

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

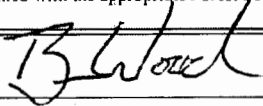
FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

1a. Type of work: ☒ DRILL ☐ REENTER		7. If Unit or CA Agreement, Name and No. N/A
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		8. Lease Name and Well No. RANA SALADA FED COM 0605 121H
2. Name of Operator NOVO OIL & GAS NORTHERN DELAWARE, LLC		9. API Well No. 30-015-
3a. Address 105 NORTH HUDSON AVE., SUITE 500 OKLAHOMA CITY, OK 73102	3b. Phone No. (include area code) (4045) 609-1596	10. Field and Pool, or Exploratory CULEBRA BLUFF; BONE SPRING, SO
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface 1127' FNL & 335' FEL 1-23S-28E At proposed prod. zone 330' FNL & 1650' FEL 5-23S-29E		11. Sec., T. R. M. or Blk. and Survey or Area SHL: Lot 1 1-23S-28E NMPM BHL: Lot 2 5-23S-29E NMPM
14. Distance in miles and direction from nearest town or post office* 5 AIR MILES NE OF LOVING, NM		12. County or Parish EDDY
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) SHL: 335' BHL: 330'		13. State NM
16. No. of acres in lease SHL: 798.88 BHL: 602.12		17. Spacing Unit dedicated to this well LOTS 2-4 5-23S-29E LOTS 1-4 6-23S-29E
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SHL: 30' (Rana 211H) BHL: 2120' (ditto)		20. BLM/BIA Bond No. on file BLM NMB001536
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3090' UNGRADED	22. Approximate date work will start* 09/01/2018	23. Estimated duration 3 MONTHS

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM. |

25. Signature 	Name (Printed/Typed) BRIAN WOOD (PHONE: 505 466-8120)	Date 07/08/2018
Title CONSULTANT (FAX: 505 466-9682)		
Approved by (Signature)	Name (Printed/Typed)	Date
Title	Office	

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

 SURVEY NO. 6145B

Novo Oil & Gas Northern Delaware, LLC
Rana Salada Fed Com 0605 121H
SHL 1127' FNL & 335' FEL 1-23S-28E
BHL 330' FNL & 1650' FEL 5-23S-29e
Eddy County, NM

DRILL PLAN PAGE 1

Drilling Program

1. ESTIMATED TOPS

Formation Name	TVD	MD	Bearing
Quaternary	0'	0'	water
Rustler anhydrite	313'	313'	N/A
Salado salt	759'	759'	N/A
Castile anhydrite	1406'	1406'	N/A
Base salt	2627'	2630'	N/A
Bell Canyon sandstone	2826'	2831'	hydrocarbons
Cherry Canyon sandstone	3917'	3931'	hydrocarbons
Brushy Canyon sandstone	5360'	5390'	hydrocarbons
Bone Spring limestone	6351'	6391'	hydrocarbons
1 st Bone Spring sandstone	7481'	7532'	hydrocarbons
2 nd Bone Spring carbonate	7751'	7802'	hydrocarbons
(KOP	7764'	7814'	hydrocarbons)
2nd Bone Spring sandstone (goal)	8191'	8349'	hydrocarbons
TD	8241'	16981'	hydrocarbons

2. NOTABLE ZONES

Second Bone Spring sand is the goal. All perforations will be $\geq 330'$ from the dedication perimeter. Closest water well (C 02804) is 8931' southeast. Depth to water was not reported in this 100' deep well.

3. PRESSURE CONTROL

A 13.625" 5,000-psi BOP system will be installed on a multi-bowl (speed head) wellhead with a 13.625" flanged casing spool. Top flange of casing spool will be set in a cellar below ground level. BOP system will consist of a single pipe ram

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Eddy County, NM

DRILL PLAN PAGE 2

on the bottom, mud cross, double pipe ram with blind rams on bottom and pipe rams on top, and annular preventer. The blowout preventer will be installed on top of the 13.375" surface casing and will remain installed to TD of the well. Wellhead, blowout preventer, and choke manifold diagram are included.

BOP system will be isolated with a test plug and tested by an independent tester to 250-psi low and 5000-psi high for 10 minutes. Variance is requested to use a co-flex hose between the BOP system and choke manifold. A co-flex pressure test certificate will be on the location when testing the BOP.

Surface casing will be pressure tested to 250-psi low and 1500-psi high. Intermediate casing will be pressure tested to 250-psi low and 70% of burst pressure (4025 psi) for 30 minutes.

4. CASING & CEMENT

Variance is requested for the option to use a surface rig to drill the surface hole, set the surface casing, and cement the surface casing. If the schedule between rigs would preclude presetting the surface casing, then the primary rig will MIRU and drill all of the well.

All casing will be API and new. See attached casing assumption worksheet.

Hole O. D.	Set MD	Set TVD	Casing OD	Weight (lb/ft)	Grade	Joint	Collapse	Burst	Tension
17.5"	0' - 500'	0' - 500'	13.375" surface	54.5	J-55	BTC	1.125	1.125	1.60
12.25"	0' - 5200'	0' - 5171'	9.625" intermed.	40	HCL-80	BTC	1.125	1.125	1.60
8.75"	0' - 16981'	0' - 8241'	5.5" product.	20	P-110	DQX, GBCD, CDC, DWC/C	1.125	1.125	1.60

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Eddy County, NM

DRILL PLAN PAGE 3

Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Tail	429	1.62	694	13.8	Class C + gel + accelerator + LCM
TOC = GL		100% Excess			Centralizers on every jt to GL	
Intermediate	Lead	716	2.28	1632	11.9	Class C + gel + accelerator + LCM
	Tail	200	1.34	268	14.8	Class C + gel + retarder + LCM
TOC = GL		20% Excess			Centralizers on bottom 3 jts and then 1 centralizer every 4th jt to GL	
Production	Tail	715	1.72	1229	13.2	Class H + fluid loss + retarder + LCM
TOC = 4700'		20% Excess			None planned	

5. MUD PROGRAM

An electronic PVT mud system will monitor flow rate, pump pressure, stroke rate, and volume. All necessary mud products (barite, bentonite, LCM) to control weight and fluid loss will be on site at all times. Mud program may change due to hole conditions. A closed loop system will be used.

Type	Interval (MD)	lb/gal	Viscosity	Fluid Loss
fresh water spud	0' - 500'	8.3	30 - 60	NC
brine or cut brine	500' - 5200'	9.8 - 10.2	35 - 45	NC
OBM	5200' - 16981'	8.5 - 10.0	35 - 65	4 - 6

6. CORES, TESTS, & LOGS

No core or drill stem test is planned.

A 2-person mud logging program will be used from $\approx 3000'$ to TD.

GR will be log will be acquired by MDW tools from the intermediate casing to TD.

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DRILL PLAN PAGE 4

7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈ 4096 psi. Expected bottom hole temperature is $\approx 150^{\circ}$ F.

An H2S plan is attached.

8. OTHER INFORMATION

Anticipated spud date is upon approval. It is expected it will take ≈ 3 months to drill and complete the well.

Well was formerly known as Rana Salada Fed Com 1 5 23S 29E 2B 1H.



Well: Rana Salada Fed Com 0605 121H
Site: Section 01-T23S-R28E
Project: Eddy County, New Mexico
Design: rev2

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level
Depth Reference: RKB=3090.9+25 @ 3115.90ft

Northing 487172.53 Easting 634076.33 Latitude 32.33895139 Longitude -104.03304850

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	2000.00	0.00	0.00	2000.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 2°/100' build
3	2403.93	8.08	14.88	2402.59	27.48	7.30	2.00	14.88	7.30	Begin 8.06° tangent
4	7246.81	8.08	14.88	7197.41	685.23	182.04	0.00	0.00	182.04	Begin 2°/100' drop
5	7650.73	0.00	0.00	7600.00	712.71	189.34	2.00	180.00	189.34	Begin vertical hold
6	7814.27	0.00	0.00	7763.54	712.71	189.34	0.00	0.00	189.34	Begin 12°/100' build
7	8584.27	90.00	90.00	8241.00	712.71	666.81	12.00	90.00	666.81	Begin 90.00° lateral
8	16981.27	90.00	90.00	8241.00	712.71	9083.80	0.00	0.00	9083.80	PBHL/TD 16981.26 MD 8241.00 TVD

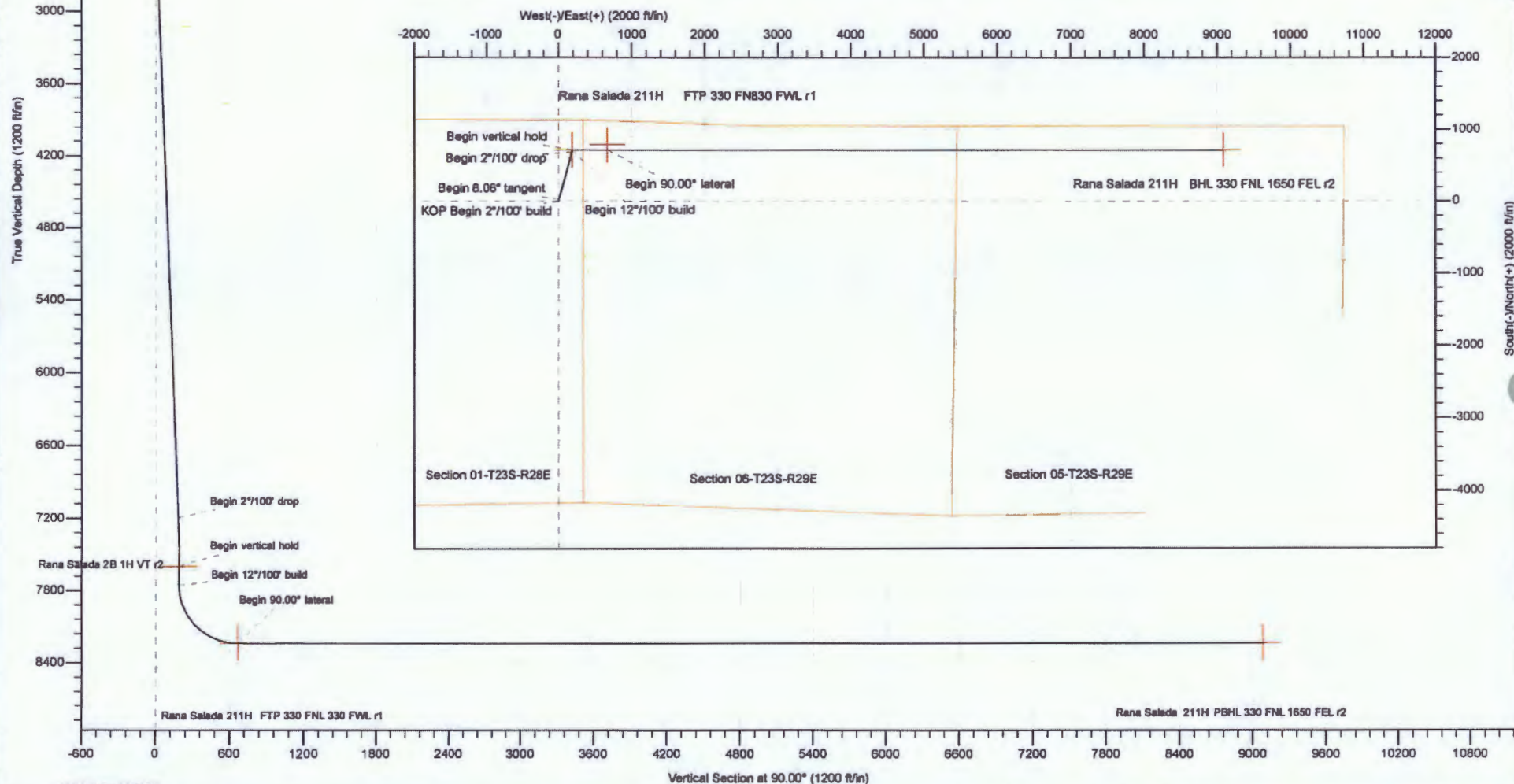
DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Rana Salada 2B 1H VT r2	7600.00	712.71	189.34	487885.24	634267.67	32.34090904	-104.03242897
Rana Salada 2B 1H FTP 330 FNL 330 FWL r1	8241.00	786.20	666.81	487958.73	634745.14	32.34110736	-104.03088228
Rana Salada 2B 1H PBHL 330 FNL 1650 FEL r2	8241.00	712.71	9083.80	487885.24	643162.11	32.34083706	-104.00362950



Azimuths to Grid North
True North: -0.16°
Magnetic North: 6.92°

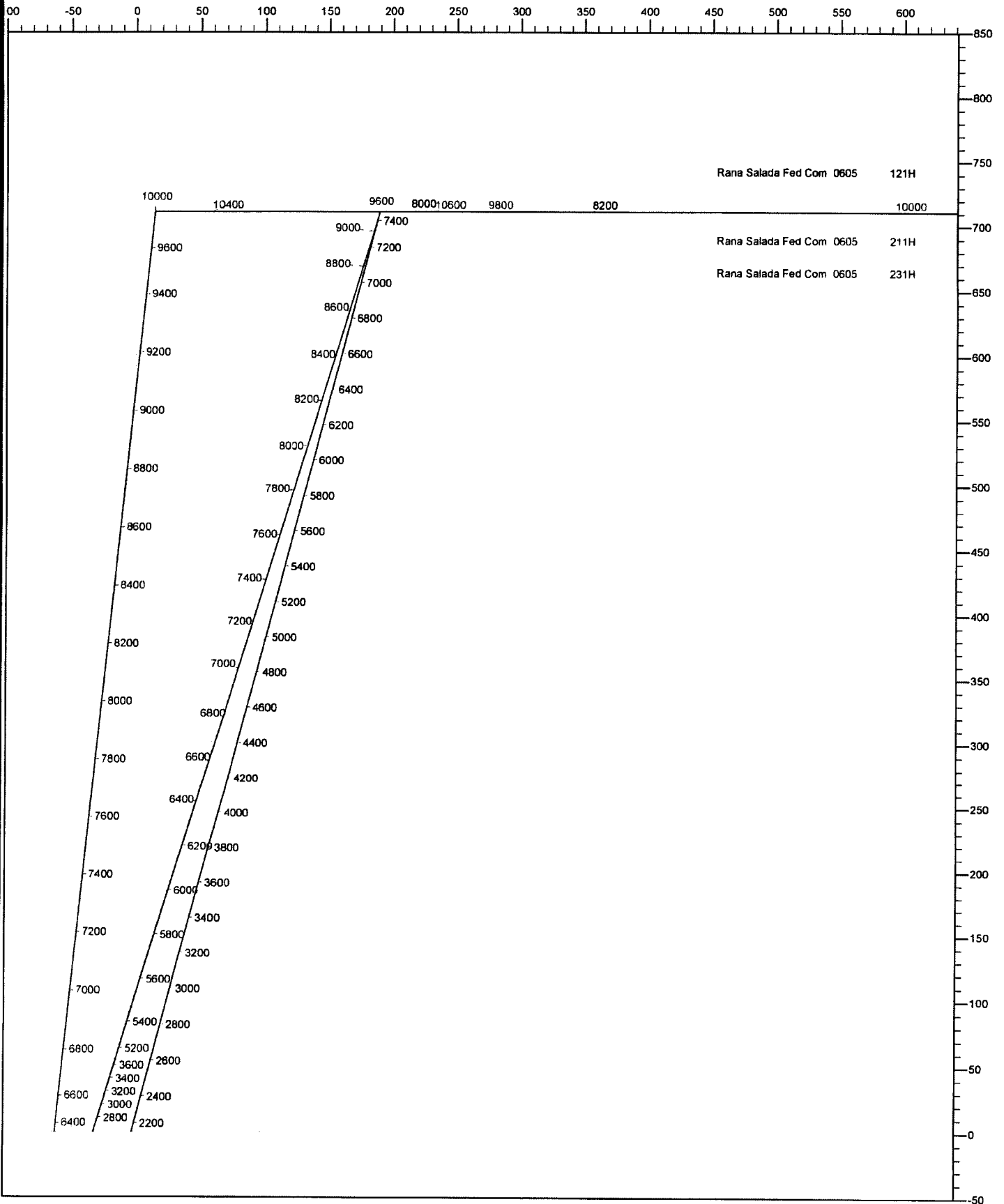
Magnetic Field
Strength: 47865.5nT
Dip Angle: 60.08°
Date: 5/17/2018
Model: IGRF2015





Well: Rana Salada Fed Com 0605 121H
Site: Section 01-T23S-R28E
Project: Eddy County, New Mexico
Design: rev0

West(-)/East(+) (100 ft/in)





Standard_Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Site: Section 01-T23S-R28E
Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVL Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0116_LT_v14

Project	Eddy County, New Mexico	System Datum:	Mean Sea Level
Map System:	US State Plane 1983		
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Section 01-T23S-R28E		
Site Position:			
From:	Map	Northing: 485,631.24 usft Easting: 631,756.43 usft Slot Radius: 13-3/16 "	Latitude: 32.33473233 Longitude: -104.04058012 Grid Convergence: 0.16 °
Position Uncertainty:	0.00 ft		

Well	Rana Salada Fed Com 0605 121H, Surf loc: 1127 FNL 335 FEL Sec01-T23S-R28E		
Well Position	+N/-S 0.00 ft +E/-W 0.00 ft	Northing: 487,172.53 usft Easting: 634,078.33 usft	Latitude: 32.33895139 Longitude: -104.03304850
Position Uncertainty	0.00 ft	Wellhead Elevation: ft	Ground Level: 3,090.90 ft

Wellbore	Original Hole		
Magnetics	Model Name IGRF2015 Sample Date 5/17/2018	Declination (*) 7.08 Dip Angle (*) 60.08	Field Strength (nT) 47,865.46462577

Design	rev2		
Audit Notes:			
Version:	Phase: PLAN	Tie On Depth: 0.00	
Vertical Section:	Depth From (TVD) (ft) 0.00 +N/-S (ft) 0.00 +E/-W (ft) 0.00	Direction (*) 90.00	

Survey Tool Program	Date 6/5/2018		
From (ft) 0.00	To (ft) 16,981.06 rev2 (Original Hole)	Tool Name MWD	Description OWSG MWD - Standard



Standard_Report

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Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0118_LT_v14

Planned Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	EW (ft)	DLeg (°/100ft)	V. Sec (ft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	487,172.53	634,078.33
KOP Begin 2°/100' build									
2,100.00	2.00	14.88	2,099.98	1.69	0.45	2.00	0.45	487,174.22	634,078.78
2,200.00	4.00	14.88	2,199.84	6.74	1.79	2.00	1.79	487,179.27	634,080.12
2,300.00	6.00	14.88	2,299.45	15.17	4.03	2.00	4.03	487,187.70	634,082.36
2,400.00	8.00	14.88	2,398.70	26.95	7.16	2.00	7.16	487,199.48	634,085.49



Standard_Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Site: Section 01-T23S-R28E
Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0116_LT_v14

Planned Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	EW (ft)	D/Leg (°/100ft)	V. Sec (ft)	Northing (usft)	Easting (usft)
2,403.93	8.08	14.88	2,402.59	27.48	7.30	2.00	7.30	487,200.01	634,085.63
Begin 8.08° tangent									
2,500.00	8.08	14.88	2,497.71	40.52	10.77	0.00	10.77	487,213.05	634,089.10
2,600.00	8.08	14.88	2,596.72	54.11	14.37	0.00	14.37	487,226.64	634,092.70
2,700.00	8.08	14.88	2,695.72	67.69	17.98	0.00	17.98	487,240.22	634,096.31
2,800.00	8.08	14.88	2,794.73	81.27	21.59	0.00	21.59	487,253.80	634,099.92
2,900.00	8.08	14.88	2,893.74	94.85	25.20	0.00	25.20	487,267.38	634,103.53
3,000.00	8.08	14.88	2,992.75	108.43	28.81	0.00	28.81	487,280.96	634,107.14
3,100.00	8.08	14.88	3,091.76	122.02	32.42	0.00	32.42	487,294.55	634,110.75
3,200.00	8.08	14.88	3,190.76	135.60	36.02	0.00	36.02	487,308.13	634,114.35
3,300.00	8.08	14.88	3,289.77	149.18	39.63	0.00	39.63	487,321.71	634,117.96
3,400.00	8.08	14.88	3,388.78	162.76	43.24	0.00	43.24	487,335.29	634,121.57
3,500.00	8.08	14.88	3,487.79	176.34	46.85	0.00	46.85	487,348.87	634,125.18
3,600.00	8.08	14.88	3,586.79	189.93	50.46	0.00	50.46	487,362.46	634,128.79
3,700.00	8.08	14.88	3,685.80	203.51	54.06	0.00	54.06	487,376.04	634,132.39
3,800.00	8.08	14.88	3,784.81	217.09	57.67	0.00	57.67	487,389.62	634,136.00
3,900.00	8.08	14.88	3,883.82	230.67	61.28	0.00	61.28	487,403.20	634,139.61
4,000.00	8.08	14.88	3,982.82	244.25	64.89	0.00	64.89	487,416.78	634,143.22
4,100.00	8.08	14.88	4,081.83	257.84	68.50	0.00	68.50	487,430.37	634,146.83
4,200.00	8.08	14.88	4,180.84	271.42	72.11	0.00	72.11	487,443.95	634,150.44
4,300.00	8.08	14.88	4,279.85	285.00	75.71	0.00	75.71	487,457.53	634,154.04
4,400.00	8.08	14.88	4,378.85	298.58	79.32	0.00	79.32	487,471.11	634,157.65
4,500.00	8.08	14.88	4,477.86	312.16	82.93	0.00	82.93	487,484.69	634,161.26
4,600.00	8.08	14.88	4,576.87	325.75	86.54	0.00	86.54	487,498.28	634,164.87
4,700.00	8.08	14.88	4,675.88	339.33	90.15	0.00	90.15	487,511.86	634,168.48
4,800.00	8.08	14.88	4,774.89	352.91	93.75	0.00	93.75	487,525.44	634,172.08
4,900.00	8.08	14.88	4,873.89	366.49	97.36	0.00	97.36	487,539.02	634,175.69



Standard_Report

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Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
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MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Gnd
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0116_LT_v14

Planned Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	EW (ft)	DLeg (°/100ft)	V. Sec (ft)	Northing (usft)	Easting (usft)
5,000.00	8.08	14.88	4,972.90	380.07	100.97	0.00	100.97	487,552.60	634,179.30
5,100.00	8.08	14.88	5,071.91	393.66	104.58	0.00	104.58	487,566.18	634,182.91
5,200.00	8.08	14.88	5,170.92	407.24	108.19	0.00	108.19	487,579.77	634,186.52
5,300.00	8.08	14.88	5,269.92	420.82	111.80	0.00	111.80	487,593.35	634,190.13
5,400.00	8.08	14.88	5,368.93	434.40	115.40	0.00	115.40	487,606.93	634,193.73
5,500.00	8.08	14.88	5,467.94	447.98	119.01	0.00	119.01	487,620.51	634,197.34
5,600.00	8.08	14.88	5,566.95	461.57	122.62	0.00	122.62	487,634.09	634,200.95
5,700.00	8.08	14.88	5,665.95	475.15	126.23	0.00	126.23	487,647.68	634,204.56
5,800.00	8.08	14.88	5,764.96	488.73	129.84	0.00	129.84	487,661.26	634,208.17
5,900.00	8.08	14.88	5,863.97	502.31	133.45	0.00	133.45	487,674.84	634,211.77
6,000.00	8.08	14.88	5,962.98	515.89	137.05	0.00	137.05	487,688.42	634,215.38
6,100.00	8.08	14.88	6,061.98	529.48	140.66	0.00	140.66	487,702.00	634,218.99
6,200.00	8.08	14.88	6,160.99	543.06	144.27	0.00	144.27	487,715.59	634,222.60
6,300.00	8.08	14.88	6,260.00	556.64	147.88	0.00	147.88	487,729.17	634,226.21
6,400.00	8.08	14.88	6,359.01	570.22	151.49	0.00	151.49	487,742.75	634,229.82
6,500.00	8.08	14.88	6,458.01	583.80	155.09	0.00	155.09	487,756.33	634,233.42
6,600.00	8.08	14.88	6,557.02	597.38	158.70	0.00	158.70	487,769.91	634,237.03
6,700.00	8.08	14.88	6,656.03	610.97	162.31	0.00	162.31	487,783.50	634,240.64
6,800.00	8.08	14.88	6,755.04	624.55	165.92	0.00	165.92	487,797.08	634,244.25
6,900.00	8.08	14.88	6,854.05	638.13	169.53	0.00	169.53	487,810.66	634,247.86
7,000.00	8.08	14.88	6,953.05	651.71	173.14	0.00	173.14	487,824.24	634,251.47
7,100.00	8.08	14.88	7,052.06	665.29	176.74	0.00	176.74	487,837.82	634,255.07
7,200.00	8.08	14.88	7,151.07	678.88	180.35	0.00	180.35	487,851.41	634,258.68
7,246.81	8.08	14.88	7,197.41	685.23	182.04	0.00	182.04	487,857.76	634,260.37
Begin 2°/100' drop									
7,300.00	7.01	14.88	7,250.14	691.99	183.83	2.00	183.83	487,864.51	634,262.16
7,400.00	5.01	14.88	7,349.59	702.11	186.52	2.00	186.52	487,874.64	634,264.85



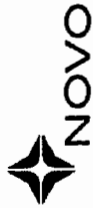
Standard_Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Site: Section 01-T23S-R28E
Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0118_LT_v14

Planned Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	EW (ft)	DLeg (°/100ft)	V. Sec (ft)	Northing (usft)	Easting (usft)
7,500.00	3.01	14.88	7,449.34	708.88	188.32	2.00	188.32	487,881.41	634,266.65
7,600.00	1.01	14.88	7,549.27	712.28	189.22	2.00	189.22	487,884.80	634,267.55
7,650.73	0.00	0.00	7,600.00	712.71	189.34	2.00	189.34	487,885.24	634,267.67
Begin vertical hold									
7,700.00	0.00	0.00	7,649.27	712.71	189.34	0.00	189.34	487,885.24	634,267.67
7,800.00	0.00	0.00	7,749.27	712.71	189.34	0.00	189.34	487,885.24	634,267.67
7,814.27	0.00	0.00	7,763.54	712.71	189.34	0.00	189.34	487,885.24	634,267.67
Begin 12°/100' build									
7,900.00	10.29	90.00	7,848.81	712.71	197.02	12.00	197.02	487,885.24	634,275.34
8,000.00	22.29	90.00	7,944.62	712.71	225.01	12.00	225.01	487,885.24	634,303.34
8,100.00	34.29	90.00	8,032.52	712.71	272.31	12.00	272.31	487,885.24	634,350.64
8,200.00	46.29	90.00	8,108.66	712.71	336.86	12.00	336.86	487,885.24	634,415.19
8,300.00	58.29	90.00	8,169.72	712.71	415.82	12.00	415.82	487,885.24	634,494.15
8,400.00	70.29	90.00	8,213.02	712.71	505.75	12.00	505.75	487,885.24	634,584.08
8,500.00	82.29	90.00	8,236.69	712.71	602.73	12.00	602.73	487,885.24	634,681.05
8,564.27	90.00	90.00	8,241.00	712.71	686.80	12.00	686.80	487,885.24	634,745.13
Begin 90.00° lateral									
8,600.00	90.00	90.00	8,241.00	712.71	702.53	0.00	702.53	487,885.24	634,780.86
8,700.00	90.00	90.00	8,241.00	712.71	802.53	0.00	802.53	487,885.24	634,880.86
8,800.00	90.00	90.00	8,241.00	712.71	902.53	0.00	902.53	487,885.24	634,980.86
8,900.00	90.00	90.00	8,241.00	712.71	1,002.53	0.00	1,002.53	487,885.24	635,080.86
9,000.00	90.00	90.00	8,241.00	712.71	1,102.53	0.00	1,102.53	487,885.24	635,180.86
9,100.00	90.00	90.00	8,241.00	712.71	1,202.53	0.00	1,202.53	487,885.24	635,280.86
9,200.00	90.00	90.00	8,241.00	712.71	1,302.53	0.00	1,302.53	487,885.24	635,380.86
9,300.00	90.00	90.00	8,241.00	712.71	1,402.53	0.00	1,402.53	487,885.24	635,480.86
9,400.00	90.00	90.00	8,241.00	712.71	1,502.53	0.00	1,502.53	487,885.24	635,580.86
9,500.00	90.00	90.00	8,241.00	712.71	1,602.53	0.00	1,602.53	487,885.24	635,680.86



Standard_Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Site: Section 01-T23S-R28E
Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:
Database:

Well Rana Salada Fed Com 0605 121H
RKB=3090.9+25 @ 3115.90ft
RKB=3090.9+25 @ 3115.90ft
Grid
Minimum Curvature
DB_Aug0116_LT_v14

Planned Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	EW (ft)	D Leg (°/100ft)	V. Sec (ft)	Northing (usft)	Easting (usft)
9,600.00	90.00	90.00	8,241.00	712.71	1,702.53	0.00	1,702.53	487,885.24	635,780.86
9,700.00	90.00	90.00	8,241.00	712.71	1,802.53	0.00	1,802.53	487,885.24	635,880.86
9,800.00	90.00	90.00	8,241.00	712.71	1,902.53	0.00	1,902.53	487,885.24	635,980.86
9,900.00	90.00	90.00	8,241.00	712.71	2,002.53	0.00	2,002.53	487,885.24	636,080.86
10,000.00	90.00	90.00	8,241.00	712.71	2,102.53	0.00	2,102.53	487,885.24	636,180.86
10,100.00	90.00	90.00	8,241.00	712.71	2,202.53	0.00	2,202.53	487,885.24	636,280.86
10,200.00	90.00	90.00	8,241.00	712.71	2,302.53	0.00	2,302.53	487,885.24	636,380.86
10,300.00	90.00	90.00	8,241.00	712.71	2,402.53	0.00	2,402.53	487,885.24	636,480.86
10,400.00	90.00	90.00	8,241.00	712.71	2,502.53	0.00	2,502.53	487,885.24	636,580.86
10,500.00	90.00	90.00	8,241.00	712.71	2,602.53	0.00	2,602.53	487,885.24	636,680.86
10,600.00	90.00	90.00	8,241.00	712.71	2,702.53	0.00	2,702.53	487,885.24	636,780.86
10,700.00	90.00	90.00	8,241.00	712.71	2,802.53	0.00	2,802.53	487,885.24	636,880.86
10,800.00	90.00	90.00	8,241.00	712.71	2,902.53	0.00	2,902.53	487,885.24	636,980.86
10,900.00	90.00	90.00	8,241.00	712.71	3,002.53	0.00	3,002.53	487,885.24	637,080.86
11,000.00	90.00	90.00	8,241.00	712.71	3,102.53	0.00	3,102.53	487,885.24	637,180.86
11,100.00	90.00	90.00	8,241.00	712.71	3,202.53	0.00	3,202.53	487,885.24	637,280.86
11,200.00	90.00	90.00	8,241.00	712.71	3,302.53	0.00	3,302.53	487,885.24	637,380.85
11,300.00	90.00	90.00	8,241.00	712.71	3,402.53	0.00	3,402.53	487,885.24	637,480.85
11,400.00	90.00	90.00	8,241.00	712.71	3,502.53	0.00	3,502.53	487,885.24	637,580.85
11,500.00	90.00	90.00	8,241.00	712.71	3,602.53	0.00	3,602.53	487,885.24	637,680.85
11,600.00	90.00	90.00	8,241.00	712.71	3,702.53	0.00	3,702.53	487,885.24	637,780.85
11,700.00	90.00	90.00	8,241.00	712.71	3,802.53	0.00	3,802.53	487,885.24	637,880.85
11,800.00	90.00	90.00	8,241.00	712.71	3,902.53	0.00	3,902.53	487,885.24	637,980.85
11,900.00	90.00	90.00	8,241.00	712.71	4,002.53	0.00	4,002.53	487,885.24	638,080.85
12,000.00	90.00	90.00	8,241.00	712.71	4,102.53	0.00	4,102.53	487,885.24	638,180.85
12,100.00	90.00	90.00	8,241.00	712.71	4,202.53	0.00	4,202.53	487,885.24	638,280.85
12,200.00	90.00	90.00	8,241.00	712.71	4,302.53	0.00	4,302.53	487,885.24	638,380.85



Standard_Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Site: Section 01-T23S-R28E
Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0116_LT_v14

