



**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 6H**

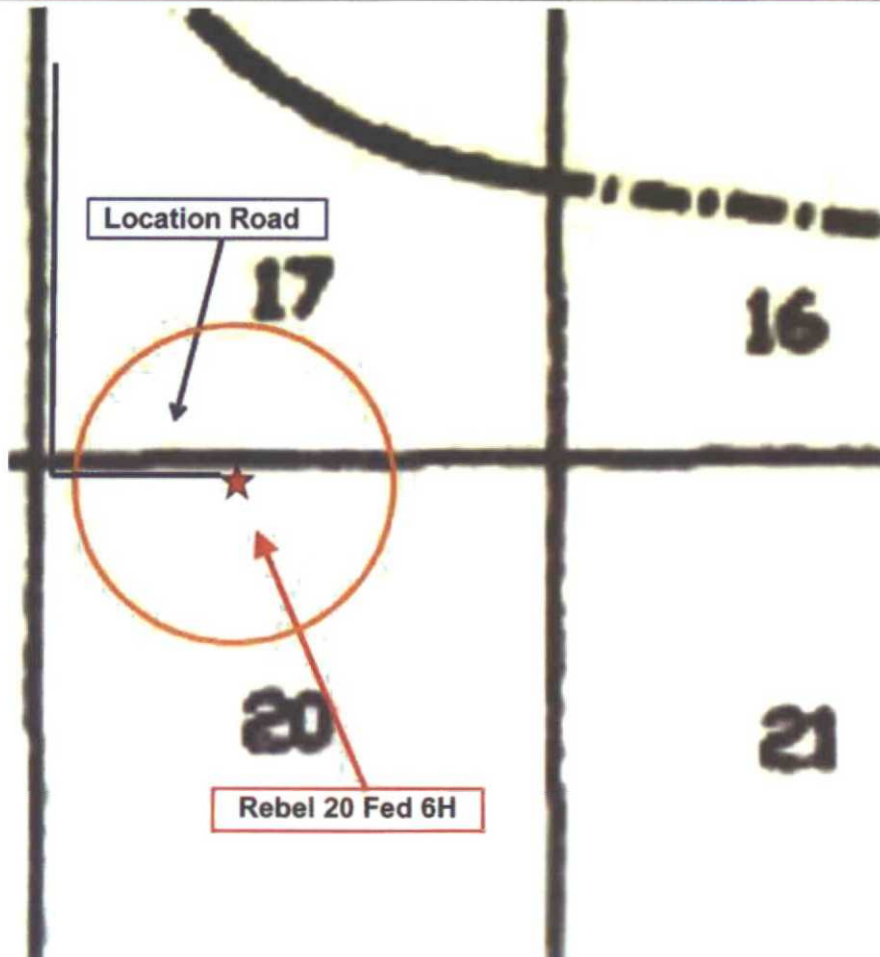
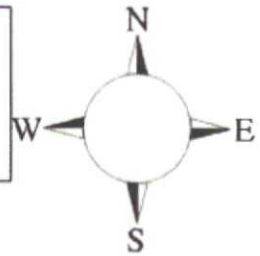
**Sec-20 T-24S R-32E  
250' FNL & 1980' FWL  
LAT. = 32.2095185' N (NAD83)  
LONG = 103.6988857 W**

**Lea County NM**

**JAN 04 2016**

## Rebel 20 Fed 6H

This is an open drilling site. H<sub>2</sub>S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H<sub>2</sub>S, including warning signs, wind indicators and H<sub>2</sub>S monitor.



Assumed 100 ppm **NOE = 3000'** (Radius of Exposure)  
100 ppm H<sub>2</sub>S concentration shall trigger activation of this plan.

### 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. There are no homes or buildings in or near the ROE.

**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

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

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

#### **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**

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:

1. 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<sub>2</sub>S zone (within 3 days or 500 feet) and weekly H<sub>2</sub>S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H<sub>2</sub>S Drilling Operations Plan and the Public Protection Plan.

### **II. HYDROGEN SULFIDE TRAINING**

Note: All H<sub>2</sub>S 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<sub>2</sub>S.



