A120052

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF OIL, GAS, AND MINERALS

APPLICATION FOR PERMIT TO: ☒ DRILL ☐ DEEPEN ☐ CONVERT AND OPERATE A WELL

By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment.

A120052

1a. Part 615 Supervisor of Wells: ☒ Oil and Gas ☐ Brine Disposal ☐ Hydrocarbon Storage ☐ Injection for Secondary Recovery

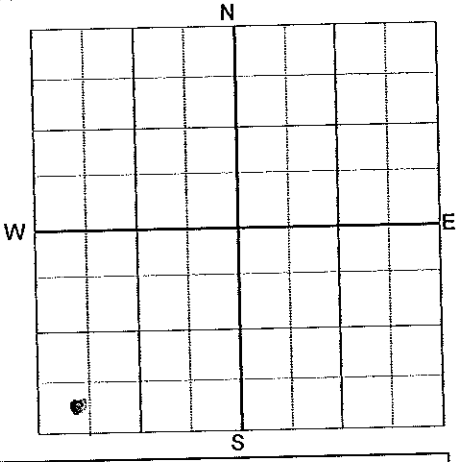
1b. Part 625 Mineral Wells: ☐ Waste Disposal ☐ Brine Production ☐ Processed brine disposal ☐ Storage ☐ Test, fee sched. on rev.

1c. Fee enclosed: ☒ Yes ☐ No, revision of application ☐ No, leg of horz drainhole

2. List all previous permit numbers

3. Fed. ID. No. (do not use SSN): 73-1577174

Locate well and outline drilling unit on section plat



4. Conformance bond: ☒ Blanket ☐ Single well

5. ☐ Attached ☒ On file

6. Bond number: 100753026-622

7. Bond amount: $250,000.00

8. Applicant (name of permittee as bonded): Devon Energy Production Company, L.P.

9. Address: 20 North Broadway, Oklahoma City, OK 73102

Phone: 405-552-8196

I authorize DEQ 4 additional days to process this application. ☒ Yes ☐ No

10. Lease or well name (be as brief as possible): State Richfield

Well number: 1-34 HD

11. Surface owner: State of Michigan

12. Surface location: SW 1/4 of SW 1/4 of SW 1/4 of Sec 27 T 22N R 1W — Township: Richfield — County: Roscommon

13. If directional, bottom hole location: SW 1/4 of SW 1/4 of SE 1/4 of Sec 34 T 22N R 1W — Township: Richfield — County: Roscommon

14. The surface location for this well is 332 feet from nearest (N/S) South section line AND 632 feet from nearest (E/W) West section line

15. Is this a directional well? ☐ No ☒ Yes If yes, complete line15. The bottom hole location for this well is 461 feet from nearest (N/S) South section line AND 2082 feet from nearest (E/W) East section line

16. The bottom hole location (whether straight or directional) of this well is 461 feet from nearest (N/S) South drilling unit line AND 2082 feet from nearest (E/W) East drilling unit line

17. Kind of tools: ☒ Rotary ☐ Cable ☐ Combination

18. Is sour oil or gas expected? ☐ No ☒ Yes ☒ H_2S Cont. plan enclosed

19. Base of lowest known fresh water aquifer: Formation Marshal Sandstone Depth 1350'

20. Intended total depth: MD 16272' TVD 10696'

21. Formation at total depth: Utica/Collingwood

22. Producing/injection formation(s): Utica/Collingwood

23. Objective pool, field, or project: Pool

24. PROPOSED DRILLING, CASING AND CEMENTING AND SEALING PROGRAM

HOLE			CASING			CEMENT			MUD	
Depth (MD)	Geol. Formation	Bit Dia.	O.D. Size	Wt/Ft Grade Condition	Depth (MD)	Sacks	T.O.C.	W.O.C	Wt.	Vis.
100'	Glacial Drift	N/A	24"	0.5" w.t. Drive Pipe	100'	N/A	N/A			
1500'	Coldwater Sh.	17.5	13-3/8"	54.5#, J-55, BTC	1500'	N/A				
6250'	Bass Island	12.25	9-5/8"	47#, HCL-80, BTC	6250'	N/A				
11023'	Utica	8.5	7"	32#, HCL-80, BTC	11023'	820	5750'	12	13.5	45
16272'	Utica	6	4-1/2"	15.1#, P-110, VAM TOP	16272'	765	7500'	12	11.0	50

25. DETAIL CEMENTING PROGRAM. IDENTIFY ALL CEMENT CLASSES, ADDITIVES, AND VOLUMES (IN CU. FT.) FOR EACH CASING STRING.

Surface

Intermediate 50:50 Premium POZ with 18% Sodium Cloride and tail w/ Premium Low Fluid Loss w/ 18% Sodium Chloride

Production/Injection 50:50 Premium Poz with 3% gel

RECEIVED
APR 18 2012
DEQ-EMD
Office of Oil, Gas & Minerals

26. Send correspondence and permit to

Name Worth Surveying E-mail worthsurveying@sbcglobal.net

Address P.O. Box 4003, Jackson, MI 49204 Phone 517-788-9806

CERTIFICATION "I state that I am authorized by said applicant. This application was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Enclose permit fee of $300 for all Part 615 wells; $2,500 for a Part 625 waste disposal well; or $500 for a brine production, processed brine disposal, or storage well. Make checks payable to State of Michigan.

DEQ Cashier use only.

27. Application prepared by (print or type): Thomas F. Worth/Greg Sibley Phone 713-265-6518

28. Signature Date April 13, 2012

Office of Oil, Gas, and Minerals Use Only

Permit number	API number	Date issued	Owner number
			6459

EQP 7200-1 (rev. 1/2012) SEE INSTRUCTIONS FOR MAILING ON REVERSE

A.11. Description of the drilling program including drilling fluids to be used, fluid handling and any over-pressured zones to be encountered.

Once the State Richfield 1-27 P hole reaches TD and logs are run, the well will be plugged back to approximately 9,580', and the cement dressed off for the sidetrack and drilling of the 34-1 HD.

Orient BHA and drill 8-1/2" curve from ~10,123' MD/TVD. The curve will be landed at approximately 90° in the Utica/Collingwood Section at 11023' MD / 10,696' TVD. 7", 32#, HCL-80, BTC casing will be run and cemented as described in Attachment A.12. Drilling fluid will be used on next section of hole.

A 6" lateral will be drilled (State Richfield 34-1 HD) to 16,272' MD / 10,696' TVD in Utica/Collingwood using brine system from previous section. Will use steel pits/tanks for holding brine drilling fluid and cuttings washer for handling solid salt cuttings. 4-1/2", 15.1#, P-110, VAM TOP casing will be run and cemented at TD as described in Attachment A.12.

Free water will be pulled from pits and hauled to commercial disposal. Mud/cuttings will be solidified and buried in reserve pit (or hauled to commercial disposal if no reserve pit is used).

In the event abnormal pressure is encountered A-1, the existing brine drilling fluid system will be displaced with pre-mixed hematite mud at sufficient density to control pressure, and the 7" could be run earlier in the Niagaran.

A.12. Description of the cementing program including type, properties and compressive strength of cement to be used on each casing string. Indicate if stage tools will be used.

The following cementing program is planned for the State Richfield 34-1 HD 1 (horizontal drain hole):

The 7" intermediate casing will be cemented in 8-1/2" hole at 11023' MD (10696' TVD) with approximately 528 cubic feet 50:50 Premium POZ with 18% Sodium Cloride (yield 1.43 cubic feet / sack, density 14.23 ppg) followed by 530 cubic feet of Premium Low Fluid Loss w/ 18% Sodium Chloride (yield 1.17 cubic feet / sack, density 16.35 ppg). It is calculated that this volume will bring the top of cement to 5,750' in the annulus.

The 4-1/2" production casing will be cemented in 6" hole at 116272' MD (10696' TVD) with approximately 878 cubic feet of 50:50 Premium Poz with 3% gel (yield 1.14 cubic feet / sack, density 15.0 ppg). It is calculated that this volume will bring the top of cement to 7,500' in the annulus.

No stage tools are planned for any of these cementing operations.

A.13. Description of the proposed wireline logging program.

There are no plans to run wireline logs in the horizontal drain hole of this well.

If hole conditions permit, a Baker STAR Imager LWD may be washed-down in the lateral.

A.14. Description of the testing program, including pressure tests on casing strings and any planned drill stem tests.

The following tests are planned to be conducted on the State Richfield 34-1 HD1:

Second intermediate/production casing – 7" 32# HCL-80 – will be tested to 6,350 psi.

Production casing – 4-1/2" 15.1# P-110 – will be tested to 8,700 psi.

There are no drill stem tests anticipated for this well at this time. Production testing will commence once well has been completed.

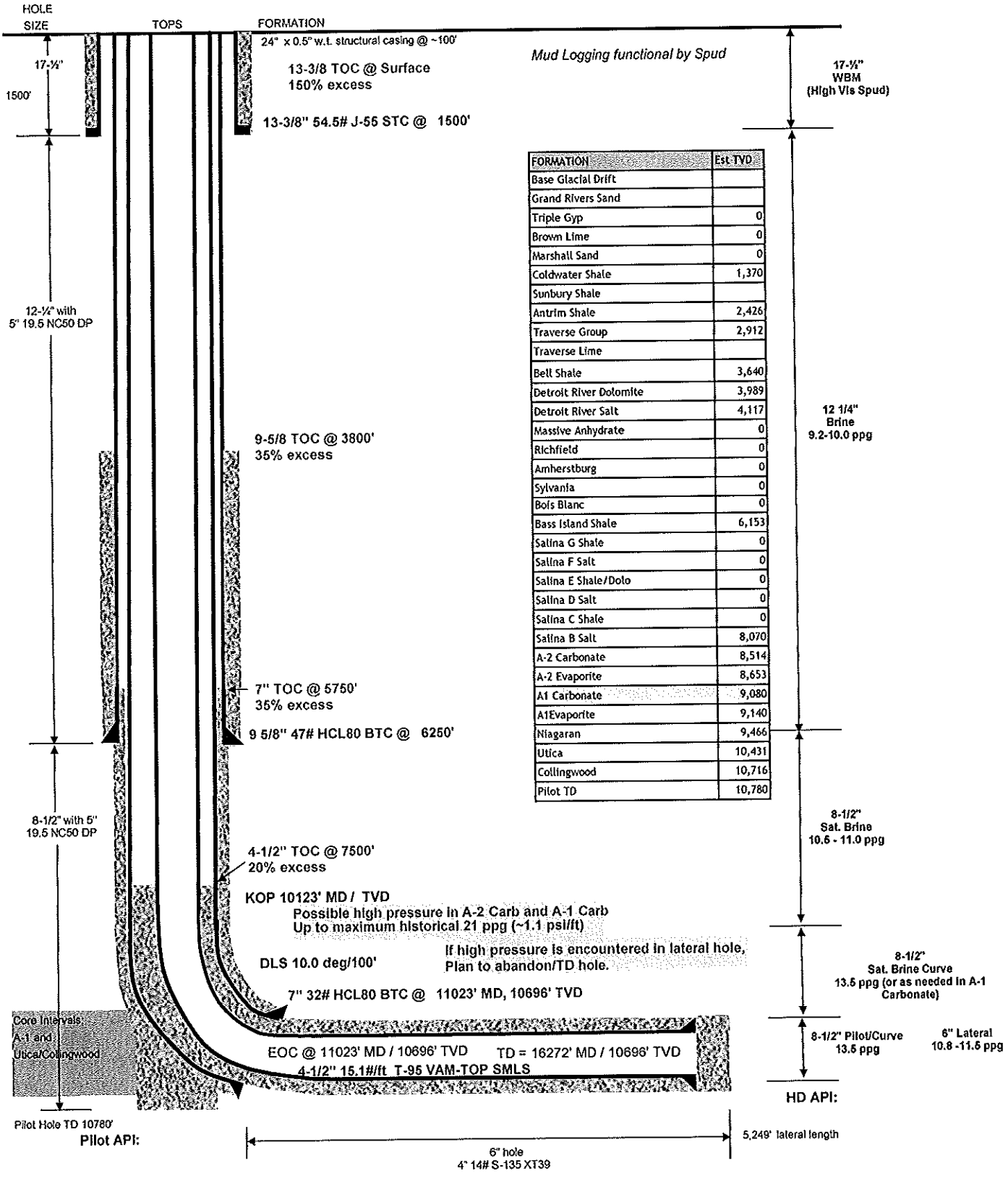
A.15. Description of the proposed coring program.

