids in it and had a rusty discoloration with oil sludge.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 30

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3529.JPG

Date of Photograph: 05/22/2018

Latitude: 31.679776 N

Longitude: -103.640520 W

Orientation: SW

Map Datum: WGS-84

Time of Photo: 10:13 AM

Photographer: Carol Johnson

Description: This image shows approximately 750 feet downstream along Horseshoe Draw from the point of entry of produced water into the draw. A TDS reading was taken and the levels of TDS at this location were over the meter's capabilities to read Conductivity, Specific Conductance, salinity, and TDS.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 31

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3539.JPG

Date of Photograph: 05/22/2018

Latitude: 31.679214 N

Longitude: -103.639476 W

Orientation: N

Map Datum: WGS-84

Time of Photo: 10:20 AM

Photographer: Carol Johnson

Description: This image shows approximately 0.23 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed bed, bank, and riparian vegetation. The fluids in the draw were discolored and had oil sludge in them throughout the draw to this point downstream from the point of entry. The tank battery area can be seen in the background of this photo.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 32

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3540.JPG
Date of Photograph: 05/22/2018
Latitude: 31.679222 N
Longitude: -103.639251 W
Orientation: SE
Map Datum: WGS-84
Time of Photo: 10:20 AM
Photographer: Carol Johnson

Description: This image shows approximately 0.23 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed bed, bank, and riparian vegetation. The fluids in the draw were discolored and had oil sludge in them throughout the draw to this point downstream from the point of entry. This photo shows the downstream view from this location in the draw.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 33

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3541.JPG
Date of Photograph: 05/22/2018
Latitude: 31.679222 N
Longitude: -103.639251 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 10:22 AM
Photographer: Carol Johnson
Description: This image shows approximately 0.23 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. A TDS reading was taken and the levels of TDS at this location were over the meter's capabilities to read Conductivity, Specific Conductance, salinity, and TDS.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 34

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3543.JPG

Date of Photograph: 05/22/2018

Latitude: 31.678274 N

Longitude: -103.636415 W

Orientation: W

Map Datum: WGS-84

Time of Photo: 10:34 AM

Photographer: Carol Johnson

Description: This image shows approximately 0.48 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. A TDS reading of 7,044 mg/L TDS was taken at this location. We observed banks and riparian vegetation in the draw at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 35

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3545.JPG

Date of Photograph: 05/22/2018

Latitude: 31.677909 N

Longitude: -103.636045 W

Orientation: NE

Map Datum: WGS-84

Time of Photo: 10:38 AM

Photographer: Jeanne Eckhart

Description: This image shows approximately 0.51 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed bed and riparian vegetation in the draw. There was water in the draw at the time of the inspection. This photo shows an upstream view from this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 36

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3546.JPG

Date of Photograph: 05/22/2018

Latitude: 31.677909 N

Longitude: -103.636045 W

Orientation: SE

Map Datum: WGS-84

Time of Photo: 10:38 AM

Photographer: Jeanne Eckhart

Description: This image shows approximately 0.51 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed bed and riparian vegetation in the draw. There was water in the draw at the time of the inspection. This photo shows a downstream view of the draw from this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 37

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3544.JPG
Date of Photograph: 05/22/2018
Latitude: 31.677909 N
Longitude: -103.636045 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 10:38 AM
Photographer: Jeanne Eckhart
Description: This image shows approximately 0.51 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. A TDS reading of 6,666 mg/L TDS was taken at this location. We observed banks and riparian vegetation in the draw at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 38

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3564.JPG
Date of Photograph: 05/22/2018
Latitude: 31.678117 N
Longitude: -103.634058 W
Orientation: W
Map Datum: WGS-84
Time of Photo: 10:56 AM
Photographer: Jeanne Eckhart
Description: This image shows approximately 0.67 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed banks and riparian vegetation in the draw at this location. At this location Horseshoe Draw merges with the Pecos River. Both waterbodies were flowing at the time of the inspection. This photo shows an upstream view of Horseshoe Draw at the confluence.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 39

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3563.JPG

Date of Photograph: 05/22/2018

Latitude: 31.678117 N

Longitude: -103.634058 W

Orientation: W

Map Datum: WGS-84

Time of Photo: 10:56 AM

Photographer: Jeanne Eckhart

Description: This image shows approximately 0.67 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed banks and riparian vegetation in the draw at this location. At this location Horseshoe Draw merges with the Pecos River. Both waterbodies were flowing at the time of the inspection. This photo shows a downstream view of the Pecos River at the confluence.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 40

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3562.JPG

Date of Photograph: 05/22/2018

Latitude: 31.678117 N

Longitude: -103.634058 W

Orientation: NE

Map Datum: WGS-84

Time of Photo: 10:56 AM

Photographer: Jeanne Eckhart

Description: This image shows approximately 0.67 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. We observed banks and riparian vegetation in the draw at this location. At this location Horseshoe Draw merges with the Pecos River. Both waterbodies were flowing at the time of the inspection. This photo shows an upstream view of the Pecos River at the confluence.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 41