## **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:**

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.....	405-823-4796
Drilling Supervisor – Slope – Norman Naill.....	405-760-7234
EHS Professional – Mark Hurst.....	575-513-9087

## Agency Call List

### Lea

### Hobbs

### County (575)

Lea County Communication Authority .....	393-3981
State Police .....	392-5588
City Police .....	397-9265
Sheriff's Office .....	393-2515
Ambulance .....	911
Fire Department.....	397-9308
LEPC (Local Emergency Planning Committee).....	393-2870
NMOCD.....	393-6161
US Bureau of Land Management.....	393-3612

### Eddy

### Carlsbad

### County (575)

State Police .....	885-3137
City Police .....	885-2111
Sheriff's Office .....	887-7551
Ambulance .....	911
Fire Department.....	885-2111
LEPC (Local Emergency Planning Committee).....	887-3798
US Bureau of Land Management.....	887-6544
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 .....	(281) 784-4700
Cudd Pressure Control.....	(915) 699-0139 or (915) 563-3356
Halliburton .....	(575) 746-2757
B. J. Services.....	(575) 746-3569

### *Give*

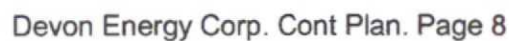
### *GPS*

### *position:*

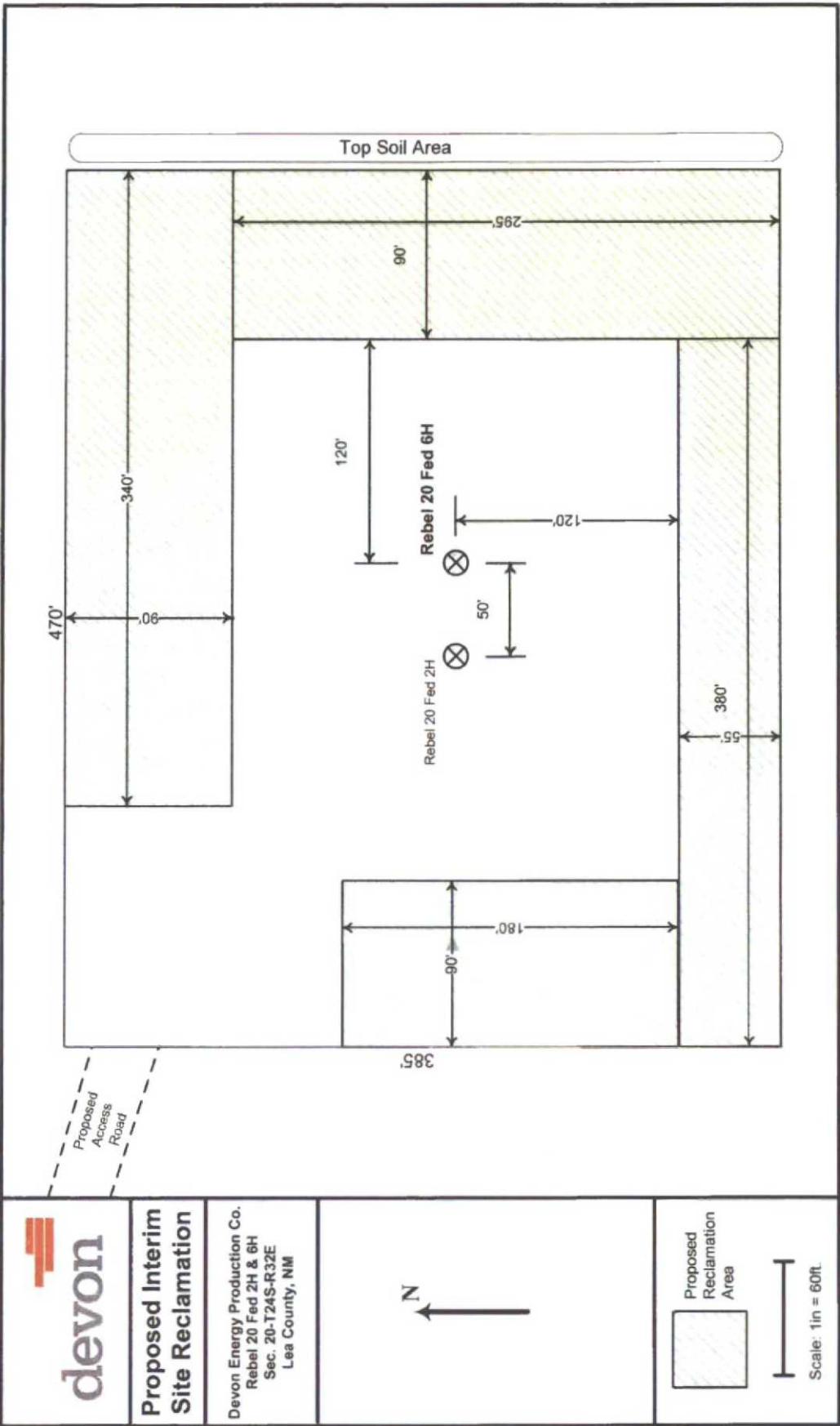
Native Air – Emergency Helicopter – Hobbs.....	(575) 392-6429
Flight For Life - Lubbock, TX .....	(806) 743-9911
Aerocare - Lubbock, TX .....	(806) 747-8923
Med Flight Air Amb - Albuquerque, NM .....	(575) 842-4433
Lifeguard Air Med Svc. Albuquerque, NM .....	(575) 272-3115

