

Devon Energy Center 333 West Sheridan Avenue Oklahoma City, Oklahoma 73102-5015

# Hydrogen Sulfide (H<sub>2</sub>S) Contingency Plan

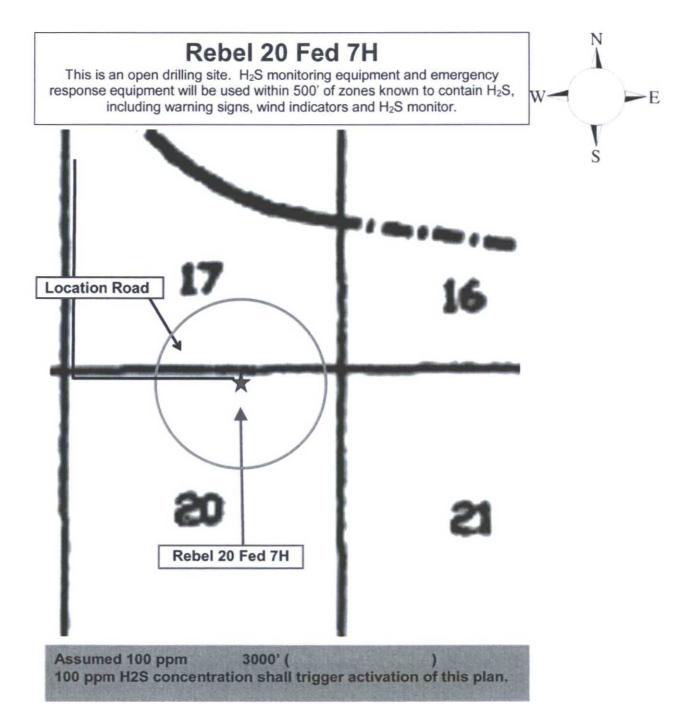
For

Rebel 20 Fed 7H

Sec-20 T-24S R-32E 250' FNL & 1980' FEL LAT. = 32.2095369' N (NAD83) LONG = 103.6946030' W

Lea County NM





#### Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. <u>There are no homes or buildings in or near the ROE</u>.

# Assumed 100 ppm ROE = 3000'

100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.

## Emergency Procedures

In the event of a release of gas containing H<sub>2</sub>S, the first responder(s) must

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H<sub>2</sub>S monitors and air packs in order to control the release.
- Use the "buddy system" to ensure no injuries occur during the response
- Take precautions to avoid personal injury during this operation.
- Contact operator and/or local officials to aid in operation. See list of phone numbers attached.
- Have received training in the
  - Detection of H<sub>2</sub>S, and
  - Measures for protection against the gas,
  - Equipment used for protection and emergency response.

## Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO<sub>2</sub>). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H <sub>2</sub> S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO <sub>2</sub>	2.21 Air = 1	2 ppm	N/A	1000 ppm

## Characteristics of H<sub>2</sub>S and SO<sub>2</sub>

## **Contacting Authorities**

Devon Energy Corp. personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. Devon Energy Corp. Company response must be in coordination with the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER)

#### Hydrogen Sulfide Drilling Operation Plan

#### I. HYDROGEN SULFIDE (H<sub>2</sub>S) TRAINING

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All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

- 1. The hazards and characteristics of hydrogen sulfide (H<sub>2</sub>S)
- 2. The proper use and maintenance of personal protective equipment and life support systems.
- 3. The proper use of H<sub>2</sub>S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
- 4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

- The effects of H<sub>2</sub>S metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
- 2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
- 3. The contents and requirements of the H<sub>2</sub>S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable  $H_2S$  zone (within 3 days or 500 feet) and weekly  $H_2S$  and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific  $H_2S$  Drilling Operations Plan and the Public Protection Plan.

#### II. HYDROGEN SULFIDE TRAINING

Note: All  $H_2S$  safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain  $H_2S$ .