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3561.JPG
Date of Photograph: 05/22/2018
Latitude: 31.678117 N
Longitude: -103.634058 W
Orientation: NE
Map Datum: WGS-84
Time of Photo: 10:56 AM
Photographer: Jeanne Eckhart
Description: This image shows approximately 0.67 miles downstream along Horseshoe Draw from the point of entry of produced water into the draw. At this location Horseshoe Draw merges with the Pecos River. A TDS reading of 6,421 mg/L was taken at the confluence.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 42

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3586.JPG
Date of Photograph: 05/22/2018
Latitude: 31.673058 N
Longitude: -103.630693 W
Orientation: SE
Map Datum: WGS-84
Time of Photo: 12:18 PM
Photographer: Jeanne Eckhart

Description: This image shows approximately 1.14 miles downstream from the point of entry of produced water into the draw. We observed banks and riparian vegetation in the draw at this location. The Pecos River was flowing strongly during the inspection. A TDS reading of 6,400 mg/L was taken at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 43

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3564.JPG

Date of Photograph: 05/22/2018

Latitude: 31.678491 N

Longitude: -103.634068 W

Orientation: SW

Map Datum: WGS-84

Time of Photo: 10:56 AM

Photographer: Jeanne Eckhart

Description: This image shows approximately 300 feet upstream from the confluence of Horseshoe Draw and the Pecos River. We observed riparian vegetation, bed, bank, and a strong flow in the Pecos River. This image is a downstream view towards the confluence.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 44

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3565.JPG

Date of Photograph: 05/22/2018

Latitude: 31.678491 N

Longitude: -103.634068 W

Orientation: E

Map Datum: WGS-84

Time of Photo: 11:00 AM

Photographer: Jeanne Eckhart

Description: This image shows approximately 300 feet upstream from the confluence of Horseshoe Draw and the Pecos River. A TDS reading of 6,279 mg/L was taken at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 45

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3566.JPG
Date of Photograph: 05/22/2018
Latitude: 31.689976 N
Longitude: -103.636243 W
Orientation: NE
Map Datum: WGS-84
Time of Photo: 11:32 AM
Photographer: Jeanne Eckhart
Description:

This image shows the Pecos River upstream approximately 1 mile upstream from the confluence of the Horseshoe Draw and Pecos River. The Pecos River was over 150 feet and approximately 5 feet deep. This image shows an upstream view on the Pecos River.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 46

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3567.JPG
Date of Photograph: 05/22/2018
Latitude: 31.689976 N
Longitude: -103.636243 W
Orientation: SE
Map Datum: WGS-84
Time of Photo: 11:32 AM
Photographer: Jeanne Eckhart
Description: This image shows the Pecos River upstream approximately 1 mile upstream from the confluence of the Horseshoe Draw and Pecos River. The Pecos River was over 150 feet and approximately 5 feet deep. This image shows a downstream view on the Pecos River.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 47

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3566.JPG
Date of Photograph: 05/22/2018
Latitude: 31.689976 N
Longitude: -103.636243 W
Orientation: E
Map Datum: WGS-84
Time of Photo: 11:32 AM
Photographer: Jeanne Eckhart
Description:

This image shows the Pecos River upstream approximately 1 mile upstream from the confluence of the Horseshoe Draw and Pecos River. The Pecos River was over 150 feet and approximately 5 feet deep. A TDS reading of 6,416 mg/L was taken at this location.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 48

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3570.JPG
Date of Photograph: 05/22/2018
Latitude: 31.689222 N
Longitude: -103.621160 W
Orientation: S
Map Datum: WGS-84
Time of Photo: 11:49 AM
Photographer: Carol Johnson
Description:

This image shows the Pecos River upstream approximately 2 miles upstream from the confluence of the Horseshoe Draw and Pecos River. The Pecos River had been dammed up at this location and the river had eroded through dam prior to the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 49

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3585.JPG
Date of Photograph: 05/22/2018
Latitude: 31.689222 N
Longitude: -103.621160 W
Orientation: S
Map Datum: WGS-84
Time of Photo: 11:56 AM
Photographer: Carol Johnson
Description:

This image shows the Pecos River upstream approximately 2 miles upstream from the confluence of the Horseshoe Draw and Pecos River. The Pecos River had been dammed up at this location and the river had eroded through prior to the inspection.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 50

Location: 31.681490 N, -103.640479 W		
City: Pecos	County: Reeves	State: Texas



Photograph File Name: DSCN3582.JPG
Date of Photograph: 05/22/2018
Latitude: 31.689222 N
Longitude: -103.621160 W
Orientation: S
Map Datum: WGS-84
Time of Photo: 11:52 AM
Photographer: Carol Johnson
Description:

This image shows the Pecos River upstream approximately 2 miles upstream from the confluence of the Horseshoe Draw and Pecos River. The Pecos River had been dammed up at this location and the river had eroded through prior to the inspection. A TDS reading of 6,323 mg/L was taken at this location.