Prepared in conjunction with  
Dave Small

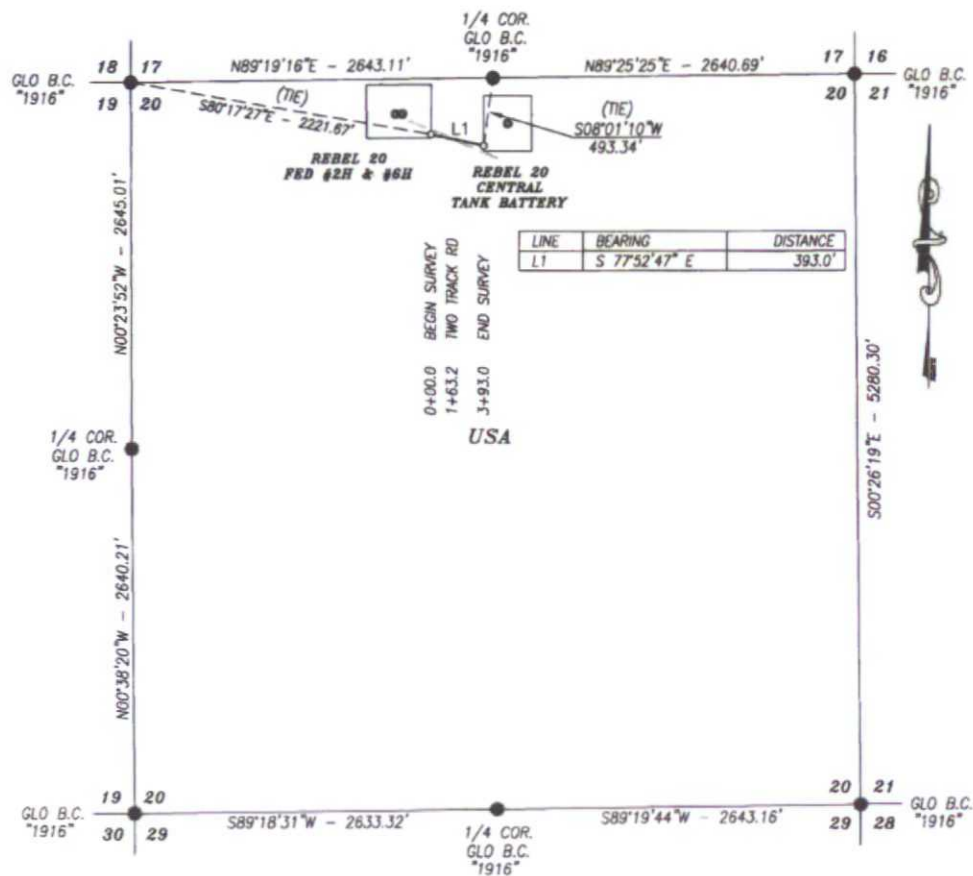








**FLOW LINE PLAT**  
**DEVON ENERGY PRODUCTION CO. L.P.**  
 2 - 6" BURIED FIBER PIPE FLOW LINES FROM THE REBEL 20 FED #2H & #6H TO  
 THE REBEL CENTRAL TANK BATTERY IN  
**SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, N.M.P.M.,**  
 LEA COUNTY, NEW MEXICO.