Planned Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	E/W (ft)	D/Leg (°/100ft)	V. Sec (ft)	Northing (usft)	Easting (usft)
12,300.00	90.00	90.00	8,241.00	712.71	4,402.53	0.00	4,402.53	487,885.24	638,480.85
12,400.00	90.00	90.00	8,241.00	712.71	4,502.53	0.00	4,502.53	487,885.24	638,580.85
12,500.00	90.00	90.00	8,241.00	712.71	4,602.53	0.00	4,602.53	487,885.24	638,680.85
12,600.00	90.00	90.00	8,241.00	712.71	4,702.53	0.00	4,702.53	487,885.24	638,780.85
12,700.00	90.00	90.00	8,241.00	712.71	4,802.53	0.00	4,802.53	487,885.24	638,880.85
12,800.00	90.00	90.00	8,241.00	712.71	4,902.53	0.00	4,902.53	487,885.24	638,980.85
12,900.00	90.00	90.00	8,241.00	712.71	5,002.53	0.00	5,002.53	487,885.24	639,080.85
13,000.00	90.00	90.00	8,241.00	712.71	5,102.53	0.00	5,102.53	487,885.24	639,180.85
13,100.00	90.00	90.00	8,241.00	712.71	5,202.53	0.00	5,202.53	487,885.24	639,280.85
13,200.00	90.00	90.00	8,241.00	712.71	5,302.53	0.00	5,302.53	487,885.24	639,380.85
13,300.00	90.00	90.00	8,241.00	712.71	5,402.53	0.00	5,402.53	487,885.24	639,480.85
13,400.00	90.00	90.00	8,241.00	712.71	5,502.53	0.00	5,502.53	487,885.24	639,580.85
13,500.00	90.00	90.00	8,241.00	712.71	5,602.53	0.00	5,602.53	487,885.24	639,680.85
13,600.00	90.00	90.00	8,241.00	712.71	5,702.53	0.00	5,702.53	487,885.24	639,780.85
13,700.00	90.00	90.00	8,241.00	712.71	5,802.53	0.00	5,802.53	487,885.24	639,880.85
13,800.00	90.00	90.00	8,241.00	712.71	5,902.53	0.00	5,902.53	487,885.24	639,980.85
13,900.00	90.00	90.00	8,241.00	712.71	6,002.53	0.00	6,002.53	487,885.24	640,080.85
14,000.00	90.00	90.00	8,241.00	712.71	6,102.53	0.00	6,102.53	487,885.24	640,180.85
14,100.00	90.00	90.00	8,241.00	712.71	6,202.53	0.00	6,202.53	487,885.24	640,280.85
14,200.00	90.00	90.00	8,241.00	712.71	6,302.53	0.00	6,302.53	487,885.24	640,380.85
14,300.00	90.00	90.00	8,241.00	712.71	6,402.53	0.00	6,402.53	487,885.24	640,480.85
14,400.00	90.00	90.00	8,241.00	712.71	6,502.53	0.00	6,502.53	487,885.24	640,580.85
14,500.00	90.00	90.00	8,241.00	712.71	6,602.53	0.00	6,602.53	487,885.24	640,680.85
14,600.00	90.00	90.00	8,241.00	712.71	6,702.53	0.00	6,702.53	487,885.24	640,780.85
14,700.00	90.00	90.00	8,241.00	712.71	6,802.53	0.00	6,802.53	487,885.24	640,880.85
14,800.00	90.00	90.00	8,241.00	712.71	6,902.53	0.00	6,902.53	487,885.24	640,980.85
14,900.00	90.00	90.00	8,241.00	712.71	7,002.53	0.00	7,002.53	487,885.24	641,080.85



Standard_Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Site: Section 01-T23S-R28E
Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0116_LT_v14

Planned Survey

MD (ft)	Inc (°)	Azi (azimuth) (°)	TVD (ft)	N/S (ft)	EW (ft)	DLeg (°/100ft)	V. Sec (ft)	Northing (usft)	Easting (usft)
15,000.00	90.00	90.00	8,241.00	712.71	7,102.53	0.00	7,102.53	487,885.24	641,180.85
15,100.00	90.00	90.00	8,241.00	712.71	7,202.53	0.00	7,202.53	487,885.24	641,280.85
15,200.00	90.00	90.00	8,241.00	712.71	7,302.53	0.00	7,302.53	487,885.24	641,380.85
15,300.00	90.00	90.00	8,241.00	712.71	7,402.53	0.00	7,402.53	487,885.24	641,480.85
15,400.00	90.00	90.00	8,241.00	712.71	7,502.53	0.00	7,502.53	487,885.24	641,580.85
15,500.00	90.00	90.00	8,241.00	712.71	7,602.53	0.00	7,602.53	487,885.24	641,680.85
15,600.00	90.00	90.00	8,241.00	712.71	7,702.53	0.00	7,702.53	487,885.24	641,780.85
15,700.00	90.00	90.00	8,241.00	712.71	7,802.53	0.00	7,802.53	487,885.24	641,880.85
15,800.00	90.00	90.00	8,241.00	712.71	7,902.53	0.00	7,902.53	487,885.24	641,980.85
15,900.00	90.00	90.00	8,241.00	712.71	8,002.53	0.00	8,002.53	487,885.24	642,080.85
16,000.00	90.00	90.00	8,241.00	712.71	8,102.53	0.00	8,102.53	487,885.24	642,180.85
16,100.00	90.00	90.00	8,241.00	712.71	8,202.53	0.00	8,202.53	487,885.24	642,280.85
16,200.00	90.00	90.00	8,241.00	712.71	8,302.53	0.00	8,302.53	487,885.24	642,380.84
16,300.00	90.00	90.00	8,241.00	712.71	8,402.53	0.00	8,402.53	487,885.24	642,480.84
16,400.00	90.00	90.00	8,241.00	712.71	8,502.53	0.00	8,502.53	487,885.24	642,580.84
16,500.00	90.00	90.00	8,241.00	712.71	8,602.53	0.00	8,602.53	487,885.24	642,680.84
16,600.00	90.00	90.00	8,241.00	712.71	8,702.53	0.00	8,702.53	487,885.24	642,780.84
16,700.00	90.00	90.00	8,241.00	712.71	8,802.53	0.00	8,802.53	487,885.24	642,880.84
16,800.00	90.00	90.00	8,241.00	712.71	8,902.53	0.00	8,902.53	487,885.24	642,980.84
16,900.00	90.00	90.00	8,241.00	712.71	9,002.53	0.00	9,002.53	487,885.24	643,080.84
16,981.26	90.00	90.00	8,241.00	712.71	9,083.79	0.00	9,083.79	487,885.24	643,162.10
PBHLTD 16981.26 MD 8241.00 TVD 16,981.27	90.00	90.00	8,241.00	712.71	9,083.80	0.01	9,083.80	487,885.24	643,162.11



Standard_Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Site: Section 01-T23S-R28E
Well: Rana Salada Fed Com 0605 121H
Wellbore: Original Hole
Design: rev2

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: DB_Aug0116_LT_v14

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
2,000.00	2,000.00	0.00	0.00	KOP Begin 2°/100' build
2,403.93	2,402.59	27.48	7.30	Begin 8.06° tangent
7,246.81	7,197.41	685.23	182.04	Begin 2°/100' drop
7,650.73	7,600.00	712.71	189.34	Begin vertical hold
7,814.27	7,763.54	712.71	189.34	Begin 12°/100' build
8,564.27	8,241.00	712.71	666.80	Begin 90.00° lateral
16,981.26	8,241.00	712.71	9,083.79	PBHLTD 16981.26 MD 8241.00 TVD



Anticollision Report

Company:	Nova Oil and Gas Northern Delaware LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0605 121H RKB=3090.9+25 @ 3115.90ft
Project:	Eddy County, New Mexico	TVD Reference:	RKB=3090.9+25 @ 3115.90ft
Reference Site:	Section 01-T23S-R28E	MD Reference:	Grid
Site Error:	0.00 ft Rana Salada Fed Com 0605 121H	North Reference:	Minimum Curvature
Reference Well:	0.00 ft	Survey Calculation Method:	2.00 sigma
Well Error:	Original Hole	Output errors are at	DB_Aug0116_LT_v14
Reference Wellbore	rev2	Database:	Offset Datum
Reference Design:		Offset TVD Reference:	

Reference:	rev2		
Filter type:	GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference		
Interpolation Method:	MD Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,898.13 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	6/5/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	16,981.06	rev2 (Original Hole)	MWD	OWSG MWD - Standard

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Section 01-T23S-R28E						
Rana Salada Fed Com 0605	231H - Original Ho	2,000.00	2,001.80	59.96	46.06	4.315 CC
Rana Salada Fed Com 0605	231H - Original Ho	2,100.00	2,101.82	60.43	45.82	4.136 ES
Rana Salada Fed Com 0605	231H - Original Ho	2,200.00	2,201.96	62.13	46.80	4.053 SF
Rana Salada Fed Com 0605	211H - Original H	2,000.00	2,000.80	30.00	16.11	2.159 CC
Rana Salada Fed Com 0605 211H - Original H		2,100.00	2,100.82	30.50	15.89	2.087 ES, SF

Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
0.00	0.00	1.80	-1.80	0.00	0.00	-90.07	-0.07	-59.96	59.96					
100.00	100.00	101.80	98.20	0.13	0.14	-90.07	-0.07	-59.96	59.96	59.68	0.28	217.794		
200.00	200.00	201.80	198.20	0.49	0.50	-90.07	-0.07	-59.96	59.96	58.97	0.99	60.429		
300.00	300.00	301.80	298.20	0.85	0.86	-90.07	-0.07	-59.96	59.96	58.25	1.71	35.081		
400.00	400.00	401.80	398.20	1.21	1.22	-90.07	-0.07	-59.96	59.96	57.53	2.43	24.714		
500.00	500.00	501.80	498.20	1.57	1.57	-90.07	-0.07	-59.96	59.96	56.82	3.14	19.077		
600.00	600.00	601.80	598.20	1.93	1.93	-90.07	-0.07	-59.96	59.96	56.10	3.86	15.534		
700.00	700.00	701.80	698.20	2.29	2.29	-90.07	-0.07	-59.96	59.96	55.38	4.58	13.100		
800.00	800.00	801.80	798.20	2.64	2.65	-90.07	-0.07	-59.96	59.96	54.67	5.29	11.326		
900.00	900.00	901.80	898.20	3.00	3.01	-90.07	-0.07	-59.96	59.96	53.95	6.01	9.975		
1,000.00	1,000.00	1,001.80	998.20	3.36	3.37	-90.07	-0.07	-59.96	59.96	53.23	6.73	8.912		
1,100.00	1,100.00	1,101.80	1,098.20	3.72	3.73	-90.07	-0.07	-59.96	59.96	52.52	7.44	8.054		
1,200.00	1,200.00	1,201.80	1,198.20	4.08	4.08	-90.07	-0.07	-59.96	59.96	51.80	8.16	7.347		
1,300.00	1,300.00	1,301.80	1,298.20	4.44	4.44	-90.07	-0.07	-59.96	59.96	51.08	8.88	6.753		
1,400.00	1,400.00	1,401.80	1,398.20	4.79	4.80	-90.07	-0.07	-59.96	59.96	50.36	9.60	6.249		
1,500.00	1,500.00	1,501.80	1,498.20	5.15	5.16	-90.07	-0.07	-59.96	59.96	49.65	10.31	5.814		
1,600.00	1,600.00	1,601.80	1,598.20	5.51	5.52	-90.07	-0.07	-59.96	59.96	48.93	11.03	5.436		
1,700.00	1,700.00	1,701.80	1,698.20	5.87	5.88	-90.07	-0.07	-59.96	59.96	48.21	11.75	5.105		
1,800.00	1,800.00	1,801.80	1,798.20	6.23	6.23	-90.07	-0.07	-59.96	59.96	47.50	12.46	4.811		
1,900.00	1,900.00	1,901.80	1,898.20	6.59	6.59	-90.07	-0.07	-59.96	59.96	46.78	13.18	4.549		
2,000.00	2,000.00	2,001.80	1,998.20	6.95	6.95	-90.07	-0.07	-59.96	59.96	46.06	13.90	4.315 CC		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: DB_Aug0116_LT_v14
Offset TVD Reference: Offset Datum

Section 01-T23S-R28E - Rana Salada Fed Com 0605 231H - Original Hole - rev1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	Offset Wellbore Centre +E-W (ft)	Between Centres (ft)	Between Ellipse (ft)	Minimum Separation (ft)	Separation Factor		
2,100.00	2,099.98	2,101.82	2,098.18	7.30	7.31	-106.53	-0.07	-59.96	60.43	45.82	14.61	4.136 ES		
2,200.00	2,199.84	2,201.96	2,198.04	7.66	7.67	-111.13	-0.07	-59.96	62.13	46.80	15.33	4.053 SF		
2,300.00	2,299.45	2,302.35	2,297.65	8.02	8.03	-118.14	-0.07	-59.96	65.78	49.73	16.05	4.099		
2,400.00	2,398.70	2,403.10	2,396.90	8.38	8.39	-126.53	-0.07	-59.96	72.35	55.59	16.77	4.315		
2,500.00	2,497.71	2,504.09	2,495.91	8.74	8.75	-134.45	-0.07	-59.96	81.55	64.06	17.49	4.663		
2,600.00	2,596.72	2,605.08	2,594.92	9.11	9.11	-140.68	-0.07	-59.96	91.98	73.77	18.21	5.052		
2,700.00	2,695.72	2,706.08	2,693.92	9.48	9.48	-145.61	-0.07	-59.96	103.28	84.35	18.93	5.456		
2,800.00	2,794.73	2,807.07	2,792.93	9.86	9.84	-149.55	-0.07	-59.96	115.18	95.53	19.65	5.861		
2,900.00	2,893.74	2,908.06	2,891.94	10.24	10.20	-152.75	-0.07	-59.96	127.52	107.15	20.37	6.259		
3,000.00	2,992.75	3,009.05	2,990.95	10.62	10.56	-155.38	-0.07	-59.96	140.19	119.09	21.10	6.646		
3,100.00	3,091.76	3,089.96	3,089.96	11.01	10.85	-157.56	-0.07	-59.96	153.10	131.35	21.75	7.040		
3,200.00	3,190.76	3,188.96	3,188.96	11.40	11.21	-159.41	-0.07	-59.96	166.19	143.73	22.46	7.399		
3,300.00	3,289.77	3,287.97	3,287.97	11.79	11.56	-160.99	-0.07	-59.96	179.43	156.25	23.18	7.742		
3,400.00	3,388.78	3,386.98	3,386.98	12.18	11.92	-162.35	-0.07	-59.96	192.78	168.89	23.89	8.068		
3,500.00	3,487.79	3,485.99	3,485.99	12.57	12.27	-163.53	-0.07	-59.96	206.23	181.62	24.61	8.380		
3,600.00	3,586.79	3,584.99	3,584.99	12.97	12.63	-164.57	-0.07	-59.96	219.75	194.42	25.33	8.677		
3,700.00	3,685.80	3,684.00	3,684.00	13.36	12.98	-165.49	-0.07	-59.96	233.34	207.29	26.04	8.959		
3,800.00	3,784.81	3,783.01	3,783.01	13.76	13.34	-166.30	-0.07	-59.96	246.97	220.21	26.76	9.229		
3,900.00	3,883.82	3,882.02	3,882.02	14.16	13.69	-167.03	-0.07	-59.96	260.66	233.18	27.48	9.485		
4,000.00	3,982.82	3,981.02	3,981.02	14.56	14.05	-167.69	-0.07	-59.96	274.37	246.18	28.20	9.730		
4,100.00	4,081.83	4,080.03	4,080.03	14.96	14.40	-168.29	-0.07	-59.96	288.13	259.21	28.92	9.964		
4,200.00	4,180.84	4,179.04	4,179.04	15.36	14.76	-168.83	-0.07	-59.96	301.91	272.27	29.64	10.187		
4,300.00	4,279.85	4,278.05	4,278.05	15.76	15.11	-169.32	-0.07	-59.96	315.71	285.35	30.35	10.401		
4,400.00	4,378.85	4,377.05	4,377.05	16.17	15.47	-169.78	-0.07	-59.96	329.53	298.46	31.07	10.605		
4,500.00	4,477.86	4,476.06	4,476.06	16.57	15.82	-170.19	-0.07	-59.96	343.38	311.56	31.79	10.800		
4,600.00	4,576.87	4,575.07	4,575.07	16.98	16.18	-170.58	-0.07	-59.96	357.24	324.72	32.51	10.988		
4,700.00	4,675.88	4,674.08	4,674.08	17.38	16.53	-170.93	-0.07	-59.96	371.11	337.88	33.23	11.167		
4,800.00	4,774.89	4,773.09	4,773.09	17.79	16.89	-171.26	-0.07	-59.96	385.00	351.04	33.95	11.339		
4,900.00	4,873.89	4,872.09	4,872.09	18.19	17.24	-171.57	-0.07	-59.96	398.90	364.22	34.67	11.505		
5,000.00	4,972.90	4,971.10	4,971.10	18.60	17.60	-171.85	-0.07	-59.96	412.81	377.41	35.39	11.663		
5,100.00	5,071.91	5,070.11	5,070.11	19.01	17.95	-172.12	-0.07	-59.96	426.72	390.61	36.11	11.816		
5,200.00	5,170.92	5,169.12	5,169.12	19.41	18.31	-172.37	-0.07	-59.96	440.65	403.82	36.83	11.963		
5,300.00	5,269.92	5,268.12	5,268.12	19.82	18.66	-172.61	-0.07	-59.96	454.59	417.03	37.56	12.104		
5,400.00	5,368.93	5,367.13	5,367.13	20.23	19.02	-172.83	-0.07	-59.96	468.53	430.25	38.28	12.241		
5,500.00	5,467.94	5,466.14	5,466.14	20.64	19.37	-173.04	-0.07	-59.96	482.48	443.48	39.00	12.372		
5,600.00	5,566.95	5,565.15	5,565.15	21.05	19.73	-173.23	-0.07	-59.96	496.43	456.71	39.72	12.499		
5,700.00	5,665.95	5,664.15	5,664.15	21.46	20.08	-173.42	-0.07	-59.96	510.39	469.95	40.44	12.621		
5,800.00	5,764.96	5,763.16	5,763.16	21.87	20.44	-173.59	-0.07	-59.96	524.35	483.19	41.16	12.739		
5,900.00	5,863.97	5,862.17	5,862.17	22.28	20.79	-173.76	-0.07	-59.96	538.32	496.44	41.88	12.853		
6,000.00	5,962.98	5,961.18	5,961.18	22.69	21.15	-173.92	-0.07	-59.96	552.30	509.69	42.61	12.963		
6,100.00	6,061.98	6,060.18	6,060.18	23.10	21.50	-174.07	-0.07	-59.96	566.27	522.95	43.33	13.070		
6,200.00	6,160.99	6,159.19	6,159.19	23.51	21.85	-174.21	-0.07	-59.96	580.26	536.21	44.05	13.173		
6,300.00	6,260.00	6,272.81	6,272.80	23.92	22.26	-174.35	0.85	-59.86	593.52	548.67	44.85	13.232		
6,400.00	6,359.01	6,397.60	6,397.44	24.33	22.71	-174.37	6.70	-59.25	602.98	557.30	45.67	13.203		
6,500.00	6,458.02	6,523.16	6,522.48	24.74	23.16	-174.27	18.04	-58.06	608.21	561.78	46.42	13.101		
6,600.00	6,557.02	6,649.02	6,647.18	25.16	23.60	-174.03	34.85	-56.30	609.20	562.09	47.11	12.932		
6,700.00	6,656.03	6,774.68	6,770.83	25.57	24.05	-173.66	57.06	-53.97	605.95	558.23	47.72	12.697		
6,800.00	6,755.04	6,899.67	6,892.73	25.98	24.50	-173.15	84.48	-51.09	598.52	550.25	48.27	12.399		
6,900.00	6,854.05	7,003.71	6,993.50	26.39	24.87	-172.63	110.23	-48.39	588.32	539.36	48.96	12.017		
7,000.00	6,953.05	7,103.04	7,089.69	26.81	25.24	-172.11	134.90	-45.81	578.10	528.41	49.69	11.635		
7,100.00	7,052.06	7,202.38	7,185.88	27.22	25.62	-171.58	159.57	-43.22	567.92	517.50	50.42	11.264		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
RKB=3090.9+25 @ 3115.90ft
RKB=3090.9+25 @ 3115.90ft
TVD Reference: Grid
MD Reference: Minimum Curvature
North Reference: 2.00 sigma
Survey Calculation Method: DB_Aug0116_LT_v14
Output errors are at: Offset Datum
Database:
Offset TVD Reference:

Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 231H - Original Hole - rev1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
7,200.00	7,151.07	7,301.72	7,282.07	27.63	25.99	-171.02	184.24	-40.63	557.80	506.64	51.16	10.904		
7,300.00	7,250.14	7,401.00	7,378.21	28.04	26.38	-170.42	208.90	-38.05	547.24	495.35	51.89	10.545		
7,400.00	7,349.59	7,500.12	7,473.96	28.43	26.77	-169.71	233.45	-35.47	533.71	481.08	52.63	10.141		
7,500.00	7,449.34	7,601.80	7,569.16	28.80	27.17	-168.87	257.87	-32.91	516.86	463.48	53.38	9.683		
7,600.00	7,549.27	7,704.17	7,663.70	29.15	27.58	-167.88	282.12	-30.37	496.76	442.63	54.12	9.178		
7,700.00	7,649.27	7,807.23	7,757.57	29.48	27.99	-151.89	306.19	-27.85	473.87	418.99	54.87	8.636		
7,800.00	7,749.27	7,889.81	7,851.33	29.81	28.33	-150.70	330.24	-25.32	450.72	395.17	55.55	8.114		
7,900.00	7,848.81	7,986.19	7,944.86	30.14	28.73	123.11	354.23	-22.81	431.75	375.45	56.30	7.668		
7,989.71	7,935.06	8,070.34	8,026.34	30.45	29.08	127.51	375.13	-20.62	425.57	368.53	57.04	7.461		
8,000.00	7,944.62	8,079.70	8,035.40	30.49	29.11	128.02	377.45	-20.37	425.66	368.53	57.13	7.451		
8,100.00	8,032.52	8,166.04	8,119.01	30.84	29.48	132.71	398.89	-18.12	436.61	378.62	58.00	7.528		
8,200.00	8,108.66	8,241.45	8,192.03	31.21	29.79	135.99	417.62	-16.16	467.92	409.08	58.84	7.952		
8,300.00	8,169.72	8,302.63	8,251.28	31.62	30.05	136.71	432.82	-14.57	520.12	460.55	59.57	8.731		
8,400.00	8,213.02	8,346.91	8,294.15	32.13	30.24	133.28	443.81	-13.41	590.52	530.42	60.10	9.825		
8,500.00	8,236.69	8,372.35	8,318.78	32.79	30.35	122.26	450.13	-12.75	674.39	613.97	60.42	11.162		
8,600.00	8,241.00	8,379.13	8,325.35	33.59	30.38	108.27	451.81	-12.58	766.07	705.52	60.55	12.652		
8,700.00	8,241.00	8,381.73	8,327.87	34.56	30.39	108.81	452.46	-12.51	860.16	799.54	60.63	14.188		
8,800.00	8,241.00	8,384.34	8,330.39	35.67	30.40	109.35	453.11	-12.44	955.45	894.76	60.69	15.744		
8,900.00	8,241.00	8,386.94	8,332.92	36.93	30.41	109.89	453.75	-12.37	1,051.60	990.86	60.74	17.312		
9,000.00	8,241.00	8,389.55	8,335.44	38.30	30.42	110.43	454.40	-12.30	1,148.41	1,087.62	60.79	18.891		
9,100.00	8,241.00	8,407.85	8,337.96	39.77	30.50	110.97	455.05	-12.24	1,245.71	1,184.81	60.90	20.455		
9,200.00	8,241.00	8,405.25	8,340.48	41.34	30.49	111.51	455.69	-12.17	1,343.41	1,282.49	60.92	22.052		
9,300.00	8,241.00	8,397.36	8,343.00	43.00	30.45	112.04	456.34	-12.10	1,441.42	1,380.50	60.92	23.662		
9,400.00	8,241.00	8,400.04	8,345.52	44.72	30.47	112.58	456.99	-12.03	1,539.68	1,478.72	60.96	25.259		
9,500.00	8,241.00	8,402.57	8,348.05	46.52	30.48	113.11	457.63	-11.97	1,638.14	1,577.15	60.99	26.858		
9,600.00	8,241.00	8,405.17	8,350.57	48.37	30.49	113.64	458.28	-11.90	1,736.78	1,675.75	61.03	28.458		
9,700.00	8,241.00	8,407.78	8,353.09	50.27	30.50	114.17	458.93	-11.83	1,835.56	1,774.49	61.07	30.058		



Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
RKB=3090.9+25 @ 3115.90ft
RKB=3090.9+25 @ 3115.90ft
TVD Reference: Grid
MD Reference: Minimum Curvature
North Reference: 2.00 sigma
Survey Calculation Method: DB_Aug0116_LT_v14
Output errors are at: Offset Datum
Database:
Offset TVD Reference:

Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +/-N-S (ft)	+E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
0.00	0.00	0.80	-0.80	0.00	0.00	-90.08	-0.04	-30.00	30.00						
100.00	100.00	100.80	99.20	0.13	0.14	-90.08	-0.04	-30.00	30.00	29.73	0.27	110.407			
200.00	200.00	200.80	199.20	0.49	0.50	-90.08	-0.04	-30.00	30.00	29.01	0.99	30.344			
300.00	300.00	300.80	299.20	0.85	0.85	-90.08	-0.04	-30.00	30.00	28.29	1.71	17.589			
400.00	400.00	400.80	399.20	1.21	1.21	-90.08	-0.04	-30.00	30.00	27.58	2.42	12.384			
500.00	500.00	500.80	499.20	1.57	1.57	-90.08	-0.04	-30.00	30.00	26.86	3.14	9.556			
600.00	600.00	600.80	599.20	1.93	1.93	-90.08	-0.04	-30.00	30.00	26.14	3.86	7.779			
700.00	700.00	700.80	699.20	2.29	2.29	-90.08	-0.04	-30.00	30.00	25.43	4.57	6.560			
800.00	800.00	800.80	799.20	2.64	2.65	-90.08	-0.04	-30.00	30.00	24.71	5.29	5.671			
900.00	900.00	900.80	899.20	3.00	3.01	-90.08	-0.04	-30.00	30.00	23.99	6.01	4.994			
1,000.00	1,000.00	1,000.80	999.20	3.36	3.36	-90.08	-0.04	-30.00	30.00	23.28	6.72	4.462			
1,100.00	1,100.00	1,100.80	1,099.20	3.72	3.72	-90.08	-0.04	-30.00	30.00	22.56	7.44	4.032			
1,200.00	1,200.00	1,200.80	1,199.20	4.08	4.08	-90.08	-0.04	-30.00	30.00	21.84	8.16	3.677			
1,300.00	1,300.00	1,300.80	1,299.20	4.44	4.44	-90.08	-0.04	-30.00	30.00	21.13	8.88	3.380			
1,400.00	1,400.00	1,400.80	1,399.20	4.79	4.80	-90.08	-0.04	-30.00	30.00	20.41	9.59	3.128			
1,500.00	1,500.00	1,500.80	1,499.20	5.15	5.16	-90.08	-0.04	-30.00	30.00	19.69	10.31	2.910			
1,600.00	1,600.00	1,600.80	1,599.20	5.51	5.51	-90.08	-0.04	-30.00	30.00	18.97	11.03	2.721			
1,700.00	1,700.00	1,700.80	1,699.20	5.87	5.87	-90.08	-0.04	-30.00	30.00	18.26	11.74	2.555			
1,800.00	1,800.00	1,800.80	1,799.20	6.23	6.23	-90.08	-0.04	-30.00	30.00	17.54	12.46	2.408			
1,900.00	1,900.00	1,900.80	1,899.20	6.59	6.59	-90.08	-0.04	-30.00	30.00	16.82	13.18	2.277			
2,000.00	2,000.00	2,000.80	1,999.20	6.95	6.95	-90.08	-0.04	-30.00	30.00	16.11	13.89	2.159 CC			
2,100.00	2,099.98	2,100.82	2,099.18	7.30	7.31	-108.11	-0.04	-30.00	30.50	15.89	14.61	2.087 ES, SF			
2,200.00	2,199.84	2,200.96	2,199.04	7.66	7.67	-116.87	-0.04	-30.00	32.51	17.18	15.33	2.121			
2,300.00	2,299.45	2,301.35	2,298.65	8.02	8.03	-128.80	-0.04	-30.00	37.27	21.23	16.04	2.323			
2,400.00	2,398.70	2,402.10	2,397.90	8.38	8.39	-140.59	-0.04	-30.00	45.92	29.16	16.76	2.740			
2,500.00	2,497.71	2,496.91	2,496.91	8.74	8.73	-149.49	-0.04	-30.00	57.51	40.05	17.46	3.294			
2,600.00	2,596.72	2,598.10	2,598.08	9.11	9.09	-154.90	1.56	-29.51	68.49	50.31	18.17	3.769			
2,700.00	2,695.72	2,701.15	2,698.72	9.48	9.46	-158.01	6.15	-28.09	76.96	58.07	18.89	4.074			
2,800.00	2,794.73	2,801.54	2,798.19	9.86	9.82	-160.37	11.14	-26.55	85.17	65.56	19.61	4.343			
2,900.00	2,893.74	2,901.93	2,897.66	10.24	10.18	-162.31	16.12	-25.02	93.50	73.17	20.33	4.599			
3,000.00	2,992.75	3,002.33	2,997.13	10.62	10.53	-163.93	21.10	-23.48	101.92	80.87	21.05	4.842			
3,100.00	3,091.76	3,102.72	3,096.60	11.01	10.89	-165.31	26.08	-21.94	110.41	88.64	21.77	5.071			
3,200.00	3,190.76	3,203.11	3,196.07	11.40	11.26	-166.48	31.06	-20.41	118.95	96.46	22.49	5.288			
3,300.00	3,289.77	3,303.51	3,295.54	11.79	11.62	-167.50	36.04	-18.87	127.54	104.32	23.22	5.494			
3,400.00	3,388.78	3,403.90	3,395.01	12.18	11.98	-168.39	41.03	-17.34	136.16	112.22	23.94	5.688			
3,500.00	3,487.79	3,504.29	3,494.48	12.57	12.34	-169.18	46.01	-15.80	144.81	120.14	24.66	5.872			
3,600.00	3,586.79	3,604.68	3,593.95	12.97	12.70	-169.88	50.99	-14.26	153.48	128.09	25.39	6.046			
3,700.00	3,685.80	3,692.53	3,691.05	13.36	13.02	-170.50	55.55	-12.86	162.50	136.43	26.07	6.233			
3,800.00	3,784.81	3,786.34	3,784.83	13.76	13.36	-171.14	57.44	-12.27	174.30	147.54	26.76	6.514			
3,900.00	3,883.82	3,884.52	3,883.02	14.16	13.71	-171.79	57.48	-12.26	188.16	160.70	27.47	6.850			
4,000.00	3,982.82	3,983.53	3,982.02	14.56	14.06	-172.36	57.48	-12.26	202.09	173.90	28.19	7.170			
4,100.00	4,081.83	4,082.54	4,081.03	14.96	14.41	-172.85	57.48	-12.26	216.02	187.12	28.90	7.474			
4,200.00	4,180.84	4,181.55	4,180.04	15.36	14.77	-173.29	57.48	-12.26	229.98	200.35	29.62	7.763			
4,300.00	4,279.85	4,280.55	4,279.05	15.76	15.12	-173.68	57.48	-12.26	243.94	213.60	30.34	8.040			
4,400.00	4,378.85	4,379.56	4,378.05	16.17	15.48	-174.02	57.48	-12.26	257.92	226.85	31.06	8.304			
4,500.00	4,477.86	4,478.57	4,477.06	16.57	15.83	-174.33	57.48	-12.26	271.90	240.12	31.78	8.556			
4,600.00	4,576.87	4,577.58	4,576.07	16.98	16.18	-174.61	57.48	-12.26	285.89	253.39	32.50	8.797			
4,700.00	4,675.88	4,676.59	4,675.08	17.38	16.54	-174.86	57.48	-12.26	299.88	266.66	33.22	9.028			
4,800.00	4,774.89	4,775.59	4,774.09	17.79	16.89	-175.09	57.48	-12.26	313.88	279.94	33.94	9.249			
4,900.00	4,873.89	4,874.60	4,873.09	18.19	17.25	-175.30	57.48	-12.26	327.89	293.23	34.66	9.461			
5,000.00	4,972.90	4,973.61	4,972.10	18.60	17.60	-175.49	57.48	-12.26	341.89	306.52	35.38	9.664			

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: Grid
North Reference: Minimum Curvature
Survey Calculation Method: 2.00 sigma
Output errors are at: DB_Aug0116_LT_v14
Database: Offset Datum
Offset TVD Reference:

Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance		Minimum		Separation		Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,100.00	5,071.91	5,082.67	5,081.16	19.01	17.99	-175.68	58.57	-11.92	354.90	318.74	36.16	9.814		
5,200.00	5,170.92	5,196.53	5,194.87	19.41	18.40	-175.84	63.82	-10.31	364.13	327.20	36.94	9.858		
5,300.00	5,269.92	5,311.05	5,308.94	19.82	18.82	-175.97	73.44	-7.34	369.39	331.73	37.66	9.807		
5,400.00	5,368.93	5,425.87	5,422.81	20.23	19.24	-176.08	87.45	-3.02	370.66	332.31	38.34	9.667		
5,500.00	5,467.94	5,539.17	5,534.52	20.64	19.65	-176.16	105.53	2.56	367.93	328.95	38.98	9.438		
5,600.00	5,566.95	5,639.08	5,632.73	21.05	20.03	-176.23	123.02	7.95	363.58	323.87	39.71	9.156		
5,700.00	5,665.95	5,738.98	5,730.95	21.46	20.40	-176.30	140.51	13.35	359.24	318.80	40.44	8.884		
5,800.00	5,764.96	5,838.89	5,829.16	21.87	20.78	-176.37	158.00	18.74	354.89	313.72	41.17	8.621		
5,900.00	5,863.97	5,938.79	5,927.37	22.28	21.17	-176.44	175.49	24.14	350.54	308.65	41.90	8.367		
6,000.00	5,962.98	6,038.70	6,025.59	22.69	21.55	-176.52	192.98	29.53	346.20	303.57	42.63	8.121		
6,100.00	6,061.98	6,138.60	6,123.80	23.10	21.94	-176.59	210.47	34.92	341.85	298.49	43.36	7.884		
6,200.00	6,160.99	6,238.51	6,222.01	23.51	22.33	-176.67	227.96	40.32	337.51	293.42	44.09	7.655		
6,300.00	6,260.00	6,338.41	6,320.23	23.92	22.73	-176.75	245.45	45.71	333.16	288.34	44.82	7.433		
6,400.00	6,359.01	6,438.32	6,418.44	24.33	23.12	-176.84	262.94	51.11	328.82	283.26	45.56	7.218		
6,500.00	6,458.02	6,538.22	6,516.66	24.74	23.52	-176.92	280.43	56.50	324.48	278.19	46.29	7.010		
6,600.00	6,557.02	6,638.12	6,614.87	25.16	23.92	-177.01	297.92	61.89	320.14	273.11	47.03	6.808		
6,700.00	6,656.03	6,738.03	6,713.08	25.57	24.32	-177.10	315.41	67.29	315.80	268.04	47.76	6.612		
6,800.00	6,755.04	6,837.93	6,811.30	25.98	24.73	-177.19	332.90	72.68	311.46	262.96	48.50	6.422		
6,900.00	6,854.05	6,937.84	6,909.51	26.39	25.13	-177.29	350.39	78.08	307.12	257.88	49.23	6.238		
7,000.00	6,953.05	7,037.74	7,007.72	26.81	25.54	-177.39	367.89	83.47	302.78	252.81	49.97	6.059		
7,100.00	7,052.06	7,137.65	7,105.94	27.22	25.95	-177.49	385.38	88.86	298.44	247.73	50.71	5.886		
7,200.00	7,151.07	7,237.55	7,204.15	27.63	26.36	-177.59	402.87	94.26	294.10	242.66	51.44	5.717		
7,300.00	7,250.14	7,337.43	7,302.34	28.04	26.77	-177.69	420.35	99.65	289.28	237.09	52.18	5.544		
7,400.00	7,349.59	7,437.11	7,400.33	28.43	27.18	-177.77	437.80	105.03	281.35	228.43	52.91	5.317		
7,500.00	7,449.34	7,536.45	7,497.99	28.80	27.60	-177.82	455.19	110.40	269.95	216.31	53.64	5.033		
7,600.00	7,549.27	7,635.34	7,595.20	29.15	28.01	-177.84	472.51	115.74	255.10	200.74	54.36	4.693		
7,700.00	7,649.27	7,733.73	7,691.93	29.48	28.42	-162.97	489.73	121.05	237.22	182.15	55.07	4.308		
7,800.00	7,749.27	7,832.03	7,788.57	29.81	28.83	-162.98	506.94	126.36	218.90	163.12	55.78	3.924		
7,900.00	7,848.81	7,930.30	7,885.18	30.14	29.24	110.62	524.15	131.66	203.00	146.52	56.48	3.594		
7,998.05	7,942.81	8,024.18	7,977.47	30.48	29.64	118.75	540.58	136.73	196.34	139.11	57.23	3.431		
8,000.00	7,944.62	8,026.00	7,979.26	30.49	29.65	118.95	540.90	136.83	196.34	139.09	57.25	3.430		
8,100.00	8,032.52	8,114.97	8,066.72	30.84	30.02	129.26	556.47	141.63	206.67	148.47	58.19	3.551		
8,200.00	8,108.66	8,193.31	8,143.73	31.21	30.35	137.93	570.19	145.86	240.99	181.73	59.26	4.067		
8,300.00	8,189.72	8,257.59	8,206.93	31.62	30.62	142.72	581.44	149.33	299.48	239.31	60.17	4.977		
8,400.00	8,213.02	8,305.02	8,253.56	32.13	30.82	142.16	589.75	151.89	376.89	316.09	60.80	6.199		
8,500.00	8,236.69	8,333.52	8,281.57	32.79	30.95	131.82	594.74	153.43	466.76	405.61	61.16	7.632		
8,600.00	8,241.00	8,343.16	8,291.04	33.59	30.99	113.61	596.42	153.95	563.07	501.76	61.31	9.184		
8,700.00	8,241.00	8,348.56	8,296.35	34.56	31.01	115.96	597.37	154.25	660.86	599.46	61.40	10.763		
8,800.00	8,241.00	8,353.96	8,301.66	35.67	31.03	118.24	598.31	154.54	759.18	697.71	61.47	12.350		
8,900.00	8,241.00	8,359.35	8,306.97	36.93	31.06	120.48	599.26	154.83	857.86	796.32	61.54	13.940		
9,000.00	8,241.00	8,364.75	8,312.27	38.30	31.08	122.64	600.20	155.12	956.79	895.19	61.60	15.532		
9,100.00	8,241.00	8,370.15	8,317.58	39.77	31.10	124.74	601.15	155.41	1,055.89	994.23	61.66	17.125		
9,200.00	8,241.00	8,375.55	8,322.89	41.34	31.12	126.78	602.09	155.70	1,155.11	1,093.40	61.71	18.718		
9,300.00	8,241.00	8,380.95	8,328.20	43.00	31.15	128.74	603.04	155.99	1,254.44	1,192.68	61.76	20.311		
9,400.00	8,241.00	8,386.35	8,333.51	44.72	31.17	130.63	603.99	156.29	1,353.85	1,292.03	61.81	21.902		
9,500.00	8,241.00	8,408.25	8,338.81	46.52	31.26	132.46	604.93	156.58	1,453.31	1,391.38	61.93	23.466		
9,600.00	8,241.00	8,402.85	8,344.12	48.37	31.24	134.21	605.88	156.87	1,552.83	1,490.89	61.94	25.070		
9,700.00	8,241.00	8,402.55	8,349.43	50.27	31.24	135.89	606.82	157.16	1,652.39	1,590.42	61.97	26.666		
9,800.00	8,241.00	11,469.98	9,900.00	52.21	56.02	179.95	711.16	1,902.53	1,659.80	1,617.19	42.62	38.949		
9,900.00	8,241.00	11,569.98	9,900.00	54.20	57.89	179.95	711.16	2,002.53	1,659.80	1,616.17	43.63	38.038		
10,000.00	8,241.00	11,669.98	9,900.00	56.22	59.80	179.95	711.16	2,102.53	1,659.80	1,615.11	44.69	37.144		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
RKB=3090.9+25 @ 3115.90ft
RKB=3090.9+25 @ 3115.90ft
TVD Reference: Grid
MD Reference: Minimum Curvature
North Reference: 2.00 sigma
Survey Calculation Method: DB_Aug0116_LT_v14
Output errors are at: Offset Datum
Database:
Offset TVD Reference:

Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance		Minimum Separation		Separation Factor		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
10,100.00	8,241.00	11,769.98	9,900.00	58.27	61.75	179.95	711.16	2,202.53	1,659.80	1,614.03	45.77	36.266			
10,200.00	8,241.00	11,869.98	9,900.00	60.36	63.73	179.95	711.16	2,302.53	1,659.80	1,612.93	46.87	35.409			
10,300.00	8,241.00	11,969.98	9,900.00	62.47	65.74	179.95	711.16	2,402.53	1,659.80	1,611.79	48.01	34.573			
10,400.00	8,241.00	12,069.98	9,900.00	64.60	67.78	179.95	711.16	2,502.53	1,659.80	1,610.63	49.17	33.759			
10,500.00	8,241.00	12,169.98	9,900.00	66.75	69.85	179.95	711.16	2,602.53	1,659.80	1,609.46	50.35	32.968			
10,600.00	8,241.00	12,269.98	9,900.00	68.93	71.94	179.95	711.16	2,702.53	1,659.80	1,608.26	51.55	32.201			
10,700.00	8,241.00	12,369.98	9,900.00	71.12	74.05	179.95	711.16	2,802.53	1,659.80	1,607.04	52.76	31.457			
10,800.00	8,241.00	12,469.98	9,900.00	73.32	76.18	179.95	711.18	2,902.53	1,659.80	1,605.80	54.00	30.736			
10,900.00	8,241.00	12,569.98	9,900.00	75.54	78.33	179.95	711.16	3,002.53	1,659.80	1,604.54	55.26	30.038			
11,000.00	8,241.00	12,669.98	9,900.00	77.78	80.50	179.95	711.16	3,102.53	1,659.80	1,603.28	56.53	29.364			
11,100.00	8,241.00	12,769.98	9,900.00	80.02	82.68	179.95	711.16	3,202.53	1,659.80	1,601.99	57.81	28.711			
11,200.00	8,241.00	12,869.98	9,900.00	82.28	84.87	179.95	711.16	3,302.53	1,659.80	1,600.69	59.11	28.081			
11,300.00	8,241.00	12,969.98	9,900.00	84.55	87.08	179.95	711.16	3,402.53	1,659.80	1,599.38	60.42	27.472			
11,400.00	8,241.00	13,069.98	9,900.00	86.82	89.30	179.95	711.16	3,502.53	1,659.80	1,598.06	61.74	26.883			
11,500.00	8,241.00	13,169.98	9,900.00	89.11	91.53	179.95	711.16	3,602.53	1,659.80	1,596.73	63.07	26.315			
11,600.00	8,241.00	13,269.98	9,900.00	91.40	93.77	179.95	711.16	3,702.53	1,659.80	1,595.38	64.42	25.766			
11,700.00	8,241.00	13,369.98	9,900.00	93.70	96.03	179.95	711.16	3,802.53	1,659.80	1,594.03	65.77	25.235			
11,800.00	8,241.00	13,469.98	9,900.00	96.01	98.29	179.95	711.16	3,902.53	1,659.80	1,592.66	67.14	24.723			
11,900.00	8,241.00	13,569.98	9,900.00	98.32	100.58	179.95	711.16	4,002.53	1,659.80	1,591.29	68.51	24.228			
12,000.00	8,241.00	13,669.98	9,900.00	100.64	102.83	179.95	711.16	4,102.53	1,659.80	1,589.91	69.89	23.749			
12,100.00	8,241.00	13,769.98	9,900.00	102.97	105.12	179.95	711.16	4,202.53	1,659.80	1,588.52	71.28	23.287			
12,200.00	8,241.00	13,869.98	9,900.00	105.30	107.41	179.95	711.16	4,302.53	1,659.80	1,587.13	72.67	22.839			
12,300.00	8,241.00	13,969.98	9,900.00	107.63	109.71	179.95	711.16	4,402.53	1,659.80	1,585.73	74.07	22.407			
12,400.00	8,241.00	14,069.98	9,900.00	109.97	112.01	179.95	711.16	4,502.53	1,659.80	1,584.32	75.48	21.989			
12,500.00	8,241.00	14,169.98	9,900.00	112.32	114.32	179.95	711.16	4,602.53	1,659.80	1,582.90	76.90	21.584			
12,600.00	8,241.00	14,269.98	9,900.00	114.67	116.63	179.95	711.16	4,702.53	1,659.80	1,581.48	78.32	21.193			
12,700.00	8,241.00	14,369.98	9,900.00	117.02	118.95	179.95	711.16	4,802.53	1,659.80	1,580.05	79.75	20.814			
12,800.00	8,241.00	14,469.98	9,900.00	119.37	121.28	179.95	711.16	4,902.53	1,659.80	1,578.62	81.18	20.448			
12,900.00	8,241.00	14,569.98	9,900.00	121.73	123.60	179.95	711.16	5,002.53	1,659.80	1,577.19	82.61	20.091			
13,000.00	8,241.00	14,669.98	9,900.00	124.09	125.94	179.95	711.16	5,102.53	1,659.80	1,575.74	84.06	19.746			
13,100.00	8,241.00	14,769.98	9,900.00	126.46	128.27	179.95	711.16	5,202.53	1,659.80	1,574.30	85.50	19.412			
13,200.00	8,241.00	14,869.98	9,900.00	128.83	130.61	179.95	711.16	5,302.53	1,659.80	1,572.85	86.95	19.089			
13,300.00	8,241.00	14,969.98	9,900.00	131.20	132.96	179.95	711.16	5,402.53	1,659.80	1,571.39	88.41	18.775			
13,400.00	8,241.00	15,069.98	9,900.00	133.57	135.31	179.95	711.16	5,502.53	1,659.80	1,569.94	89.86	18.470			
13,500.00	8,241.00	15,169.98	9,900.00	135.94	137.66	179.95	711.16	5,602.53	1,659.80	1,568.47	91.33	18.174			
13,600.00	8,241.00	15,269.98	9,900.00	138.32	140.01	179.95	711.16	5,702.53	1,659.80	1,567.01	92.79	17.887			
13,700.00	8,241.00	15,369.98	9,900.00	140.70	142.37	179.95	711.16	5,802.53	1,659.80	1,565.54	94.26	17.609			
13,800.00	8,241.00	15,469.98	9,900.00	143.08	144.73	179.95	711.16	5,902.53	1,659.80	1,564.07	95.73	17.338			
13,900.00	8,241.00	15,569.98	9,900.00	145.46	147.09	179.95	711.16	6,002.53	1,659.80	1,562.59	97.21	17.075			
14,000.00	8,241.00	15,669.98	9,900.00	147.85	149.45	179.95	711.16	6,102.53	1,659.80	1,561.12	98.68	16.819			
14,100.00	8,241.00	15,769.98	9,900.00	150.24	151.82	179.95	711.16	6,202.53	1,659.80	1,559.64	100.16	16.571			
14,200.00	8,241.00	15,869.98	9,900.00	152.63	154.19	179.95	711.16	6,302.53	1,659.80	1,558.15	101.65	16.329			
14,300.00	8,241.00	15,969.98	9,900.00	155.02	156.56	179.95	711.16	6,402.53	1,659.80	1,556.67	103.13	16.094			
14,400.00	8,241.00	16,069.98	9,900.00	157.41	158.93	179.95	711.18	6,502.53	1,659.80	1,555.18	104.62	15.865			
14,500.00	8,241.00	16,169.98	9,900.00	159.80	161.31	179.95	711.16	6,602.53	1,659.80	1,553.69	106.11	15.642			
14,600.00	8,241.00	16,269.98	9,900.00	162.20	163.69	179.95	711.16	6,702.53	1,659.80	1,552.20	107.61	15.425			
14,700.00	8,241.00	16,369.98	9,900.00	164.59	166.06	179.95	711.16	6,802.53	1,659.80	1,550.70	109.10	15.214			
14,800.00	8,241.00	16,469.98	9,900.00	166.99	168.45	179.95	711.16	6,902.53	1,659.80	1,549.20	110.60	15.008			
14,900.00	8,241.00	16,569.98	9,900.00	169.39	170.83	179.95	711.16	7,002.53	1,659.80	1,547.71	112.10	14.807			
15,000.00	8,241.00	16,669.98	9,900.00	171.79	173.21	179.95	711.16	7,102.53	1,659.80	1,546.20	113.60	14.611			
15,100.00	8,241.00	16,769.98	9,900.00	174.19	175.60	179.95	711.16	7,202.53	1,659.80	1,544.70	115.10	14.421			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
TVD Reference: RKB=3090.9+25 @ 3115.90ft
MD Reference: RKB=3090.9+25 @ 3115.90ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: DB_Aug0116_LT_v14
Offset TVD Reference: Offset Datum

Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Bore Major Axis			Distance								Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
15,200.00	8,241.00	16,869.98	9,900.00	176.59	177.98	179.95	711.16	7,302.53	1,659.80	1,543.20	116.60	14.235			
15,300.00	8,241.00	16,969.98	9,900.00	178.99	180.37	179.95	711.16	7,402.53	1,659.80	1,541.69	118.11	14.053			
15,400.00	8,241.00	17,069.98	9,900.00	181.39	182.76	179.95	711.16	7,502.53	1,659.80	1,540.18	119.62	13.876			
15,500.00	8,241.00	17,169.98	9,900.00	183.80	185.15	179.95	711.16	7,602.53	1,659.80	1,538.67	121.13	13.703			
15,600.00	8,241.00	17,269.98	9,900.00	186.20	187.55	179.95	711.16	7,702.53	1,659.80	1,537.16	122.64	13.534			
15,700.00	8,241.00	17,369.98	9,900.00	188.61	189.94	179.95	711.16	7,802.53	1,659.80	1,535.65	124.15	13.369			
15,800.00	8,241.00	17,469.98	9,900.00	191.02	192.33	179.95	711.16	7,902.53	1,659.80	1,534.14	125.66	13.208			
15,900.00	8,241.00	17,569.98	9,900.00	193.43	194.73	179.95	711.16	8,002.53	1,659.80	1,532.62	127.18	13.051			
16,000.00	8,241.00	17,669.98	9,900.00	195.84	197.13	179.95	711.16	8,102.53	1,659.80	1,531.11	128.69	12.897			
16,100.00	8,241.00	17,769.98	9,900.00	198.24	199.52	179.95	711.16	8,202.53	1,659.80	1,529.59	130.21	12.747			
16,200.00	8,241.00	17,869.98	9,900.00	200.66	201.92	179.95	711.16	8,302.53	1,659.80	1,528.07	131.73	12.600			
16,300.00	8,241.00	17,969.98	9,900.00	203.07	204.32	179.95	711.16	8,402.53	1,659.80	1,526.55	133.25	12.456			
16,400.00	8,241.00	18,069.98	9,900.00	205.48	206.72	179.95	711.16	8,502.53	1,659.80	1,525.03	134.77	12.316			
16,500.00	8,241.00	18,169.98	9,900.00	207.89	209.12	179.95	711.16	8,602.53	1,659.80	1,523.51	136.29	12.178			
16,600.00	8,241.00	18,269.98	9,900.00	210.30	211.53	179.95	711.16	8,702.53	1,659.80	1,521.98	137.82	12.043			
16,700.00	8,241.00	18,369.98	9,900.00	212.72	213.93	179.95	711.16	8,802.53	1,659.80	1,520.46	139.34	11.912			
16,800.00	8,241.00	18,469.98	9,900.00	215.13	216.33	179.95	711.16	8,902.53	1,659.80	1,518.93	140.87	11.783			
16,900.00	8,241.00	18,569.98	9,900.00	217.55	218.74	179.95	711.16	9,002.53	1,659.80	1,517.41	142.39	11.656			
16,981.27	8,241.00	18,651.24	9,900.00	219.51	220.69	179.95	711.16	9,083.80	1,659.80	1,516.17	143.63	11.556			



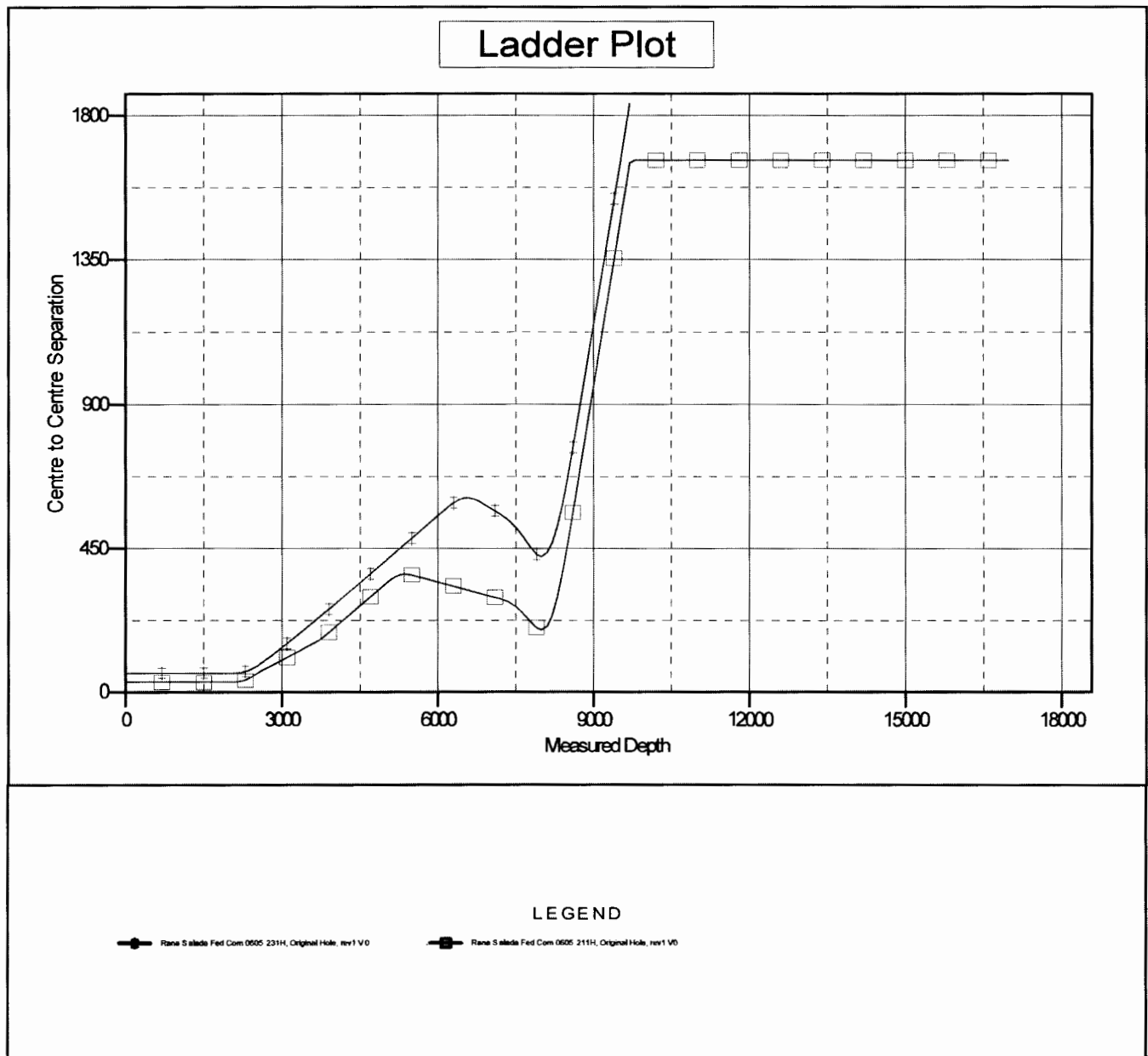
Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
RKB=3090.9+25 @ 3115.90ft
RKB=3090.9+25 @ 3115.90ft
TVD Reference: Grid
MD Reference: Minimum Curvature
Survey Calculation Method: 2.00 sigma
Output errors are at: DB_Aug0116_LT_v14
Database: Offset Datum
Offset TVD Reference:

Reference Depths are relative to RKB=3090.9+25 @ 3115.90ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.33333334

Coordinates are relative to: Rana Salada Fed Com 0605 121H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.16°



CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report

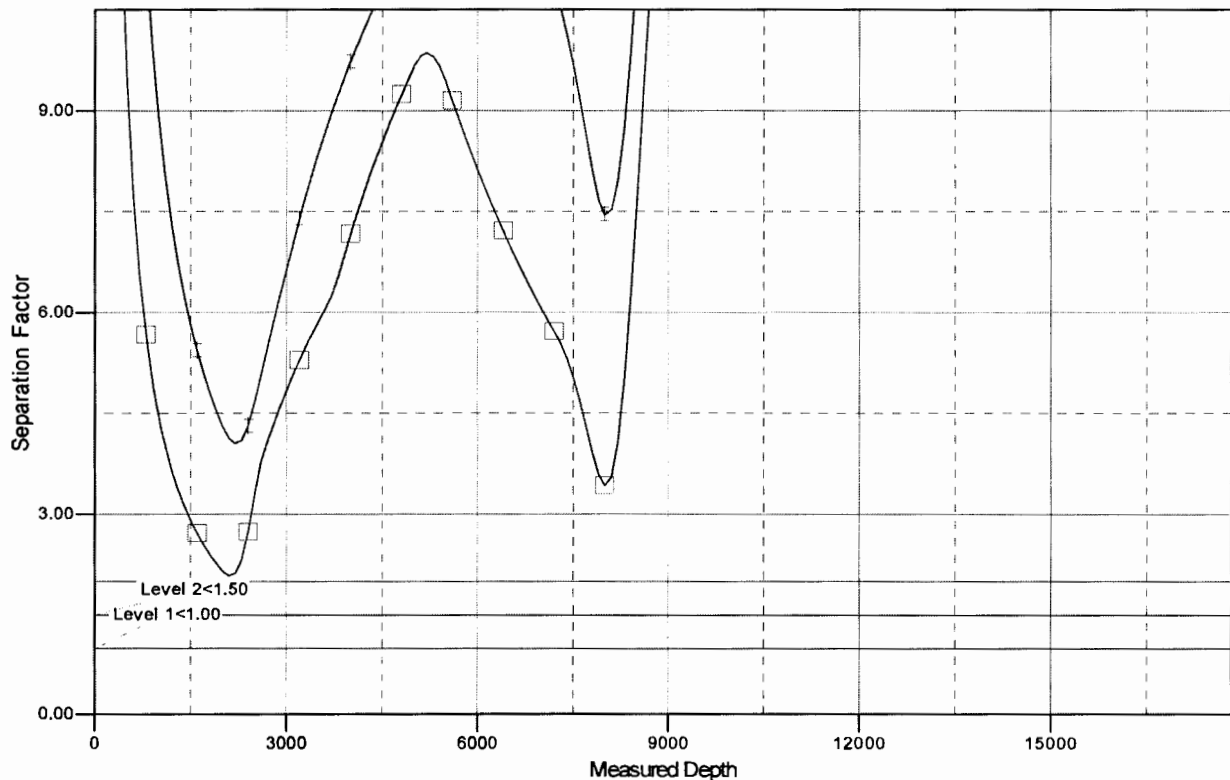
Company: Nova Oil and Gas Northern Delaware LLC
Project: Eddy County, New Mexico
Reference Site: Section 01-T23S-R28E
Site Error: 0.00 ft Rana Salada Fed Com 0605 121H
Reference Well: 0.00 ft
Well Error: Original Hole
Reference Wellbore: rev2
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 0605 121H
RKB=3090.9+25 @ 3115.90ft
RKB=3090.9+25 @ 3115.90ft
TVD Reference: Grid
MD Reference: Minimum Curvature
North Reference: 2.00 sigma
Survey Calculation Method: DB_Aug0116_LT_v14
Output errors are at: Offset Datum
Database:
Offset TVD Reference:

Reference Depths are relative to RKB=3090.9+25 @ 3115.90ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.3333334

Coordinates are relative to: Rana Salada Fed Com 0605 121H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.16°

Separation Factor Plot



LEGEND

— Rana Salada Fed Com 0605 121H, Original Hole, rev1 V0

— Rana Salada Fed Com 0605 121H, Original Hole, rev1 V0

**NOVO OIL & GAS, LLC**

Date

5/22/2018

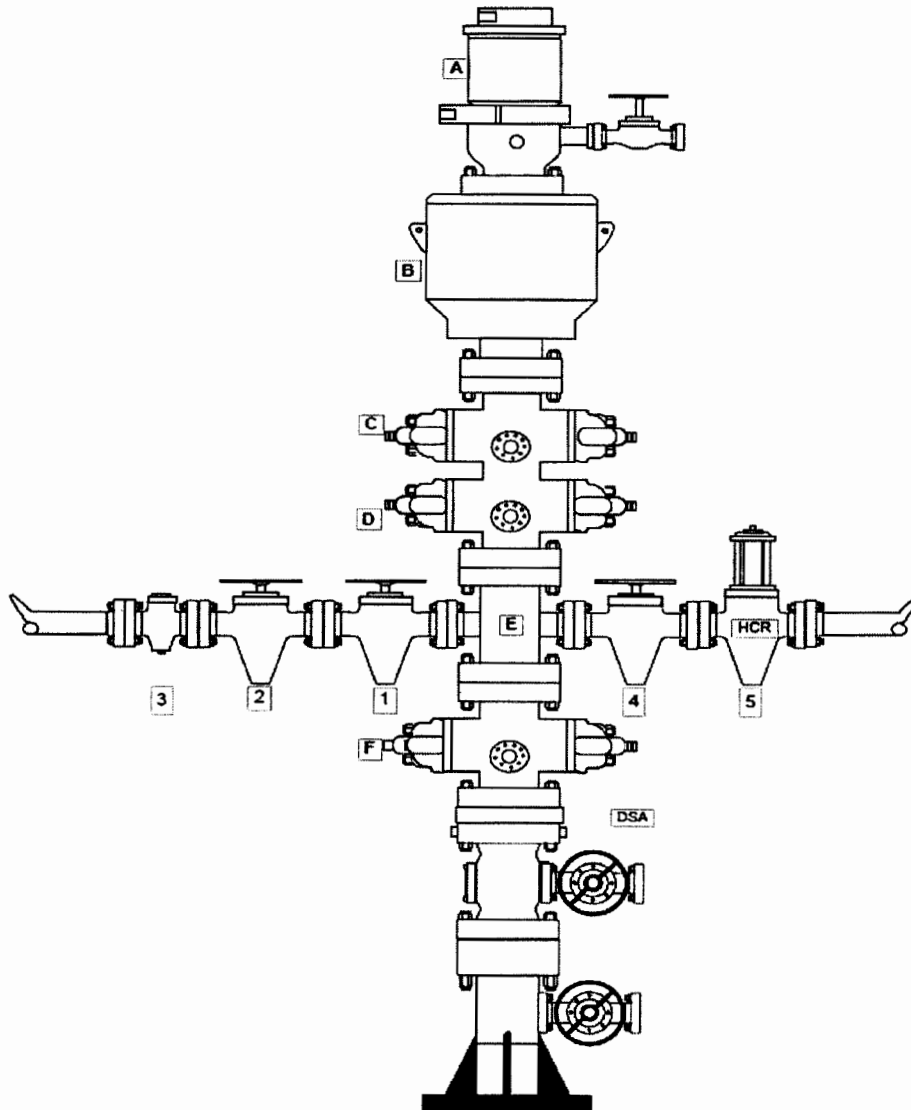
105 North Hudson Ave, Suite 500
Oklahoma City, Oklahoma 73102

Page No.

1 of 1

5M BLOWOUT PREVENTER SCHEMATIC**BLOWOUT PREVENTOR COMPONENTS**

ITEM	SIZE	PRESSURE	DESCRIPTION
A	13-5/8"	1,500 psi	Rotating Head + Orbit Valve
B	13-5/8"	5,000 psi	Annular Preventer
C	13-5/8"	5,000 psi	Pipe Rams
D	13-5/8"	5,000 psi	Blind Rams
E	13-5/8"	5,000 psi	Mud Cross
F	13-5/8"	5,000 psi	Pipe Rams

**KILL LINE**

ITEM	SIZE	PRESSURE	DESCRIPTION
1	2-1/16"	5,000 psi	Gate Valve
2	2-1/16"	5,000 psi	Gate Valve
3	2-1/16"	5,000 psi	Check Valve

CHOKE LINE

ITEM	SIZE	PRESSURE	DESCRIPTION
4	2-1/16"	5,000 psi	Gate Valve
5	2-1/16"	5,000 psi	HCR Valve



NOVO OIL & GAS, LLC

105 North Hudson Ave, Suite 500
Oklahoma City, Oklahoma 73102

Date

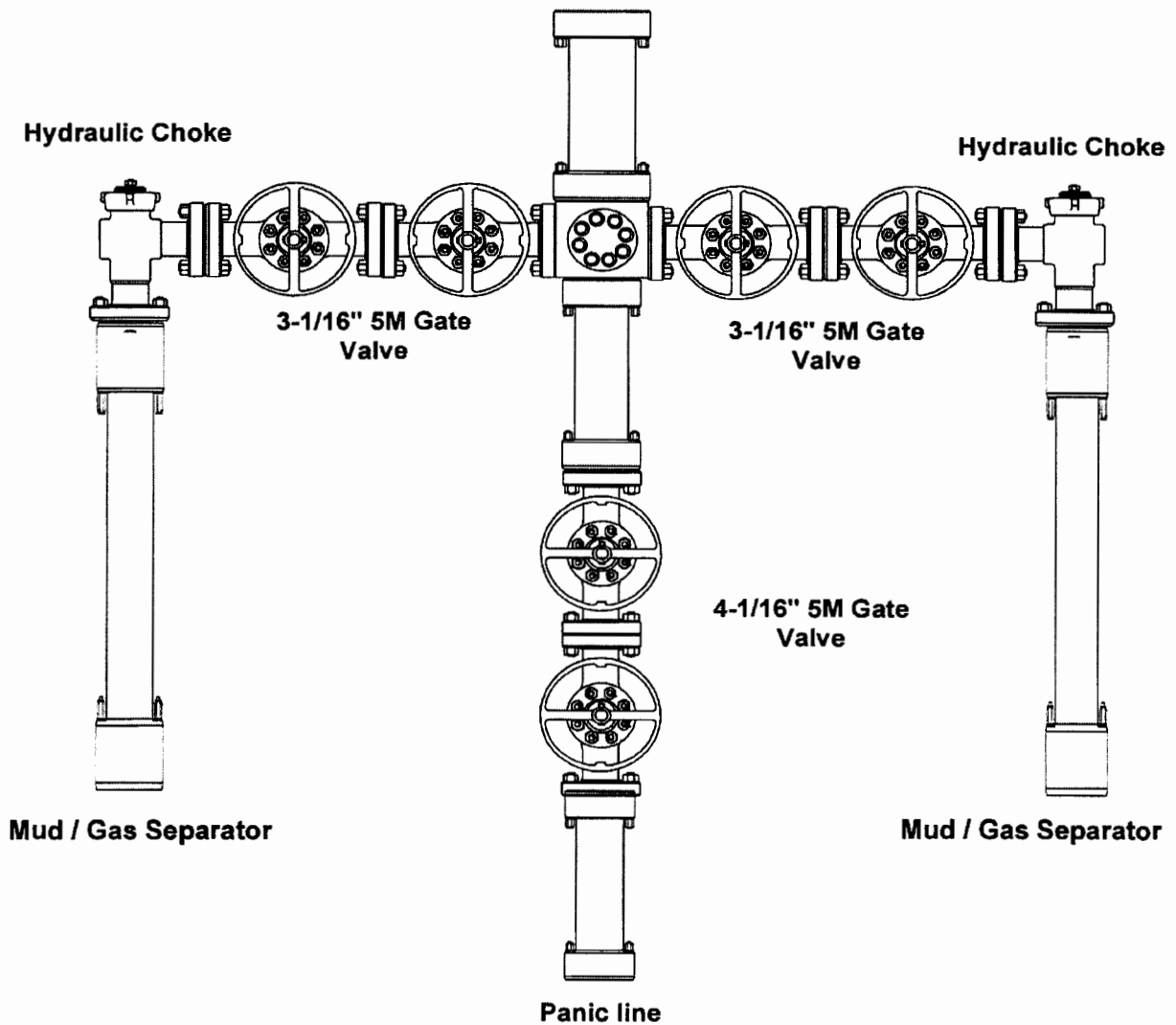
5/22/2018

Page No.

