



COG Operating LLC

Eddy County, NM (NAD27 NME)

Bradley 8 Fee

#5H

WB1

Plan: Plan #1 03-09-15

Surface: 150' FSL, 990' FWL, Sec 8, T19S, R26E, Unit M

PP: 330' FSL, 990' FWL, Sec 8, T19S, R26E, Unit M

BHL: 330' FNL, 985' FWL, Sec 8, T19S, R26E, Unit D

Standard Planning Report

09 March, 2015



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #5H
Company:	COG Operating LLC	TVD Reference:	KB @ 3391.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27-NME)	MD Reference:	KB @ 3391.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1.03-09-15		

Project	Eddy County, NM (NAD27-NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Bradley 8 Fee		
Site Position:		Northing:	606,797.50 usft
From:	Map	Easting:	478,847.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 40' 5.40482 N
		Longitude:	104° 24' 7.45386 W
		Grid Convergence:	-0.04 °

Well	#5H		
Well Position	+N/-S	12.20 usft	Northing:
	+E/-W	-2,039.30 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 40' 5.51185 N
		Longitude:	104° 24' 31.31116 W
		Ground Level:	3,373.00 usft

Wellbore	WB1		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/9/2015	7.62	60.36	48,345

Design	Plan #1.03-09-15		
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Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			359.06

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,554.60	0.00	0.00	2,554.60	0.00	0.00	0.00	0.00	0.00	0.00	
3,377.33	90.50	359.06	3,075.45	525.35	-8.63	11.00	11.00	0.00	359.06	
7,685.93	90.50	359.06	3,037.85	4,833.20	-79.40	0.00	0.00	0.00	0.00	PBHL-Bradley 8 #5H