**DESCRIPTION**

A STRIP OF LAND 30.0 FEET WIDE AND 393.0 FEET OR 23.82 RODS OR 0.074 MILES IN LENGTH CROSSING USA LAND IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, LEA COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

**BASIS OF BEARING:**

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE GRID VALUES.

**CERTIFICATION**

I, CHAD HARCROW, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.



*Chad Harcrow*  
 CHAD HARCROW N.M.P.S. NO. 17777

6/1/15  
 DATE

**HARCROW SURVEYING, LLC**  
 2314 W. MAIN ST., ARTESIA, N.M. 88210  
 PH: (575) 746-2158 FAX: (575) 746-2158  
 c.harcrow@harcrowsurveying.com

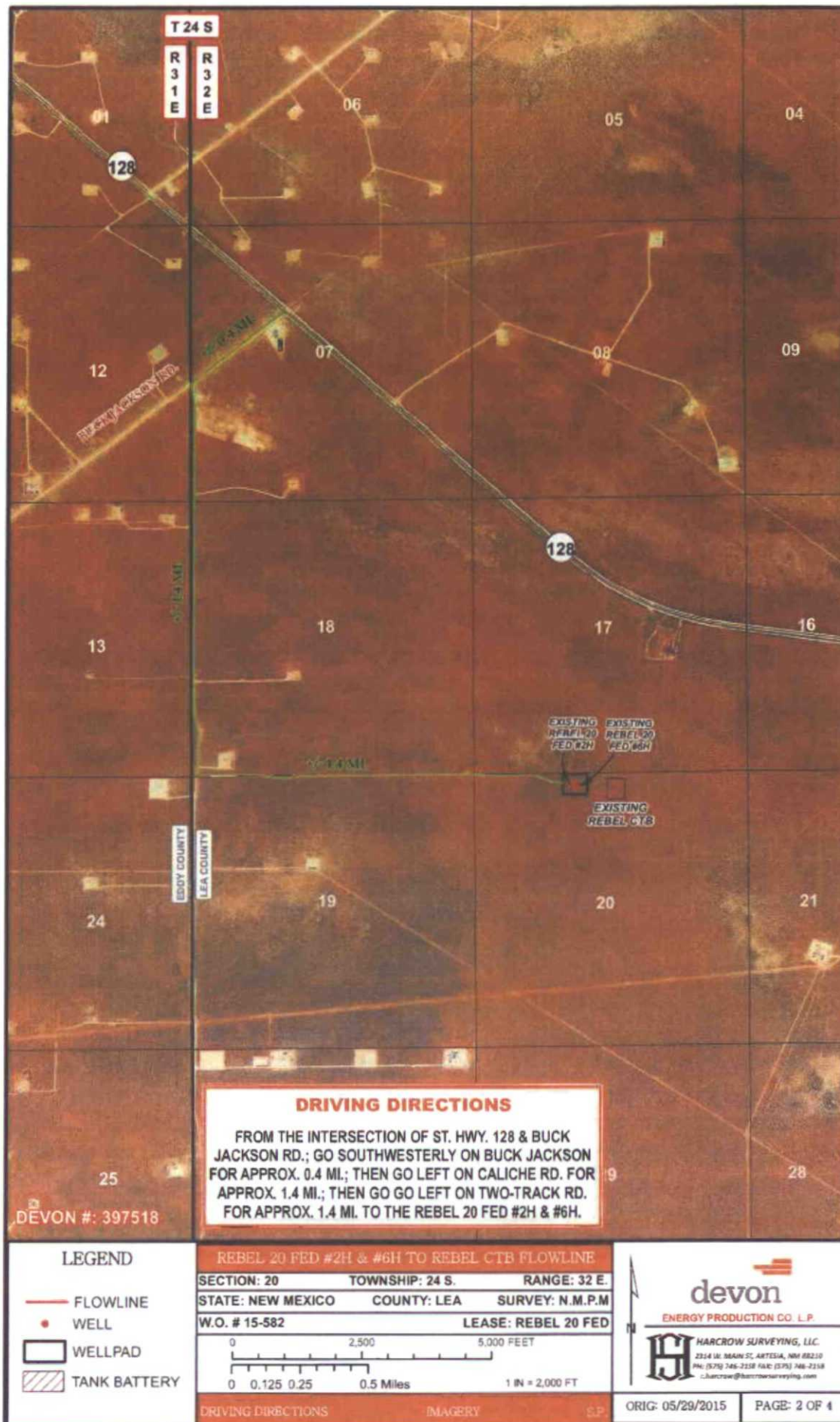


1000 0 1000 2000 FEET  
 SCALE: 1"=1000'