There are no plans to obtain cores from any formation in the State Richfield 34-1 HD1.

devon

WELLBORE SCHEMATIC

WELL:	State Richfield 27-1 P & 34-1 HD (AFE #203603)		
FIELD:	PC		
CATEGORY:	Horizontal Exploration Well - Oil & Gas		
SHL:	332' FSL & 632' FWL of 27-20N-1W		
BHL:	461' FSL & 2082' FEL of 34-20N-1W		
COUNTY:	Roscommon	STATE:	MI
ELEVATION:	1223 GL	API NO.:	0
	1245 KB (22')	Latitude:	44.2625
RIG :	AES 20	Longitude:	84.4269



FORMATION	Est TVD
Base Glacial Drift	
Grand Rivers Sand	
Triple Gyp	0
Brown Lime	0
Marshall Sand	0
Coldwater Shale	1,370
Sunbury Shale	
Antrim Shale	2,426
Traverse Group	2,912
Traverse Lime	
Bell Shale	3,640
Detroit River Dolomite	3,989
Detroit River Salt	4,117
Massive Anhydrate	0
Richfield	0
Amherstburg	0
Sylvania	0
Bois Blanc	0
Bass Island Shale	6,153
Salina G Shale	0
Salina F Salt	0
Salina E Shale/Dolo	0
Salina D Salt	0
Salina C Shale	0
Salina B Salt	8,070
A-2 Carbonate	8,514
A-2 Evaporite	8,653
A1 Carbonate	9,080
A1Evaporite	9,140
Niagaran	9,466
Utica	10,431
Collingwood	10,716
Pilot TD	10,780

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF OIL, GAS, AND MINERALS

SURVEY RECORD OF WELL LOCATION

This information is required by authority of Part 615 Supervisor of Wells, or Part 625 Mineral Wells, of Act 451 PA 1994, as amended, in order to obtain a drilling permit.

Applicant: Devon Energy Production Co., L.P.

Well name and number: State Richfield, 1-34 HD

	Township	County
1a. Surface location: SW 1/4 of SW 1/4 of SW 1/4 of section 27 T 22N R 1W	Richfield	Roscommon
1b. If this is a directional well, bottom hole location will be: SW 1/4 of SW 1/4 of SE 1/4 of section 34 T 22N R 1W	Richfield	Roscommon

Instructions: Outline drilling unit for oil/gas wells (Part 615) or property boundary for mineral wells (Part 625) and spot well location on plat shown. Locate the well in two directions from the nearest section, quarter section, and unit (or property, Part 625) lines.

2. The surface location is

332 ft. from nearest (N/S) South section line

632 ft. from nearest (E/W) West section line

and

332 ft. from nearest (N/S) South quarter section line

632 ft. from nearest (E/W) West quarter section line

3. Bottom hole will be (if directional)

461 ft. from nearest (N/S) South section line

2082 ft. from nearest (E/W) East section line

and

461 ft. from nearest (N/S) South quarter section line

592 ft. from nearest (E/W) West quarter section line

4. Bottom hole will be (directional or straight)

461 ft. from nearest (N/S) South drilling unit line

2082 ft. from nearest (E/W) East drilling unit line

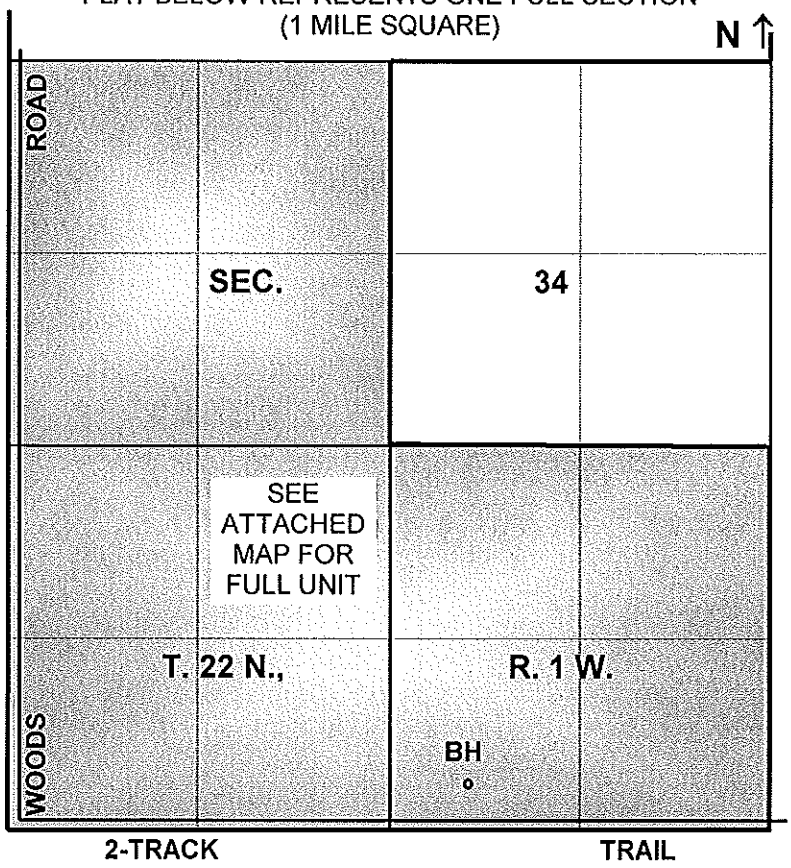
5. Show access to stake on plat and describe if it is not readily accessible. Set lath and steel rod for well location. Site may be reached 4/10 mile North of the intersection of Campground Road with Woods Road, and 632 feet East of Woods Road. A trail runs East from Woods Road along the South section line, and orange flagging has been tied from the trail to the site. (See detail dwgs)

6. Zoning ☐ Residential, effective date _____

Initial date of residential zoning _____

☒ Other Agricultural

PLAT BELOW REPRESENTS ONE FULL SECTION (1 MILE SQUARE)



ON SEPARATE PLAT OR PLOT PLAN, LOCATE, IDENTIFY AND SHOW DISTANCES TO:

A. All roads, power lines, buildings, residences, fresh water wells, and other man-made features, within 600 feet of the stake.

B. All lakes, streams, wetlands, drainage-ways, floodplains, environmentally sensitive areas, natural rivers, critical dune areas, and threatened or endangered species within 1320 feet of the stake.

C. All type I and IIa public water supply wells within 2000 feet and all type IIb and III public water supply wells within 800 feet of the well stake.

Name of individual who surveyed site	Company	Date of survey
Thomas F. Worth, P.S.	Worth Surveying	March 13, 2012
Address		**Phone**
P.O. Box 4003, Jackson, MI 49204		517-788-9806

I CERTIFY THE ABOVE INFORMATION IS COMPLETE AND ACCURATE TO THE BEST OF MY KNOWLEDGE AND BELIEF.

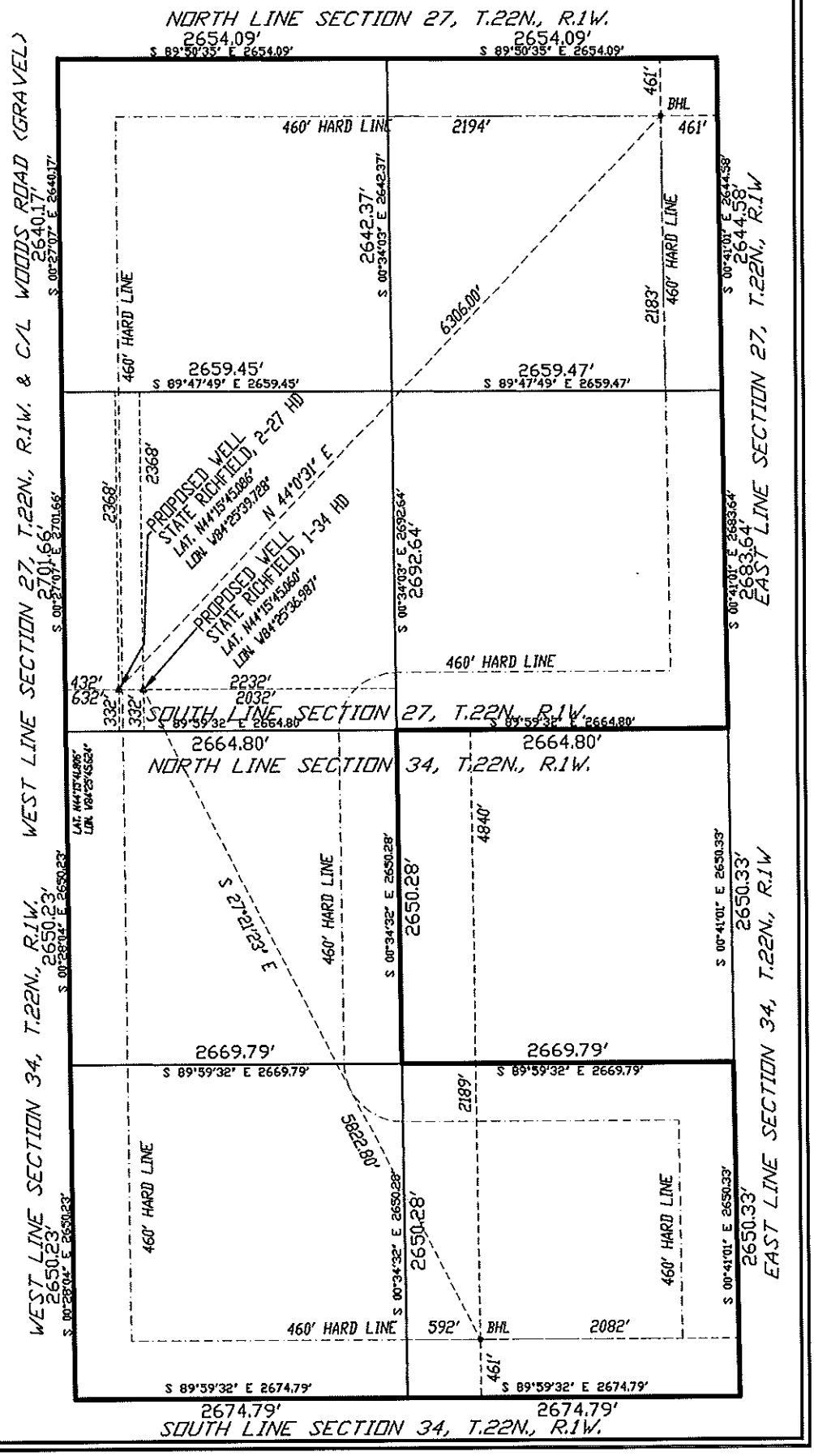
Signature of licensed surveyor (affix seal)