1 of 1

5M CHOKE MANIFOLD SCHEMATIC

ITEM	SIZE	PRESSURE	DESCRIPTION



ITEM	SIZE	PRESSURE	DESCRIPTION

ITEM	SIZE	PRESSURE	DESCRIPTION



POWERING PROGRESS™

MTR DATA BOOK

CUSTOMER: AUSTIN DISTRIBUTING

DATE: 11/20/2014

Purchase Order: PENDING

Sales Order #: 205663

Product Description: 10K3.566.0CK4.1/1610KFLGE/E L/E

Hose S/N: D-112014-10

CONTENTS INCLUDED

1	GMCO FITTINGS
	14-177-1 INSERT STEM
	14-245-1 INSERT HEAD
	14-242-1 FERRULE
2	EDWARDS FABRICATION LIFT EYE CLAMPS
	19351, 19356 Individual Test Certificates for Each Clamp
3	4 1/16 10K FLANGES
	R20834 Heat Numbers
4	WELDING SPECIFICATIONS
	Certification and Procedure for welding
5	NDE RESULTS
	1921 Ultrasonic Test Results and Imaging
6	TEST CHART
	Chart Recording of Hydrostatic Test
7	TEST CERTIFICATE
	Document Product Details & Positive Results of Hydrostatic Testing
8	CERTIFICATE OF CONFORMANCE
	A Declaration of the conformity with the type approval
9	IMAGES
	Images of the product prior to shipping.
10	PACKING LIST
	Details of Shipping Contents, Dimensions and Weights



PLYMOUTH TUBE CO. USA®

672 W State Road 14, Winamac, Indiana 46998
Phone: (574) 946-3126 Fax-Cold Draw: (574) 946-3850 Fax-Hot Mill: (574) 946-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS

119679 - 1 / 1

SOLD TO

J P Steel
6841 FM 362
Brookshire, TX 77423
USA

WORK ORDER 006409

HEAT NUMBER 486597

MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

Q26 HXXX + 64-15

14-177-1

ISO 9001: 2008
Registered

CUSTOMER P.O. 17554	CUSTOMER PART JP 3.562X.531	QUANTITY 9,736.34 Lb	LADING NO 00071757	CERT ID / REV 01	CERT DATE 06/18/2014								
PART DESCRIPTION EJ35620531DR1724-00 Spec: ASTM A-519 Seamless Mech. Alloy Smls Mechanical, HF [D/E] Smls Q&T Grade: 4130 OD: 3.5625" Tol+.0360" Tol-.0360" Wall: 0.5310" Tol+.0530" Tol-.0530" AW Lgth Type: Random Lgth: 17.00' / 24.00' End Finish: Debur ID & OD Finish Type: Quench & Temper L80/N80 Oil: Light Oil													
CERTIFICATION REQUIREMENTS ASTM A-519-06 / API 5CT Quench & Tempered. Induction heated, water quenched and infrared pyrometer monitored. Tensiles tested were 1" STRIP specimens per A370. Ultrasonic tested and passed. Tubes UT inspected to ASTM E213/API 5CT 10.15 and SR2 requirements w/ 5% notches. Test covered 100% full length of OD & ID surfaces both longitudinal & transverse.													
Chemical Analysis													
C	Mn	P	S	Si	Al	Cr	Mo	Ni	Pb	Cu	V	Ti	Sn
.31	.51	.011	.003	.27	.015	.97	.21	.13	-----	.16	.006	-----	.008
Cb	Ca	N	As	Sb	H								
.001	.0017	.0095	.0039	.0014	-----								
Product Checks													
C	Mn	P	S	Si	Al	Cr	Mo	Ni	Pb	Cu	V	Ti	
CHK01	.317	.52	.012	.005	.275	.016	.96	.211	.123	.148	.0034		
CHK02	.31	.52	.011	.0043	.275	.016	.96	.211	.123	.147	.0035		
Sn	Cb	Ca	N	As	Sb	H							
CHK01	.0091	.000	.0017	.0000	.0095	.0000							
CHK02	.0091	.000	.0016	.0000	.0099	.0000							
Physical Properties													

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

David Conlin
Quality Assurance



PLYMOUTH TUBE CO. USA
 572 W State Road 14, Winamac, Indiana 46986
 Phone: (574) 948-3125 Fax-Cold Draw: (574) 948-3850 Fax-Hot Mill: (574) 948-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS

119679 - 1 / 1

SOLD TO

J P Steel
 6811 FM 362
 Brookshire, TX 77423
 USA

WORK ORDER 006409

HEAT NUMBER 486597

MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

**ISO 9001: 2008
 Registered**

CUSTOMER P.O. 17554	CUSTOMER PART JP 3.562X.531	QUANTITY 9,736.34 Lb	LADING NO 00071757	CERT ID / REV 01	CERT DATE 06/18/2014																																																		
PART DESCRIPTION EJ35620531DR1724-00																																																							
<table border="0"> <tr> <td>Grain Size</td> <td>J1</td><td>J2</td><td>J3</td><td>J4</td><td>J5</td><td>J6</td><td>J7</td><td>J8</td><td>J9</td><td>J10</td><td>J11</td><td>J12</td> <td>C</td><td>R</td><td>S</td><td>AR</td><td>AT</td><td>BH</td><td>BT</td><td>CH</td><td>CT</td><td>DE</td><td>DT</td><td>SAM 'B'</td> </tr> <tr> <td></td> <td>7</td><td>50</td><td>49</td><td>48</td><td>45</td><td>42</td><td>38</td><td>35</td><td>33</td><td>33</td><td>33</td><td>32</td> <td>--</td><td>--</td><td>--</td><td>0.0</td><td>0.5</td><td>1.0</td><td>1.0</td><td>0.0</td><td>0.0</td><td>1.0</td><td>1.5</td><td>-----</td> </tr> </table>						Grain Size	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	C	R	S	AR	AT	BH	BT	CH	CT	DE	DT	SAM 'B'		7	50	49	48	45	42	38	35	33	33	33	32	--	--	--	0.0	0.5	1.0	1.0	0.0	0.0	1.0	1.5	-----
Grain Size	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	C	R	S	AR	AT	BH	BT	CH	CT	DE	DT	SAM 'B'																															
	7	50	49	48	45	42	38	35	33	33	33	32	--	--	--	0.0	0.5	1.0	1.0	0.0	0.0	1.0	1.5	-----																															
<table border="0"> <tr> <td>SAM 'D'</td> <td>Freq.</td> <td>Severity</td> </tr> <tr> <td>-----</td> <td>.000</td> <td>.000</td> </tr> </table>						SAM 'D'	Freq.	Severity	-----	.000	.000																																												
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	100	125	.073	100																																																			
This test report data is for the heat Chemistry Stated above. The material in this test report is: 1) Manufactured in the USA. 2) Free from Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE), and Mercury contamination.																																																							

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

David Paulina
 Quality Assurance



PLYMOUTH TUBE CO. USA

572 W State Road 14, Winamac, Indiana 46986
Phone: (574) 948-3125 Fax-Cold Draw: (574) 948-3850 Fax-Hot Mill: (574) 948-7220

PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS

119679 - 1 / 1

SOLD TO

**J P Steel
6811 FM 362
Brookshire, TX 77423
USA**

WORK ORDER 006409

HEAT NUMBER 486597

MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

**ISO 9001: 2008
Registered**

CUSTOMER P.O.	CUSTOMER PART	QUANTITY	LADING NO	CERT ID / REV	CERT DATE
17554	JP 3.562X.531	9,736.34 Lb	00071757	01	06/18/2014
PART DESCRIPTION EJ35620531DR1724-00					
3) No Repairs by welding					
End of Certification					

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.


Quality Assurance

Benteler Steel/Tube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13686

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER
Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1
EN 10204:2005-01

Benteler Steel/Tube GmbH · Postfach 1340 · 33043 Paderborn · Deutschland

JP Steel
PO Box 592
BROOKSHIRE TX 77492
USA

Dokument-Nr.: 65-716081/002/P

Document No.:
No. du document:

Kunden-Bestell-Nr.: BST 12-12036 / JP 11459

Purchase Order No.:
No. de commande du client:

Benteler Auftrags-Nr.: 1578593

Benteler Order No.:
No. de commande Benteler:

Veranzendeln-Nr.: 6571039

Dispatch Note No.:
No. d'avis d'expédition:

Produkt: NAHTLOSE STAHLROHRE
Product: SEAMLESS STEEL TUBES
Produit: TUBES D'ACIER SANS SOUDURE

Hersteller:
Manufacturer:
Producteur:
Herstellerzeichen:
Manufacturer's brand:
Marque du producteur:



Stempel des Abnahmebeauftragten: WA
Stamp of the inspection representative:
Poignon du contrôleur:

Stahlschmelzungsverfahren: ELEKTROSTAHL
Steelmaking process: ELECTRIC FURNACE
Procédé d'élaboration de l'acier: FOUR ELECTRIQUE

Blatt: 1 / 4
Page:

Lieferbedingungen: ASTM-A 519-2006

Terms of delivery:

Conditions de livraison:

Maße - Toleranzen:

Dimensions-tolérances:

Dimensions-tolérances:

Stahlsorte:

Steel grade:

Nuance d'acier:

Lieferzustand:

Delivery condition:

État de livraison:

Produktkennzeichnung:

Product marking:

Marquage du produit:

outside diameter acc. to customer request, wall thickness acc. to customer request, ASTM-A 519-2006

GRADE 4130

QT

PKE: BENTELER SIGN BENTELER DIMENSIONS GRADE 4130 BST 12-12036 / JP 11459 ASTM-A 519 WA

AZZ = Aztekenbeschriftung, Etching ink marking, Graure 3 l'encore, PK = Farbkennzeichnung, colour marking, marquage par couleur, PS = Farbschablonierung, point stencilling, marquage par pointillé, FSD = Farbschablonierung, Colour jet primer, imprimante à jet d'encre de couleur, UK = Laserkennzeichnung, Laser marking, Marquage laser, PKE = Elaserkennzeichnung, log marking, marquage par logotype, PS = Prägestempel, die stamp, marquage par poinçonnage, TS = Tensordruckkennzeichnung, ink jet spray marking, imprimante à jet d'encre.

Benteler Steel/Tubo GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

Ersetzt / replace

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BENTELER

Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1
INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.: 65-716081/002/P
Document No.:
No. du document:

Prüf-Nr.:
Inspection No.:
No. du certificat:

Blatt: 2 / 4

Page:

Pos.	Stück	Maße	Länge	Gewicht	Schmelzen-Nr.	Prüfdruck	Rohr-Nr.-Gruppe	Vielfachlängen
Item	Number	Dimensions	Length	Weight	Heat No.	Test pressure	Tube number group	Multiple lengths
Poste	Nombre	Dimensions	Longueur	Poids	No. de coulée	Pression d'épreuve	Série de no. des tubes	Longueurs multiples
		feet	feet	lbs				
0002	34	4.500" O.D. * 0.625" 17 FT - 24 FT	748,36	19326	573599			

Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]

Pos.	Schmelzen-Nr.	C	SI	MN	P	S	CR	MO	NI
Item	Heat No.								
Poste	No. de coulée								
0002	573599	0,310	0,220	0,53	0,007	0,002	0,89	0,17	0,09

Prüfergebnisse / Test results / Résultats des essais

Die Rohre wurden zerstörungsfrei geprüft:

The tubes are non destructive tested:

Les tubes ont passé un essai non destructif:

UT-long.imperfections: acc. to API 5CT, SR 2; UT-long. Test method: acc. to ASTM-E

213; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; UT-transv.

imperfections: acc. to API 5CT, SR2; acc. to ASTM-E 213; Outside notch depth: 5,0

%; Inside notch depth: 5,0 %; UT-lamination detection: acc. to EN 10246-14, table 1

PASSED

Augensichtkontrolle:

Visual inspection:

Examen visuel:

PASSED

Materialverwechslungsprüfung:

Material conformity test:

Vérification de la nuance:

PASSED

Maßkontrolle:

Dimensions examination:

Vérification des dimensions:

PASSED

Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probenahme erfolgte an Vielfachlängen.

The sampling was carried out on multiple lengths.

L'échantillonnage eut lieu aux longueurs multiples.

Benteler SteelTube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13866

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Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER

SteelTube

Blatt: 3 / 4

Page:

Page:

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1

CERTIFICAT DE RECEPTION EN 10204-3.1

Prüf-Nr.: 65-716081/002/P

Inspection No.: No. du certificat

Zugversuch längs Streifenprobe / Tensile test longitudinal Strip test specimen / Essai de traction longitudinale Bande decoupee sur tube

Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Streckgrenze	Zugfestigkeit	Dehnung	Einschnürung
Item	Specimen No.	Heat No.	Specimen dimensions	Yield strength	Tensile strength	Elongation	Area reduction
Poste	No. de l'éprouvette	No. de coulée	Dimensions de l'éprouv.	Limite élastique	Résistance à la traction	Allongement	Coefficient de striction
Anforderungen				RT 0,5 %	Rm	A2"	1. Formel
Requirements			mm	MPa	MPa	%	1. Formula
Exigences				552-555	MIN 555	MIN 14	1. Formule
0002	000001	573599	25,40 x 15,40	637	758	36	
0002	000002	573599	25,40 x 15,70	635	769	36	

Härteprüfung / Hardness test / Essai de dureté

Pos.	Proben-Nr.	Schmelzen-Nr.	Härte
Item	Specimen No.	Heat No.	Hardness
Poste	No. de l'éprouv.	No. de coulée	Dureté
Anforderungen			HRC HB HV HRS HBW
Requirements			
Exigences			MAX 22,0
0002	000001	573599	020

Kerbschlagbiegeversuch / Notched bar impact test / Essai de flexion par choc (résistance) [1 CHARPY_V]

Pos.	Proben-Nr.	Schmelzen-Nr.	Probenabmessung	Probenlage	Prüftemperatur	Kerbschlagarbeit	Kerbschlagzähigkeit	Verf.-Bruchanteil
Item	Specimen No.	Heat No.	Specimen dimensions	Specimen position	Test temperature	Absorbed energy	Impact strength	Shear fracture
Poste	No. de l'éprouv.	No. de coulée	Dimensions de l'éprouvette	Position de l'éprouvette	Température d'essai	Energie absorbée	Résistance au choc	Rupture ductile
Anforderungen			Länge Breite Höhe	längs (L)		einzel mittel	einzel mittel	
Requirements			Length Width Height	longitudinal (L)		single average	single average	
Exigences			Longueur Largeur Hauteur	longitudinal (L)		individuelle moyenne	individuelle moyenne	
			mm mm mm	quer (Q)	GRAD	ft-lbf ft-lbf	J/cm²	
			55 10,00 10,00	transversal (Q)	°C	ft-lbf		
			55 10,00 10,00	transversal (Q)	-30	MIN 020		
0002	000001	573599	55 10,00 10,00	L	-30	116		
			10,00 10,00			110		
			10,00 10,00			111 112		

Benteler SteelTube GmbH
Postfach 13 40
33043 Paderborn
Deutschland
Tel.: +49.5254.81-0 Fax: +49.5254.13666

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

BENTELER

SteelTube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1

INSPECTION CERTIFICATE EN 10204-3.1
CERTIFICAT DE RECEPTION EN 10204-3.1

Dokument-Nr.:
Document No.:
No. du document:

65-716081/002/P

Prüf-Nr.:
Inspection No.:
No. du certificat:

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Page:
Page:

Wärmebehandlung / Heat treatment / Traitement thermique

Hardening temperature: 850 °C, Holding time: 1 min, Cooling: water / Tempering temperature: 735 °C, Holding time: 6 min, Cooling: air

Vermerk / Remark / Remarque

Certificate remarks: Steel is manufactured to fine grain practice. The tubes comply with the requirements of NACE MR0175-03., hardness max. 22 HRC. No mercury, mercury compounds or mercury bearing instruments and / or equipment has been used in any manner which might cause contamination in manufacture assembly, or test of material. No weld repair has been carried out.; Certificate-Remark: The steel will be produced by an electric arc furnace, ladle furnace and continuous casting machine, stirring by argon. The mode of operation in this process is commonly referred to as "clean steel process". The products are fully killed.

Verkäufer(in) / Salesman/ woman in charge / Personne chargée : Mr Storm, Tel.: 05254/81-4274, Fax: 4289

Dinslaken, 26.10.2012, TEL.: 02064.623-5370 FAX: 02064.623-5390

Abnahmebeauftragter
Inspection representative

Contrôleur

DR. BASEL KEITA / Thei

* Es wird bestätigt, daß die gelieferten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechts gültig.
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

P.O. BOX 924469
HOUSTON, TX 77292
PHONE: (713) 290-8490



6645 W. TIDWELL
HOUSTON, TX 77092
FAX: (713) 290-8627

To: J.P. STEEL, LLC
PO BOX 592
KATY, TX 77492-0592

Report Date: 10/18/13
Report No: 250944.0
Rev.: A
Cust Acct: JPS10050

PO#: 15484
Material: 4.50" OD X .625" WALL 4130 Q & T ALLOY
ID/Heat: HT# 573599
Job Info:

Tensile Test Results

No./Location	Size (in.)	Area (in ²)	Ult. Load (lbs.)	Yield (psi)	Tensile (psi)	Elong. (%)	R. of A. (%)	Hardness
1	.495	.1924		90,200	112,300	26	73	

Unless otherwise stated, yield stress is 0.2% offset, gage length is 2 in. for 1/2 in. bars or 1 in. for 1/4 in. bars.

Signed: *Mike Mason*

MIKE MASON

Our reports are for the exclusive use of our customer and our name may be used only with prior written approval. Our reports apply only to the sample tested or inspected and do not necessarily represent the quality of other apparently similar or identical materials. All test specimens and testing conforms to ASTM A-370 requirements unless otherwise stated. This test report shall not be reproduced, except in full, without the written approval of P&B Testing Inc.

ArcelorMittal

ARCELORMITTAL TUBULAR PRODUCTS
SHELBY LLC.
132 WEST MAIN STREET
SHELBY, OHIO 44875-1471
Telephone 419/342-1200 FAX: 419/342-1437

MATERIAL TEST REPORT

ISO/TS 16949:2009 ISO 9001:2008

14-242-1 9564XXX+69A-F

SHELBY ORDER NO.
447180

C U S T O M E R	MARMON KEYSTONE CORPORATION 6441 BINGLE ROAD HOUSTON TX 77092 ATTN: EARTHA JILES		SPECIFICATION ASTM A513 GMCO A513 DOM 1 01-10 FAX: (713)460-5414		CUSTOMER ORDER 35-057810-03

GRADE 520	SIZE(O.D x ID x WALL) 7.250 X 6.000 X .625	QUANTITY 17509 LB	396.00 FT	SHIPPED 09/02/14	DATE 09/02/14
--------------	---	----------------------	-----------	---------------------	------------------

CONDITION ASTM 513 Type 5 Produced to OD/ID Ref: WALL EW TUFFDOM STRESS RELIEVE ANNEAL			PART NO. REV.	S#00335344 50064541
--	--	--	------------------	------------------------

HEAT NO.	CHEMICAL ANALYSIS												GRAIN SIZE
	C	Mn	P	S	Si	Ni	Cr	Mo	Cu	V	Al	OTHER	
4131797	.16	1.41	.012	.003	.220	.010	.040	.010	.040	.002	.040	.0030 TI .0010 Cb .0020	

MECHANICAL PROPERTIES										MAGNAFLUX	
HEAT NO.	LOAD NO.	YIELD PSI	TENSILE PSI	ELONG % 2.0" 33	RED AREA %	HARDNESS		IMPACT FT.-LBS SIZE 10.0X10.0 TEMP C -20-30 RESULTS 128 57 140 68 133 65	FREQ.	SEVERITY	
						BHN	ROCKWELL RB 92				
4131797	T6457128	76900	89400								

JOMINY HARDENABILITY (EXPRESSED IN 16THS)																
HEAT NO.	1	2	3	4	5	6	7	8	10	12	14	16	20	24	28	32

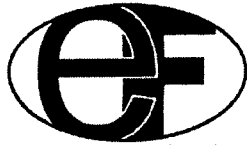
I-K RATING					SLAG-OXIDE RATING		
HEAT NO.	A	B	C	D	INGOT	OXIDE	SLAG

MELT SOURCE OTHER INSPECTION Melted and Manufactured in USA EN 10204 3.1	THIS TEST REPORT NOTARIZED WHEN REQUIRED SWORN AND SUBSCRIBED BEFORE ME THIS _____ DAY OF _____
--	---

Material under this mtr was not exposed to mercury during processing.

NOTARY PUBLIC

Frank Simeone



Edwards Fabrication

1385 Hwy. 35 Bypass S. O: (361) 790-7910
P.O. Box 2350 F: (361) 790-7927
Rockport, TX 78381

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 16522

Certificate Number			Date of Examination	
19351			09/11/14	
ID#	Part Number	Description	SWL*	Proofload
19351	7361-0864	4.0" Lift-Eye Clamp 2 Bolt	4205 lbs.	8410 lbs.
DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.				
* Safe Work Load				

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct
as contained in the records of Edwards Fabrication L.L.C.

Michael White
Test Operator



Thomas F. Edwards
President
Edwards Fabrication L.L.C.



Edwards Fabrication

1385 Hwy. 35 Bypass S. O: (361) 790-7910
P.O. Box 2350 F: (361) 790-7927
Rockport, TX 78381

tedwards@edwardsfabrication.com
www.edwardsfabrication.com

CERTIFICATE OF TEST

Client:
Gates E & S North America
134 44th Street
Corpus Christi, TX 78405

Purchase Order: 16522

Certificate Number			Date of Examination	
19356			09/11/14	
ID#	Part Number	Description	SWL*	Proofload
19356	7361-0864	4.0" Lift-Eye Clamp 2 Bolt	4208 lbs.	8416 lbs.
DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate.				
* Safe Work Load				

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

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Test Operator



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President
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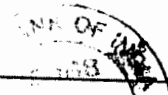
API Monogram Licensee
ISO 9001-2008 Certified
PED 97/23/EC
AD 2000-Merkblatt W0



MARS FORGE PVT. LTD.

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119
E-mail : info@marsforge.com, Web. : www.marsforge.com

MATERIAL TEST REPORT										
The certificate of Material as per EN 10204 3.1										Doc.No.F-P-21-12/
Customer : R & S OILFIELD INC.USA										TC Ref No : 21/K/2014-20
DATE 25.08.2014	Purchase Order Ref.No. : 520 Dated 31.07.2014		Invoice No. : 21		MF Drawing No. : MF 0294-01F					
Chemical Analysis Ref: 54/270714	Physical Analysis Ref MFT-644, MFI-147		Test Certificate Ref 025396		Mode of Shipping : SEA					
Quantity : 27 PCS	Part Description: Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI 4130 N.Q.T				PSL LEVEL 2	Raw Material Spec No MARS 6A -001 REV.03				
Heat Code Punch : R 20834	R & S Part Number : RSMFW410X...				Melting Practice : EAF→LRF→VD→CCM					
Heat Number: R 20834	Grade/Condition: SAE4130		Reduction Ratio: Raw Material Reduction Ratio : 1:3.02							
CHEMICAL ANALYSIS RESULTS										
Elements	C.	Mn.	Si.	Cr.	Ni.	Mo.	S.	P.	V.	Cu.
Minimum %	0.28	0.40	0.15	0.80	---	0.15	---	---	---	---
Maximum %	0.33	0.60	0.35	1.10	0.25	0.25	0.025	0.025	0.10	0.30
Heat Analysis %	0.32	0.55	0.19	1.07	0.21	0.22	0.005	0.008	0.003	0.05
MECHANICAL PROPERTIES (QTC SIZE: 4" x 4")					CHARPY IMPACT PROPERTIES					
(ASTM A 370)	Requirement	Actual	Size		10 x 10 x 55mm		DIRN		L	
0.2% Yield Strength (PSI)	75,000 PSI MIN	78798 PSI	Impact		20 Ft-Lbs Min @ -75° F					
Tensile Strength (PSI)	95,000 PSI MIN	104814 PSI	Energy (ft-lbs)		51.63		57.53		50.15	
% Elongation	18.0% MIN	25.20%	Average		53.10 Ft Lbs					
% Reduction Of Area	35.0% MIN	70.30%	L.E. (Inch)		0.026		0.029		0.024	
Hardness (HBW)	207-235 HBW	207 TO 229 HBW								
HEAT TREATMENT										
CYCLE	TEMPERATURE(C)	TEMPERATURE (F)	TIME@TEMP	QUENCH MEDIA						
Normalized	910 °C	1670 °F	150 Minutes	AIR COOLED						
Austenitized	880 °C	1616 °F	150 Minutes	WATER QUENCHED						
Tempered	695 °C	1283 °F	150 Minutes	AIR COOLED						
Water Temperature IN AT 35°C AND OUT AT 45°C										
NON DESTRUCTIVE EXAM (NDE)										
		Yes/No	Spec Number							
Ultrasonic Testing (UT)		NO	---							
Magnetic Particle Inspection (MPI)		YES	ASME Section-V, Article -7							
*Country of origin - India										
* We hereby declare that the material herein described is in accordance with specifications of the order.										



API Monogram Licensee
ISO 9001-2008 Certified
PED 97/23/EC
AD 2000-Merkblatt W0



MARS FORGE PVT. LTD

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119
E-mail : info@marsforge.com, Web. : www.marsforge.com

Doc No : F-P-21-17

MAGNETIC PARTICLE EXAMINATION REPORT

PART No.	: RSMFW410X	DATE	: 25.08.2014
PART NAME	: Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI 4130 N.Q.T	INSPECTOR/ LEVEL	: ASNT L-II
HEAT NO	: R 20834	QUANTITY	: 27 PCS
PROC No	: W-P-21-09	REJECT	: None
ACCEPT	: Acceptable		
WO/PO No.	: R&S PO#520 Dated 31.07.2014		

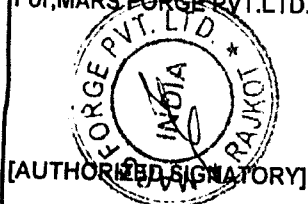
TEST PROCEDURE

EQUIPMENT	: "Magnafield "Make , Electromagnetic Crack Detector
DETECTING MEDIA	: Fluorescent Powder
METHOD	: Wet fluorescent method
CURRENT APPLY	: H.W.D.C./A.C. Current used
LOCATION	: Cover 100% (Assessable) area of the job
MAGNETIZATION	: Longitudinal
TYPE OF MAGNETIZATION	: Continuous
EXAMINATION	: Surface & sub surface defect.
REFERENCE STANDARD	: ASME Section V, Article 7, SE709
TESTED BY	: HITESH MAHETA
DATE OF TEST	: 02.08.2014

OBSERVATION : No relevant indication found

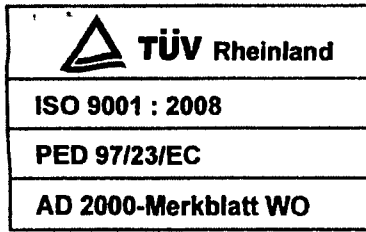
RESULT : Jobs are found satisfactory in MPT.

For, MARS FORGE PVT. LTD.



[AUTHORIZED SIGNATORY]





MARS FORGE PVT. LTD.

"Shraddha House" M-170, Gujarat Housing Board
Akshar Marg, Rajkot - 360 001. Gujarat (India)
Tel. No. : 91 - 281 - 244 83 83, 247 90 88, Fax : 91- 281 - 245533

Works : Rajkot Gondal Nh. 8-B, Village : Shapar, Dist. Rajkot (Guj.) Ind
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 2521
E-mail : info@marsforge.com, Web. : www.marsforge.co

TEST CERTIFICATE

TC Ref : 12/A/2011-2012

Date : 27-05-2012

Our Drawing No.	: MF 0285 P1
Heat No. Code	: R 15965
Quantity	: 159 Nos.
Sample Qty.	: 01 Nos.
Chemical Analysis Ref.	: 111/07052012
Physical Analysis Ref.	: AI-277
Test Certificate Ref.	: 1111

Customer : R & S OILFIELD INC. HOUSTON - USA.
Customer's Part No. : 4-1500 WN
Purchase Order Ref. : 172 / Dt.19-03-2012
Delivery Challan No. : 12/ DT : 27.05.2011
Vehicle No. : BY SEA

CHEMICAL ANALYSIS RESULTS :

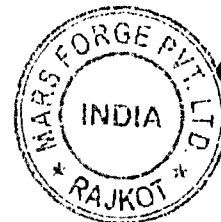
Material	Heat No.	C.	Mn.	Si.	Cr.	Ni.	Mo.	S.	P.	V.
Specified A350 LF2	SPECN.	---	0.60	0.10	--	---	---	---	--	---
		0.35	1.05	0.35	0.30	0.40	0.12	0.050	0.040	0.08
Actual	R 15965	0.20	0.93	0.20	0.058	0.076	0.021	0.008	0.009	0.002

Hardness Reqd. Range	Hardness Actual	ASTM Grain Size	Heat Treatment	Jominy Value	INCLUSION RATING			
					A	B	C	D
187 BHN MAX.	143 - 174 BHN	6-7	Normalised	---	<u>1.0</u> 0.5	<u>0.5</u> ---	---	<u>1.0</u> ---

* NORMALISED AT 930° C, SOAK FOR 120 MINUTES, AIR COOL.

PHYSICAL TEST RESULTS :

Heat Code On Forgings	Yield PSI.	UTS PSI.	%E	%RA.	Impact (dirn. - L, Size- 10x10x55 mm) 27 Joules min. at -50° F			
---	45000	70000	22.00	30.00	I	II	III	Avg.
PUNCH R 15965	50235	76393	33.80	67.10	67 1.40	65 2.30	63 1.31	65.16 J.



Handwritten Signature
QUALITY CONTROL





MORRIS INSPECTIONS

Mailing Address:
2316 Memorial Pkwy.
Portland, TX 78374-3206

Business Telephone
(361) 643-7066
Cellular Telephone
(361) 877-0776

QW-484 SUGGESTED FORMAT FOR MANUFACTURER'S RECORD OF WELDER
OR WELDING OPERATOR QUALIFICATION TESTS
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder's Name	JEFFREY CHARLES TOWNSEND		S. S. No.		
Welding Process(es)	Shielded Metal Arc Welding		Type	Manual	Position (QW-405.1)
Welding Procedure Specification No.	SM-4130	PQR No.	SM-4130	Backing (QW-402.7)	None
Material Spec. (QW-403) No.	HF-4130	Grade	LN80	P-No.	Group
To	HF-4130	Grade	LN80	P-No.	Group
Material Spec (QW403) No.	HF-4130	Grade	LN80	P-No.	Group
Test Thickness	.531" Range Up to 1.062"		Test Dia.	4.00"	Range 2 7/8" O.D. over
Process(es)	SMAW		SMAW		
Filler Metal (QW-404) Spec.	SFA 5.1	SFA 5.5	SFA		
	Class No. E-6010	Class No. E-8018	Class No.		
	F No. 3 A No. 1	F No. 4 A No. 3	F No.	A No.	
Filler Diameter (QW-404.6)	1/8"		5/32"		
Weld Deposit Thickness	.125"		.406"		
Consumable Insert (QW-404.22)	N/A		N/A		
Gas (QW-408) Shielding	N/A		N/A		
Flow Rate	N/A		N/A		
Gas (QW-408) Purge	N/A		N/A		
Flow Rate	N/A		N/A		
Elec. (QW-409) AC-DC	Direct		Direct		
Polarity	Reverse		Reverse		
Volt Range	22-26		23-27		
Amp Range	80-120		150-210		
Progression (QW-405.3)	Root	Up	Hot Pass	Up	Filler Up Cap Up
Transfer Mode (QW-409.2) GMAW	N/A				
Other			Preheat	700 F.	PWHT. N/A

For information Only
Material 4130 IS NOT listed in ASME Section IX
but acceptable.