Planning Report



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Project:	Eddy County NM (NAD27 NME)	MD Reference:	KB @ 3391.00usft (Silver Oak 3)
Site:	Bradley 8 Fee	North Reference:	Grid
Well:	#5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-09-15		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,554.60	0.00	0.00	2,554.60	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Start 11°/100' Build									
2,600.00	4.99	359.06	2,599.94	1.98	-0.03	1.98	11.00	11.00	0.00
2,700.00	15.99	359.06	2,698.12	20.16	-0.33	20.16	11.00	11.00	0.00
2,800.00	26.99	359.06	2,791.02	56.74	-0.93	56.75	11.00	11.00	0.00
2,900.00	37.99	359.06	2,875.24	110.37	-1.81	110.39	11.00	11.00	0.00
3,000.00	48.99	359.06	2,947.67	179.08	-2.94	179.11	11.00	11.00	0.00
3,001.21	49.13	359.06	2,948.46	180.00	-2.96	180.02	11.00	11.00	0.00
PP-Bradley 8 #5H									
3,100.00	59.99	359.06	3,005.66	260.35	-4.28	260.39	11.00	11.00	0.00
3,200.00	70.99	359.06	3,047.07	351.19	-5.77	351.24	11.00	11.00	0.00
3,300.00	81.99	359.06	3,070.39	448.27	-7.36	448.33	11.00	11.00	0.00
3,371.34	89.84	359.06	3,075.47	519.36	-8.53	519.43	11.00	11.00	0.00
TL, 3080' TVD @ 0 VZ, 90.5° Inc									
3,377.33	90.50	359.06	3,075.45	525.35	-8.63	525.42	10.99	10.99	0.00
LP, Hold 90.5° Inc, 359.06° Azm									
3,400.00	90.50	359.06	3,075.25	548.02	-9.00	548.09	0.00	0.00	0.00
3,500.00	90.50	359.06	3,074.38	648.00	-10.65	648.09	0.00	0.00	0.00
3,600.00	90.50	359.06	3,073.51	747.98	-12.29	748.08	0.00	0.00	0.00
3,700.00	90.50	359.06	3,072.63	847.96	-13.93	848.08	0.00	0.00	0.00
3,800.00	90.50	359.06	3,071.76	947.95	-15.57	948.07	0.00	0.00	0.00
3,900.00	90.50	359.06	3,070.89	1,047.93	-17.22	1,048.07	0.00	0.00	0.00
4,000.00	90.50	359.06	3,070.02	1,147.91	-18.86	1,148.07	0.00	0.00	0.00
4,100.00	90.50	359.06	3,069.14	1,247.89	-20.50	1,248.06	0.00	0.00	0.00
4,200.00	90.50	359.06	3,068.27	1,347.88	-22.14	1,348.06	0.00	0.00	0.00
4,300.00	90.50	359.06	3,067.40	1,447.86	-23.79	1,448.06	0.00	0.00	0.00