STATE OF MICHIGAN THOMAS F. WORTH LAND SURVEYOR No. 35980 LICENSED LAND SURVEYOR

Date: April 13, 2012

Devon Energy Production Company, L.P.
STATE RICHFIELD, 1-34 HD
S.W. 1/4 of S.W. 1/4 of S.W. 1/4 of SECTION 27,
T.22N., R.1W., RICHFIELD TOWNSHIP, ROSCOMMON COUNTY,
MICHIGAN
SCALE 1"=1200'

UNIT MAP



NOTE:
BASIS OF BEARINGS
MICHIGAN STATE PLANE CENTRAL
NAD83

NORTH SURVEYING
P.O. BOX 4003
JACKSON, MI 49204
(517)788-9806

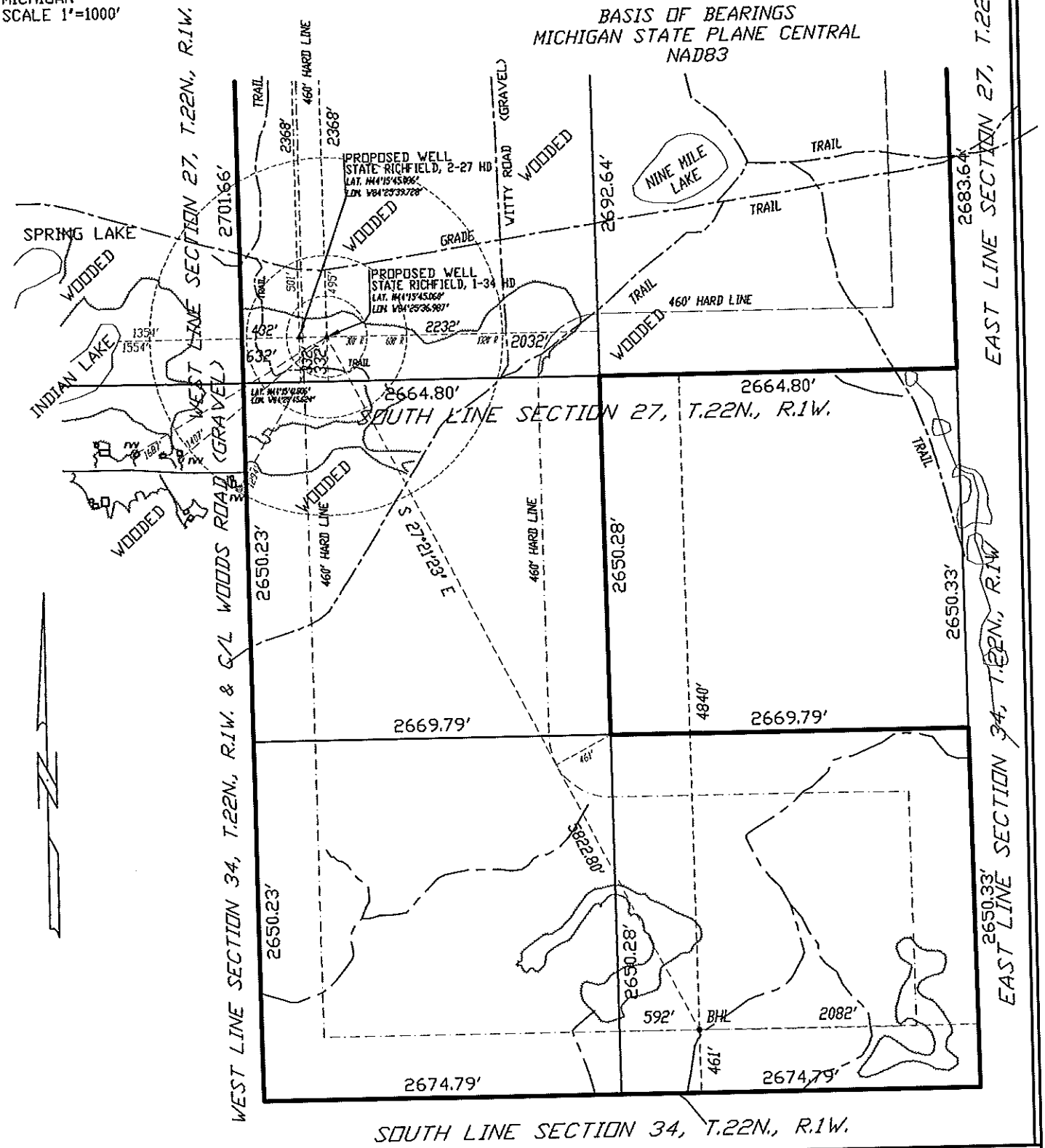
DRAWN BY:	AWA
DATE:	13-APR-12
DWG. NO.:	
APPROVED BY:	

 700 ft Scale: 1 : 24,000 Detail: 13-1 Datum: WGS84

Devon Energy Production Company, L.P.
STATE RICHFIELD, 1-34 HD
S.W. 1/4 of S.W. 1/4 of S.W. 1/4 of SECTION 27,
T.22N., R.1W., RICHFIELD TOWNSHIP, ROSCOMMON COUNTY,
MICHIGAN
SCALE 1"=1000'

SECTION MAP

NOTE:
BASIS OF BEARINGS
MICHIGAN STATE PLANE CENTRAL
NAD83



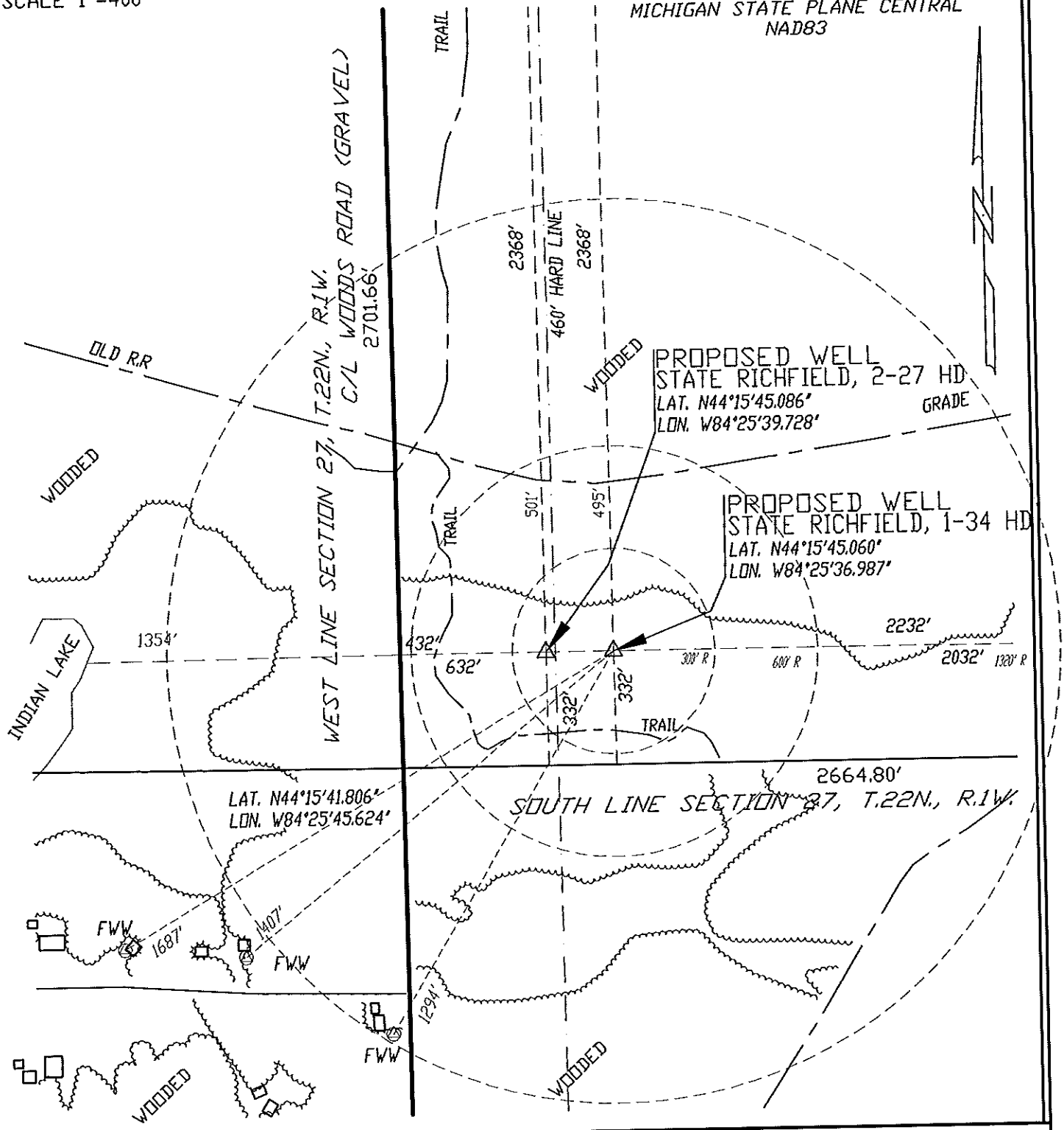
DRAWN BY: AWA
DATE: 13-APR-12
DWG. NO.:
APPROVED BY:

WORTH SURVEYING
P.O. BOX 4003
JACKSON, MI 49204
(517)788-9806

Devon Energy Production Company, L.P.
STATE RICHFIELD, 1-34 HD
S.W. 1/4 of S.W. 1/4 of S.W. 1/4 of SECTION 27,
T.22N., R.1W., RICHFIELD TOWNSHIP, ROSCOMMON COUNTY,
MICHIGAN
SCALE 1"=400'