**DEVON ENERGY PRODUCTION CO. L.P.**

SURVEY OF A PROPOSED FLOW LINE LOCATED IN SECTION 20, TOWNSHIP 24 SOUTH, RANGE 32 EAST, LEA COUNTY, NMPM, NEW MEXICO

SURVEY DATE: MAY 21, 2015	DEVON #: 397518
DRAFTING DATE: MAY 28, 2015	PAGE 1 OF 4
APPROVED BY: CH	DRAWN BY: VD
	FILE: 15-582







DEVON #: 397518

#### LEGEND

- FLOWLINE
- WELL
- WELLPAD
- TANK BATTERY

#### REBEL 20 FED #2H & #6H TO REBEL CTB FLOWLINE

SECTION: 20      TOWNSHIP: 24 S.      RANGE: 32 E.  
 STATE: NEW MEXICO      COUNTY: LEA      SURVEY: N.M.P.M.  
 W.O. # 15-582      LEASE: REBEL 20 FED



PIPELINE OVERVIEW

IMAGERY

S.P.



**devon**  
ENERGY PRODUCTION CO. L.P.

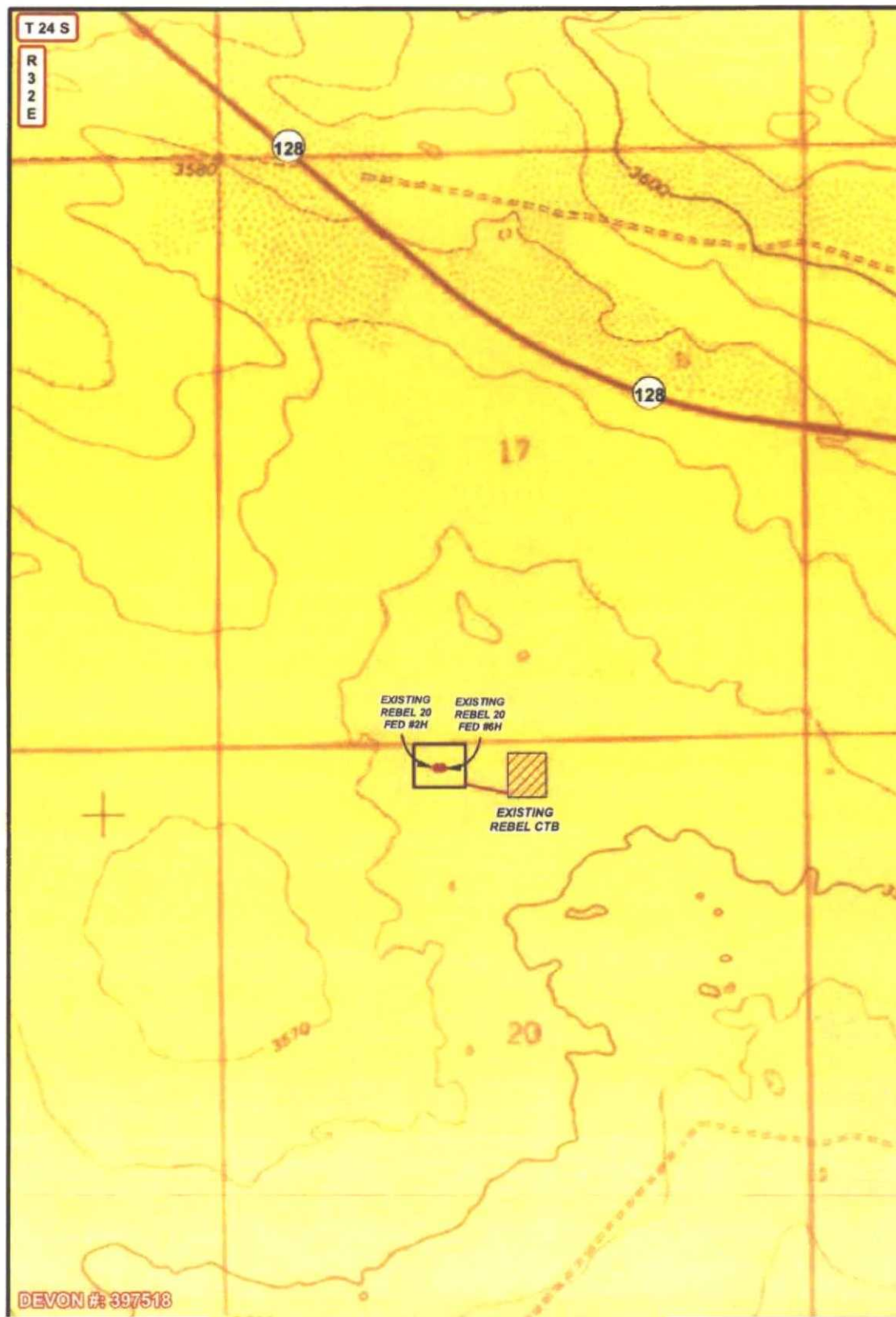


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 c.harcrow@harcrowsurveying.com