4,400.00	90.50	359.06	3,066.52	1,547.84	-25.43	1,548.05	0.00	0.00	0.00
4,500.00	90.50	359.06	3,065.65	1,647.83	-27.07	1,648.05	0.00	0.00	0.00
4,600.00	90.50	359.06	3,064.78	1,747.81	-28.71	1,748.04	0.00	0.00	0.00
4,700.00	90.50	359.06	3,063.91	1,847.79	-30.36	1,848.04	0.00	0.00	0.00
4,800.00	90.50	359.06	3,063.03	1,947.77	-32.00	1,948.04	0.00	0.00	0.00
4,900.00	90.50	359.06	3,062.16	2,047.76	-33.64	2,048.03	0.00	0.00	0.00
5,000.00	90.50	359.06	3,061.29	2,147.74	-35.28	2,148.03	0.00	0.00	0.00
5,100.00	90.50	359.06	3,060.42	2,247.72	-36.93	2,248.03	0.00	0.00	0.00
5,200.00	90.50	359.06	3,059.54	2,347.70	-38.57	2,348.02	0.00	0.00	0.00
5,300.00	90.50	359.06	3,058.67	2,447.69	-40.21	2,448.02	0.00	0.00	0.00
5,400.00	90.50	359.06	3,057.80	2,547.67	-41.85	2,548.01	0.00	0.00	0.00
5,500.00	90.50	359.06	3,056.93	2,647.65	-43.50	2,648.01	0.00	0.00	0.00
5,600.00	90.50	359.06	3,056.05	2,747.64	-45.14	2,748.01	0.00	0.00	0.00
5,700.00	90.50	359.06	3,055.18	2,847.62	-46.78	2,848.00	0.00	0.00	0.00
5,800.00	90.50	359.06	3,054.31	2,947.60	-48.42	2,948.00	0.00	0.00	0.00
5,900.00	90.50	359.06	3,053.44	3,047.58	-50.07	3,047.99	0.00	0.00	0.00
6,000.00	90.50	359.06	3,052.56	3,147.57	-51.71	3,147.99	0.00	0.00	0.00
6,100.00	90.50	359.06	3,051.69	3,247.55	-53.35	3,247.99	0.00	0.00	0.00
6,200.00	90.50	359.06	3,050.82	3,347.53	-54.99	3,347.98	0.00	0.00	0.00
6,300.00	90.50	359.06	3,049.94	3,447.51	-56.64	3,447.98	0.00	0.00	0.00
6,400.00	90.50	359.06	3,049.07	3,547.50	-58.28	3,547.98	0.00	0.00	0.00
6,500.00	90.50	359.06	3,048.20	3,647.48	-59.92	3,647.97	0.00	0.00	0.00
6,600.00	90.50	359.06	3,047.33	3,747.46	-61.56	3,747.97	0.00	0.00	0.00
6,700.00	90.50	359.06	3,046.45	3,847.45	-63.21	3,847.96	0.00	0.00	0.00
6,800.00	90.50	359.06	3,045.58	3,947.43	-64.85	3,947.96	0.00	0.00	0.00
6,900.00	90.50	359.06	3,044.71	4,047.41	-66.49	4,047.96	0.00	0.00	0.00
7,000.00	90.50	359.06	3,043.84	4,147.39	-68.13	4,147.95	0.00	0.00	0.00