1/4 SECTION MAP

NOTE:
BASIS OF BEARINGS
MICHIGAN STATE PLANE CENTRAL
NAD83



DRAWN BY:	AWA
DATE:	13-APR-12
DWG. NO.:	
APPROVED BY:	

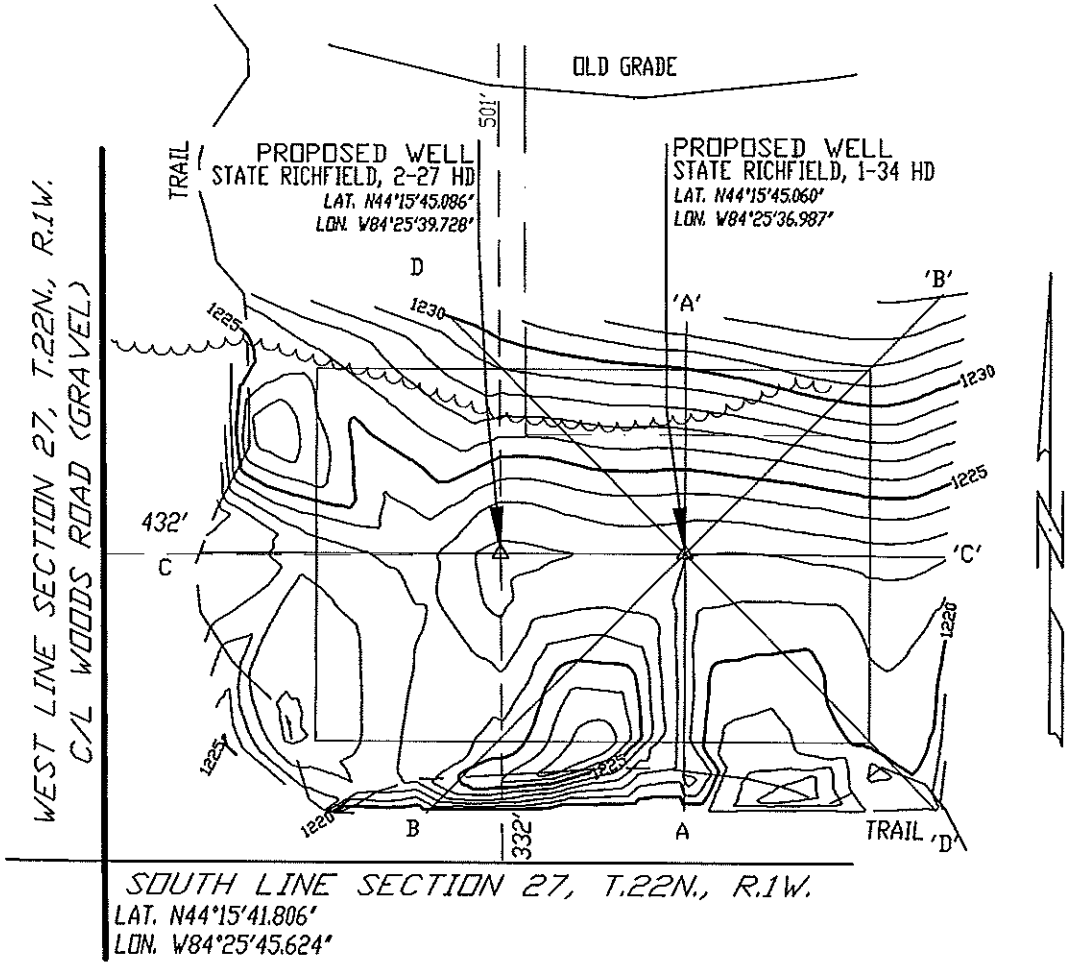
WORTH SURVEYING

P.O. BOX 4003
JACKSON, MI 49204
(517)788-9806

Devon Energy Production Company, L.P.
STATE RICHFIELD, 1-34 HD
S.W. 1/4 of S.W. 1/4 of S.W. 1/4 of SECTION 27,
T.22N., R.1W., RICHFIELD TOWNSHIP, ROSCOMMON COUNTY,
MICHIGAN
SCALE 1"=200'
VERT. SCALE 1"=10'
CONTOUR INTERVAL = 1'

SITE MAP

NOTE:
BASIS OF BEARINGS
MICHIGAN STATE PLANE CENTRAL
NAD83



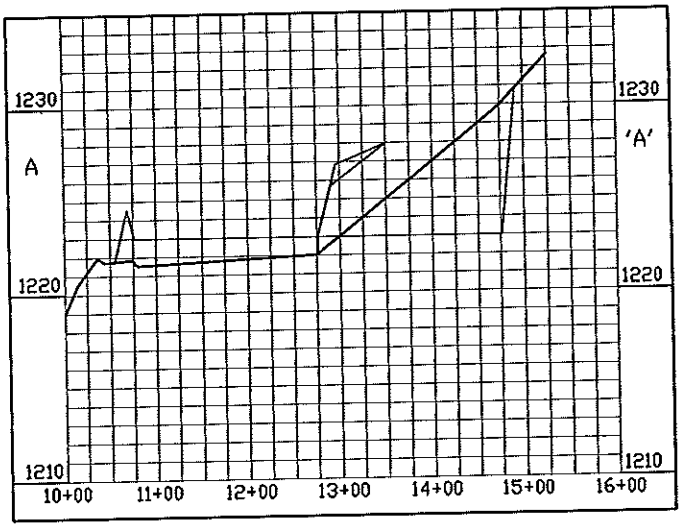
DRAWN BY:	AWA
DATE:	13-APR-12
DWG. NO.:	
APPROVED BY:	

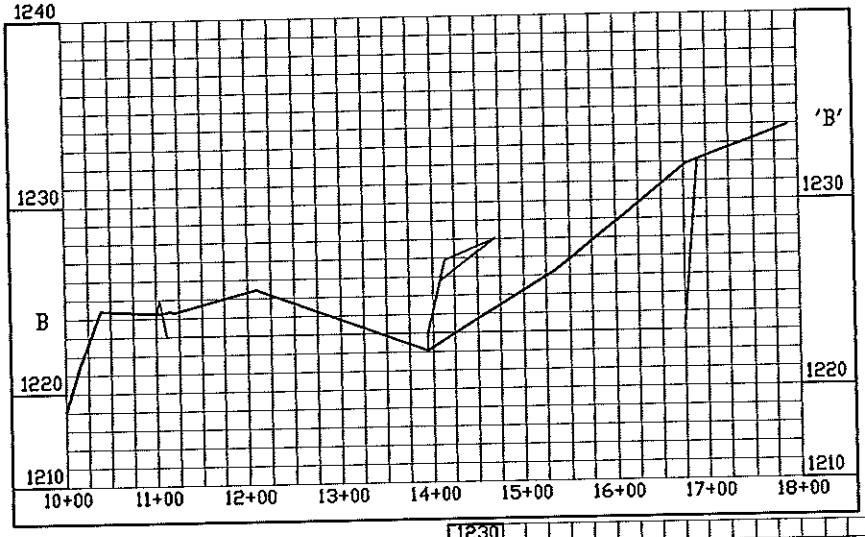
WORTH SURVEYING

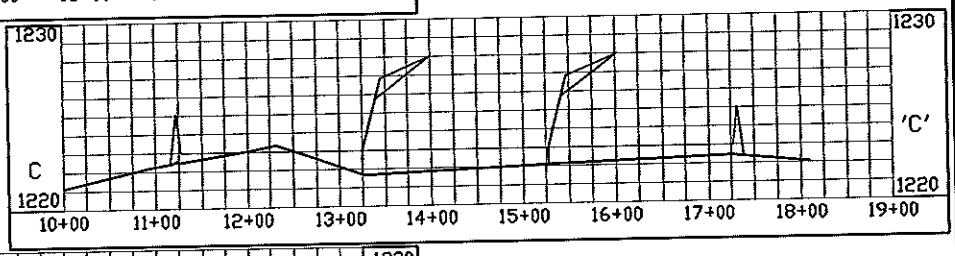
P.O. BOX 4003
JACKSON, MI 49204
(517)788-9806

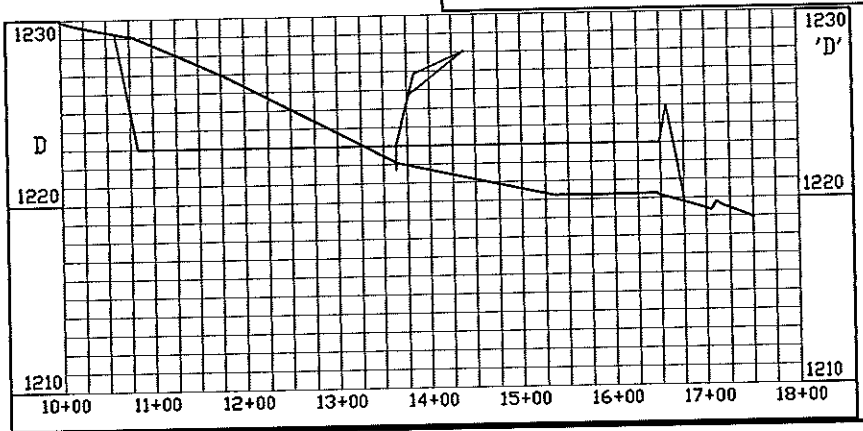
Devon Energy Production Company, L.P.
STATE RICHFIELD, 1-34 HD
S.W. 1/4 of S.W. 1/4 of SECTION 27,
T.22N., R.1W., RICHFIELD TOWNSHIP, ROSCOMMON COUNTY,
MICHIGAN
SCALE 1"=200'
VERT. SCALE 1"=10'

SITE MAP PROFILES









DRAWN BY: AWA
DATE: 13-APR-12
DWG. NO.:
APPROVED BY:

WORTH SURVEYING

P.O. BOX 4003
JACKSON, MI 49204
(517)788-9806

Devon Energy

Roscommon County, MI
Roscommon County 1-34 HD
State Richfield 1-34 HD

Main Wellbore

Plan: Plan 1

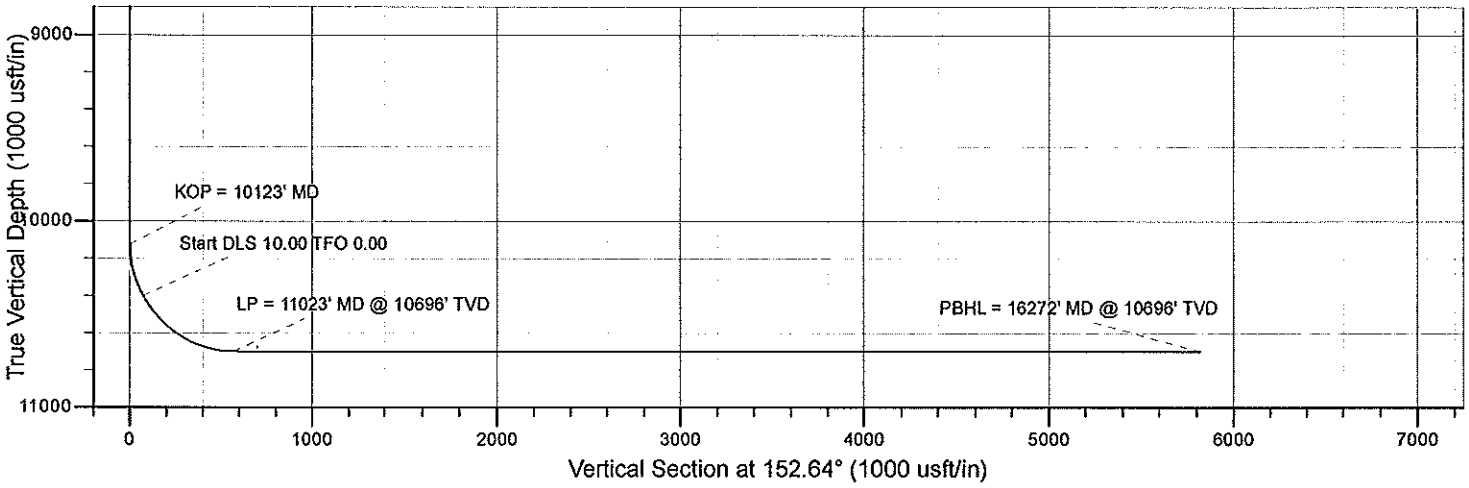
Standard Planning Report (Directional)

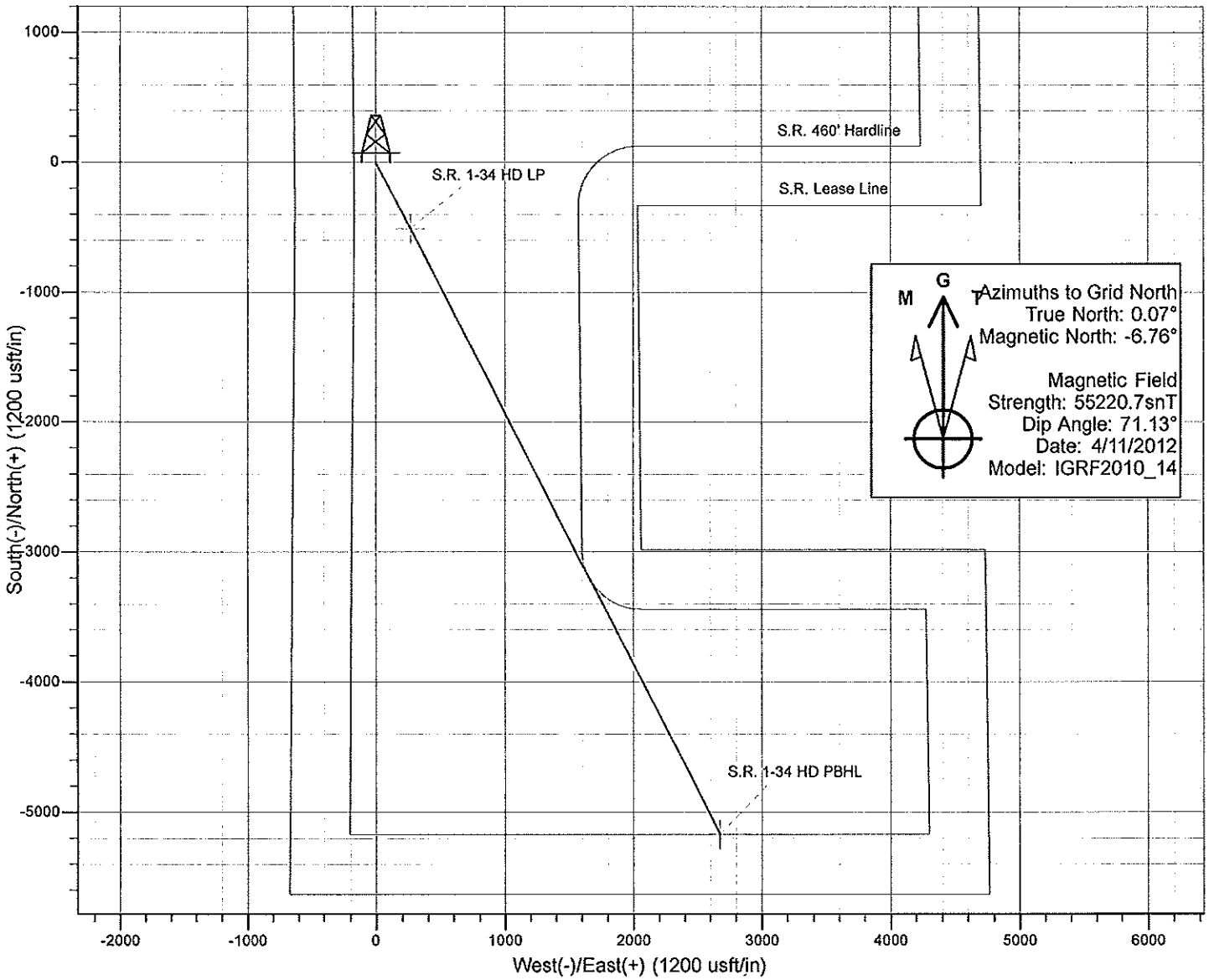
12 April, 2012

PHOENIX
TECHNOLOGY SERVICES USA INC.

Devon Energy

Project: Roscommon County, MI
Site: Roscommon County 1-34 HD
Well: State Richfield 1-34 HD
Wellbore: Main Wellbore
Design: Plan 1





Phoenix Technology Services

Planning Report

Database:	NER DB v5000	Local Co-ordinate Reference:	Site Roscommon County 1-34 HD
Company:	Devon Energy	TVD Reference:	WELL @ 1245.00usft (Original Well Elev)
Project:	Roscommon County, MI	MD Reference:	WELL @ 1245.00usft (Original Well Elev)
Site:	Roscommon County 1-34 HD	North Reference:	Grid
Well:	State Richfield 1-34 HD	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	Plan 1		

Project	Roscommon County, MI		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Michigan Central 2112		Using geodetic scale factor

Site	Roscommon County 1-34 HD				
Site Position:		Northing:	344,841.624 usft	Latitude:	44° 15' 45.060 N
From:	Lat/Long	Easting:	1,975,476.411 usft	Longitude:	84° 25' 36.987 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-0.07 °

Well	State Richfield 1-34 HD					
Well Position	+N/-S	0.00 usft	Northing:	344,841.624 usft	Latitude:	44° 15' 45.060 N
	+E/-W	0.00 usft	Easting:	1,975,476.411 usft	Longitude:	84° 25' 36.987 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	1,223.00 usft

Wellbore	Main Wellbore				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	4/11/2012	-6.82	71.13	55,221

Design	Plan 1				
Audit Notes:					
Version:		Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	152.64	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10,123.00	0.00	0.00	10,123.00	0.00	0.00	0.00	0.00	0.00	0.00	
10,409.13	28.61	152.64	10,397.39	-62.14	32.16	10.00	10.00	0.00	152.64	
11,023.06	90.00	152.64	10,696.00	-508.89	263.34	10.00	10.00	0.00	0.00	S.R. 1-34 HD LP
16,272.86	90.00	152.64	10,696.00	-5,171.43	2,676.04	0.00	0.00	0.00	0.00	S.R. 1-34 HD PBHL

Database:	NER DB v5000	**Local Co-ordinate Reference:**	Site Roscommon County 1-34 HD
Company:	Devon Energy	**TVD Reference:**	WELL @ 1245.00usft (Original Well Elev)
Project:	Roscommon County, MI	**MD Reference:**	WELL @ 1245.00usft (Original Well Elev)
Site:	Roscommon County 1-34 HD	**North Reference:**	Grid
Well:	State Richfield 1-34 HD	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	-1,245.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	-1,145.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	-1,045.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	-945.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	-845.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	-745.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	-645.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	-545.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	-445.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	-345.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	-245.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	-145.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	-45.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	55.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	155.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	255.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	355.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	455.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	555.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	655.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	755.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	855.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	955.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	1,055.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	1,155.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	1,255.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	1,355.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	1,455.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	1,555.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	1,655.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	1,755.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	1,855.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	1,955.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	2,055.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	2,155.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	2,255.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	2,355.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	2,455.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	2,555.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	2,655.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	2,755.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	2,855.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	2,955.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	3,055.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	3,155.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	3,255.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	3,355.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	3,455.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	3,555.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	3,655.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	3,755.00	0.00	0.00	0.00	0.00

Phoenix Technology Services

Planning Report

Database:	NER DB v5000	Local Co-ordinate Reference:	Site Roscommon County 1-34 HD
Company:	Devon Energy	TVD Reference:	WELL @ 1245.00usft (Original Well Elev)
Project:	Roscommon County, MI	MD Reference:	WELL @ 1245.00usft (Original Well Elev)
Site:	Roscommon County 1-34 HD	North Reference:	Grid
Well:	State Richfield 1-34 HD	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
5,100.00	0.00	0.00	5,100.00	3,855.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	3,955.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	4,055.00	0.00	0.00	0.00	0.00
5,400.00	0.00	0.00	5,400.00	4,155.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	4,255.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	4,355.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	4,455.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	4,555.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	4,655.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	4,755.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	4,855.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	4,955.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	5,055.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	5,155.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	5,255.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	5,355.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	5,455.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	5,555.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	5,655.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	5,755.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	5,855.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	5,955.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	6,055.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	6,155.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	6,255.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	6,355.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	6,455.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	6,555.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	6,655.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	6,755.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	6,855.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	6,955.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	7,055.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	7,155.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	7,255.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	7,355.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	7,455.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	7,555.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	7,655.00	0.00	0.00	0.00	0.00
9,000.00	0.00	0.00	9,000.00	7,755.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	7,855.00	0.00	0.00	0.00	0.00
9,200.00	0.00	0.00	9,200.00	7,955.00	0.00	0.00	0.00	0.00
9,300.00	0.00	0.00	9,300.00	8,055.00	0.00	0.00	0.00	0.00
9,400.00	0.00	0.00	9,400.00	8,155.00	0.00	0.00	0.00	0.00
9,500.00	0.00	0.00	9,500.00	8,255.00	0.00	0.00	0.00	0.00
9,600.00	0.00	0.00	9,600.00	8,355.00	0.00	0.00	0.00	0.00
9,700.00	0.00	0.00	9,700.00	8,455.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	8,555.00	0.00	0.00	0.00	0.00
9,900.00	0.00	0.00	9,900.00	8,655.00	0.00	0.00	0.00	0.00
10,000.00	0.00	0.00	10,000.00	8,755.00	0.00	0.00	0.00	0.00
10,100.00	0.00	0.00	10,100.00	8,855.00	0.00	0.00	0.00	0.00