Submerged Arc Flux Trade Name

Guided Bend Test Results (QW-482.2(a), QW-482.3(a), QW-482.3(b))

Specimen No.	Type	Figure No.	Results	Specimen No.	Type	Figure No.	Results
Radiographic Results in lieu of Sidebends							

Radiographic Test Results (QW-304 & QW-305)

For alternative qualification of groove welds by radiography

Radiographic Results: Satisfactory

Test Conducted by J. Morris - MORRIS INSPECTIONS

Laboratory—Test No. 09-019

We certify that the statements in this record are correct and that the test welds prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Date March 23, 2009

Organization
By

DU-TEX, INC.

(Details of record of tests are illustrative only and may be modified to conform to the type and number of test required by the Code.)
NOTE: Any essential variables in addition to those above shall be recorded. This form modified for information and typing purposes. (QW-301.4)



MORRIS INSPECTIONS

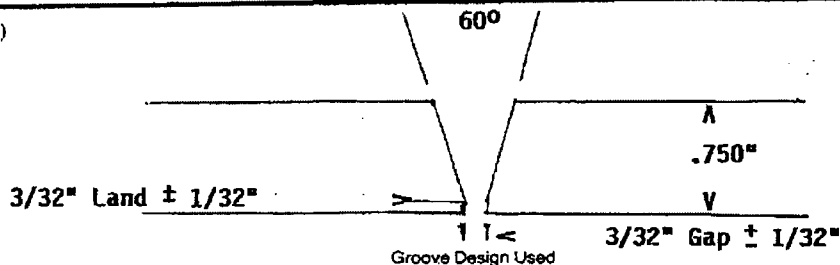
Mailing Address:
2316 Memorial Pkwy.
Portland, TX 78374-3206

Business Telephone
(361) 643-7066
Cellular Telephone
(361) 877-0776

QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR)
(See QW-201.2, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name DU-TEX, INC.
Procedure Qualification Record No. SM-4130 Date March 24, 2009
WPS No. SM-4130 Transfer Mode GMAW N/A
Welding Process(es) Shielded Metal Arc Welding
Types (Manual, Automatic, Semi-Auto.) Manual

JOINTS (QW-402)



BASE METALS (QW-403)

Material Spec. HF-4130 To HF-4130
Type or Grade LN 80 To LN 80
P-No. - Grp. - to P-No. - Grp. -
Thickness Tested .750" Range: .1875" - 1.500"
Diameter Tested 4.500" Range: Proc. unlimited
No Pass Greater than 1/2" in thickness No
Backing: Yes No XX Material Weld Metal only
Other Material 4130 IS NOT listed in ASME Section IX
but is acceptable.

FILLER METALS (QW404)

	<u>SMAW</u>	<u>SMAW</u>
Process(es)	<u>1</u>	<u>3</u>
Weld Metal Analysis A-No.	<u>1 & 2</u>	<u>Balance</u>
Weld Bead Number	<u>1/8"</u>	<u>5/32"</u>
Dia of Electrode	<u>3</u>	<u>4</u>
Filler Metal F-No.	<u>5.1</u>	<u>5.5</u>
SFA Specification	<u>E-6010</u>	<u>E-8018</u>
AWS Classification	<u>.250"</u>	<u>1.250"</u>
Weld Deposit Range	<u>.125"</u>	<u>.625"</u>
Weld Deposit Thickness	<u>N/A</u>	<u>N/A</u>
Tungsten: Size	<u>N/A</u>	<u>N/A</u>
Flux Trade Name:	<u>N/A</u>	<u>N/A</u>
Designation:	<u>N/A</u>	<u>N/A</u>
Other		

POSTWELD HEAT TREATMENT (QW-407)

Temperature None applied
Time
Other

GAS (QW-408)

Process(es) SMAW-N/A
Shielding
Flow Rate
Purge
Flow Rate
Other

ELECTRICAL CHARACTERISTICS (QW-409)

	<u>SMAW</u>	<u>SMAW</u>
Process(es)	<u>Direct</u>	<u>Direct</u>
Current	<u>Reverse</u>	<u>Reverse</u>
Polarity	<u>22-26</u>	<u>23-27</u>
Volts Range	<u>80-120</u>	<u>150-210</u>
AMPS Range		
Other		

POSITION (QW-405)

Position of Test Groove 6-G
Weld Progression (Up, Down, Flat)
Root Up Hot Pass Up Filler Up Cap Up

PREHEAT (QW-406)

Preheat Temp. 700 F.
Interpass Temp. Min. Max.
Other

TECHNIQUE (QW-410)

	<u>SMAW</u>	<u>SMAW</u>
Process(es)	<u>Variable</u>	<u>Variable</u>
Travel Speed	<u>String</u>	<u>String</u>
String or Weave Bead	<u>None</u>	<u>None</u>
Oscillation	<u>Multiple</u>	<u>Multiple</u>
Multi or Single Pass (per side)	<u>Single</u>	<u>Single</u>
Single or Multi Electrodes	<u>None</u>	<u>None</u>
Peening		
Other		

QW-483 (Back)

Tensile Test (QW-150)

NOTE: MATERIAL SPECS

Electrode Tensile Strength is 80,000 PSI

Specimen No.	Width	Thickness	Area	Ultimate Total Load lbs.	Ultimate Unit Stress psi	Character of Failure & Location
T - 1	.751"	.743"	.558"	45,000	80,645	Satisfactory-Broke in Weld Area
T - 2	.748"	.748"	.554"	44,400	80,144	Satisfactory-Broke in Weld Area

Guided Bend Test (QW-160)

Specimen No.	Type	Figure No.	Results	Specimen No.	Type	Figure	Results
6G - SB1	SBend	QW462.2	Satisfactory				
6G - SB2	SBend	QW462.2	Satisfactory				
6G - SB3	SBend	QW462.2	Satisfactory				
6G - SB4	SBend	QW462.2	Satisfactory				

Toughness Tests (QW-170)

Specimen No.	Notch Location	Specimen Size	Test Temp.	Impact Values	Lateral Exp.		Drop Weight	
					% Shear	Mils	Break	No Break

Average ft/lb for this size _____

Minimum ft/lb for this size _____

Fillet Weld Test (QW-180)

Pos.	Spec. No.	Contour	Leg No. 1	Leg No. 2	Throat	Bend Defects	Macro-Pent.	Results

Other Tests

Type of Test _____

Deposit Analysis _____

Other _____

Welder's Name Jeffrey Charles Townsend

S.S.# _____

Stamp No. N/ATest conducted by: J. Morris-MORRIS INSPECTIONSLaboratory Test No. 09-022

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Date March 25, 2009By Joe Morris

DU-TEX, INC.

Details of record of tests are illustrative only and may be modified to conform to the type and number of tests required by the Code. This form modified for information and typing purposes (QW200.2(D))

Non-Destructive Testing Report

Report # _____

Project: 192114

Ultrasonic	<u>✓</u>	Procedure #	<u>NRS- PA-VT/2013/R-00</u>
Magnetic Particle	<u> </u>	Standard #	<u>ASME</u>
Liquid Penetrant	<u> </u>	Section # Level	<u>II</u>

Shear wave	<u>✓</u>	Angle	AC	DC	Dwell Time
Straight Beam	<u>✓</u>	60	Wet	Dry	Penetrant #
Unit Type	<u>Dr 300A</u>	70	Continuous		Developer #
Ref Standard	<u>J.D. 100</u>	45	Residual		Cleaner #
Range	<u>5"</u>	0	Background		

[illegible]

Customer Representative: [Signature] Hours 2 Mileage

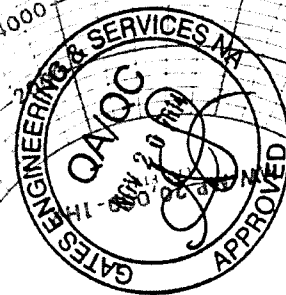
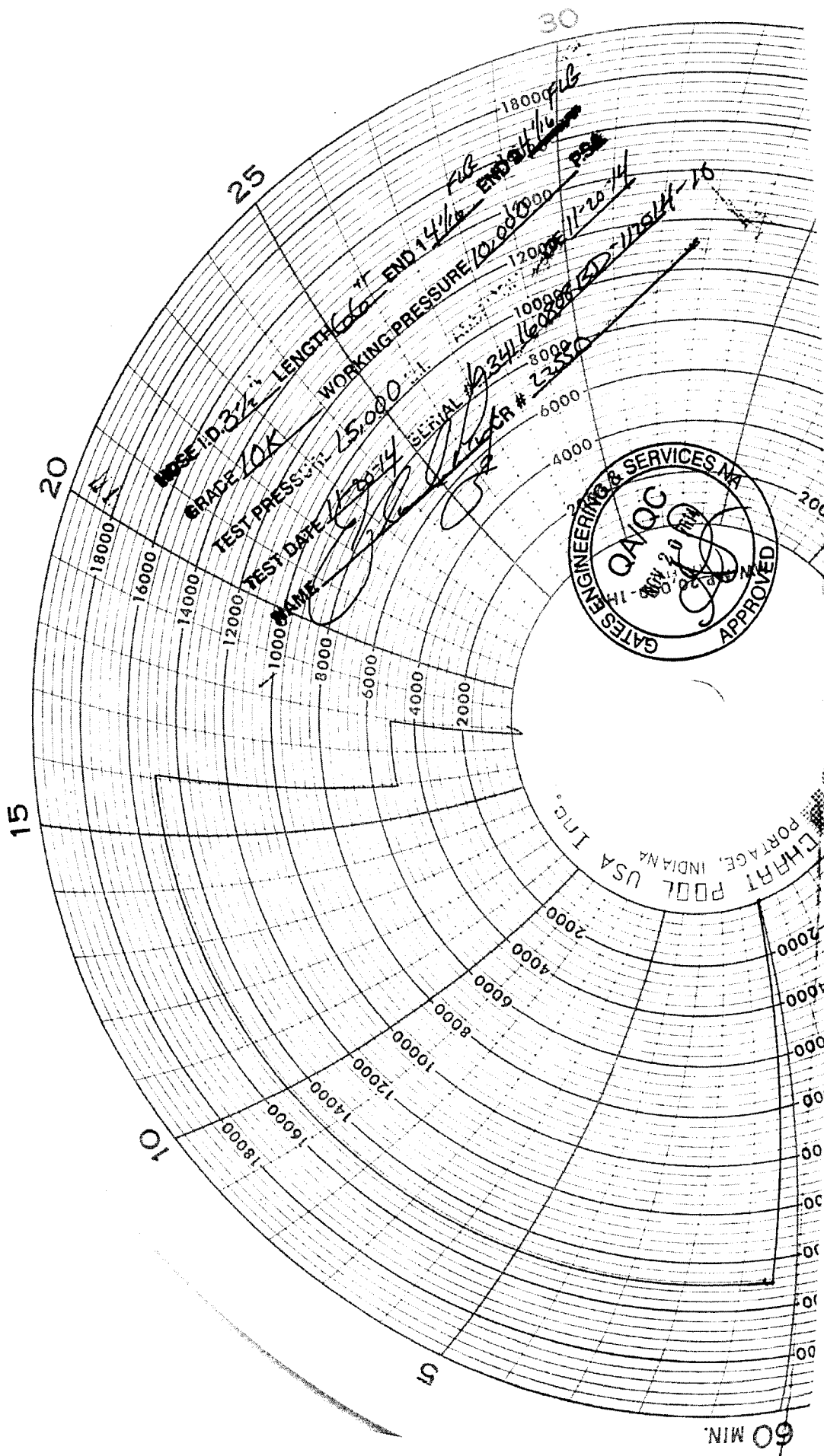


CHART POOL USA INC.
PORTAGE, INDIANA

60 MIN.



GATES E & S NORTH AMERICA, INC.
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: Tim.Cantu@gates.com
WEB: www.gates.com

10K CHOKE AND KILL ASSEMBLY PRESSURE TEST CERTIFICATE

Customer :
Customer Ref. :
Invoice No. :

AUSTIN DISTRIBUTING
PENDING
205663

Test Date:
Hose Serial No.:
Created By:

11/20/2014
D-112014-10
NORMA MATA

Product Description:

10K3.566.0CK4.1/1610KFLGE/E L/E

End Fitting 1 :
Gates Part No. :
Working Pressure :

4 1/16 10K FLG
4773-6291
10,000 PSI

End Fitting 2 :
Assembly Code :
Test Pressure :

4 1/16 10K FLG
L34116080813D-112014-10
15,000 PSI

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 15,000 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality Manager :
Date :
Signature :

QUALITY
11/20/2014

Technical Supervisor :
Date :
Signature :

PRODUCTION
11/20/2014



POWERING PROGRESS™

Gates E&S North America, Inc.

134 - 44th St.

CORPUS CHRISTI, TEXAS 78405

PHONE : (361) 887-9807

FAX: (361) 887-0812

Tim.Cantu@gates.com

CERTIFICATE OF CONFORMANCE

This is to verify that all Parts and/or Materials included in this shipment have been manufactured and/or processed in Conformance with applicable drawings and specifications, and that Records of Required Tests are on file and subject to examination. The following items were assembled at Gates E & S, North America Inc., facilities in Corpus Christi, TX, USA. This hose assembly was designed and manufactured to meet all the requirements of API Spec 7K.

CUSTOMER: AUSTIN DISTRIBUTING

CUSTOMERS P.O.#: PENDING

PART DESCRIPTION: 10K3.566.0CK4.1/1610KFLGE/E L/E

SALES ORDER #: 205663

QUANTITY: 1

SERIAL #: D-112014-10

SIGNATURE:

TITLE:

DATE:

QUALITY

11/20/2014





ILL ASSEMBLY PRESSURE TEST CERTIFICATE

AUSTIN DISTRIBUTING	Test Date:	11/20/2014
PENDING	Hose Serial No.:	D-112014-10
205663	Created By:	NORMA MATA

4 1/16 10K FLG	End Fitting 2 :	4 1/16 10K FLG
4773-6201	Assembly Code :	L34116080813D-112014-10
10,000 PSI	Test Pressure :	15,000 PSI

10K3.566.0CK4.1/1610KFLGE/E L/E

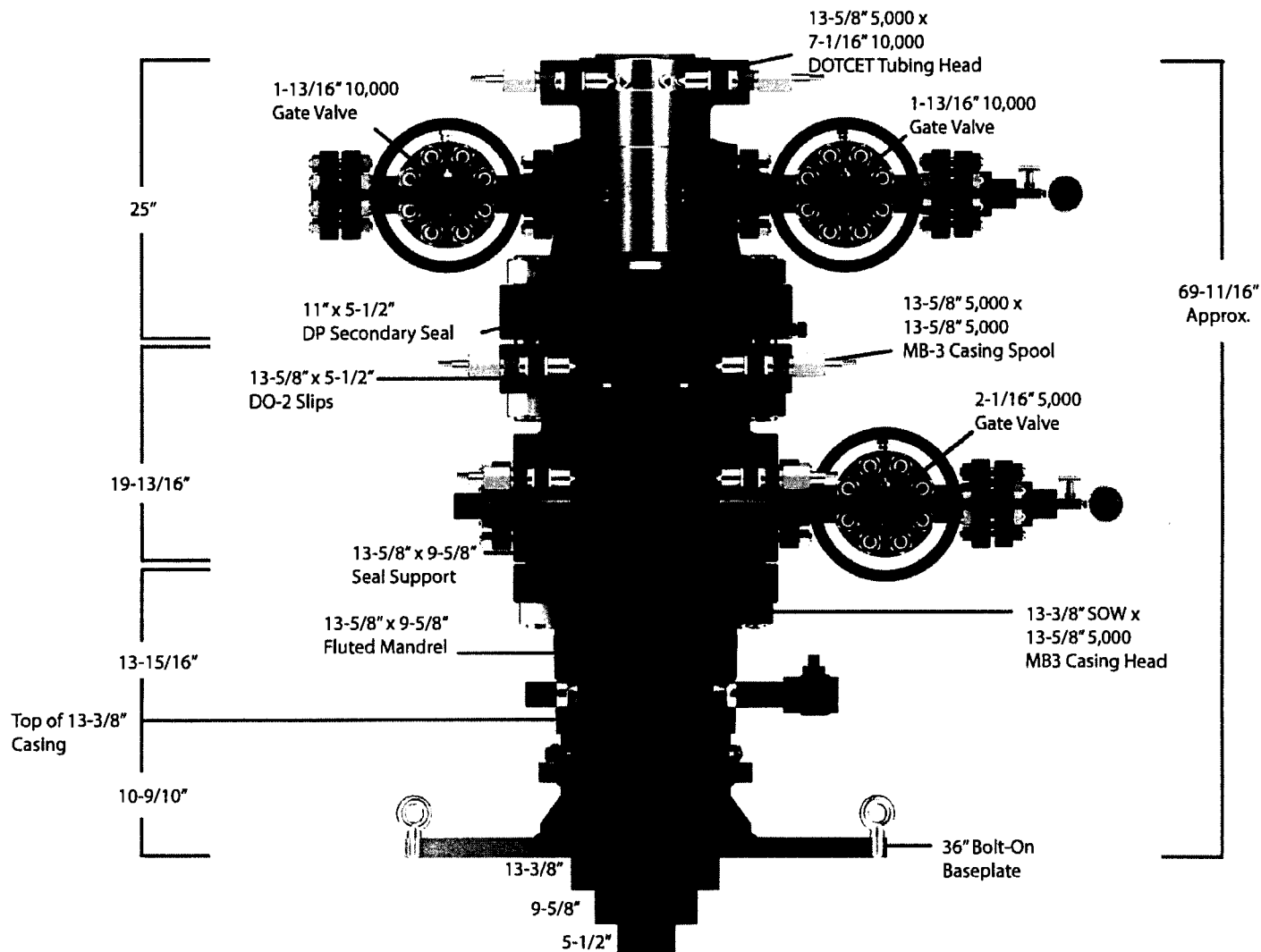
... that the following hose assembly has been tested to the



Gates E&S North America
134 - 44th St.
CORPUS CHRISTI, TEXAS 78405
PHONE : (361) 887-9807
FAX: (361) 887-0812
 Tim.Cantu@gates.com

PACKAGING: ENCLOSED CRATE

[illegible]



Quotation

Downing Wellhead Equipment

Oklahoma City,
Oklahoma - USA

Reference Data:

NOVO

Proprietary and Confidential

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TITLE:

NOVO OIL & GAS, MB-3 SYSTEM,
13-3/8" x 9-5/8" x 5-1/2"

DRAWN

CHECKED

APPROVED

SIZE

A

DWG. NO.

REV.

Scale:

Weight:

Sheet:

TECHNICAL DATA SHEET TMK UP SF 7.625 X 29.7 L80 F.

TUBULAR PARAMETERS

Nominal OD, (inch)	7.625
Wall Thickness, (inch)	0.375
Pipe Grade	L80 HC
Drift	Special

PIPE BODY PROPERTIES

PE Weight, (lbs/ft)	29.04
Nominal Weight, (lbs/ft)	29.70
Nominal ID, (inch)	6.875
Drift Diameter, (inch)	N/A
Nominal Pipe Body Area, (sq inch)	8.541

CONNECTION PARAMETERS

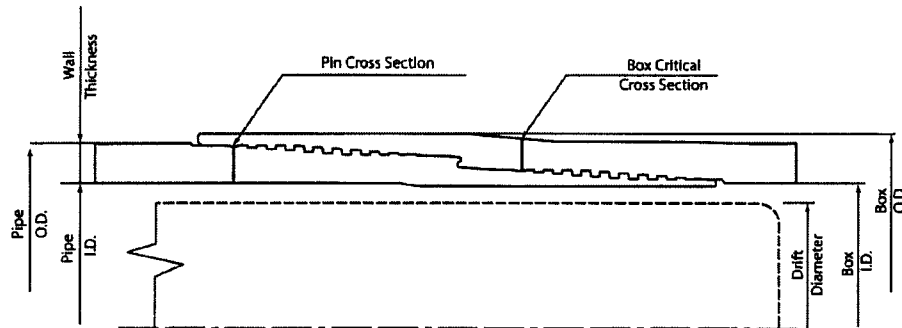
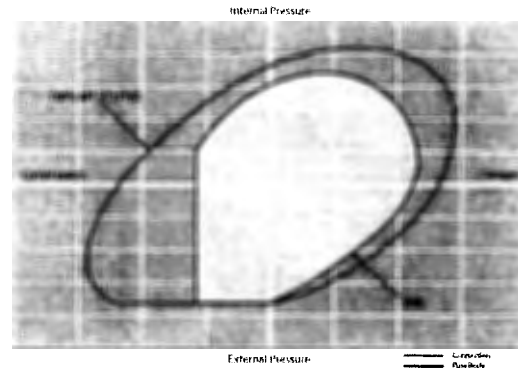
Connection OD (inch)	7.79
Connection ID, (inch)	6.844
Make-Up Loss, (inch)	5.640
Connection Critical Area, (sq inch)	6.777
Yield Strength in Tension, (klbs)	607
Yield Strength in Compression, (klbs)	607
Tension Efficiency	89%
Compression Efficiency	89%
Min. Internal Yield Pressure, (psi)	6 890
Collapse Pressure, (psi)	5 510
Uniaxial Bending (deg/100ft)	42.8

CONNECTION PROPERTIES

Yield Strength in Tension, (klbs)	683
Min. Internal Yield Pressure, (psi)	6 890
Collapse Pressure, (psi)	5 510

MAKE-UP TORQUES

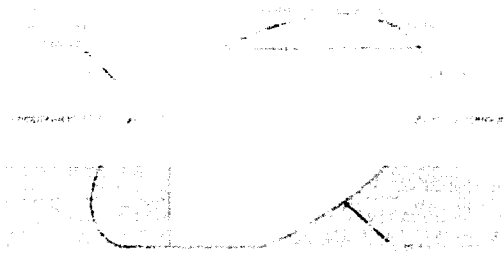
Yield Torque, (ft-lb)	22 800
Minimum Make-Up Torque, (ft-lb)	15 200
Optimum Make-Up Torque, (ft-lb)	16 700
Maximum Make-Up Torque, (ft-lb)	18 400



NOTE: The content of this Technical Data Sheet is for general information only and does not guarantee performance or imply fitness for a particular purpose, which only a competent design professional can determine, considering the specific installation and operation parameters. This information supersedes all prior versions. For this latest technical information that is printed or reprinted, is no longer controlled by TMK and might not be the latest information. Anyone using the information herein does so at their own risk. To verify that you have the latest technical information, please contact PАО "ТМК" Technical Sales in Russia (Tel. +7 (495) 775-70 00, Email: techsales@tmk-group.com) and TMK PSC in North America (Tel. +1 (781) 934-1044, Email: techsales@tmk-usa.com).

Print date: 05/18/2018 01:13

TECHNICAL DATA SHEET TMK UP DQX 5.5 X 20 P110

TUBULAR PARAMETERS		PIPE BODY PROPERTIES	
Nominal OD, (inch)	5.500	PE Weight, (lbs/ft)	19.81
Wall Thickness, (inch)	0.361	Nominal Weight, (lbs/ft)	20.00
Pipe Grade	P110	Nominal ID, (inch)	4.778
Coupling	Special	Drift Diameter, (inch)	4.653
Coupling Grade	P110	Nominal Pipe Body Area, (sq inch)	5.828
Drift	Standard	Yield Strength in Tension, (klbs)	641
CONNECTION PARAMETERS		Min. Internal Yield Pressure, (psi)	12 640
		Collapse Pressure, (psi)	11 110
Connection OD, (inch)	NA		
Connection ID, (inch)	4.778		
Make-Up Loss, (inch)	4.122		
Connection Critical Area, (sq inch)	0.000		
Yield Strength in Tension, (klbs)	NA		
Yield Strength in Compression, (klbs)	641		
Tension Efficiency	NA		
Compression Efficiency	100%		
Min. Internal Yield Pressure, (psi)	12 640		
Collapse Pressure, (psi)	11 110		
Uniaxial Bending (deg/100ft)	91.7		
MAKE-UP TORQUES			
Yield Torque, (ft-lb)	16 480		
Minimum Make-Up Torque, (ft-lb)	9 280		
Optimum Make-Up Torque, (ft-lb)	10 320		
Maximum Make-Up Torque, (ft-lb)	11 280		

NOTE: The content of this Technical Data Sheet is for general information only, and does not guarantee performance or fitness for a particular purpose when only a competent drilling professional can determine considering the specific installation and operation parameters. This information supersedes all previous versions for this connection information that is printed or downloaded, is no longer controlled by TMK and might not be the latest information. Anyone using the information herein does so at their own risk. To verify that you have the latest technical information, please contact PAF, TMK Technical Sales in Russia (Tel: +7 (495) 775-76 00, Email: techsales@tmk-group.com) and TMK P900 in North America (Tel: +1 (281) 449-1044, Email: techsales@tmkusa.com).

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GB Connection Performance Properties Sheet

Rev. 1 (08/25/2015)

ENGINEERING THE RIGHT CONNECTIONS™

Casing: 5.5 OD, 20 ppf
Casing Grade: P-110

Connection:
Coupling Grade: GB CD Butt 6.300
API P-110

PIPE BODY GEOMETRY

Nominal OD (in.)	5	1/2	Wall Thickness (in.)	0.361	Drift Diameter (in.)	4.653
Nominal Weight (ppf)		20.00	Nominal ID (in.)	4.778	API Alternate Drift Dia. (in.)	N/A
Plain End Weight (ppf)		19.83	Plain End Area (in. ²)	5.828		

PIPE BODY PERFORMANCE

Material Specification	P-110	Min. Yield Str. (psi)	110,000	Min. Ultimate Str. (psi)	125,000
Collapse					
API (psi)	11,100	Pl. End Yield Str. (kips)	641	Min. Int. Yield Press. (psi)	12,640
High Collapse (psi)	N/A	Yield Torque (ft-lbs)	74,420	Build Rate to Yield (°/100 ft)	91.7

GB CD Butt 6.300 COUPLING GEOMETRY

Coupling OD (in.)	6.300	Makeup Loss (in.)	4.2500
Coupling Length (in.)	8.500	Critical Cross-Sect. (in. ²)	8.527

GB CD Butt 6.300 CONNECTION PERFORMANCE RATINGS/EFFICIENCIES

Material Specification	API P-110	Min. Yield Str. (psi)	110,000	Min. Ultimate Str. (psi)	125,000
Tension					
Thread Str. (kips)	667	Internal Pressure (%)	100%	Build Rate to Yield (°/100 ft)	80.0
Min. Tension Yield (kips)	891	External Pressure (%)	100%	Yield Torque	
Min. Tension Ult. (kips)	1,013	Tension (%)	100%	Yield Torque (ft-lbs)	31,180
Joint Str. (kips)	667	Compression (%)	100%		
		Ratio of Areas (Cplg/Pipe)	1.46		

MAKEUP TORQUE

Min. MU Tq. (ft-lbs)	10,000	Max. MU Tq. (ft-lbs)	20,000	Running Tq. (ft-lbs)	See GBT RP
				Max. Operating Tq. (ft-lbs)*	29,620

Units: US Customary (lbm, in., °F, lbf)

1 kip = 1,000 lbs

* See Running Procedure for description and limitations.

See attached: Notes for GB Connection Performance Properties.

GBT Running Procedure (GBT RP): www.gb-tubulars.com/pdf/RP-GB-DWC-Connections.pdf

Blanking Dimensions: www.gb-tubulars.com/pdf/GB-DWC-Blanking-Dimensions.pdf

Connection yield torque rating based on physical testing or extrapolation therefrom



U. S. Steel Tubular Products

5/17/2018 5:40:28 PM

5.500" 20.00lbs/ft (0.361" Wall) P110 HC USS-CDC®

MECHANICAL PROPERTIES	Pipe	USS-CDC®	
Minimum Yield Strength	110,000	--	psi
Maximum Yield Strength	140,000	--	psi
Minimum Tensile Strength	125,000	--	psi
DIMENSIONS	Pipe	USS-CDC®	
Outside Diameter	5.500	6.050	in.
Wall Thickness	0.361	--	in.
Inside Diameter	4.778	4.778	in.
Standard Drift	4.653	4.653	in.
Alternate Drift	--	--	in.
Coupling Length	--	9.250	in.
Nominal Linear Weight, T&C	20.00	--	lbs/ft
Plain End Weight	19.83	--	lbs/ft
SECTION AREA	Pipe	USS-CDC®	
Critical Area	5.828	5.828	sq. in.
Joint Efficiency	--	100.0	%
PERFORMANCE	Pipe	USS-CDC®	
Minimum Collapse Pressure	12,200	12,200	psi
External Pressure Leak Resistance	--	9,760	psi
Minimum Internal Yield Pressure	12,640	12,370	psi
Minimum Pipe Body Yield Strength	641,000	--	lbs
Joint Strength	--	688,000	lbs
Compression Rating	--	413,000	lbs
Reference Length	--	22,933	ft
Maximum Uniaxial Bend Rating	--	59.1	deg/100 ft
MAKE-UP DATA	Pipe	USS-CDC®	
Make-Up Loss	--	4.63	in.
Minimum Make-Up Torque	--	10,500	ft-lbs
Maximum Make-Up Torque	--	13,000	ft-lbs
Connection Yield Torque	--	16,100	ft-lbs

1. Other than proprietary collapse and connection values, performance properties have been calculated using standard equations defined by API 5C3 and do not incorporate any additional design or safety factors. Calculations assume nominal pipe OD, nominal wall thickness and Specified Minimum Yield Strength (SMYS).
2. Uniaxial bending rating shown is structural only, and equal to compression efficiency.
3. Torques have been calculated assuming a thread compound friction factor of 1.0 and are recommended only. Field make-up torques may require adjustment based on actual field conditions (e.g. make-up speed, temperature, thread compound, etc.).
4. Reference length is calculated by joint strength divided by nominal threaded and coupled weight with 1.5 safety factor.
5. Connection external pressure leak resistance has been verified to 80% API pipe body collapse pressure following the guidelines of API 5C5 Call II.

Legal Notice

USS - CDC® (Casing Drilling Connection) is a trademark of U. S. Steel Corporation. This product is a modified API Buttress threaded and coupled connection designed for drilling with casing applications. All material contained in this publication is for general information only. This material should not therefore be used or relied upon for any specific application without independent competent professional examination and verification of accuracy, suitability and applicability. Anyone making use of this material does so at their own risk and assumes any and all liability resulting from such use. U. S. Steel disclaims any and all expressed or implied warranties of fitness for any general or particular application.

U. S. Steel Tubular Products
460 Wildwood Forest Drive, Suite 300S
Spring, Texas 77380

1-877-893-9461
connections@uss.com
www.usstubular.com

Technical Specifications

Connection Type: DWC/C-IS PLUS Casing standard	Size(O.D.): 5-1/2 in	Weight (Wall): 20.00 lb/ft (0.361 in)	Grade: VST P110 EC
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VST P110 EC	Material
125,000	Grade
135,000	Minimum Yield Strength (psi)
	Minimum Ultimate Strength (psi)

	Pipe Dimensions
5.500	Nominal Pipe Body O.D. (in)
4.778	Nominal Pipe Body I.D.(in)
0.361	Nominal Wall Thickness (in)
20.00	Nominal Weight (lbs/ft)
19.83	Plain End Weight (lbs/ft)
5.828	Nominal Pipe Body Area (sq in)

	Pipe Body Performance Properties
729,000	Minimum Pipe Body Yield Strength (lbs)
12,090	Minimum Collapse Pressure (psi)
14,360	Minimum Internal Yield Pressure (psi)
13,100	Hydrostatic Test Pressure (psi)

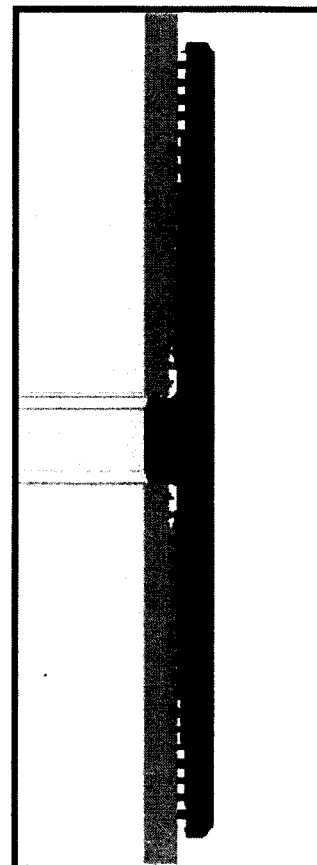
	Connection Dimensions
6.300	Connection O.D. (in)
4.778	Connection I.D. (in)
4.653	Connection Drift Diameter (in)
4.13	Make-up Loss (in)
5.828	Critical Area (sq in)
100.0	Joint Efficiency (%)

	Connection Performance Properties
729,000	Joint Strength (lbs)
26,040	Reference String Length (ft) 1.4 Design Factor
728,000	API Joint Strength (lbs)
729,000	Compression Rating (lbs)
12,090	API Collapse Pressure Rating (psi)
14,360	API Internal Pressure Resistance (psi)
104.2	Maximum Uniaxial Bend Rating [degrees/100 ft]

	Appoximated Field End Torque Values
16,600	Minimum Final Torque (ft-lbs)
19,100	Maximum Final Torque (ft-lbs)
21,600	Connection Yield Torque (ft-lbs)



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Houston, TX 77041
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Fax: 713-479-3234
E-mail: VAMUSAsales@vam-usa.com



For detailed information on performance properties, refer to DWC Connection Data Notes on following page(s).