## 1. Well Control Equipment

- A. Flare line
- B. Choke manifold Remotely Operated
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

## 2. Protective equipment for essential personnel:

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with escape units available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

## 3. H<sub>2</sub>S detection and monitoring equipment:

Portable H<sub>2</sub>S monitors positioned on location for best coverage and response. These units have warning lights which activate when H<sub>2</sub>S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

- Bell nipple
  Shale shaker
  Trip tank
- Suction pit
  Rig floor
  Cellar
- Choke manifold Living Quarters (usually the company man's trailer stairs.)

## Visual warning systems:

- A. Wind direction indicators as shown on well site diagram
- B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

#### 4. Mud program:

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The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. Proper mud weight, safe drilling practices and the use of H<sub>2</sub>S scavengers will minimize hazards when penetrating H<sub>2</sub>S bearing zones.

#### 5. Metallurgy:

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H<sub>2</sub>S trim.
- B. All elastomers used for packing and seals shall be H<sub>2</sub>S trim.

#### 6. Communication:

- A. Company personnel have/use cellular telephones in the field.
- B. Land line (telephone) communications at Office

#### 7. Well testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H<sub>2</sub>S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

## Devon Energy Corp. Company Call List

Carlsbad (575)	Cellular
Drilling Supervisor – Basin – Mark Kramer	
Drilling Supervisor – Slope – Norman Naill	
EHS Professional – Mark Hurst	575-513-9087

# Agency Call List

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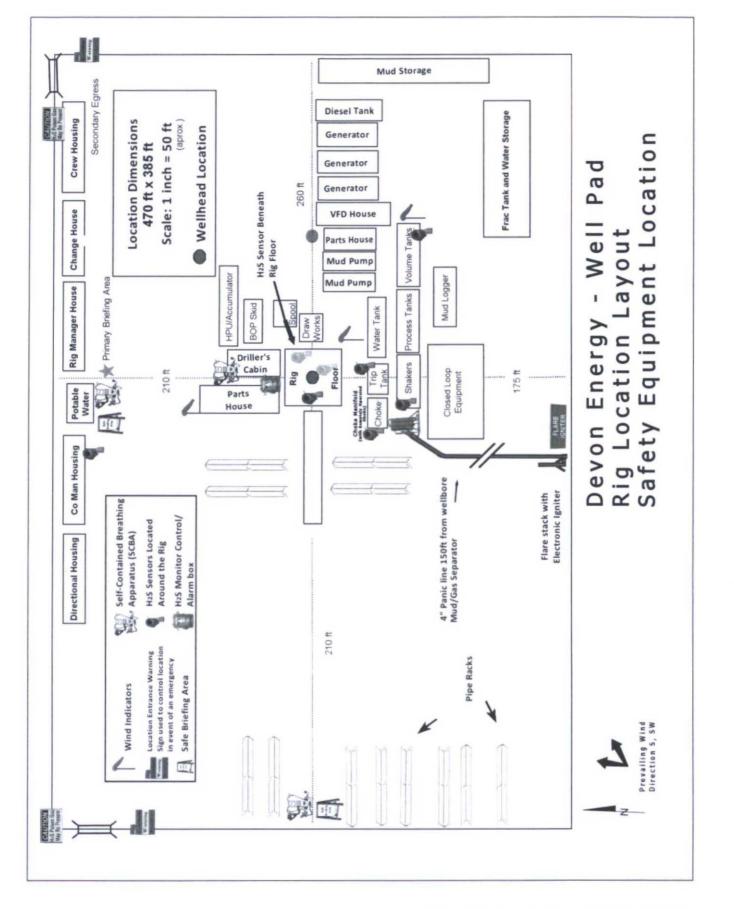
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Lea	Hobbs
County	Lea County Communication Authority
(575)	State Police
	City Police
	Sheriff's Office
	Ambulance
	Fire Department
	LEPC (Local Emergency Planning Committee)
	NMOCD
	US Bureau of Land Management
Eddy	Carlsbad
County	State Police
(575)	City Police
	Sheriff's Office
	Ambulance
	Fire Department
	LEPC (Local Emergency Planning Committee)
	US Bureau of Land Management
	NM Emergency Response Commission (Santa Fe) (505) 476-9600
	24 HR(505) 827-9126
	National Emergency Response Center (Washington, DC)(800) 424-8802
	Emergency Services
	Wild Well Control
	Cudd Pressure Control
	Halliburton
	B. J. Services
Give	Native Air – Emergency Helicopter – Hobbs
GPS	Flight For Life - Lubbock, TX
position:	Aerocare - Lubbock, TX
position.	