Database:	NER DB v5000	Local Co-ordinate Reference:	Site Roscommon County 1-34 HD
Company:	Devon Energy	TVD Reference:	WELL @ 1245.00usft (Original Well Elev)
Project:	Roscommon County, MI	MD Reference:	WELL @ 1245.00usft (Original Well Elev)
Site:	Roscommon County 1-34 HD	North Reference:	Grid
Well:	State Richfield 1-34 HD	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
KOP - 10123 MD								
10,123.00	0.00	0.00	10,123.00	8,878.00	0.00	0.00	0.00	0.00
10,200.00	7.70	152.64	10,199.77	8,954.77	-4.59	2.37	5.17	10.00
10,300.00	17.70	152.64	10,297.20	9,052.20	-24.09	12.47	27.12	10.00
10,400.00	27.70	152.64	10,389.34	9,144.34	-58.32	30.18	65.66	10.00
10,409.13	28.61	152.64	10,397.39	9,152.39	-62.14	32.16	69.97	10.00
Start DLS 10.00 TFO 0.00								
10,409.84	28.68	152.64	10,398.01	9,153.01	-62.45	32.32	70.31	10.00
10,500.00	37.70	152.64	10,473.38	9,228.38	-106.23	54.98	119.62	10.00
10,600.00	47.70	152.64	10,546.78	9,301.78	-166.39	86.10	187.34	10.00
10,700.00	57.70	152.64	10,607.31	9,362.31	-236.94	122.62	266.79	10.00
10,800.00	67.70	152.64	10,653.12	9,408.12	-315.76	163.40	355.53	10.00
10,900.00	77.70	152.64	10,682.83	9,437.83	-400.45	207.22	450.89	10.00
11,000.00	87.69	152.64	10,695.52	9,450.52	-488.43	252.75	549.95	10.00
11,023.06	90.00	152.64	10,696.00	9,451.00	-508.89	263.34	572.99	10.00
LP - 11023 MD @ 10696 TVD								
11,023.07	90.00	152.64	10,696.00	9,451.00	-508.90	263.34	573.00	0.00
11,100.00	90.00	152.64	10,696.00	9,451.00	-577.23	298.70	649.93	0.00
11,200.00	90.00	152.64	10,696.00	9,451.00	-666.04	344.66	749.93	0.00
11,300.00	90.00	152.64	10,696.00	9,451.00	-754.85	390.62	849.93	0.00
11,400.00	90.00	152.64	10,696.00	9,451.00	-843.67	436.58	949.93	0.00
11,500.00	90.00	152.64	10,696.00	9,451.00	-932.48	482.53	1,049.93	0.00
11,600.00	90.00	152.64	10,696.00	9,451.00	-1,021.29	528.49	1,149.93	0.00
11,700.00	90.00	152.64	10,696.00	9,451.00	-1,110.11	574.45	1,249.93	0.00
11,800.00	90.00	152.64	10,696.00	9,451.00	-1,198.92	620.41	1,349.93	0.00
11,900.00	90.00	152.64	10,696.00	9,451.00	-1,287.74	666.37	1,449.93	0.00
12,000.00	90.00	152.64	10,696.00	9,451.00	-1,376.55	712.32	1,549.93	0.00
12,100.00	90.00	152.64	10,696.00	9,451.00	-1,465.36	758.28	1,649.93	0.00
12,200.00	90.00	152.64	10,696.00	9,451.00	-1,554.18	804.24	1,749.93	0.00
12,300.00	90.00	152.64	10,696.00	9,451.00	-1,642.99	850.20	1,849.93	0.00
12,400.00	90.00	152.64	10,696.00	9,451.00	-1,731.80	896.16	1,949.93	0.00
12,500.00	90.00	152.64	10,696.00	9,451.00	-1,820.62	942.11	2,049.93	0.00
12,600.00	90.00	152.64	10,696.00	9,451.00	-1,909.43	988.07	2,149.93	0.00
12,700.00	90.00	152.64	10,696.00	9,451.00	-1,998.24	1,034.03	2,249.93	0.00
12,800.00	90.00	152.64	10,696.00	9,451.00	-2,087.06	1,079.99	2,349.93	0.00
12,900.00	90.00	152.64	10,696.00	9,451.00	-2,175.87	1,125.95	2,449.93	0.00
13,000.00	90.00	152.64	10,696.00	9,451.00	-2,264.69	1,171.90	2,549.93	0.00
13,100.00	90.00	152.64	10,696.00	9,451.00	-2,353.50	1,217.86	2,649.93	0.00
13,200.00	90.00	152.64	10,696.00	9,451.00	-2,442.31	1,263.82	2,749.93	0.00
13,300.00	90.00	152.64	10,696.00	9,451.00	-2,531.13	1,309.78	2,849.93	0.00
13,400.00	90.00	152.64	10,696.00	9,451.00	-2,619.94	1,355.74	2,949.93	0.00
13,500.00	90.00	152.64	10,696.00	9,451.00	-2,708.75	1,401.69	3,049.93	0.00
13,600.00	90.00	152.64	10,696.00	9,451.00	-2,797.57	1,447.65	3,149.93	0.00
13,700.00	90.00	152.64	10,696.00	9,451.00	-2,886.38	1,493.61	3,249.93	0.00
13,800.00	90.00	152.64	10,696.00	9,451.00	-2,975.19	1,539.57	3,349.93	0.00
13,900.00	90.00	152.64	10,696.00	9,451.00	-3,064.01	1,585.53	3,449.93	0.00
14,000.00	90.00	152.64	10,696.00	9,451.00	-3,152.82	1,631.48	3,549.93	0.00
14,100.00	90.00	152.64	10,696.00	9,451.00	-3,241.64	1,677.44	3,649.93	0.00
14,200.00	90.00	152.64	10,696.00	9,451.00	-3,330.45	1,723.40	3,749.93	0.00
14,300.00	90.00	152.64	10,696.00	9,451.00	-3,419.26	1,769.36	3,849.93	0.00
14,400.00	90.00	152.64	10,696.00	9,451.00	-3,508.08	1,815.32	3,949.93	0.00

Database:	NER DB v5000	Local Co-ordinate Reference:	Site Roscommon County 1-34 HD
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Project:	Roscommon County MI	MD Reference:	WELL @ 1245.00usft (Original Well Elev)
Site:	Roscommon County 1-34 HD	North Reference:	Grid
Well:	State Richfield 1-34 HD	Survey Calculation Method:	Minimum Curvature
Wellbore:	Main Wellbore		
Design:	Plan 1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
14,500.00	90.00	152.64	10,696.00	9,451.00	-3,596.89	1,861.27	4,049.93	0.00
14,600.00	90.00	152.64	10,696.00	9,451.00	-3,685.70	1,907.23	4,149.93	0.00
14,700.00	90.00	152.64	10,696.00	9,451.00	-3,774.52	1,953.19	4,249.93	0.00
14,800.00	90.00	152.64	10,696.00	9,451.00	-3,863.33	1,999.15	4,349.93	0.00
14,900.00	90.00	152.64	10,696.00	9,451.00	-3,952.15	2,045.10	4,449.93	0.00
15,000.00	90.00	152.64	10,696.00	9,451.00	-4,040.96	2,091.06	4,549.93	0.00
15,100.00	90.00	152.64	10,696.00	9,451.00	-4,129.77	2,137.02	4,649.93	0.00
15,200.00	90.00	152.64	10,696.00	9,451.00	-4,218.59	2,182.98	4,749.93	0.00
15,300.00	90.00	152.64	10,696.00	9,451.00	-4,307.40	2,228.94	4,849.93	0.00
15,400.00	90.00	152.64	10,696.00	9,451.00	-4,396.21	2,274.89	4,949.93	0.00
15,500.00	90.00	152.64	10,696.00	9,451.00	-4,485.03	2,320.85	5,049.93	0.00
15,600.00	90.00	152.64	10,696.00	9,451.00	-4,573.84	2,366.81	5,149.93	0.00
15,700.00	90.00	152.64	10,696.00	9,451.00	-4,662.65	2,412.77	5,249.93	0.00
15,800.00	90.00	152.64	10,696.00	9,451.00	-4,751.47	2,458.73	5,349.93	0.00
15,900.00	90.00	152.64	10,696.00	9,451.00	-4,840.28	2,504.68	5,449.93	0.00
16,000.00	90.00	152.64	10,696.00	9,451.00	-4,929.10	2,550.64	5,549.93	0.00
16,100.00	90.00	152.64	10,696.00	9,451.00	-5,017.91	2,596.60	5,649.93	0.00
16,200.00	90.00	152.64	10,696.00	9,451.00	-5,106.72	2,642.56	5,749.93	0.00
PBHL - 16272' MD @ 10696' TVD								
16,272.86	90.00	152.64	10,696.00	9,451.00	-5,171.43	2,676.04	5,822.79	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
S.R. 1-34 HD PBHL - plan hits target center - Point	0.00	360.00	10,696.00	-5,171.43	2,676.04	339,670.284	1,978,152.406	44° 14' 54.020 N	84° 25' 0.142 W
S.R. 1-34 HD LP - plan hits target center - Point	0.00	360.00	10,696.00	-508.89	263.34	344,332.744	1,975,739.746	44° 15' 40.038 N	84° 25' 33.360 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
10,123.00	10,123.00	0.00	0.00	KOP = 10123' MD
10,409.84	10,398.01	-62.45	32.32	Start DLS 10.00 TFO 0.00
11,023.07	10,696.00	-508.90	263.34	LP = 11023' MD @ 10696' TVD
16,272.86	10,696.00	-5,171.43	2,676.04	PBHL = 16272' MD @ 10696' TVD

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – OFFICE OF OIL, GAS, AND MINERALS

ENVIRONMENTAL IMPACT ASSESSMENT

Required for issuance of well permit pursuant to Part 615, 1994 PA 451, as amended. Falsification of this information may result in fines and/or imprisonment. Check all boxes and fill in all blanks which apply to this drilling application. Attach additional pages as necessary.