Connection specifications within the control of VAM USA were correct as of the date printed. Specifications are subject to change without notice. Certain connection specifications are dependent on the mechanical properties of the pipe. Mechanical properties of mill proprietary pipe grades were obtained from mill publications and are subject to change. Properties of mill proprietary grades should be confirmed with the mill. Users are advised to obtain current connection specifications and verify pipe mechanical properties for each application.

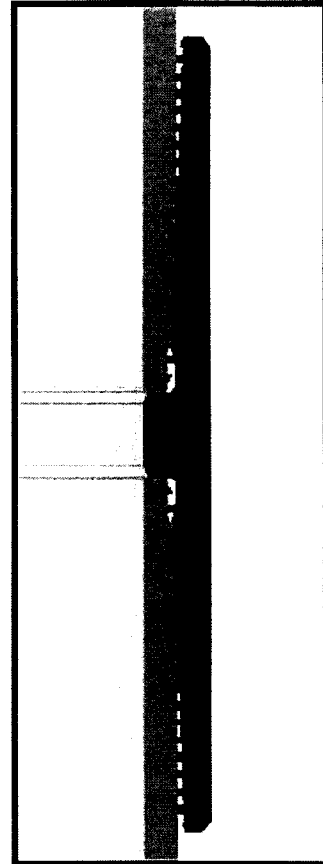
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2/6/2015



DWC Connection Data Notes:

1. DWC connections are available with a seal ring (SR) option.
2. All standard DWC/C connections are interchangeable for a give pipe OD. DWC connections are interchangeable with DWC/C-SR connections of the same OD and wall.
3. Connection performance properties are based on nominal pipe body and connection dimensions.
4. DWC connection internal and external pressure resistance is calculated using the API rating for buttress connections. API internal pressure resistance is calculated from formulas 31, 32, and 35 in the API Bulletin 5C3.
5. DWC joint strength is the minimum pipe body yield strength multiplied by the connection critical area.
6. API joint strength is for reference only. It is calculated from formulas 42 and 43 in the API Bulletin 5C3.
7. Bending efficiency is equal to the compression efficiency.
8. The torque values listed are recommended. The actual torque required may be affected by field conditions such as temperature, thread compound, speed of make-up, weather conditions, etc.
9. Connection yield torque is not to be exceeded.
10. Reference string length is calculated by dividing the joint strength by both the nominal weight in air and a design factor (DF) of 1.4. These values are offered for reference only and do not include load factors such as bending, buoyancy, temperature, load dynamics, etc.
11. DWC connections will accommodate API standard drift diameters.



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2/6/2015

Rana Salada Fed Com 3-string Casing Design Assumptions

Surface Casing

Collapse: $DF_C = 1.125$

- a. Full internal Evacuation: Collapse force is equal to mud gradient (0.433 psi/ft) in which the casing will be run and internal evacuation of casing.
- b. Cementing: Collapse force is equal net force of the planned cement slurry gradient (0.718 psi/ft) in which the casing will be run and internal force equivalent to fresh water displacement gradient (0.433 psi/ft).

Burst: $DF_B = 1.125$

- a. Casing Pressure Test: According to BLM Onshore Order No. 2 with 0.22 psi/ft or 1500 psi, whichever is greater but not to exceed 70% of the minimum internal yield.

Tensile: $DF_T = 1.60$

- a. Overpull: A tensile force of 100,000 lbs over string weight with a buoyancy factor of 0.8727 in water (8.33 ppg).

Intermediate Casing

Collapse: $DF_C = 1.125$

- a. Full Internal Evacuation: Collapse force is equal to mud gradient (0.531 psi/ft) in which the casing will be run and internal evacuation of casing.
- b. Cementing: Collapse force is equal net force of the planned cement slurry gradient (0.626 psi/ft) in which the casing will be run and internal force equivalent to the displacement of fluid gradient.

Burst: $DF_B = 1.125$

- a. Casing Pressure Test: According to BLM Onshore Order No. 2 with 0.22 psi/ft or 1500 psi, whichever is greater but to exceed 70% of the minimum internal yield.
- b. Gas Kick: Internal burst load of a 50 bbl gas kick at the casing with drill pipe in the hole. External force will be 10.2 ppg brine water gradient (0.531 psi/ft) and internal force will be with 10.0 ppg brine water gradient (0.521 psi/ft) with gas kick.

Tensile: $DF_T = 1.60$

- a. Overpull: A tensile force of 100,000 lbs over string weight with a buoyancy factor of 0.8441 in brine water (10.2 ppg).

Production Casing

Collapse: $DF_C = 1.125$

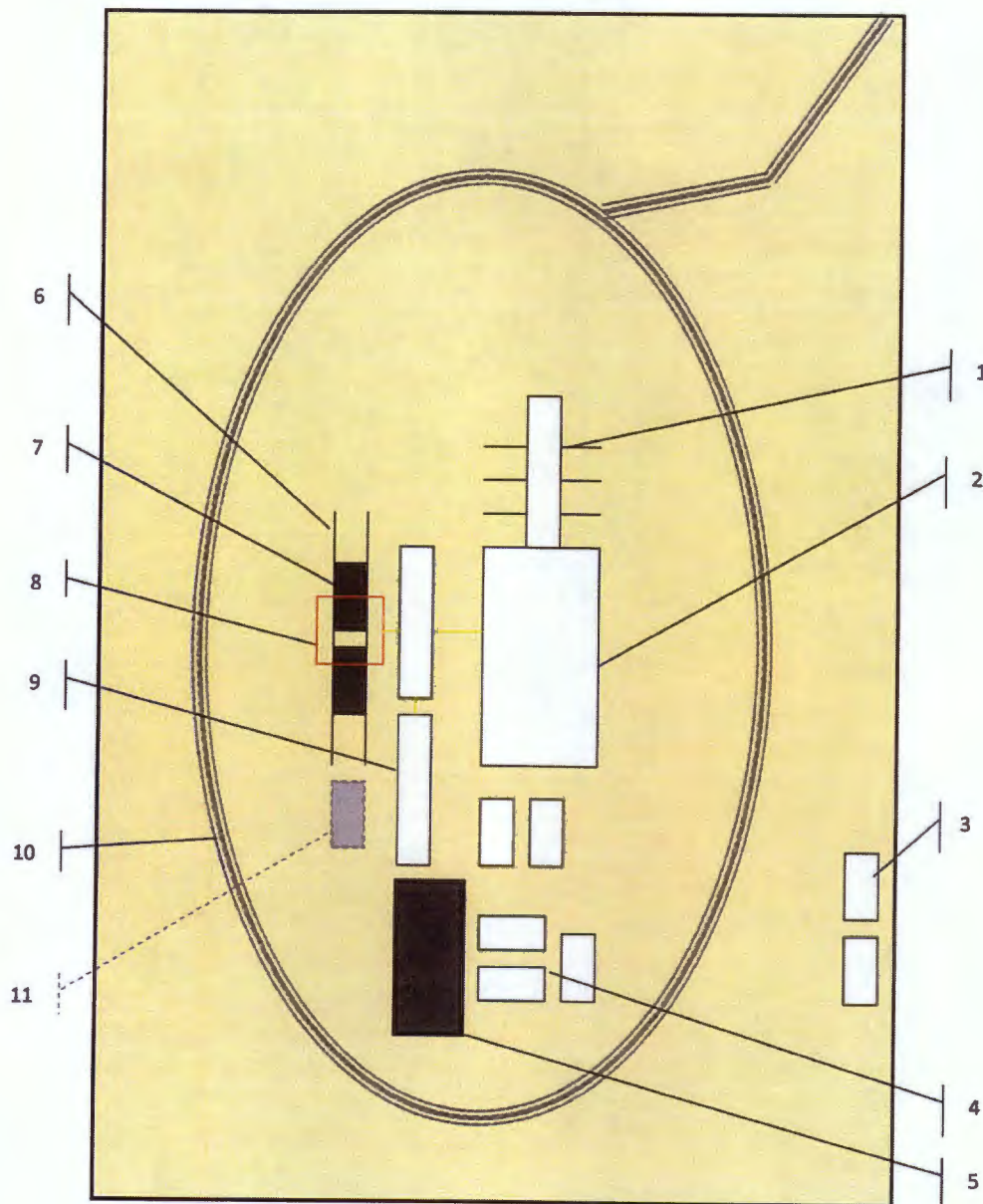
- a. Full Internal Evacuation: Collapse force is equal to mud gradient (0.531 psi/ft) in which the casing will be run and internal evacuation of casing.
- b. Cementing: Collapse force is equal net force of the planned cement slurry gradient (0.688 psi/ft) in which the casing will be run and internal force equivalent to fresh water displacement gradient (0.433 psi/ft).

Burst: $DF_B = 1.125$

- a. Pressure Test: Pressure test will be to 80% of Internal Yield Pressure of casing intended for fracture stimulation.

Tensile: $DF_T = 1.60$

- a. Overpull: A tensile force of 100,000 lbs over string weight with a buoyancy factor of 0.8472 in oil-based mud (10.0 ppg).



Schematic Closed Loop Drilling Rig*

1. Pipe Rack
2. Drill Rig
3. House Trailers/ Offices
4. Generator/Fuel/Storage
5. Overflow-Frac Tank
6. Skids
7. Roll Offs
8. Hopper or Centrifuge
9. Mud Tanks
10. Loop Drive
11. Generator (only for use with centrifuge)

*Not drawn to scale: Closed loop system requires at least 30 feet beyond mud tanks. Ideally 60 feet would be available

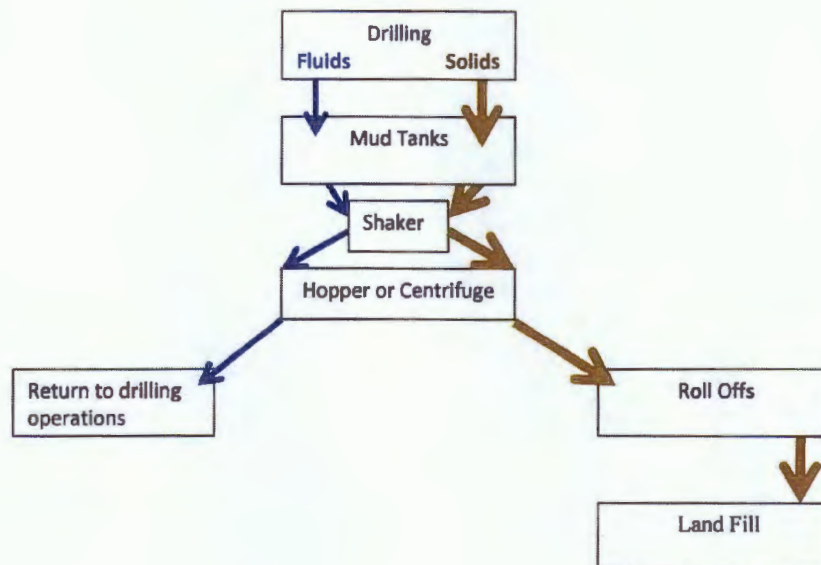


Above: Centrifugal Closed Loop System



Closed Loop Drilling System: Mud tanks to right (1)
Hopper in air to settle out solids (2)
Water return pipe (3)
Shaker between hopper and mud tanks (4)
Roll offs on skids (5)

Flow Chart for Drilling Fluids and Solids

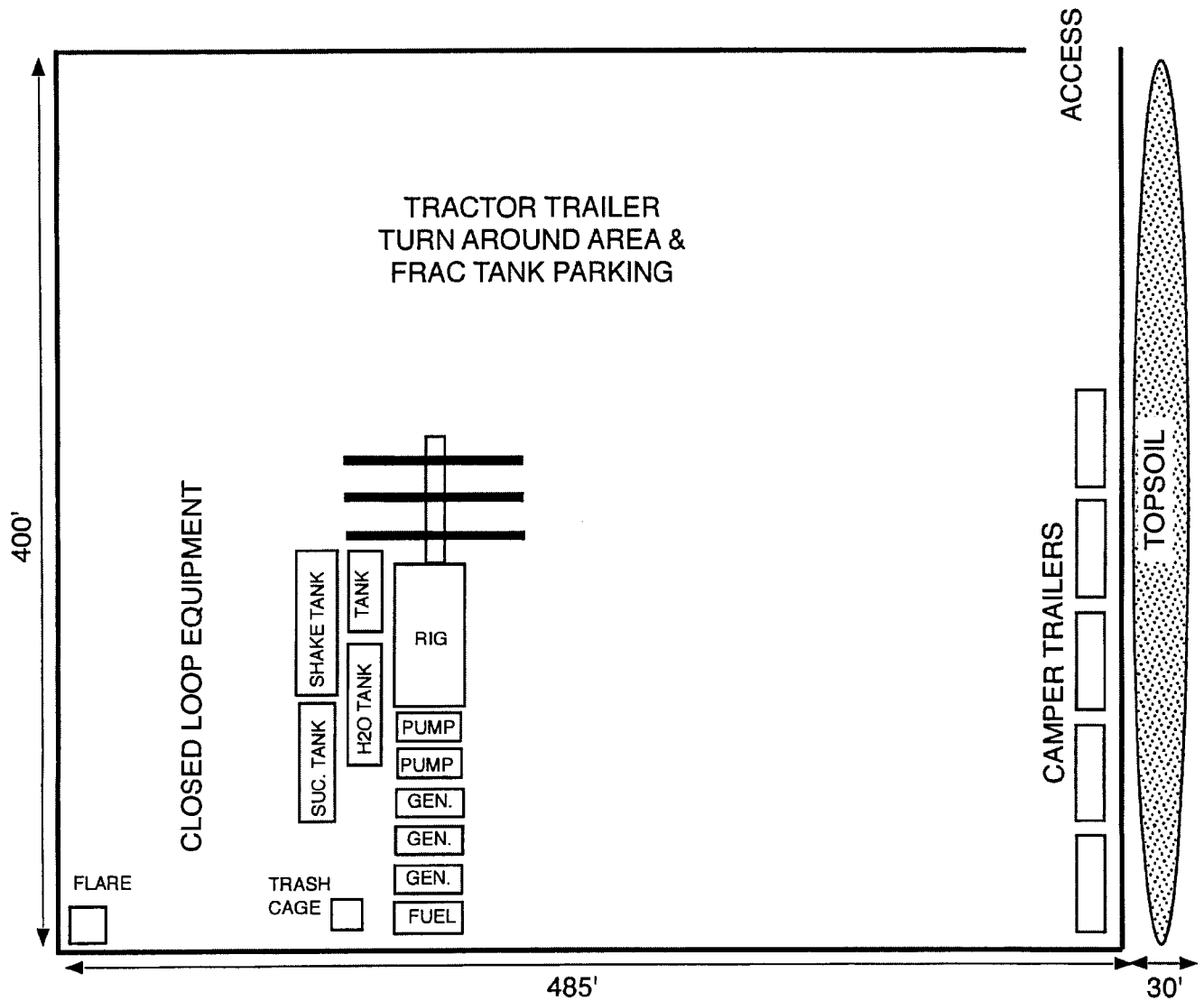


Photos Courtesy of Gandy Corporation Oil
 Field Service

PERMITS WEST, INC.
 PROVIDING PERMITS for LAND USERS
 17Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

Novo's
Rana Salada Fed Com 0605 121H
rig diagram

1" = 75'





H₂S Drilling Operations Plan

- a. All personnel will be trained in H₂S working conditions as required by Onshore Order 6 before drilling out of the surface casing.
- b. Two briefing areas will be established. Each will be at least 150' from the wellhead, perpendicular from one another, and easily entered and exited. See H₂S page 5 for more details.
- c. H₂S Safety Equipment/Systems:
 - i. Well Control Equipment
 - Flare line will be $\geq 150'$ from the wellhead and ignited by a pilot light.
 - Beware of SO₂ created by flaring.
 - Choke manifold will include a remotely operated choke.
 - Mud gas separator
 - ii. Protective Equipment for Essential Personnel
 - Every person on site will be required to wear a personal H₂S and SO₂ monitor at all times while on site. Monitors will not be worn on hard hats. Monitors will be worn on the front of the chest.
 - One self-contained breathing apparatus (SCBA) 30-minute rescue pack will be at each briefing area. Two 30-minute SCBA packs will be stored in the safety trailer.
 - Four work/escape packs will be on the rig floor. Each pack will have a long enough hose to allow unimpaired work activity.
 - Four emergency escape packs will be in the doghouse for emergency evacuation.
 - Hand signals will be used when wearing protective breathing apparatus.
 - Stokes litter or stretcher
 - Two full OSHA compliant body harnesses
 - A 100-foot long x 5/8 inch OSHA compliant rope
 - One 20-pound ABC fire extinguisher

iii. H₂S Detection & Monitoring Equipment

- Every person on site will be required to wear a personal H₂S and SO₂ monitor at all times while on site. Monitors will not be worn on hard hats. Monitors will be worn on the front of the chest.
- A stationary detector with three sensors will be in the doghouse.
- Sensors will be installed on the rig floor, bell nipple, and at the end of the flow line or where drilling fluids are discharged.
- Visual alarm will be triggered at 10 ppm.
- Audible alarm will be triggered at 10 ppm.
- Calibration will occur at least every 30 days. Gas sample tubes will be kept in the safety trailer.

iv. Visual Warning System

- Color-coded H₂S condition sign will be set at the entrance to the pad.
- Color-coded condition flag will be installed to indicate current H₂S conditions.
- Two wind socks will be installed that will be visible from all sides.

v. Mud Program

- A water based mud with a pH of ≥ 10 will be maintained to control corrosion, H₂S gas returns to the surface, and minimize sulfide stress cracking and embrittlement.
- Drilling mud containing H₂S gas will be degassed at an optimum location for the rig configuration.
- This gas will be piped into the flare system.
- Enough mud additives will be on location to scavenge and/or neutralize H₂S where formation pressures are unknown.

vi. Metallurgy

- All equipment that has the potential to be exposed to H₂S will be suitable for H₂S service.
- Equipment that will meet these metallurgical standards include the drill string, casing, wellhead, BOP assembly, casing head and spool, rotating head, kill lines, choke, choke manifold and lines, valves, mud-gas separators, DST tools, test units, tubing, flanges, and other related equipment (elastomer packings and seals).

vii. Communication from well site

- Cell phones and/or two-way radios will be used to communicate from the well site.

- d. A remote-controlled choke, mud-gas separator, and a rotating head will be installed before drilling or testing any formation expected to contain H₂S.

Company Personnel to be Notified

Kurt Shipley, Vice-President - Operations	Office: (405) 609-1596
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Local & County Agencies

Loving Fire Department	911 or (575) 745-3600
Eddy County Sheriff (Carlsbad)	911 (575) 887-7551
Eddy County Emergency Management (Carlsbad)	(575) 887-9511
Carlsbad Medical Center Hospital	(575) 887-4100
Eddy County South Road Department (Carlsbad)	(575) 885-4835

State Agencies

NM State Police (Carlsbad)	(575) 885-3138
NM Oil Conservation (Artesia)	(575) 748-1283
NM Oil Conservation (Santa Fe)	(505) 476-3440
NM Dept. of Transportation (Roswell)	(575) 637-7201

Federal Agencies

BLM Carlsbad Field Office	(575) 234-5972
National Response Center	(800) 424-8802
US EPA Region 6 (Dallas)	(800) 887-6063
	(214) 665-6444

Residents within 2 miles

none

Air Evacuation

Med Flight Air Ambulance (Albuquerque)	(800) 842-4431
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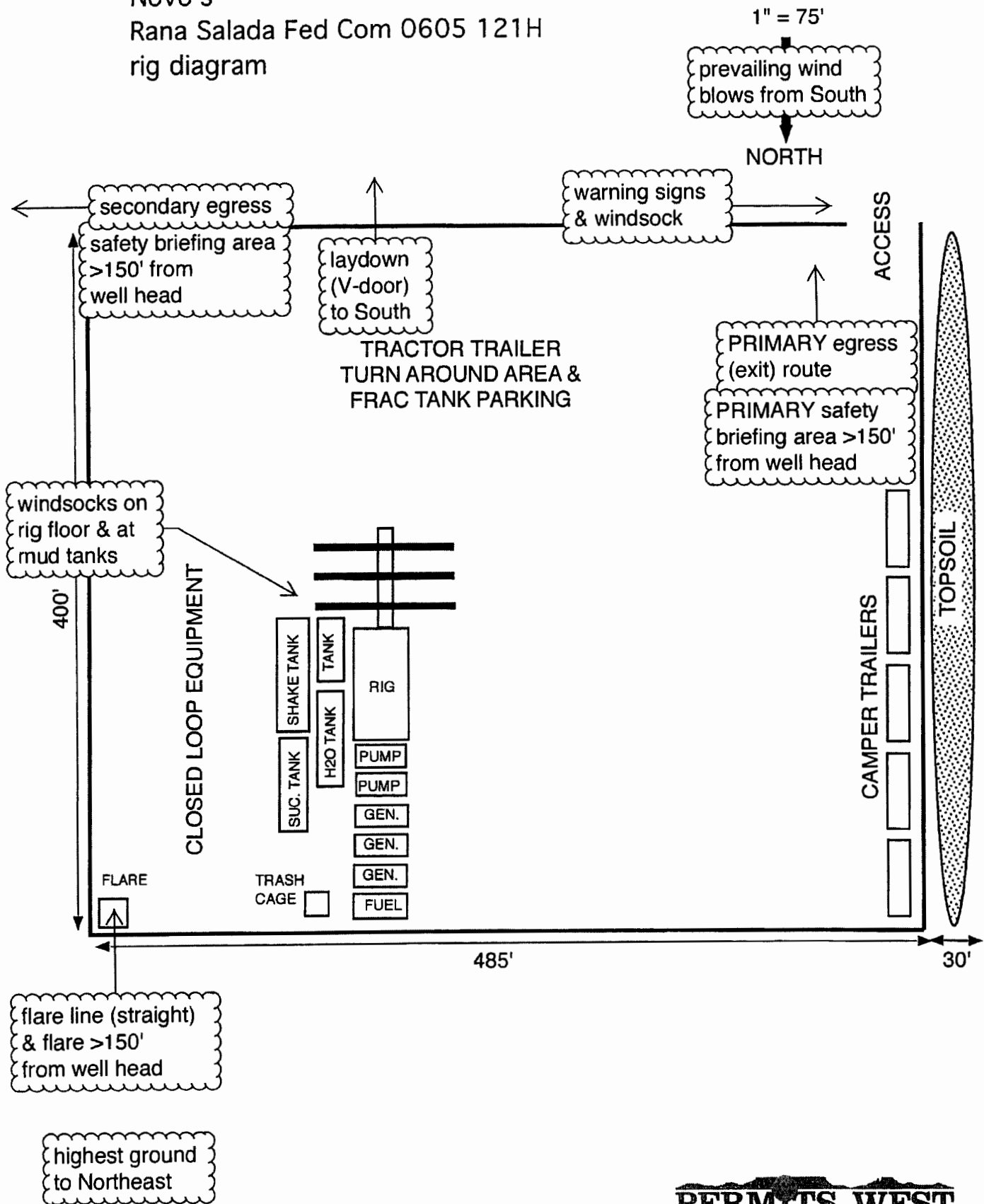
Lifeguard (Albuquerque)	(888) 866-7256
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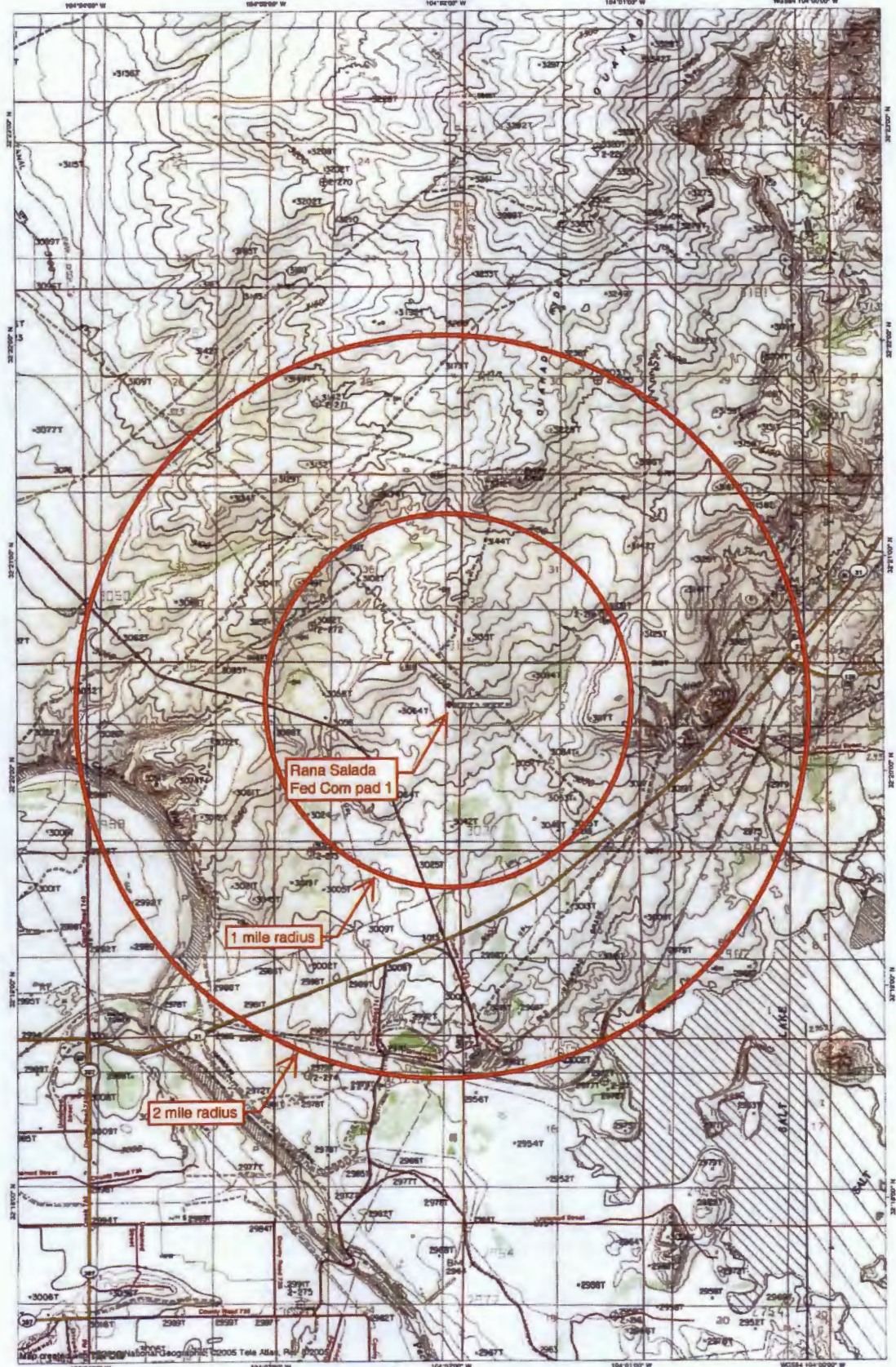
Veterinarians

Desert Willow Veterinary Services (Carlsbad)	(575) 885-3399
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Animal Care Center (Carlsbad)	(575) 885-5352
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Novo's
Rana Salada Fed Com 0605 121H
rig diagram





Novo Oil & Gas Northern Delaware, LLC
Rana Salada Fed Com 0605 121H
SHL 1127' FNL & 335' FEL 1-23S-28E
BHL 330' FNL & 1650' FEL 5-23S-29e
Eddy County, NM

SURFACE PLAN PAGE 1

Surface Use Plan

1. ROAD DIRECTIONS & DESCRIPTIONS (See MAPS 1 – 5)

From the junction of US 285 and US 62/180 in Carlsbad...
Go SE 9.9 miles on US 285 to the equivalent of Mile Post 23.4
Then turn left and go East 5-1/4 miles on paved NM 31
Turn left and go NW 1.6 miles on paved County Road 605 (Refinery Road)
Then turn right and go N 0.15 mile on a caliche road
Then bear right and go East ¾ mile on a caliche road
Then turn right and go S 0.2 mile on a caliche road*
Then turn left and go East 221' cross-country to the pad

*For access to the central tank battery (CTB)
Go South 75' on the same caliche road
Then turn left and go SE 331' cross-country to the CTB

Non-state and non-county roads will be maintained as needed to Gold Book standards. This includes pulling ditches, preserving the crown, and cleaning culverts. This will be done at least once a year, and more often as needed.

2. ROAD TO BE BUILT OR UPGRADED (See MAPS 3 - 5)

The 552' of new local roads will be crowned and ditched, have a $\leq 24'$ wide driving surface, and be surfaced with caliche. Pipelines that are crossed will be padded. Maximum disturbed width = 30'. Maximum grade = 5%. Maximum cut or fill = 3'. No culvert, cattle guard, or vehicle turn out is needed. Upgrading will consist of filling potholes with caliche as needed.

Novo Oil & Gas Northern Delaware, LLC
Rana Salada Fed Com 0605 121H
SHL 1127' FNL & 335' FEL 1-23S-28E
BHL 330' FNL & 1650' FEL 5-23S-29e
Eddy County, NM

SURFACE PLAN PAGE 2

3. EXISTING WELLS (See MAP 6)

Existing oil, gas, SWD, and P&A wells are within a mile. No water or injection well is within a mile radius.

4. PROPOSED PRODUCTION FACILITIES (See MAP 7)

A central tank battery (CTB) will be built immediately north of the well pad. Flare and/or CBU will be set on the northeast corner of the CTB. Process equipment (e. g., separators, heater-treaters) will be placed on the east side of the CTB. Tank battery will be on the north side of the CTB. No power line is planned at this time. Novo is not planning any off-pad pipelines at this time. Lucid may run a gas line to the CTB, but this has not been finalized.

5. WATER SUPPLY (See MAP 8)

Water will be trucked from an existing water well (C 03607) on private (Branson) land in NENE 24-21s-27e.

6. CONSTRUCTION MATERIALS & METHODS (See MAPS 9 - 14)

NM One Call (811) will be notified before construction starts. Top ≈6" of soil and brush will be stockpiled west of the well pad and CTB. V-door will face south. Closed loop mud system will be used. Caliche will be hauled from an existing caliche pit on private (McDonald) land in SESE 16-23s-28e.

Entire 600' x 600' well pad will be graded. However, only a 400' x 485' sub-pad will initially be surfaced with caliche to accommodate the first three wells. As more wells are added, then more of the pad will be surfaced with more caliche. In the interim, the unsurfaced area will be ripped, harrowed, seeded, and revegetated.

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Eddy County, NM

SURFACE PLAN PAGE 3

7. WASTE DISPOSAL

All trash will be placed in a portable trash cage. It will be hauled to the Lea County landfill. There will be no trash burning. Contents (drill cuttings, mud, salts, and other chemicals) of the mud tanks will be hauled to R360's state approved (NM-01-0006) disposal site at Halfway. Human waste will be disposed of in chemical toilets and hauled to the Carlsbad wastewater treatment plant.

8. ANCILLARY FACILITIES

There will be no airstrip or camp. Camper trailers will be on location for the company man, tool pusher, and mud logger.

9. WELL SITE LAYOUT (See MAPS 9-14)

Also see Rig Layout diagram for depictions of the well pad, trash cage, access onto the location, parking, living facilities, and rig orientation.

10. RECLAMATION (See MAPS 15-18)

A 240' x 300' (= 1.65 acres) working area centered on the wells will remain after interim reclamation. Once the last well is plugged, then the pad, CTB, and new roads will be reclaimed within 6 months of plugging. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM requirements. Roads will be blocked. Noxious weeds will be controlled.

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SHL 1127' FNL & 335' FEL 1-23S-28E
BHL 330' FNL & 1650' FEL 5-23S-29e
Eddy County, NM

SURFACE PLAN PAGE 4

Land use:

221' x 30' road to pad = 0.15 acre
331' x 30' road to CTB = 0.23 acre
300' x 520' CTB = 3.58 acres
+ 600' x 600' pad = 8.26 acres
12.22 acres short term
- 6.36 acres interim reclamation
5.86 acres long term

11. SURFACE OWNER

All construction will be on BLM. BLM office is the Carlsbad Field Office, 620 E. Greene, Carlsbad NM 88220. Phone is 575 234-5972.

12. OTHER INFORMATION

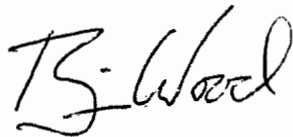
On-site inspection was held with Colleen Cepero Rios and Jim Rutley (both BLM) on March 21, 2018. Lone Mountain Archaeological Services will inspect a block and report on the project.