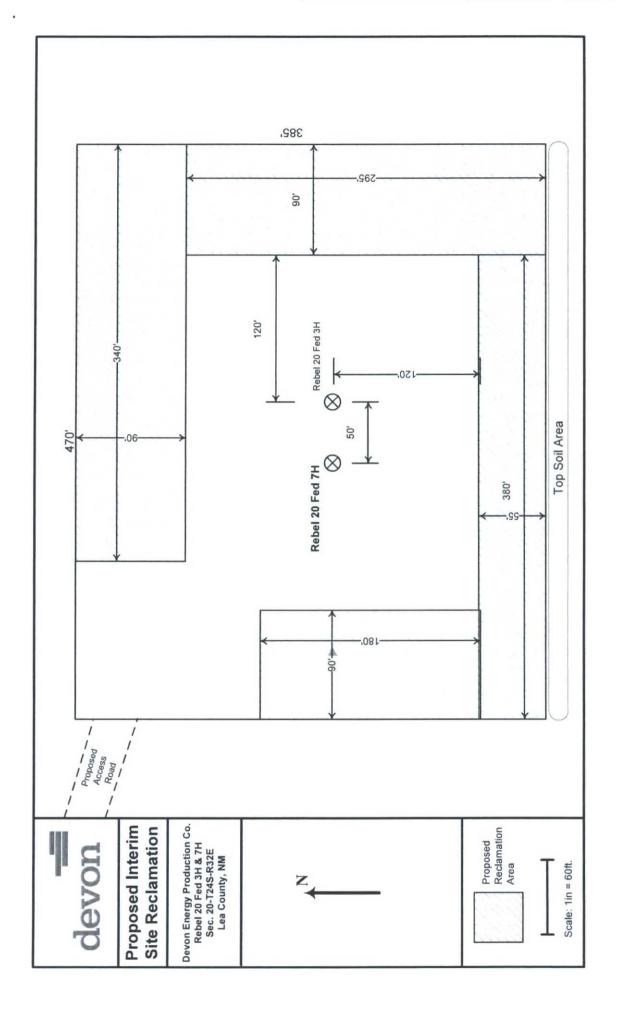
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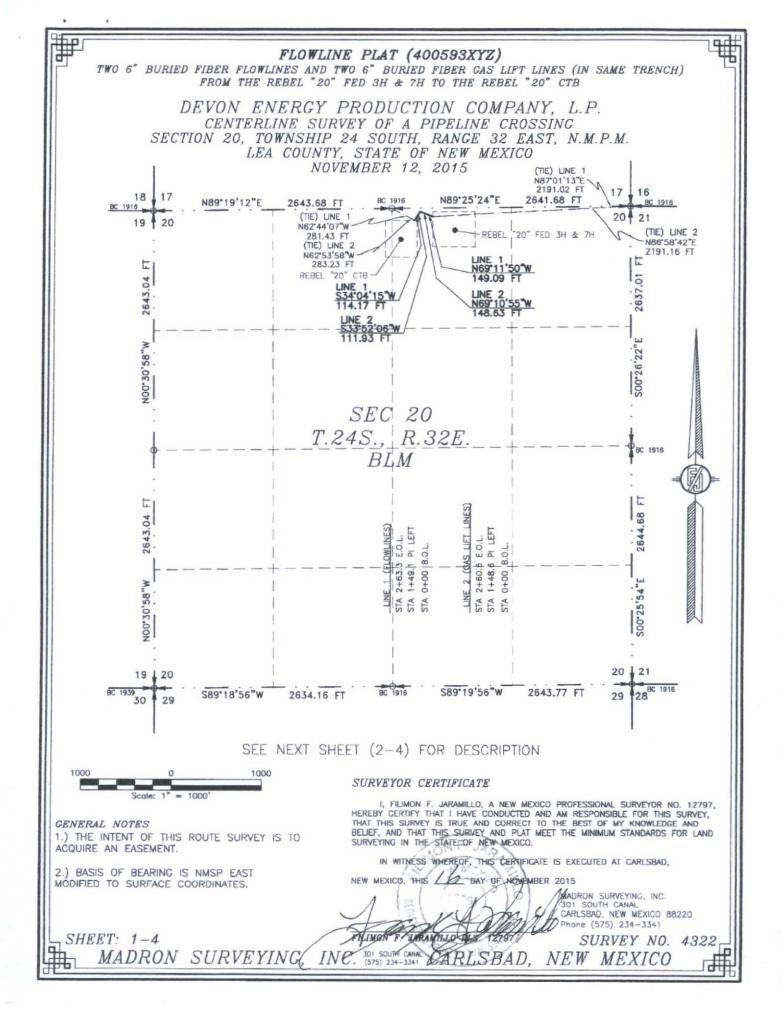
Dave Small