ORIG: 05/29/2015

PAGE: 3 OF 4





<b>LEGEND</b> FLOWLINE WELL WELLPAD TANK BATTERY PRIVATE STATE OF NM US BLM	<b>REBEL 20 FED #2H &amp; #6H TO REBEL CTB FLOWLINE</b>			 <b>devon</b> ENERGY PRODUCTION CO. L.P.  <b>HARCROW SURVEYING, LLC.</b> 2814 W. MAIN ST., ARTESIA, NM 88210 PH: (575) 746-2158 FAX: (575) 746-2158 c.harcrow@harcrowsurveying.com
	SECTION: 20	TOWNSHIP: 24 S.	RANGE: 32 E.	
	STATE: NEW MEXICO	COUNTY: LEA	SURVEY: N.M.P.M	
	W.O. # 15-582	LEASE: REBEL 20 FED		
	 0 0.05 0.1 0.2 Miles  0 2,500 FEET 1 IN = 1,000 FT			
PIPELINE OVERVIEW	LAND STATUS	S.P.		
ORIG: 05/29/2015		PAGE: 4 OF 4		

# **FLOWLINE PLAT (400594XYZ)**

TWO 6" BURIED FIBER FLOWLINES AND TWO 6" BURIED FIBER GAS LIFT LINES (IN SAME TRENCH)  
FROM THE REBEL "20" FED 2H & 6H TO THE REBEL "20" CTB