Database: Compass 5000.GCR
Company: COG Operating, LLC
Project: Eddy County, NM (NAD27 NME)
Site: Bradley 8 Fee
Well: #5H
Wellbore: WB1
Design: Plan #1 03-09-15

Local Co-ordinate Reference: Well #5H
TVD Reference: KB @ 3391.00usft (Silver Oak 3)
MD Reference: KB @ 3391.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,100.00	90.50	359.06	3,042.96	4,247.38	-69.78	4,247.95	0.00	0.00	0.00
7,200.00	90.50	359.06	3,042.09	4,347.36	-71.42	4,347.95	0.00	0.00	0.00
7,300.00	90.50	359.06	3,041.22	4,447.34	-73.06	4,447.94	0.00	0.00	0.00
7,400.00	90.50	359.06	3,040.35	4,547.32	-74.70	4,547.94	0.00	0.00	0.00
7,500.00	90.50	359.06	3,039.47	4,647.31	-76.35	4,647.93	0.00	0.00	0.00
7,600.00	90.50	359.06	3,038.60	4,747.29	-77.99	4,747.93	0.00	0.00	0.00
7,685.93	90.50	359.06	3,037.85	4,833.20	-79.40	4,833.85	0.00	0.00	0.00

TD at 7685.93' MD - PBHL-Bradley 8 #5H

Design Targets

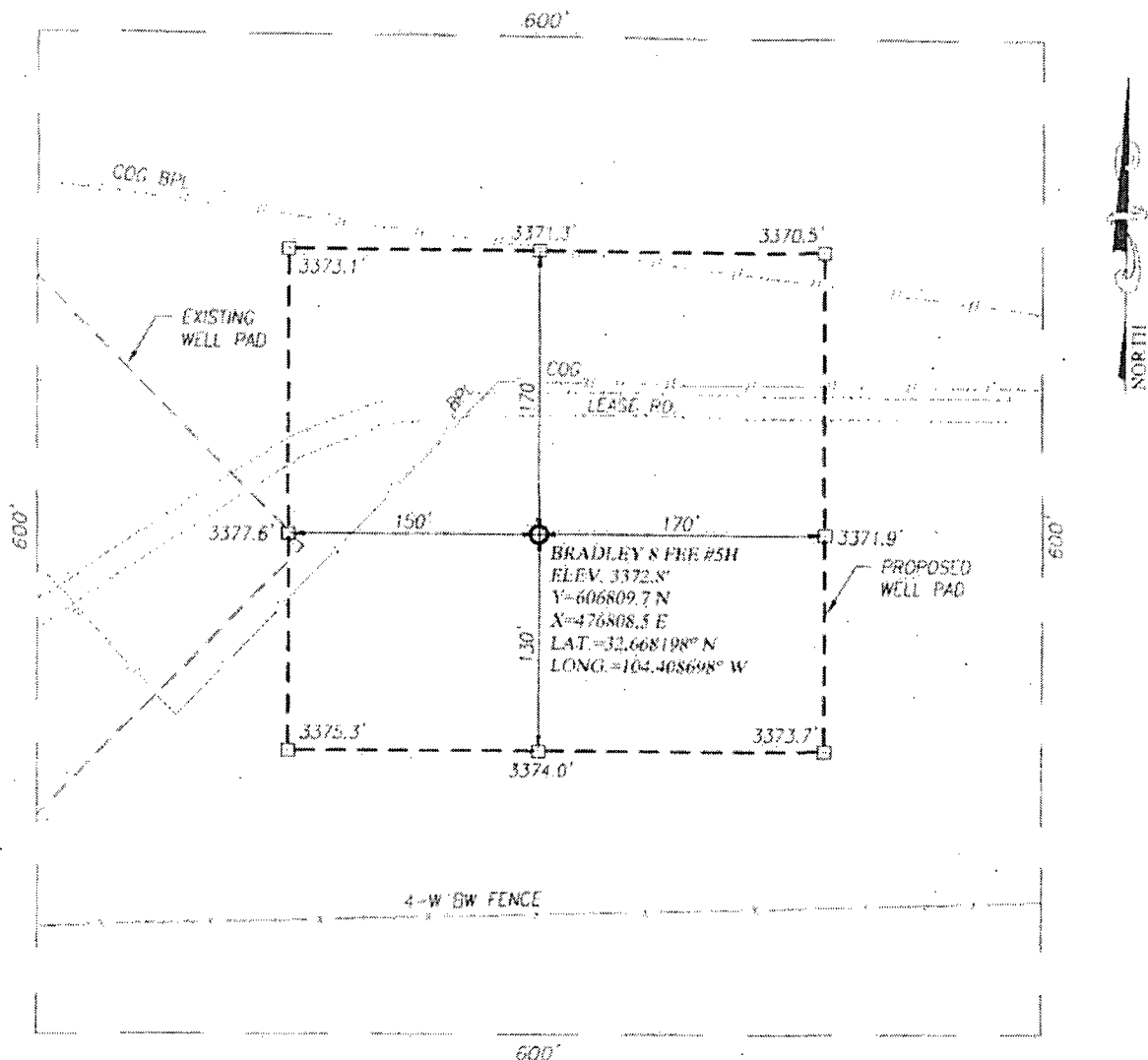
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PP-Bradley 8 #5H	0.00	0.00	2,948.46	180.00	-2.96	606,989.70	476,805.54	32° 40' 7.29304 N	104° 24' 31.34725 W
- plan hits target center									
- Point									
PBHL-Bradley 8 #5H	0.00	360.00	3,037.85	4,833.20	-79.40	611,642.90	476,729.10	32° 40' 53.33898 N	104° 24' 32.28034 W
- plan hits target center									
- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,371.34	3,075.47	TL, 3080' TVD @ 0 VZ, 90.5° Inc		-0.50	359.06