A. DESCRIPTION OF PROJECT

1. Applicant's name
Devon Energy Production Co., L.P.

Well name and number
State Richfield, 1-34 HD

Intended use of well
Exploratory

2. Mineral ownership, check each category of mineral owners in drilling unit or Antrim Uniform Spacing Plan
☐ Private ☒ State ☐ Federal ☐ Other, identify

3. Applicable spacing order and drilling unit size
☐ S.O. 14-9-94 N. Mich. Antrim, 80 acres
☒ S.O. 1-73 Niagaran, 80 acres
☐ R 324.301 General rule, 40 acres
☐ Field Spacing or Unitization Order (identify below)
☐ S.O. 3-3-95 S. Mich. Antrim, 40 acres
☐ S.O. 2-81 Oakland Co. Niagaran, 40 acres
☐ S.O. 1-86 P.D.C., 640 acres
☐ Antrim USP (identify name, number of acres, and number of drilled and permitted wells)
☒ Administrative exception requested per R324.303 (2). See instructions for applying for an administrative spacing exception
☐ Exception to spacing requested, petition for hearing filed
☐ Non-producing well, no drilling unit

4. Applicant's right to drill and produce
☒ Yes ☐ No Are all mineral interests in the drilling unit under lease and controlled by the applicant/permittee?
If no, ☐ petition filed for compulsory pooling **OR** ☐ certified efforts to obtain leases are attached (if allowed by spacing order)
☐ Not applicable, no drilling unit.
☒ Yes ☐ No Has applicant obtained all contractual rights needed to locate the well where it is proposed?
If no, ☐ what additional approvals are needed? _____

5. Special considerations
☐ Replacement well for permit no. _____ or ☐ Existing well pad
☒ Yes ☐ No Is well expected to encounter H_2S?
☐ Yes ☒ No Is well located in a city, township, or village with a population greater than 70,000?
☐ Other (describe) _____

B. IMPACTS AS A RESULT OF DRILLING

1. Access route dimensions
232 feet x 20 feet / 43,560 = 0.11 acres.

Provide a detailed description of topography, drainage, soil type(s), direction and percentage of slopes, land cover and present land use for the access route while drilling. Identify route on attached plat. Access to the site will be East from Woods Road, a gravel surface county road, located 632 feet West of the stake. The general topography along the access route is nearly level land, and ground cover consists of grass, weeds and small trees. Present land use is recreational and agricultural, and surface drainage is Westerly at slopes of approximately one per cent (1%). Soil types are Croswell sand and Gerrish-Grayling sands.

2. Well site dimensions
400 feet x 600 feet / 43,560 = 5.11 acres.

Provide a detailed description of topography, drainage, soil types(s), direction and percentage of slopes, land cover and present land use for the well site. Identify well site on attached plat The proposed well site is located on nearly level land, and surface drainage is Easterly and Westerly at slopes of approximately one per cent (1%). Present land use is recreational and agricultural, and ground cover consists of grass, weeds and small trees. Site preparation will require the removal of numerous small oak trees and pine seedlings. Soil types are Gerrish-Grayling sands.

3. Is well site located in residentially zoned area? ☐ Yes ☒ No If yes, R324.407(3) and R324.505 apply.

4. Are drain tiles present? ☐ Yes ☒ No If yes, identify where they exist on attached plat or project map. How will they be handled if they are encountered? .

5. Identify the distance and direction to all of the following, also identify on attached plat
a. All buildings, fresh water wells, public roads, power lines and other man-made features within 600' of the well site.
Woods Road is located 632 feet West of the stake, and there is a two-track trail 332 feet South. There is an old railroad grade 495 feet North of the stake.

b. All Type I and Type IIa public water supply wells within 2000' of the well site and all Type IIb and Type III public water wells within 800' of the well site None

(Type I is a community water supply with year-round service ≥ 15 living units or ≥ 25 residents. Type II is a non-community water supply with ≥ 15 service connections or ≥ 25 individuals for not less than 60 days per year. Average daily water production: IIA ≥ 20,000 GPD IIB <20,000 GPD Type III is a public water supply which is neither type I or II.)

(Part B-5 continued)
c. Surface waters, floodplains, wetlands, natural rivers, critical dune areas, threatened or endangered species within 1320' and Great Lake shorelines within 1500' of the well site Indian Lake is located 1554 feet West of the stake. There are no threatened or endangered species listed for this location.

d. Describe the actions to be taken to mitigate impacts to any of the items identified in Part B-5 a-c above. All surface water features will be protected through the use of berms and silt fencing. No other special measures will be necessary to mitigate the effects of drilling and production operations at this location.

6. Identify the source of fresh water used for drilling and completing this well

☐ "Permanent" water well, to be retained after final completion OR used for drinking water
(shall be drilled and installed pursuant to Part 127 of 1979 PA 368, as amended)
☒ "Temporary" water well, will be plugged upon final completion and not used for drinking water
(consult R 324.403 (2) for minimum construction requirements)
☐ Fresh water will be hauled from existing water well or municipal source (identify) _____
☐ No fresh water will be used in drilling this well

7. Method of Well Completion and Well Treatment (check all that may apply)

☒ Conventional perforated casing
☐ Open Hole
☒ Acidizing
☐ Hydraulic Fracturing Estimated Total Water Volume _____
NOTE: Water volumes in excess of 100,000 gallons are subject to SOW Instruction 1-2011
☐ Other (describe) _____

8. Pit location and handling and disposal of drill cuttings, muds and fluids

Anticipated depth to groundwater 12 feet + Method determined by Auger test
☒ On site in-ground pit, anticipated dimensions: L 200 ft. W 60 f D 15 ft.
☐ Remote in-ground pit, anticipated dimensions: L _____ W _____ D _____
Attach approval of landowner and attach survey of remote pit location
☒ Well drilled below base of Detroit River Anhydrite. Describe how mud and cuttings pursuant to R324.407(7)(iv) will be handled.
Pit fluids below DRA disposed by Seiler Tank Truck Service, Inc. licensed liquid waste hauler **OR**
Pit fluids below DRA disposed at the _____ disposal well.
If drill cuttings & mud don't pass paint filter test, they will be disposed at Harrison landfill.
☐ No salt cuttings **OR**
☒ Salt cuttings dissolved and disposed by Seiler Tank Truck Service, Inc. licensed liquid waste hauler **OR**
☐ Salt cuttings hauled to _____ landfill
☐ Temporary pit, cuttings and muds disposed at (identify) _____
☐ No in-ground pit, cuttings and muds disposed at (identify) _____
☐ Pit will be solidified.

C. IMPACTS AS A RESULT OF PRODUCTION

1. Kind of well ☒ exploratory ☐ development ☐ Other (describe) _____
☐ Antrim project (**submit separate project EIA, form EQP 7200-21, for access roads, flow lines, and surface facilities**) and complete C-2, omit C-3 and C-4
where is project EIA found? _____

2. Location of surface facilities (Prior to construction, the District Geologist, pursuant to R324.1002, must also approve all surface facility secondary containment plans.)

☐ Greater than 300' from wellhead. Identify facility location on attached plat and complete C-3 and C-4.
☐ Less than 300' from wellhead. Identify facility location on attached plat, complete C-3, omit C-4
☐ Surface facility exists or was previously approved for construction and is known as _____ complete C-3, omit C-4.
☒ Surface facility location was not determined for this **exploratory** well (omit C-3 and C-4). Submit a separate request for **Surface Facility Location Approval (form 7200-22)**, which includes a Facility Plan, Environmental Impact Assessment, and Soil Erosion and Sedimentation Control Plan, to District Geologist prior to construction pursuant to R324.504.

3. Flow Line Environmental Impact Assessment

☐ Identify flow line location and course from well to the surface facility on attached plat.
Flow line route dimensions _____ feet x _____ feet / 43,560 = _____ acres.
Describe the topography, drainage, soil type(s), direction and percentage of slopes, land cover and present land use along the flow line route

4. Surface Facility Environmental Impact Assessment

a. Dimensions of surface facility _____ feet x _____ feet / 43,560 = _____ acres.
b. Describe the topography, drainage, soil type(s), direction and percentage of slopes, land cover, and present land use
1. Along access route to surface facility

Part C-4, continued

2. At surface facility site

c. Are surface facilities likely to receive oil or gas with H_2S concentration greater than 300 ppm? ☐ Yes ☐ No, if yes, R324.1106(2) applies.

d. Will surface facilities be located in residentially zoned area? ☐ Yes ☐ No, If yes, R324.506 may apply

e. Identify the distance and direction to all of the following, and identify on attached plat

1. Distance and direction to all buildings, fresh water wells, public roads, power lines and other man-made features within 600' of surface facility

2. Distance and direction to any surface waters, floodplains, wetlands, natural rivers, critical dune areas, and threatened or endangered species within 1320' and Great Lakes shorelines within 1500' of the surface facility site

3. Describe the actions to be taken to mitigate impacts to any of the items identified in Part C-4e 1 and 2 above.

4. Distance and direction to all Type I and Type IIa public water supply wells within 2000' of the surface facility site and all Type IIb and Type III wells within 800' of the surface facility

Type I is a community water supply with year-round service ≥ 15 living units or ≥ 25 residents. Type II is a non-community water supply with ≥ 15 service connections or ≥ 25 individuals for not less than 60 days per year. Average daily water production: IIA ≥ 20,000 GPD IIB <20,000 GPD Type III is a public water supply which is neither type I or II.

5. Method of brine disposal

☐ Dedicated flow line to disposal well _____, permit number _____

☒ Transported by tanker. ☐ Other _____

6. Method of transporting hydrocarbons past the point of sale

☐ Oil sold through transmission line ☒ Gas sold through transmission line

☒ Oil transported by tanker for sale ☐ Gas flared on site (production restrictions may apply)

☐ Other _____

D. MITIGATION OF IMPACTS FROM DRILLING AND/OR PRODUCTION

Describe additional measures to be taken to protect environmental and/or land use values A minimal amount of earthwork will be necessary to construct the access drive and drilling pad. Topsoil will be stockpiled and replaced as conditions permit. There should be little impact on residents, public utilities or land and water use in the area due to the remote setting of the site. Sufficient cover will remain for wildlife in the area. Land values should not be adversely affected by drilling and production operations at this location.

E. ADDITIONAL PERMITS

Identify additional permits to be sought None

F. SOIL EROSION AND SEDIMENTATION PLAN

Submit a soil erosion and sedimentation plan (form 7200-18) which addresses **each** well site, surface facility, and flow line route identified in this application. (Refer to requirements under Part 91, 1994 PA 451)

G. ALTERNATE WELL AND SURFACE FACILITY LOCATIONS

Were alternate surface locations considered for this well or surface facility?

☒ No, alternate sites did not seem necessary or more desirable

☐ Yes, the following locations were considered

Why were they rejected in favor of the proposed location?

H. CERTIFICATION

"I state that I am authorized by said applicant to prepare this document. It was prepared under my supervision and direction. The facts stated herein are true, accurate and complete to the best of my knowledge."