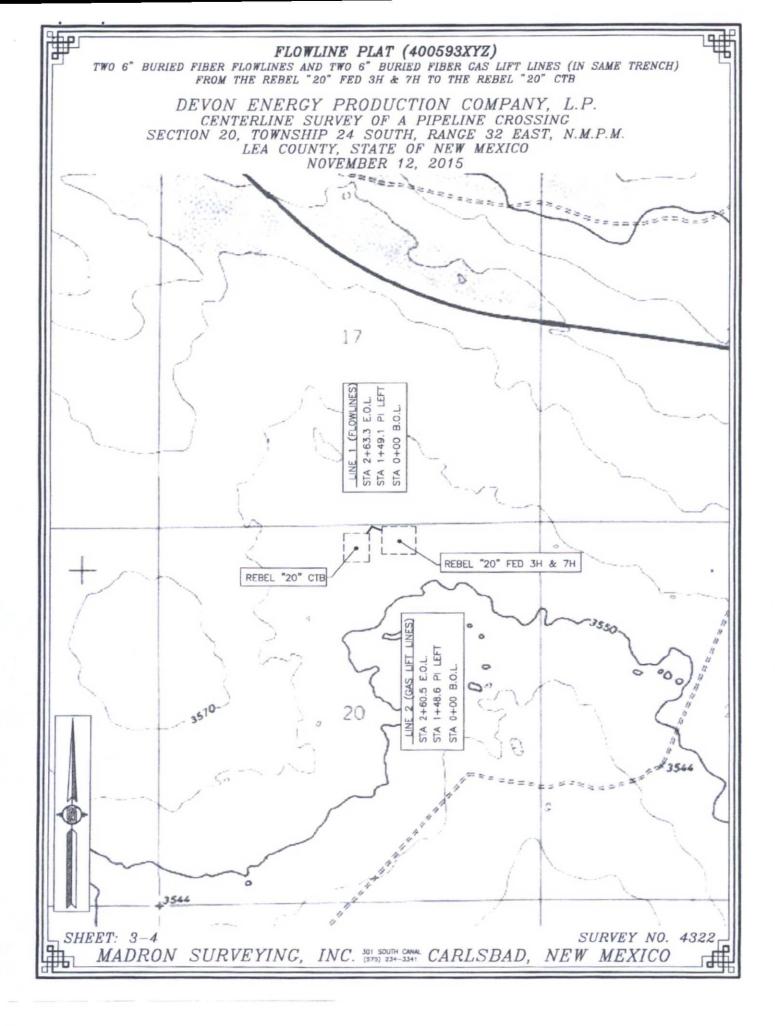


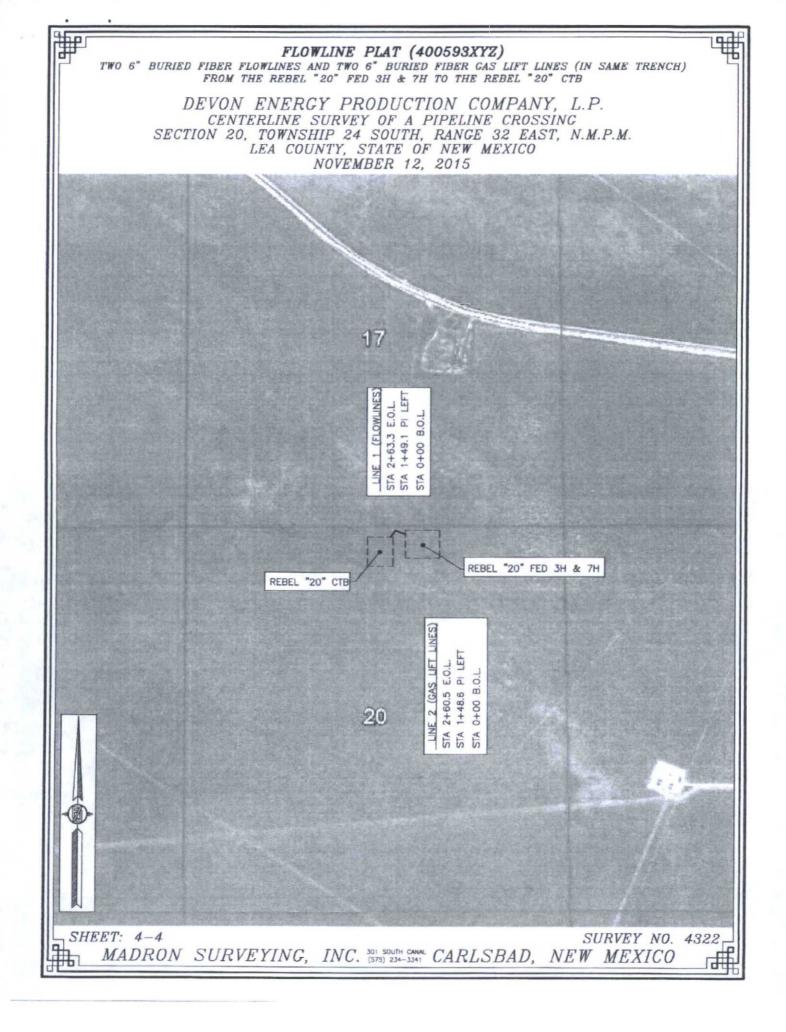