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SHL 1127' FNL & 335' FEL 1-23S-28E
BHL 330' FNL & 1650' FEL 5-23S-29e
Eddy County, NM

SURFACE PLAN PAGE 5

CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U. S. C. 1001 for the filing of false statements. Executed this 8th day of July, 2018.

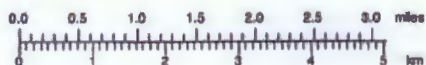
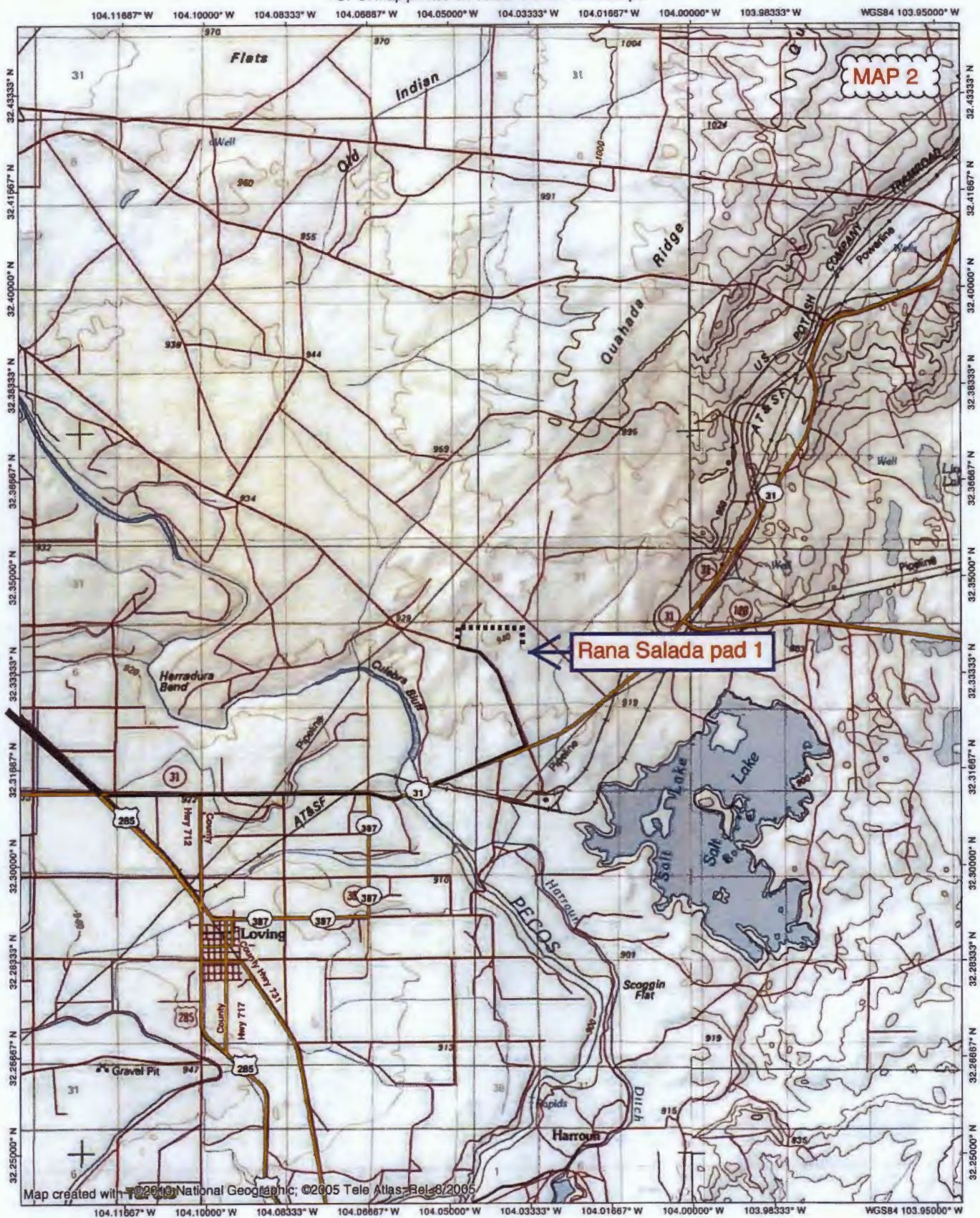


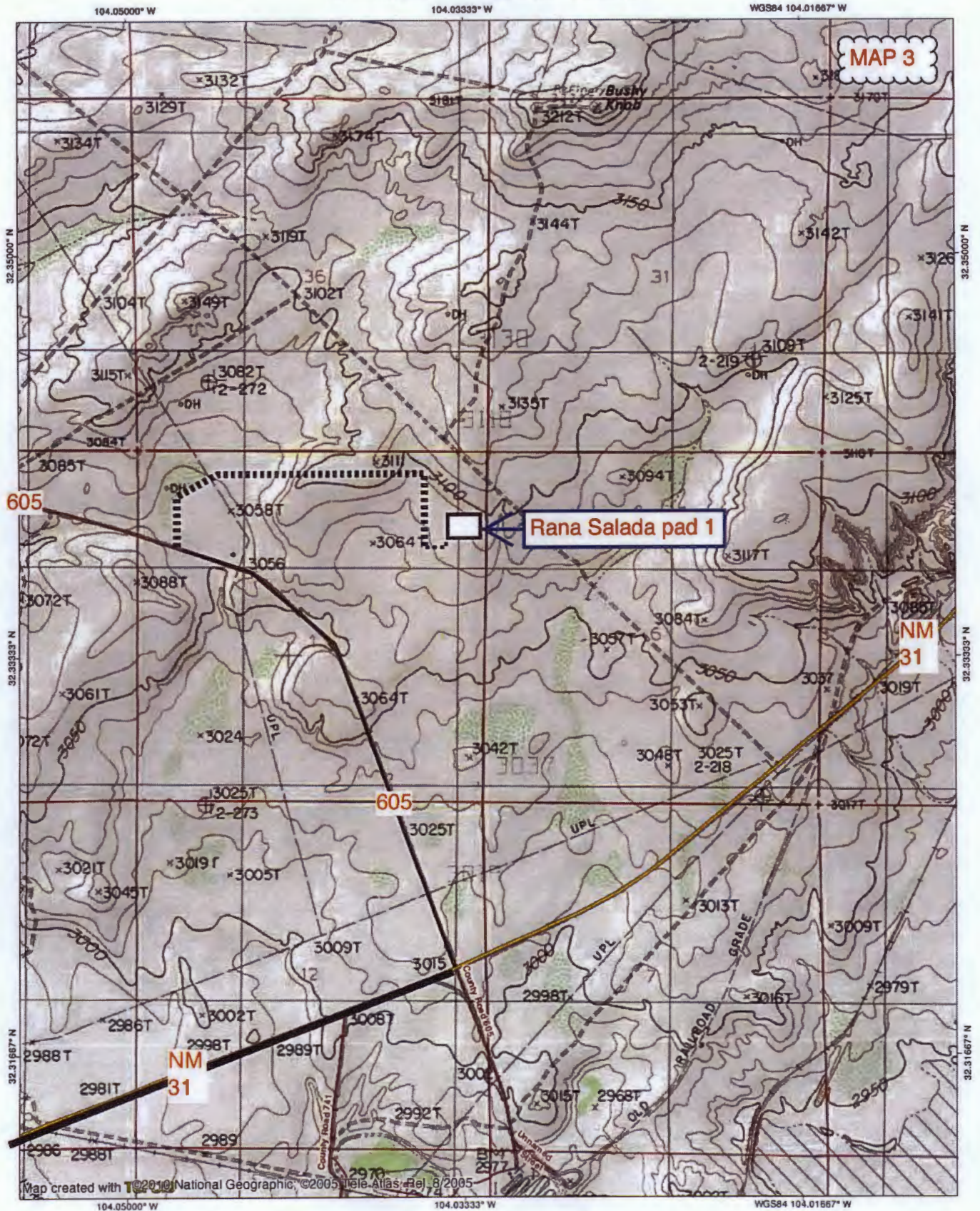
Brian Wood, Consultant
Permits West, Inc.
37 Verano Loop, Santa Fe, NM 87508
(505) 466-8120 FAX: (505) 466-9682 Cellular: (505) 699-2276

Field representative will be:
Kurt Shipley
Vice President, Operations
Novo Oil & Gas Northern Delaware, LLC
105 North Hudson Ave., Suite 500
Oklahoma City OK 73102
Office: (405) 609-1596
Cell: (405) 404-0414



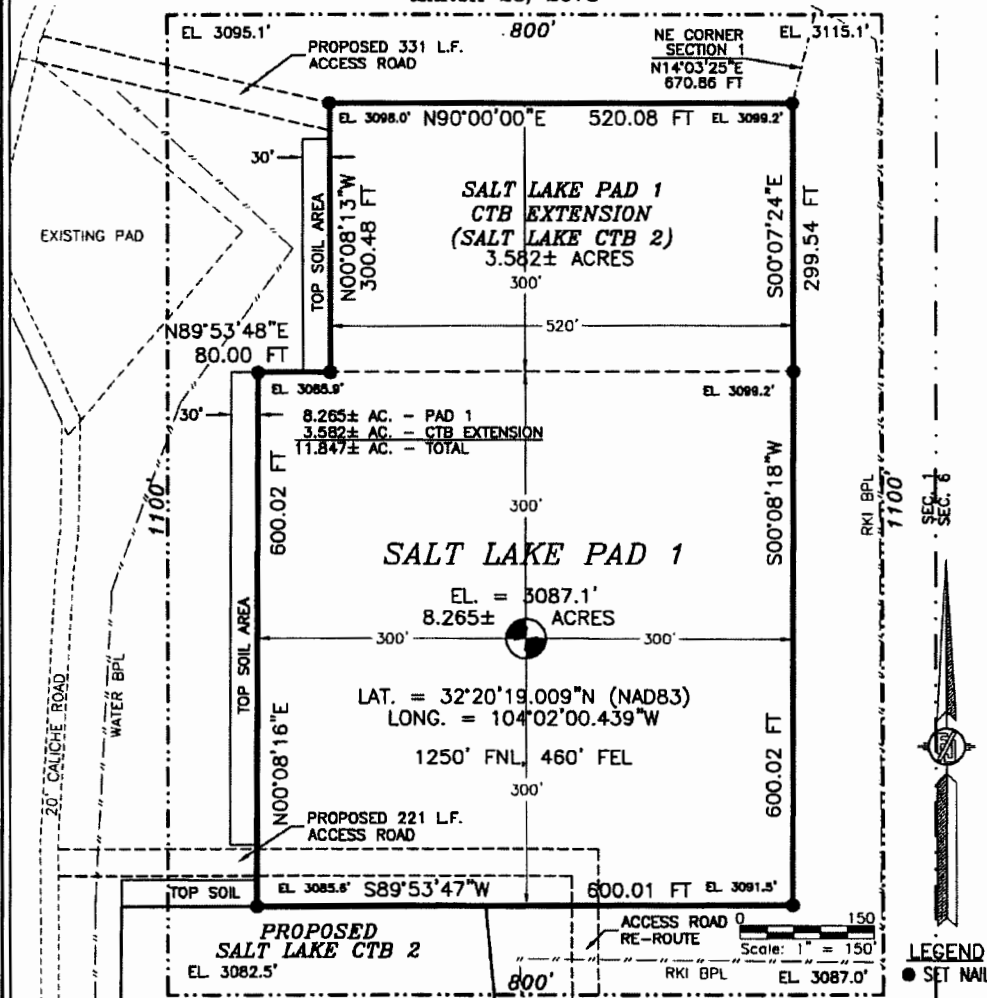
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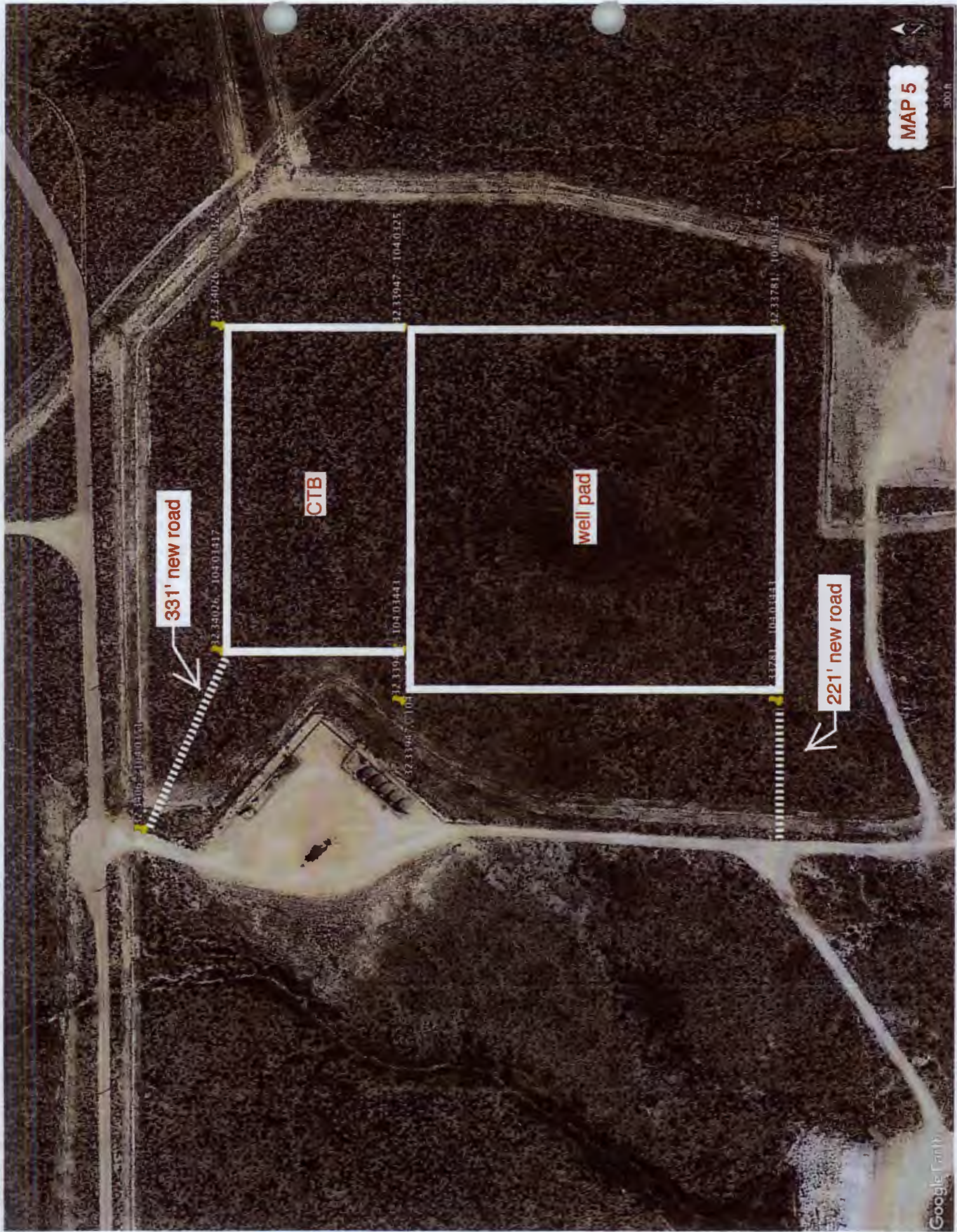


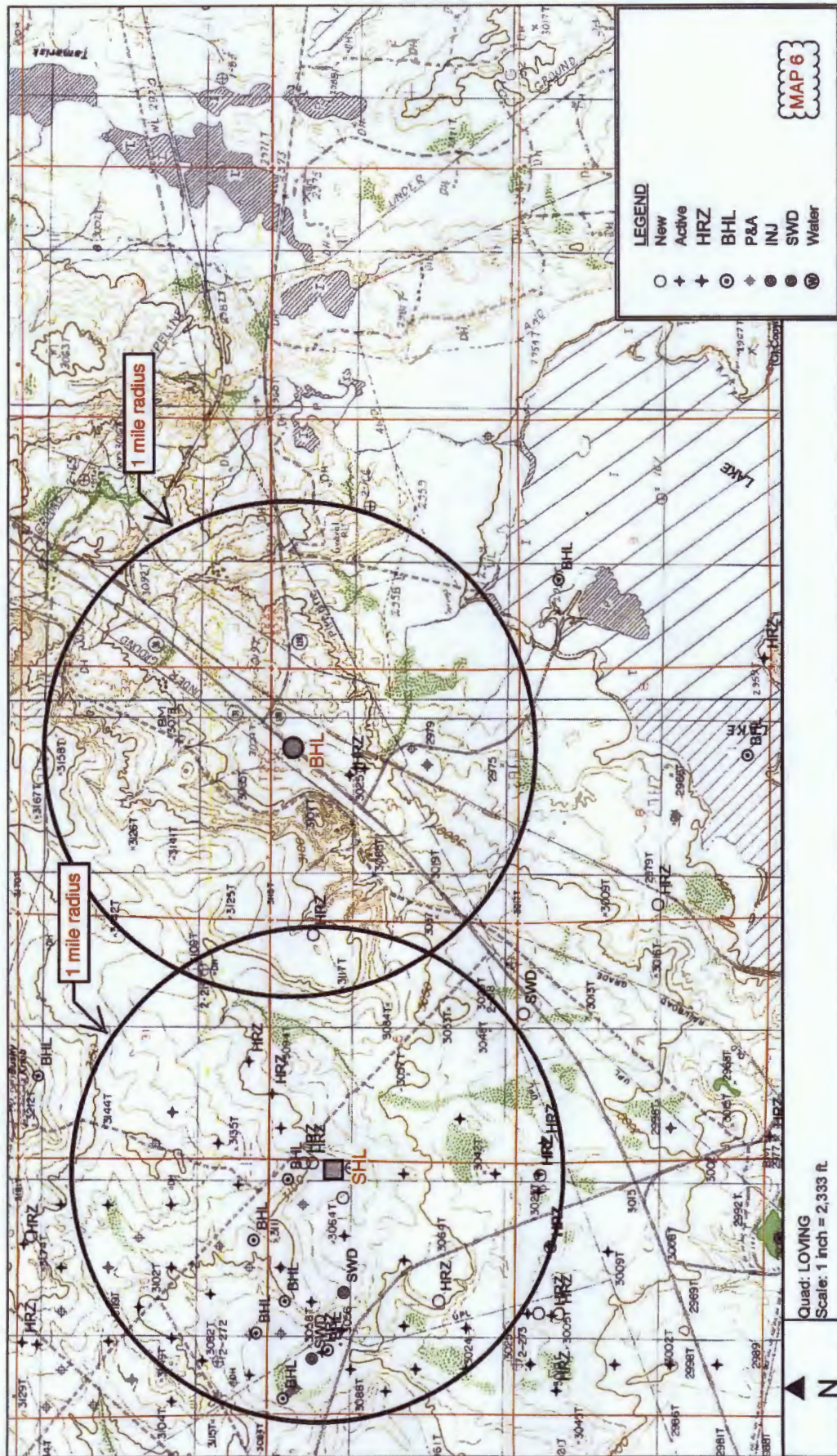


SALT LAKE PAD 1
NOVO OIL AND GAS, LLC
 IN THE W/2 NE/4 OF
SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
MARCH 23, 2018

MAP 4

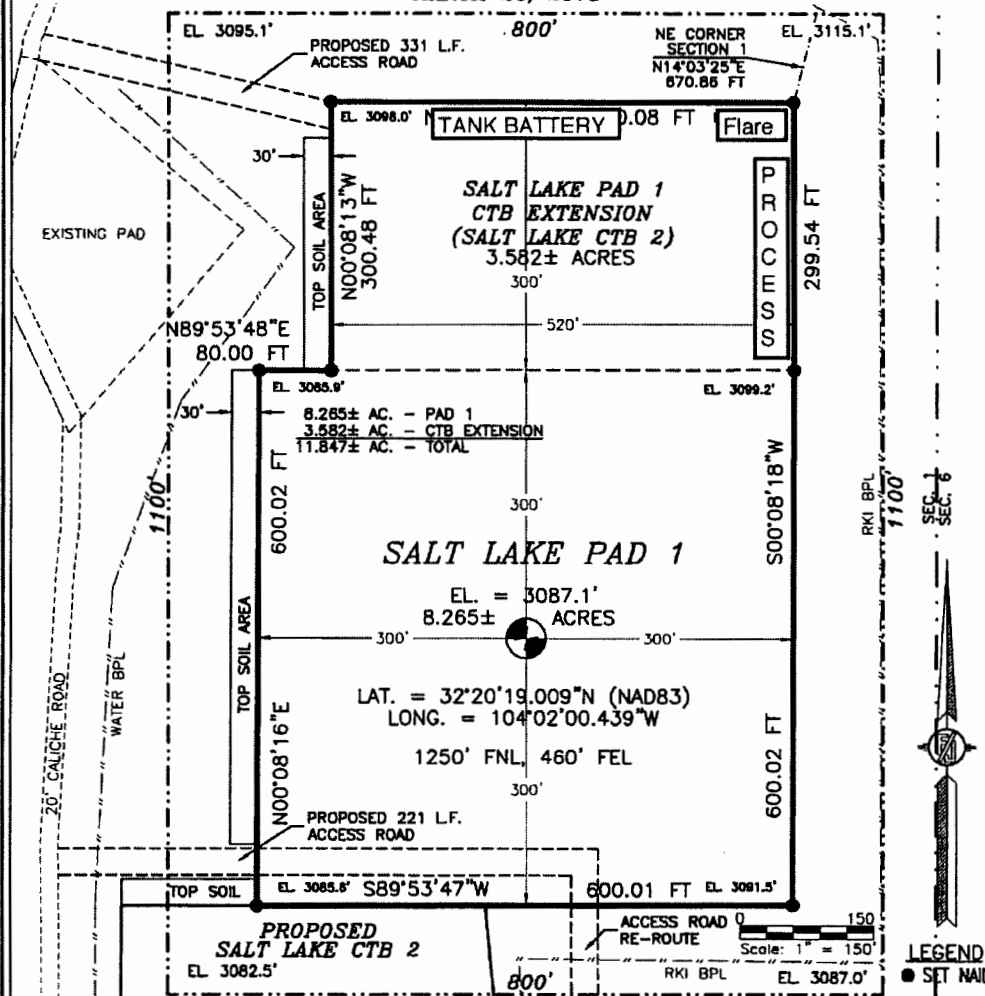






SALT LAKE PAD 1
NOVO OIL AND GAS, LLC
 IN THE W/2 NE/4 OF
 SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 MARCH 23, 2018

MAP 7



DESCRIPTION

A CERTAIN PIECE OR PARCEL OF LAND AND REAL ESTATE LYING IN BUREAU OF LAND MANAGEMENT LAND IN THE W/2 NE/4 OF SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

BEGINNING AT THE NORTHEAST CORNER OF THE PARCEL, WHENCE THE NORTHEAST CORNER OF SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M. BEARS N14°03'25"E, A DISTANCE OF 870.86 FEET;
 THENCE S00°07'24"E A DISTANCE OF 299.54 FEET TO AN ANGLE POINT OF THE PARCEL;
 THENCE S00°08'18"W A DISTANCE OF 800.02 FEET TO THE SOUTHWEST CORNER OF THE PARCEL;
 THENCE S89°53'47"W A DISTANCE OF 600.01 FEET TO THE SOUTHWEST CORNER OF THE PARCEL;
 THENCE N00°08'16"E A DISTANCE OF 600.02 FEET TO AN ANGLE POINT OF THE PARCEL;
 THENCE N89°53'40"E A DISTANCE OF 80.00 FEET TO AN ANGLE POINT OF THE PARCEL;
 THENCE N00°08'13"W A DISTANCE OF 300.48 FEET TO THE NORTHWEST CORNER OF THE PARCEL;
 THENCE N90°00'00"E A DISTANCE OF 520.08 FEET TO THE NORTHEAST CORNER OF THE PARCEL, THE POINT OF BEGINNING;
 CONTAINING 11.847 ACRES MORE OR LESS.

GENERAL NOTES

1.) THE INTENT OF THIS SURVEY IS TO ACQUIRE A BUSINESS LEASE FOR THE PURPOSE OF BUILDING A WELL PAD

2.) BASIS OF BEARING IS NEW MEXICO STATE PLANE EAST ZONE MODIFIED TO THE SURFACE (NAD83), COORDINATES ARE NAD 83, ELEVATIONS ARE NAVD 88

DRIVING DIRECTIONS: FROM CR. 31 (POTASH MINES RD.) AND CR. 805 (REFINERY RD.), GO NORTH ON CR. 805 APPROX. 0.4 MILE, TURN RIGHT (EAST) ON CALICHE ROAD AND GO EAST AND NORTHEAST APPROX. 0.2 MILE TO A "Y" IN ROAD, TURN LEFT (NORTH) AND GO APPROX. 0.8 MILE TO A ROAD SURVEY, FOLLOW ROAD SURVEY EAST 221' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

SURVEYOR CERTIFICATE

I, FILMON 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,

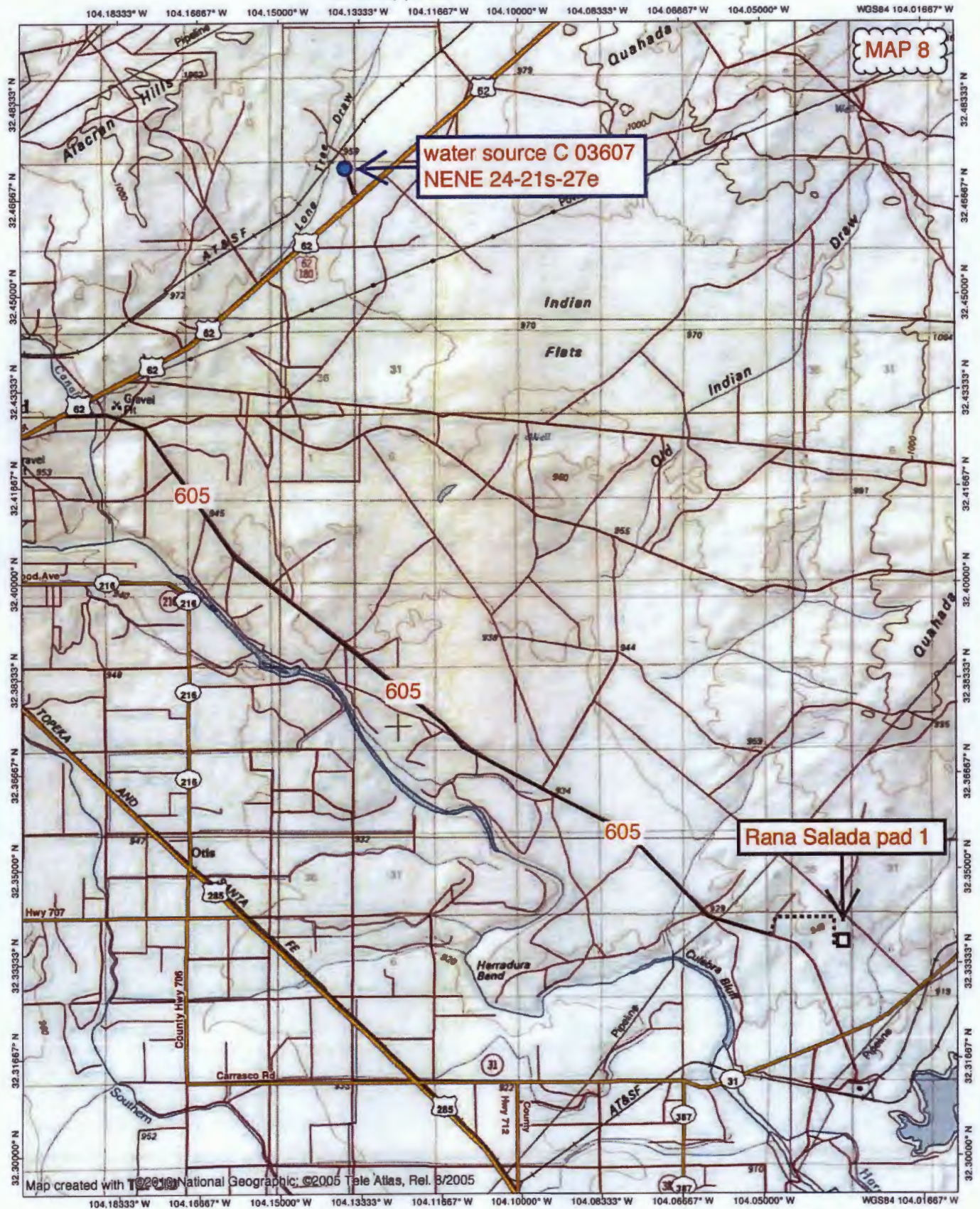
NEW MEXICO, THIS 13TH DAY OF APRIL 2018

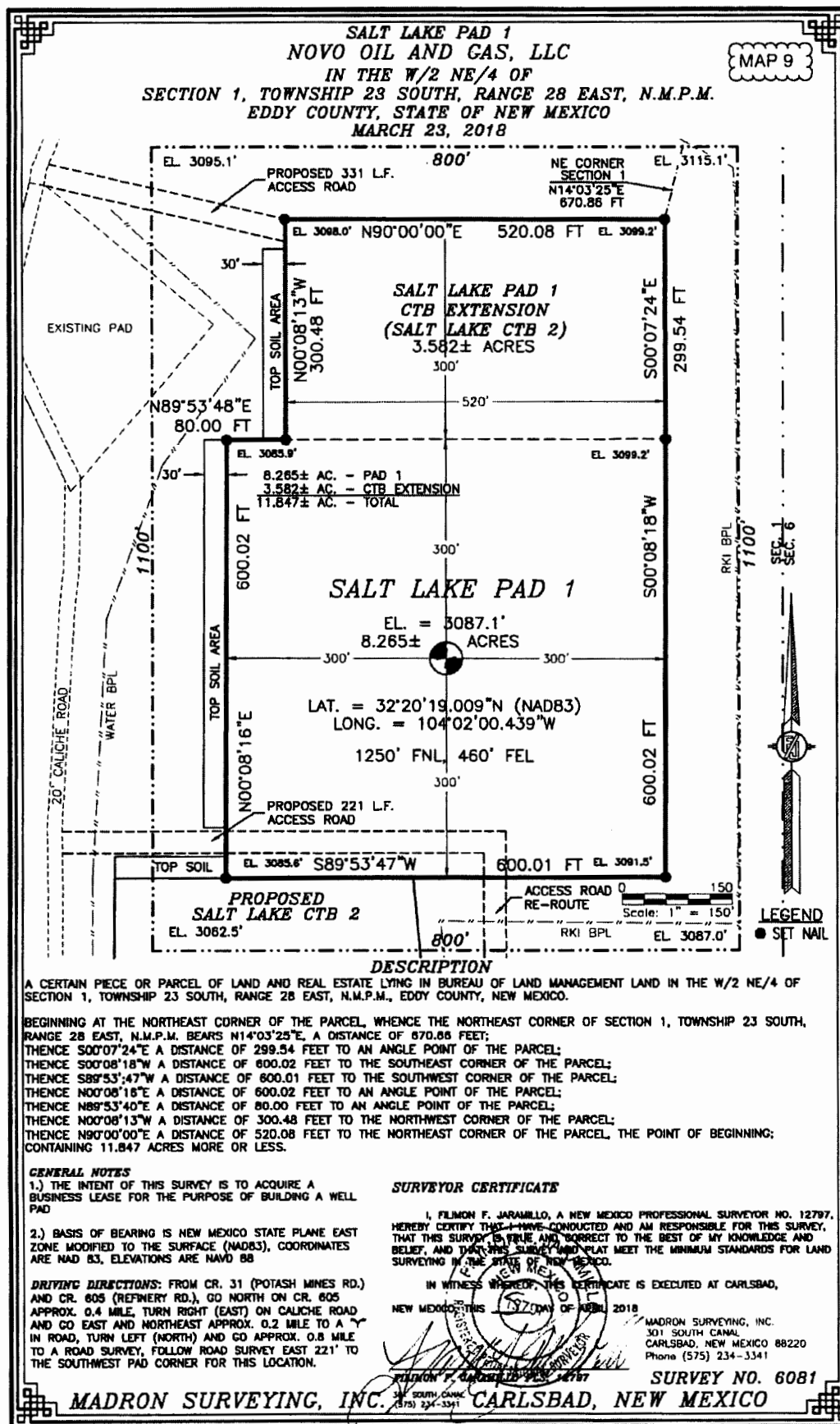
FILMON F. JARAMILLO
 FILMON F. JARAMILLO, SURVEYOR NO. 12797
 34 SOUTH CANAL
 (575) 234-3341