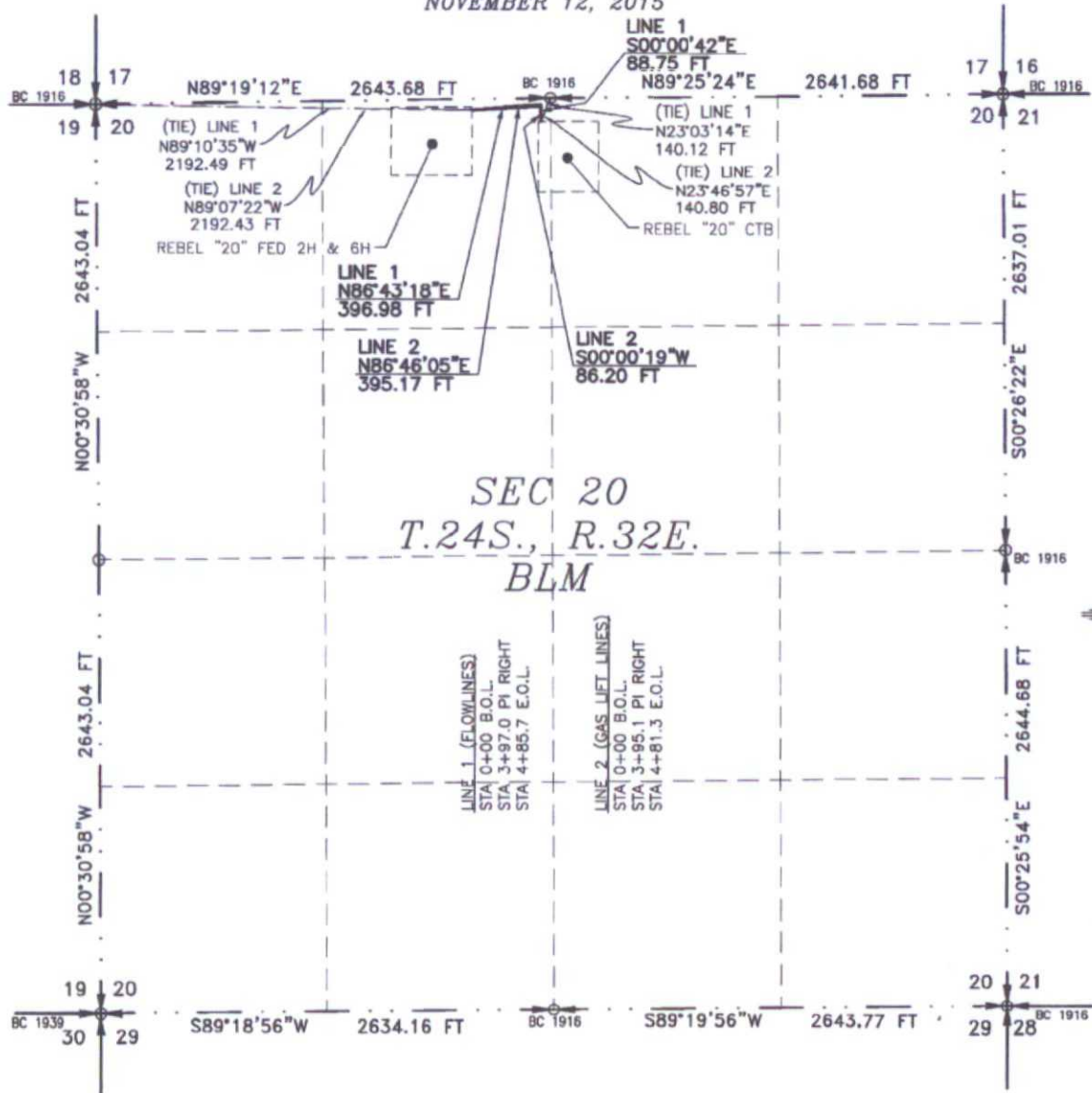
**DEVON ENERGY PRODUCTION COMPANY, L.P.**

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



SEE NEXT SHEET (2-4) FOR DESCRIPTION



## **GENERAL NOTES**

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES.

## **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.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 16 DAY OF NOVEMBER 2015

*Filimon F. Jaramillo*  
FILIMON F. JARAMILLO PLS. 12797

MADRON SURVEYING, INC.  
301 SOUTH CANAL  
CARLSBAD, NEW MEXICO 88220  
Phone (575) 234-3341

SHEET: 1-4

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO (575) 234-3341

SURVEY NO. 4323



**FLOWLINE PLAT (400594XYZ)**

**TWO 6" BURIED FIBER FLOWLINES AND TWO 6" BURIED FIBER GAS LIFT LINES (IN SAME TRENCH)  
FROM THE REBEL "20" FED 2H & 6H 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 NE/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 N89°10'35"W, A DISTANCE OF 2192.49 FEET;  
THENCE N86°43'18"E A DISTANCE OF 396.98 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE S00°00'42"E A DISTANCE OF 88.75 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 N23°03'14"E, A DISTANCE OF 140.12 FEET;

SAID STRIP OF LAND BEING 485.73 FEET OR 29.44 RODS IN LENGTH, CONTAINING 0.335 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NW/4 485.73 L.F. 29.44 RODS 0.335 ACRES

**LINE 2 TWO 6" BURIED FIBER GAS LIFT LINES**

BEGINNING AT A POINT WITHIN THE NE/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 N89°07'22"W, A DISTANCE OF 2192.43 FEET;  
THENCE N86°46'05"E A DISTANCE OF 395.17 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE S00°00'19"W A DISTANCE OF 86.20 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 N23°46'57"E, A DISTANCE OF 140.80 FEET;

SAID STRIP OF LAND BEING 481.37 FEET OR 29.17 RODS IN LENGTH, CONTAINING 0.332 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NW/4 481.37 L.F. 29.17 RODS 0.332 ACRES

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**GENERAL NOTES**

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES.