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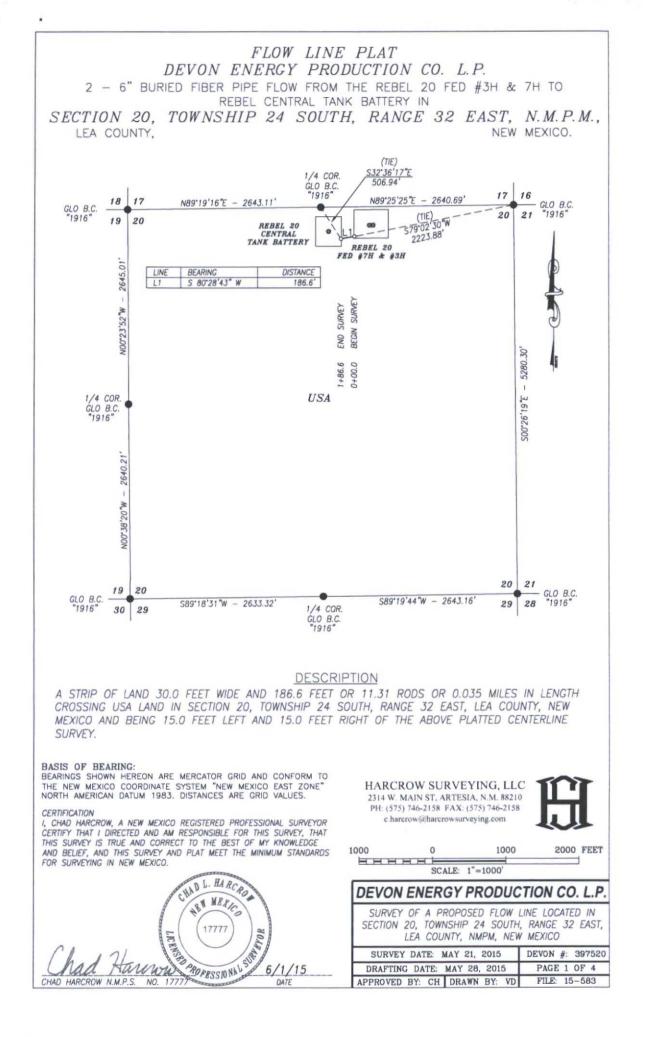