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

SURVEY NO. 6081

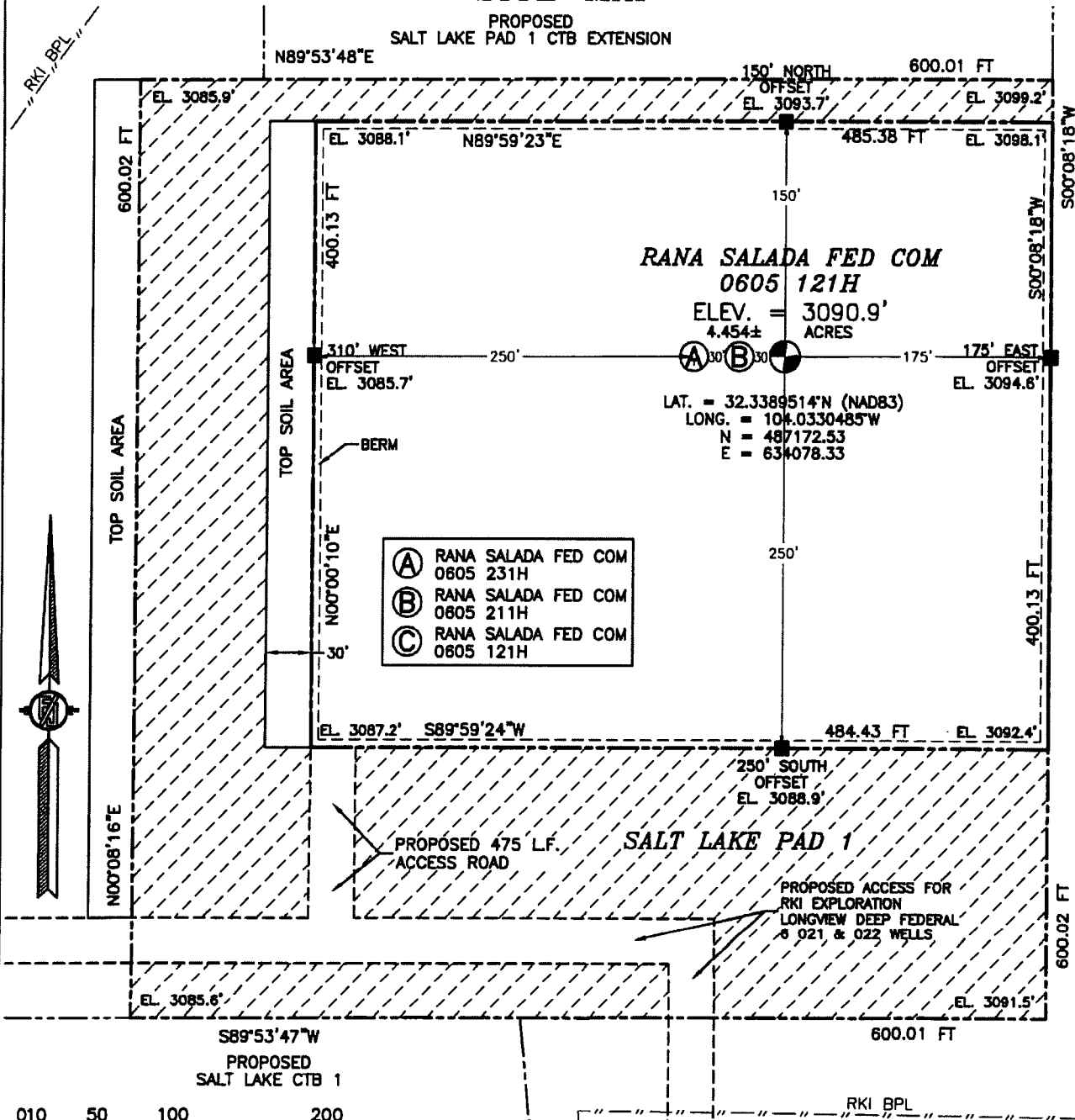
MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO





SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
SITE MAP

MAP 10

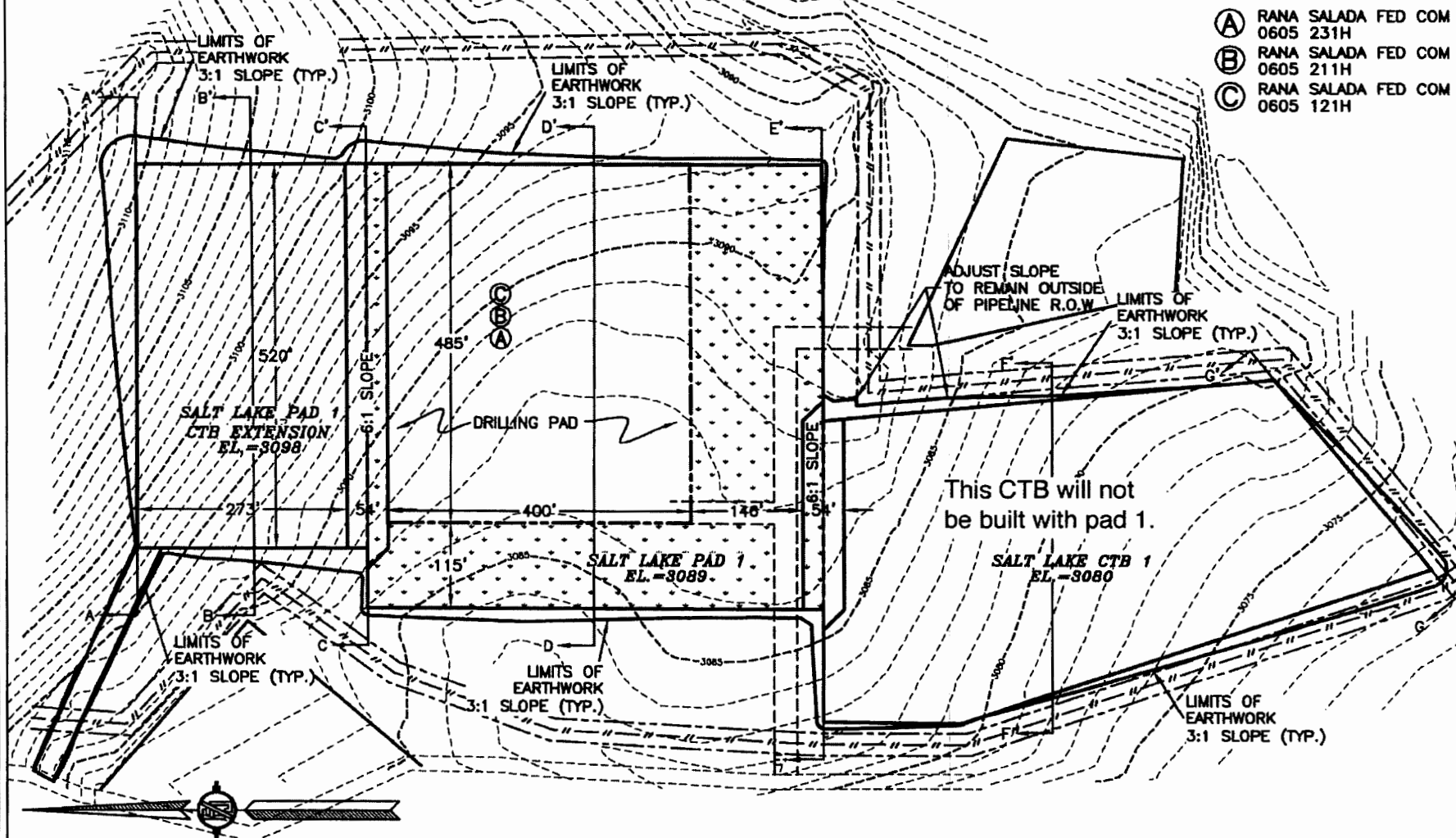


DIRECTIONS TO LOCATION
FROM CR. 31 (POTASH MINES RD.) AND CR. 805 (REFINERY RD.), GO NORTH ON CR. 805 APPROX. 0.4 MILE, TURN RIGHT (EAST) ON CALICHE ROAD AND GO EAST AND NORTHEAST APPROX. 0.2 MILE TO A "Y" IN ROAD, TURN LEFT (NORTH) AND GO APPROX. 0.8 MILE TO A ROAD SURVEY, FOLLOW ROAD SURVEY EAST 331' AND NORTH 124' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

NOVO OIL AND GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0605 121H
LOCATED 1127 FT. FROM THE NORTH LINE
AND 335 FT. FROM THE EAST LINE OF
SECTION 1, TOWNSHIP 23 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JUNE 26, 2018

PLAN VIEW



**NOVO OIL AND GAS NORTHERN DELAWARE, LLC
PAD GRADING AND CROSS SECTIONS
FOR RANA SALADA FED COM 0605 231H
SECTION 1, TOWNSHIP 23 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO**

CUT	FILL	NET
46251 CU. YD	41381 CU. YD	4871 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 11

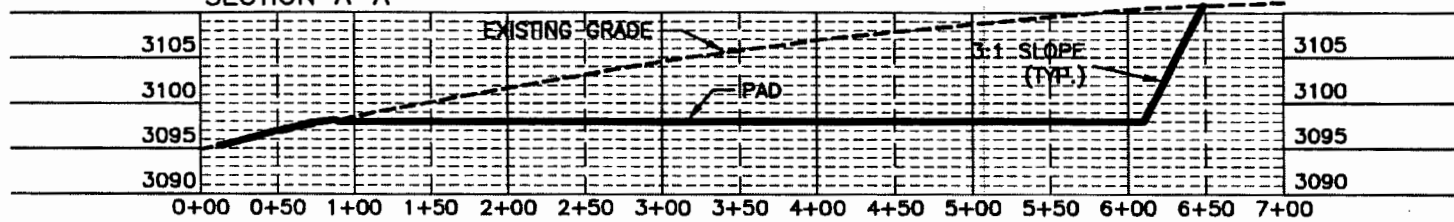
JUNE 26, 2018

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

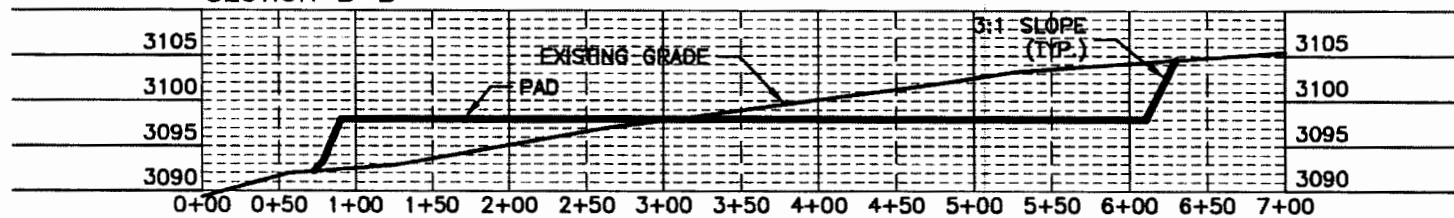
SURVEY NO. 6144B

CROSS-SECTIONS

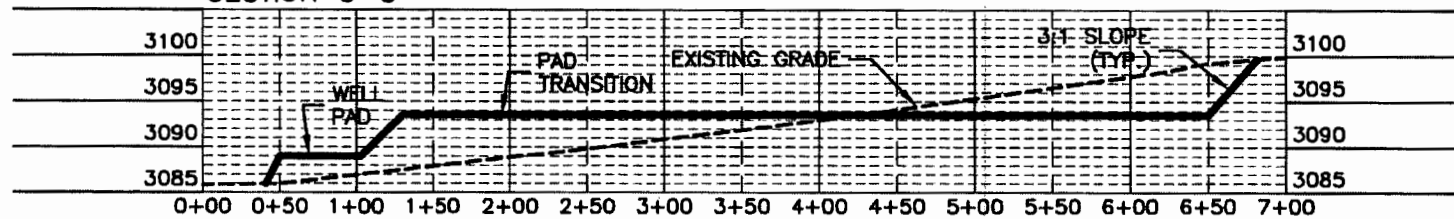
SECTION A-A'



SECTION B-B'



SECTION C-C'



0 12 60 120 240
SCALE 1" = 120' - 1" = 20' VER

NOVO OIL AND GAS NORTHERN DELAWARE, LLC
PAD GRADING AND CROSS SECTIONS
FOR RANA SALADA FED COM 0605 231H
SECTION 1, TOWNSHIP 23 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

CUT	FILL	NET
46251 CU. YD	41381 CU. YD	4871 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 12

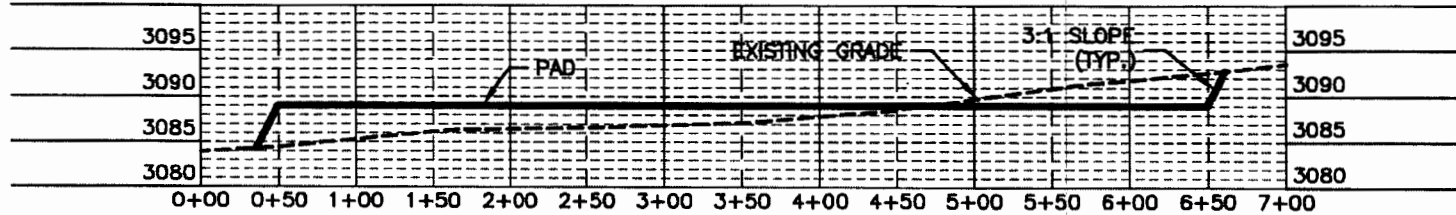
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SURVEY NO. 6144B

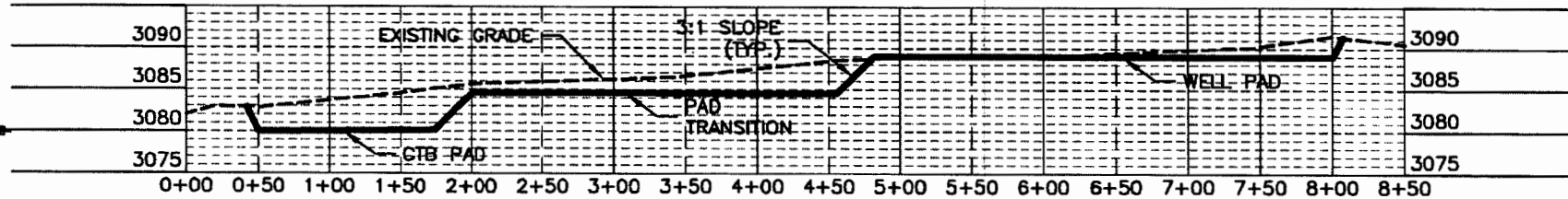
JUNE 26, 2018

CROSS-SECTIONS

SECTION D-D'



SECTION E-E'



012 60 120 240
SCALE 1" = 120' - 1" = 20' VER

NOVO OIL AND GAS NORTHERN DELAWARE, LLC
PAD GRADING AND CROSS SECTIONS
FOR RANA SALADA FED COM 0605 231H
SECTION 1, TOWNSHIP 23 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

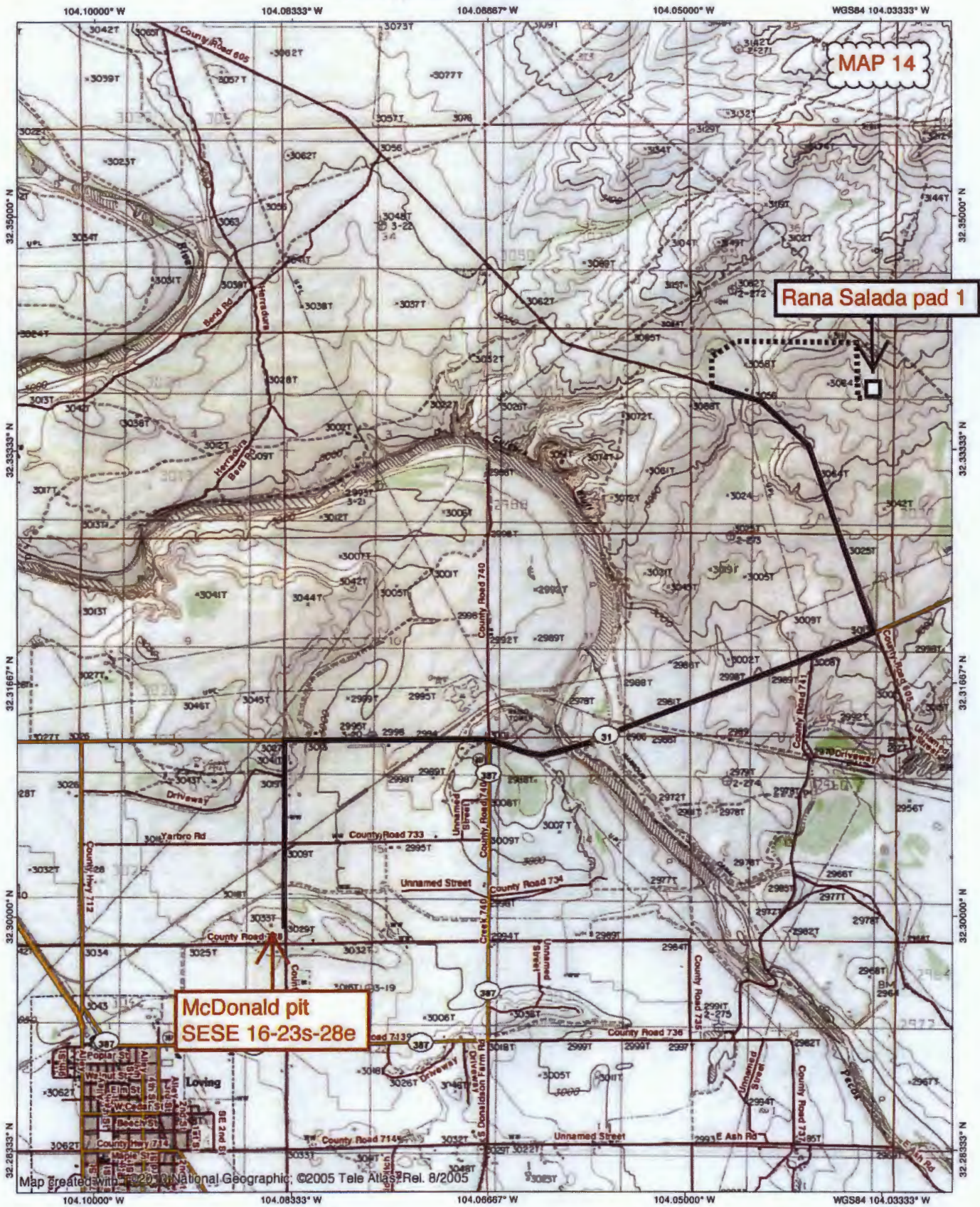
CUT	FILL	NET
46251 CU. YD	41381 CU. YD	4871 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 13

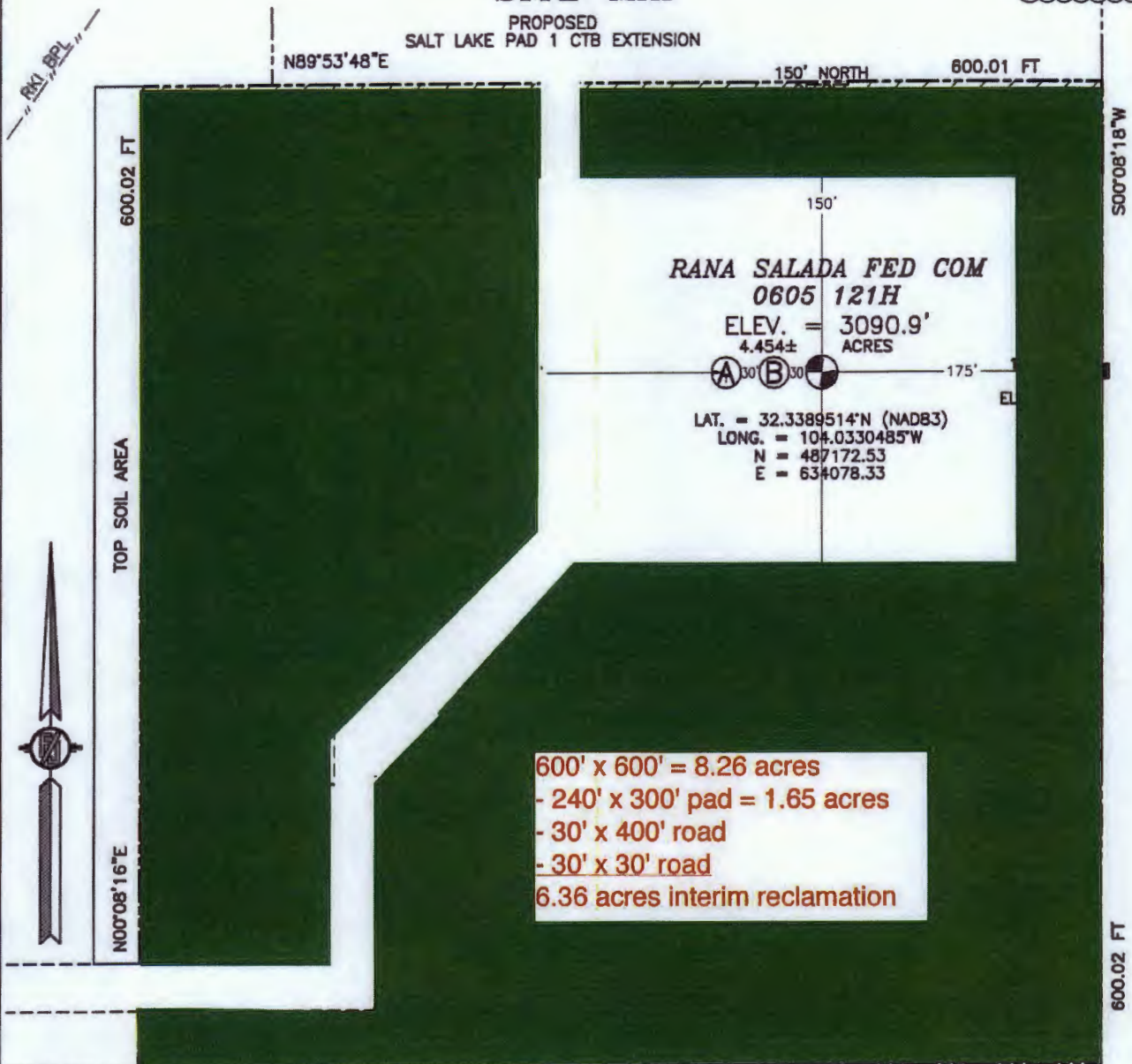
JUNE 26, 2018
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SURVEY NO. 6144B



SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
SITE MAP

MAP 15



010 50 100 200
SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM CR. 31 (POTASH MINES RD.) AND CR. 605 (REFINERY RD.), GO NORTH ON CR. 605 APPROX. 0.4 MILE, TURN RIGHT (EAST) ON CALICHE ROAD AND GO EAST AND NORTHEAST APPROX. 0.2 MILE TO A "Y" IN ROAD, TURN LEFT (NORTH) AND GO APPROX. 0.8 MILE TO A ROAD SURVEY, FOLLOW ROAD SURVEY EAST 331' AND NORTH 124' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

NOVO OIL AND GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0605 121H
LOCATED 1127 FT. FROM THE NORTH LINE
AND 335 FT. FROM THE EAST LINE OF
SECTION 1, TOWNSHIP 23 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

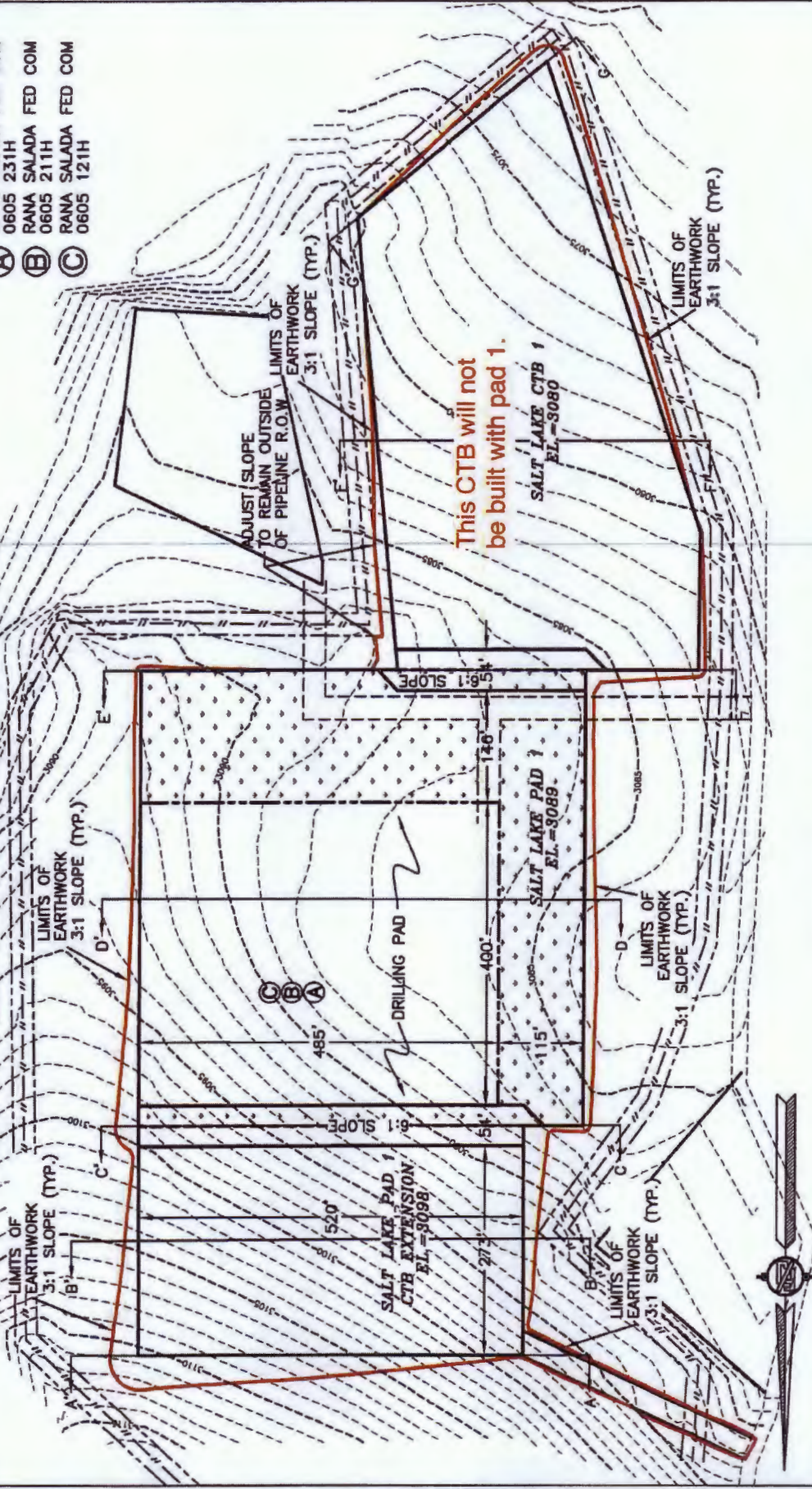
JUNE 26, 2018

SURVEY NO. 6145B

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

PLAN VIEW

- (A) RANA SALADA FED COM 0605 231H
- (B) RANA SALADA FED COM 0605 211H
- (C) RANA SALADA FED COM 0605 121H



NOVO OIL AND GAS NORTHERN DELAWARE, LLC
 PAD GRADING AND CROSS SECTIONS
 FOR RANA SALADA FED COM 0605 231H
 SECTION 1, TOWNSHIP 23 SOUTH,
 RANGE 28 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO



CUT	FILL	NET
46251 CU. YD	41381 CU. YD	4871 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 16

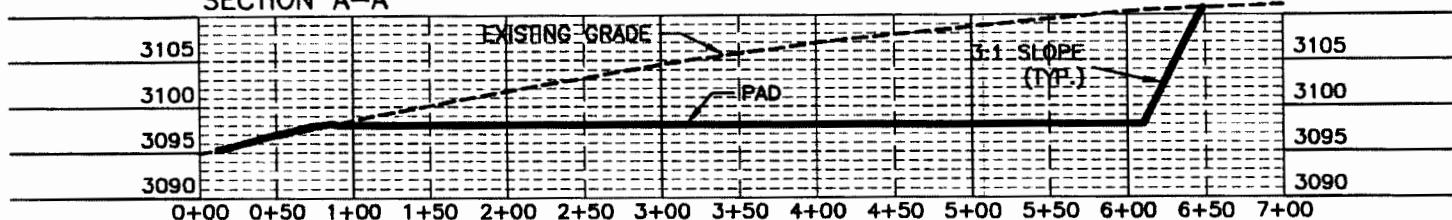
JUNE 26, 2018

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

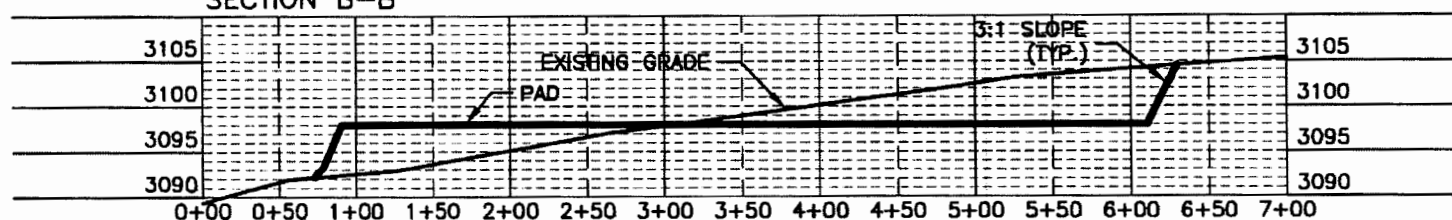
SURVEY NO. 6144B

CROSS-SECTIONS

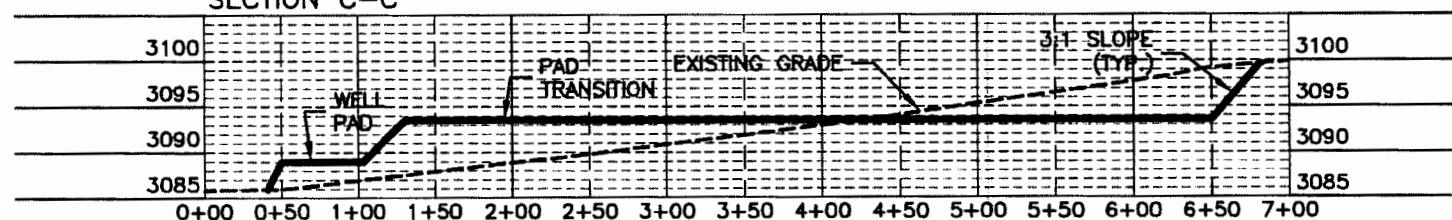
SECTION A-A'



SECTION B-B'



SECTION C-C'



012 60 120 240
SCALE 1" = 120' - 1" = 20' VER

NOVO OIL AND GAS NORTHERN DELAWARE, LLC
PAD GRADING AND CROSS SECTIONS
FOR RANA SALADA FED COM 0605 231H
SECTION 1, TOWNSHIP 23 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

CUT	FILL	NET
46251 CU. YD	41381 CU. YD	4871 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 17

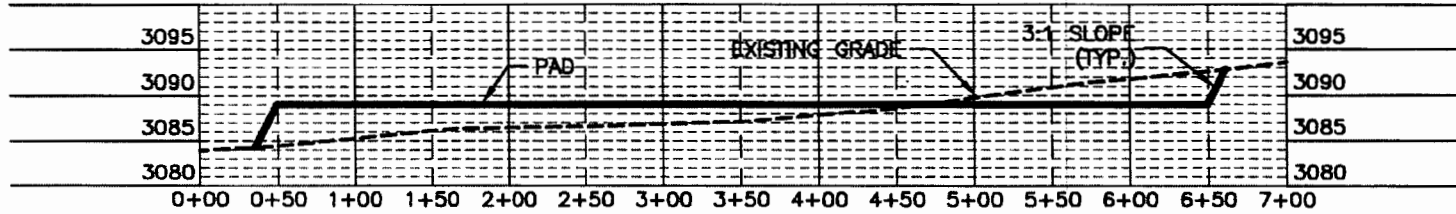
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SURVEY NO. 6144B

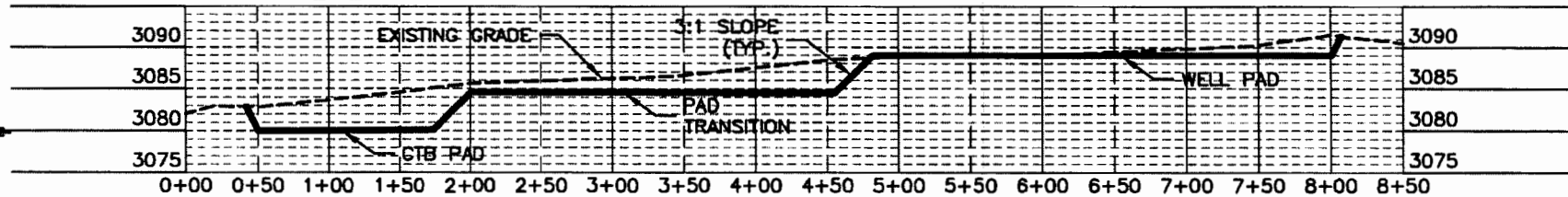
JUNE 26, 2018

CROSS-SECTIONS

SECTION D-D'



SECTION E-E'



0 12 60 120 240
SCALE 1" = 120' - 1" = 20' VER

NOVO OIL AND GAS NORTHERN DELAWARE, LLC
PAD GRADING AND CROSS SECTIONS
FOR RANA SALADA FED COM 0605 231H
SECTION 1, TOWNSHIP 23 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

CUT	FILL	NET
46251 CU. YD	41381 CU. YD	4871 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 18

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO
JUNE 26, 2018
301 SOUTH CANAL (575) 234-3341

SURVEY NO. 6144B