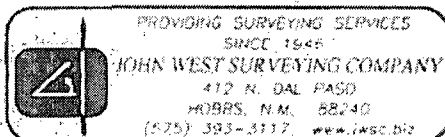
Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
2,554.60	2,554.60	0.00	0.00	KOP, Start 11°/100' Build
3,377.33	3,075.45	525.35	-8.63	LP, Hold 90.5° Inc, 359.06° Azm
7,685.93	3,037.85	4,833.20	-79.40	TD at 7685.93' MD



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF U.S. HIGHWAY 285 AND CO. RD. 21 (ROCKING R RED) GO WEST APPROX. 0.5 MILES; TURN RIGHT AND GO NORTH APPROX. 0.9 MILES; TURN LEFT AND GO WEST APPROX. 0.1 MILE TO THIS LOCATION.



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COG OPERATING, LLC

BRADLEY 8 FEE #5 WELL
LOCATED 150 FEET FROM THE SOUTH LINE
AND 990 FEET FROM THE WEST LINE OF SECTION 8,
TOWNSHIP 19 SOUTH, RANGE 26 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

Survey Date: 8/30/13

CAD Date: 9/9/13

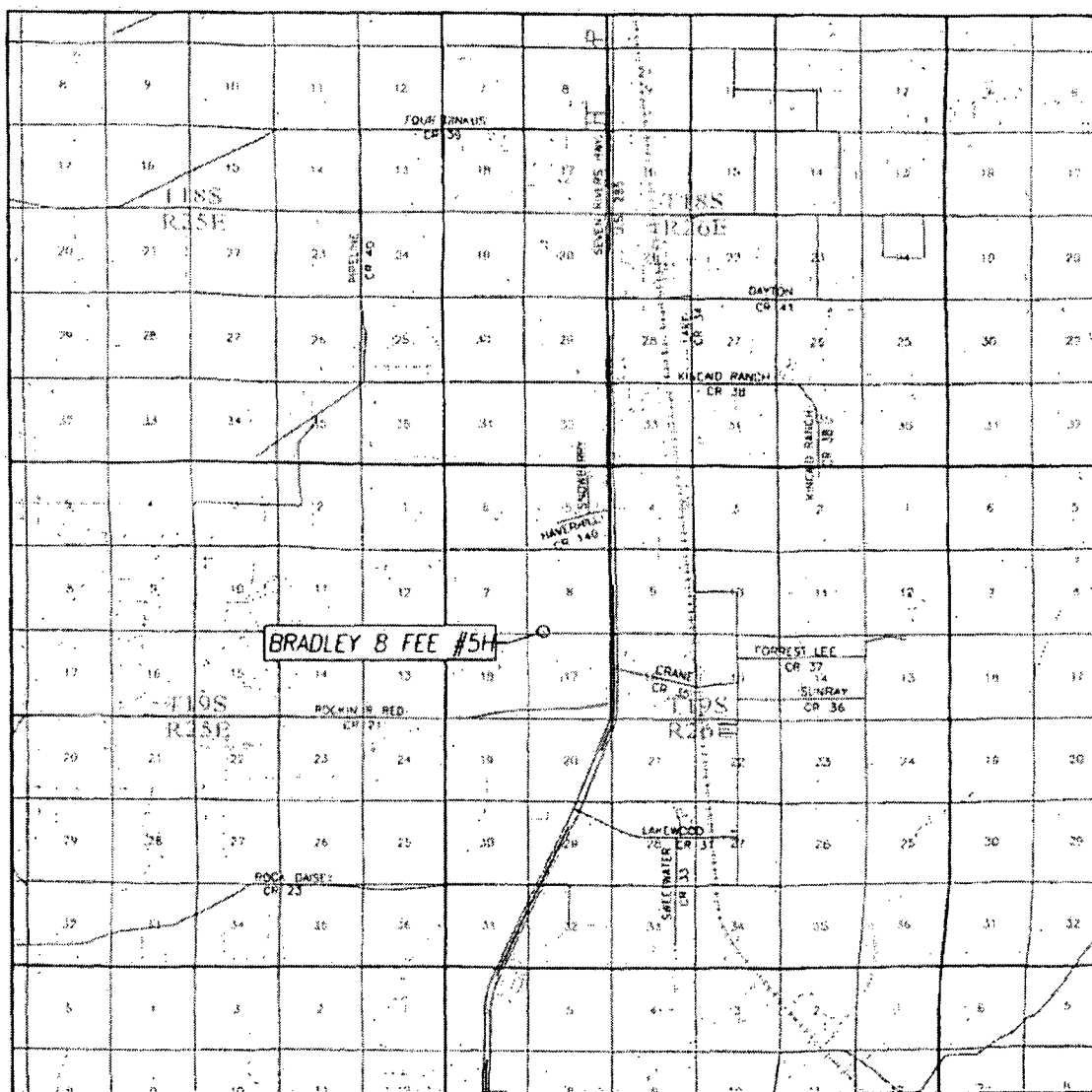
Drawn By: BKL

W.O. No.: 13110983

Rev.:

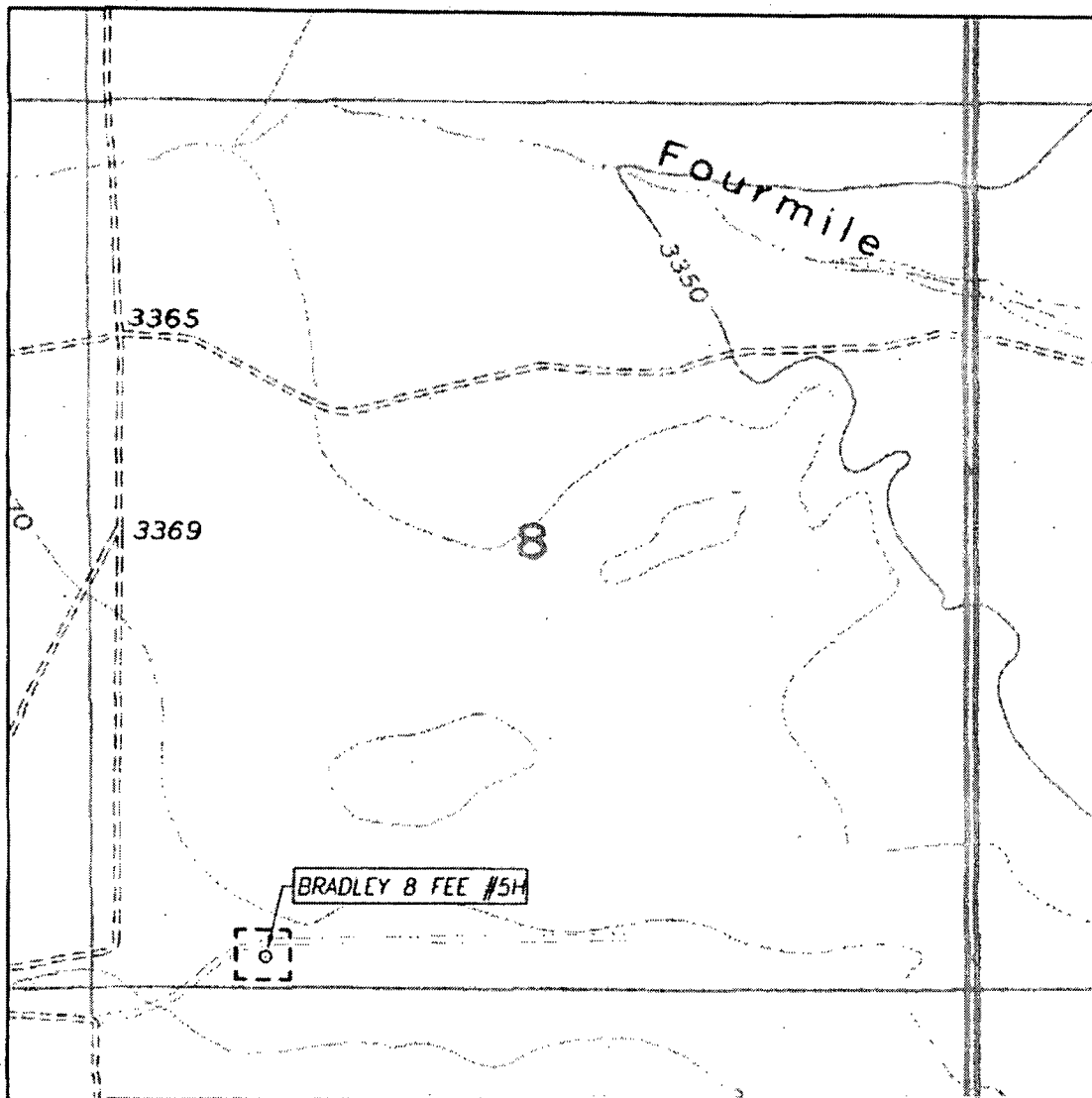
Rel. W.O.:

Sheet 1 of 1



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASSO
HOUSTON, TEXAS 77040
(575) 393-3117 ***jwsc07

LOCATION VERIFICATION MAP



SCALE: 1" = 1000'

CONTOUR INTERVAL:
DAYTON, N.M. - 10'

SEC. 8 TWP. 19-S RGE. 26-E

SURVEY N.M.P.M.

COUNTY EDDY STATE NEW MEXICO

DESCRIPTION 150' FSL & 990' FWL

ELEVATION 3373'

OPERATOR COG OPERATING, LLC

LEASE BRADLEY 8 FEE

U.S.G.S. TOPOGRAPHIC MAP
DAYTON, N.M.