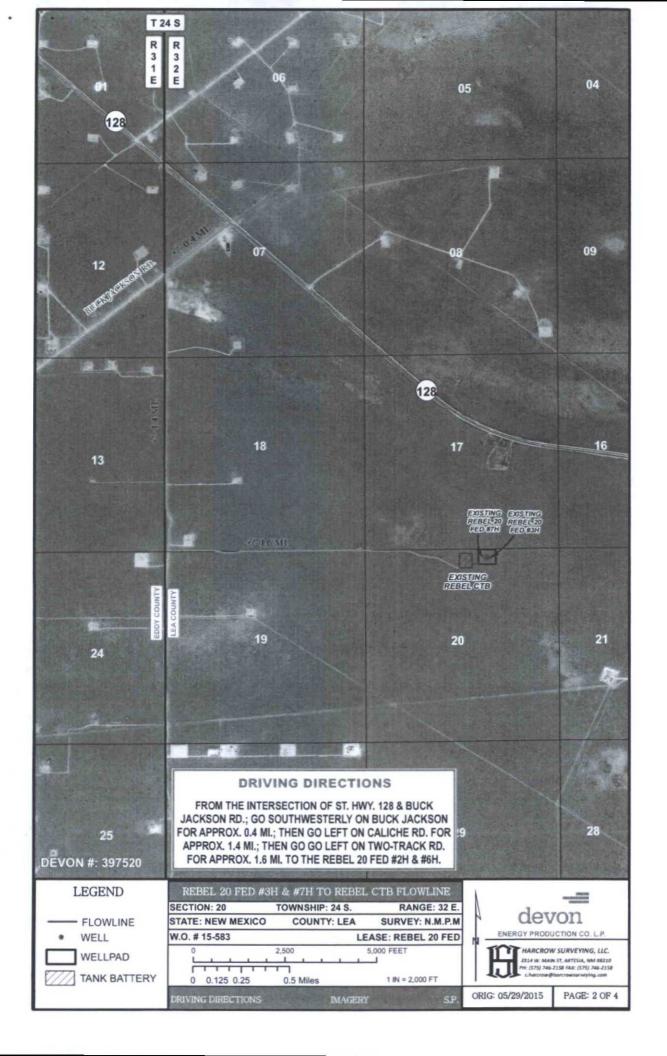


FLOWLINE PLAT (400593XYZ) TWO 6" BURIED FIBER FLOWLINES AND TWO 6" BURIED FIBER GAS LIFT LINES (IN SAME TRENCH) FROM THE REBEL "20" FED 3H & 7H TO THE REBEL "20" CTB DEVON ENERGY PRODUCTION COMPANY, L.P. CENTERLINE SURVEY OF A PIPELINE CROSSING SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M. LEA COUNTY, STATE OF NEW MEXICO NOVEMBER 12, 2015 DESCRIPTION A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY: LINE 1 TWO 6" BURIED FIBER FLOWLINES BEGINNING AT A POINT WITHIN THE NW/4 NE/4 OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS NB7'01'13"E, A DISTANCE OF 2191.02 FEET: THENCE N69'11'50"W A DISTANCE OF 149.09 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED; THENCE S34'04'15"W A DISTANCE OF 114.17 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANCE 32 EAST, N.M.P.M. BEARS N62"44"07"W, A DISTANCE OF 281.43 FEET; SAID STRIP OF LAND BEING 263.26 FEET OR 15.96 RODS IN LENGTH, CONTAINING 0.181 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS: NW/4 NE/4 263.26 L.F. 15.96 RODS 0.181 ACRES LINE 2 TWO 6" BURIED FIBER GAS LIFT LINES BEGINNING AT A POINT WITHIN THE NW/4 NE/4 OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS N86'58'42"E, A DISTANCE OF 2191.16 FEET: THENCE N69'10'55"W A DISTANCE OF 148.63 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED; THENCE \$33'52'06"W A DISTANCE OF 111.93 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS N62'53'58"W, A DISTANCE OF 283.23 FEET; SAID STRIP OF LAND BEING 260.56 FEET OR 15.79 RODS IN LENGTH, CONTAINING 0.179 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS: NW/4 NE/4 260.56 L.F. 15.79 RODS 0.179 ACRES SURVEYOR CERTIFICATE I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO. **GENERAL NOTES** 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT. IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, 2.) BASIS OF BEARING IS NMSP EAST DAY OF NOVEMBER 2015 NEW MEXICO, THIS MODIFIED TO SURFACE COORDINATES. ADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO 88220 Phone (575) 234-3341 ELIMON F. JARMALO MIS. OST SHEET: 2-4 SURVEY NO. 4322 INC. (575) 234-3341 CARLSBAD, NEW MEXICO MADRON SURVEYING