SHEET: 2-4

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(575) 234-3341

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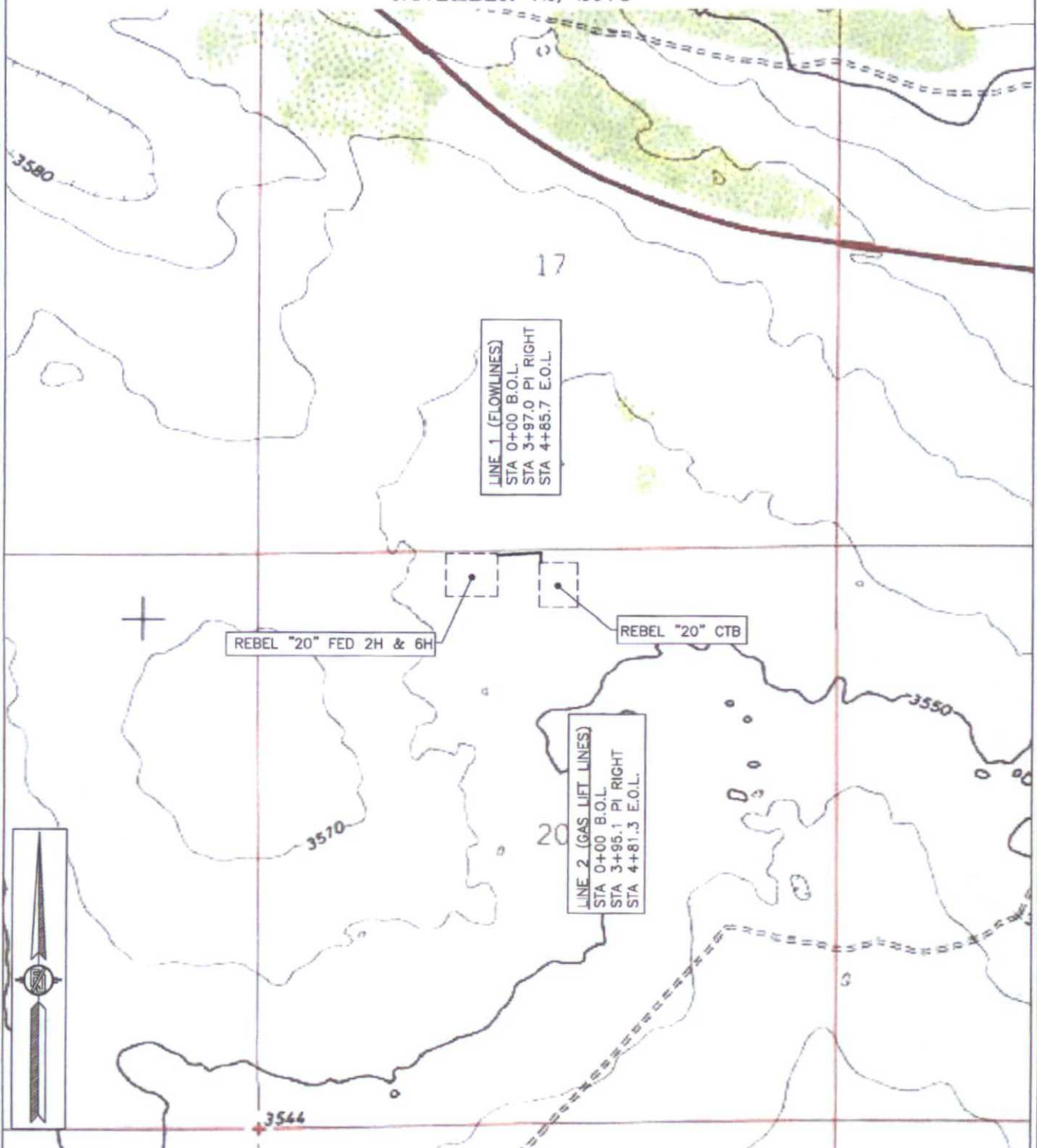
**SURVEY NO. 4323**

**CARLSBAD, NEW MEXICO**

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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



SHEET: 3-4

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SURVEY NO. 4323



**FLOWLINE PLAT (400594XYZ)**

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CENTERLINE SURVEY OF A PIPELINE CROSSING  
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LEA COUNTY, STATE OF NEW MEXICO  
NOVEMBER 12, 2015



SHEET: 4-4

MADRON SURVEYING, INC. 301 SOUTH CANAL  
(575) 234-3341

SURVEY NO. 4323  
CARLSBAD, NEW MEXICO