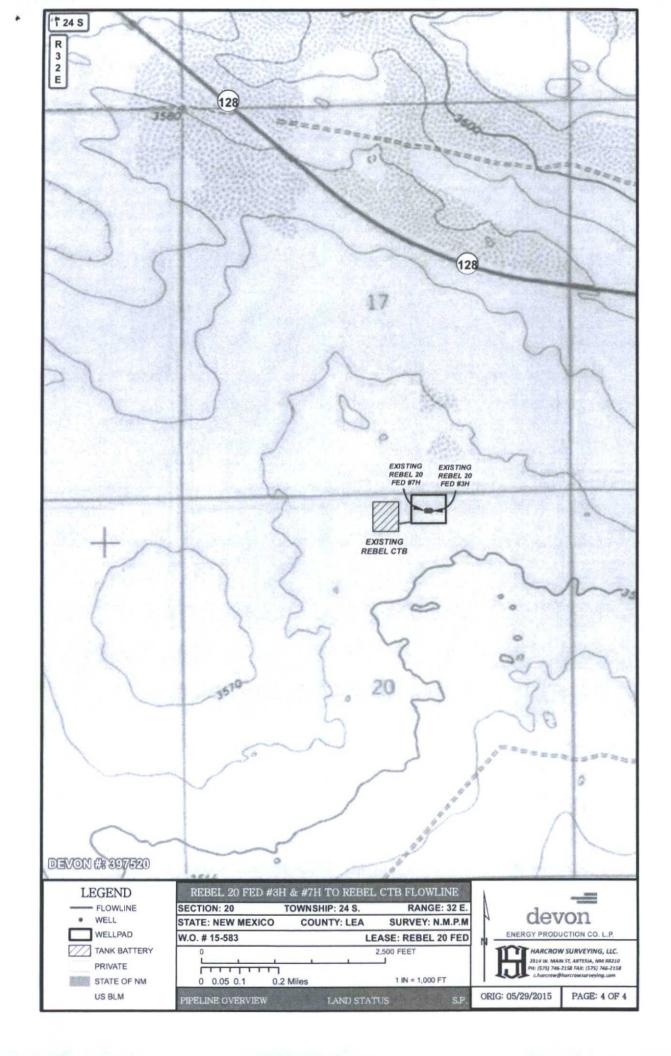


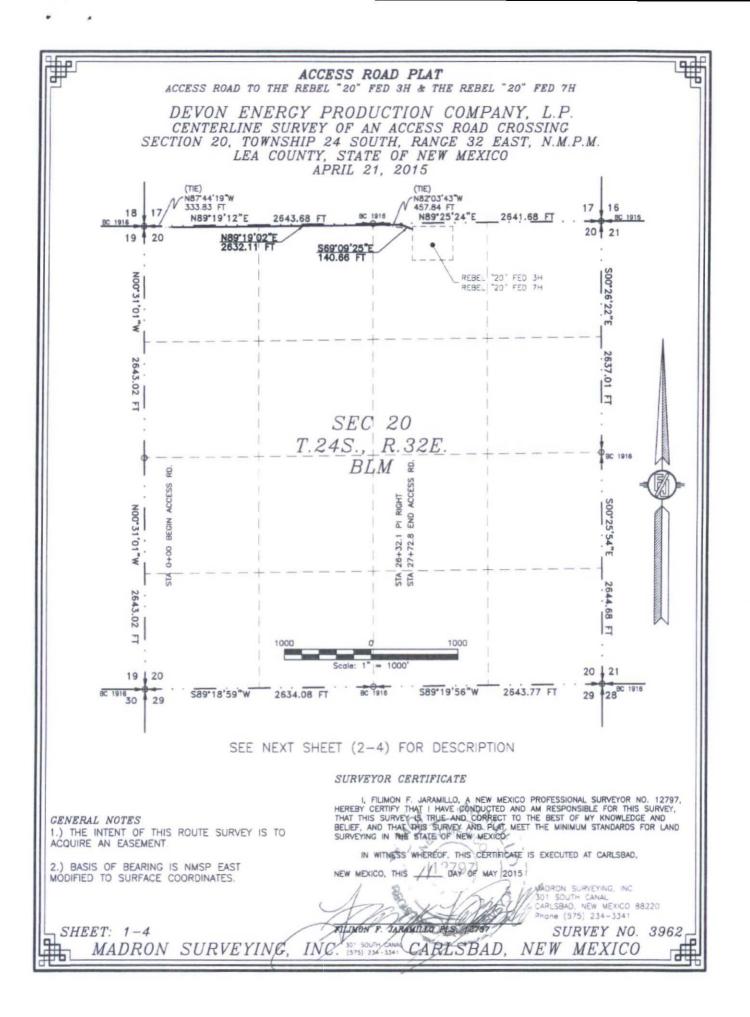












Ŧ ACCESS ROAD PLAT ACCESS ROAD TO THE REBEL "20" FED 3H & THE REBEL "20" FED 7H DEVON ENERGY PRODUCTION COMPANY, L.P. CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M. LEA COUNTY, STATE OF NEW MEXICO APRIL 21, 2015 DESCRIPTION A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY: BEGINNING AT A POINT WITHIN THE NW/4 NW/4 OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M., WHENCE THE NORTHWEST CORNER OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS N87'44'19"W, A DISTANCE OF 333.83 FEET; THENCE N89 19'02"E A DISTANCE OF 2632.11 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED; THENCE S69'09'25"E A DISTANCE OF 140.66 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS N82'03'43"W, A DISTANCE OF 457.84 FEET; SAID STRIP OF LAND BEING 2772.77 FEET OR 168.04 RODS IN LENGTH, CONTAINING 1.273 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS: NW/4 NW/4 988.38 LF. 59.90 RODS 0.454 ACRES NE/4 NW/4 1321.82 L.F. 80.11 RODS 0.607 ACRES NW/4 NE/4 462.57 L.F. 28.03 RODS 0.212 ACRES SURVEYOR CERTIFICATE I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO. GENERAL NOTES 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT. IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, 2.) BASIS OF BEARING IS NMSP EAST 1 DAY OF MAY 2015 NEW MEXICO, THIS MÓDIFIED TO SURFACE COORDINATES. MADRON SURVEYING, INC. AND SOUTH CANAL CARLSBAD, NEW MEXICO 88220 Phone (575) 234-3341 SHEET: 2-4 FLEIMON F. JARANIALO PLE 12497 SURVEY NO. 3962 MADRON SURVEYING, INC. (575) 234- 3441 CARLSBAD, NEW MEXICO

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