Thomas F. Worth, P.S. _____ April 13, 2012

Name and title (printed or typed) Authorized Signature Date

Enclose with *Application for Permit to Drill*

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY – OFFICE OF OIL, GAS, AND MINERALS

SOIL EROSION & SEDIMENTATION CONTROL PLAN

By authority of Part 91, and Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information may result in fines and/or imprisonment. Applicants for multisource commercial hazardous waste disposal wells under Part 625 are required to obtain a Part 91 permit from a county or local enforcing agency

☒ Part 615 Oil/Gas Well ☐ Part 625 Mineral Well

1. Name and address of applicant
Devon Energy Production Co., L.P.
20 North Broadway
Oklahoma City, OK 73102
Phone: (405)235-3611 Fax: (405) 552-4550

2. Well or project name:
State Richfield, 1-34 HD

3. Well or project location:
Section(s) 27 T22N R1W

4. Name and address of County or local Enforcement Agent (CEA)
Sheridan Cole
500 Lake Street
Roscommon, MI 48653
Phone: (989)275-8323 Fax: (989) 275-5675

5. Township
Richfield

6. County
Roscommon

7. Date earth changes expected to start
Within two months of obtaining permit to drill.

8. Date of expected completion
Within two months of obtaining permit to drill.

9. Name and address of person responsible for earth change:
George Durington
3101 South Lakeside Drive
Oklahoma City, OK 73179
Phone: (405)843-5566 Fax: (405) 843-5666

10. Name and address of person responsible for maintenance:
George Durington
3101 South Lakeside Drive
Oklahoma City, OK 73179
Phone: (405)843-5566 Fax: (405) 843-5666

11. Send copies of supplemental plat required by Part 615, R 324.201(2)(b) or R 324.504(4), and this form and all attachments, to CEA. For Part 625 Mineral Wells, send to CEA only as instructed by OOGM staff.
Date sent to CEA March 30, 2012

EARTH CHANGE ACTIVITIES

12. Project description: (Project activities may be permitted sequentially.)
a. Number of well sites 1, 5.11 acres
b. Number of surface facility sites 1, 5.11 acres
c. New access roads 232 feet, 0.11 acres
d. Flow line(s) trenched in off well site* NA feet, NA acres
e. Flow line(s) plowed in off well site* NA feet, NA acres
*Contact CEA for fee schedule

13. Describe sites for which permits are being sought under Part 301 (Inland Lakes & Streams) None
Describe sites for which permits are being sought under Part 303 (Wetlands) None
List file numbers if known NA

14. Attach detail map at scale of 1"=200' or larger, with contour lines at a minimum of 20' intervals OR percent slope descriptions.

15. Areas requiring control structures
Will earth changes occur in areas with slopes of 10% or greater; areas where runoff water is likely, such as runs greater than 500' of moderate slope (5% to 10%), narrow valley bottoms, etc.; areas within 500' of a lake or stream; or other areas where sedimentation to a wetland or drainage way may occur?
☐ Yes ☒ No

Indicate any of the following erosion control structures that will be utilized. Identify location on detail map and attach detail plan.

Indicate on plan whether erosion control structures are temporary or permanent.

☐ Diversions ☐ Culverts ☐ Sediment basins ☐ Silt fences ☐ Rip-rap ☒ Berms ☐ Check dams
☒ Other Silt fencing

16. Site restoration
☒ Topsoil will be segregated from subsoil and stockpiled OR ☐ No topsoil on site
☒ Recontour and revegetate as soon as weather permits. Seed mix Michigan DNR mix or landowner preference
☐ Describe other proposed methods of restoration

17. Application prepared by (name) Thomas F. Worth, P.S. Signature Date April 13, 2012

FOR USE OF COUNTY OR LOCAL ENFORCING AGENT

INSTRUCTIONS TO COUNTY OR LOCAL ENFORCMENT AGENT: Copies of supplemental plat required by Part 615, R 324.201(2)(b) or R 324.504(4), and this form and all attachments are provided for CEA review and informational purposes only. Submittal to CEA is not a requirement under Part 615 or 625. Part 615 and 625 Permits to Drill and Operate include erosion control plan approval for well sites, access roads, flow lines, and surface facilities. Return this form to the applicable field or district office of the Office of Oil, Gas, and Minerals (OOGM) within 30 days of receipt. OOGM will consider all comments and recommendations in reviewing the application.

17. Comments

☐ Conducted on site inspection Date ☐ Inspected site with representative of applicant Date

CEA (name) Date

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF OIL, GAS, AND MINERALS

WELLHEAD BLOWOUT CONTROL SYSTEM

Worksheet supplement for "Application for Permit to Drill or Deepen a Well

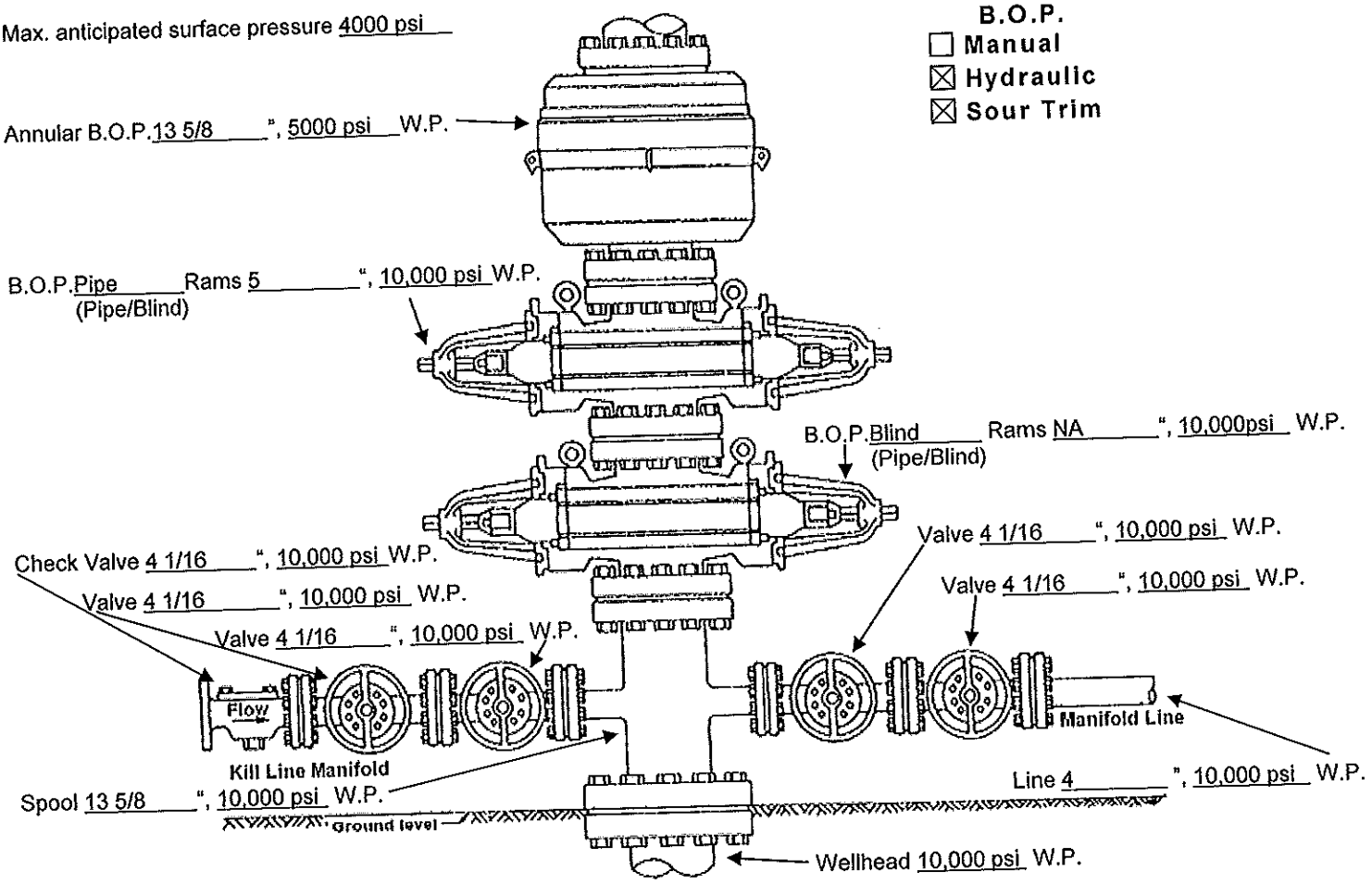
This information is required by authority of Part 615 Supervisor of Wells or Part 625 Mineral Wells, Act 451 PA 1994, as amended, in order to obtain a permit.

Applicant
Devon Energy Production Co., L.P.
20 North Broadway
Oklahoma City, OK 73102

Well name and number
State Richfield 1-34 Horizontal (HD)

Max. anticipated surface pressure 4000 psi

B.O.P.
- ☐ Manual
- ☒ Hydraulic
- ☒ Sour Trim



Fill above blanks with applicable information. If not applicable, enter "N.A." or cross-out item shown.

Describe test pressures and procedure for conducting pressure test. Identify any exceptions to R324.406 being requested.

The 13 5/8" BOP equipment will be installed.
From Top to bottom 13-5/8" 5K annular, 13-5/8" 10K (5")ram, 13-5/8" 10K blind ram, 13-5/8" 10K mud cross and 13-5/8" 10K (5") ram.

BOPE will be certified by independent third party tester prior to installation.
Test pressures for pipe/blind rams, choke/kill line valves: 250 psi low/10,000 psi high prior to drilling below 9 5/8" intermediate casing.
Test pressure for annular: 250 psi low/3,500 psi high prior to drilling below 9 5/8" intermediate casing.
An 11" 10,000 psi x 13 5/8" 10,000 psi adapter will be installed on the 11" 10,000 psi casing head to facilitate NU 13 5/8" BOPE
Test pressures for pipe/blind rams, choke/kill line valves: 250 psi low/10,000 psi high prior to drilling below 7" intermediate casing.
Test pressure for annular: 250 psi low/3,500 psi high prior to drilling below 7" intermediate casing.

H2S CONTINGENCY PLAN

H2S CONTINGENCY PLAN FOR:

Devon Energy Production Co., L.P.
20 North Broadway
Oklahoma City, OK 73102

State Richfield, 1-34 HD
SW-SW-SW Section 27, T.22N., R.1W.
Richfield Twp., Roscommon Co. Michigan

EMERGENCY PHONE NUMBERS:

Company Personnel:
Joel Guichard — (832) 465-5414 Cell
Greg Sibley — (713) 265-6518 Office

Notification Personnel:
George Durington, Oklahoma City, OK — (405) 843-5566 work — (405) 641-5579 cell

Drilling Contractor:
Undetermined.

MDNRE:
Cadillac District Office — (231) 775-3960
120 West Chapin Street
Cadillac, MI 49601
Contact: Rick Henderson – District Supervisor — (231) 876-4435 office
(989) 705-3411 field office
Bill Duley - Senior Geologist — (231) 876-4431 office

Roscommon County Emergency Coordinator
Kent Forst, Director — (989) 275-8740
101 South Second Street
Roscommon, MI 48653

Richfield Township Department of Public Saftey — (989) 389-4071 or **911**
Roscommon County Sheriff's Office — (989) 275-5101 or **911**
Central Dispatch — **(989) 275-0911**

State Police – Houghton Lake Post — (989) 422-5103 or **911**

Richfield Township Department of Public Saftey — (989) 389-4071 or **911**

West Branch Regional Medical Center — (989) 345-3660
2463 S M 30, West Branch, MI, 48661

Richfield Township Department of Public Saftey — (989) 389-4071 or **911**

PEAS — (800) 292-4706

H2S CONTINGENCY PLAN

H2S CONTINGENCY PLAN FOR:

Devon Energy Production Co., L.P.
20 North Broadway
Oklahoma City, OK 73102

State Richfield, 1-34 HD
SW-SW-SW Section 27, T.22N., R.1W.
Richfield Twp., Roscommon Co. Michigan

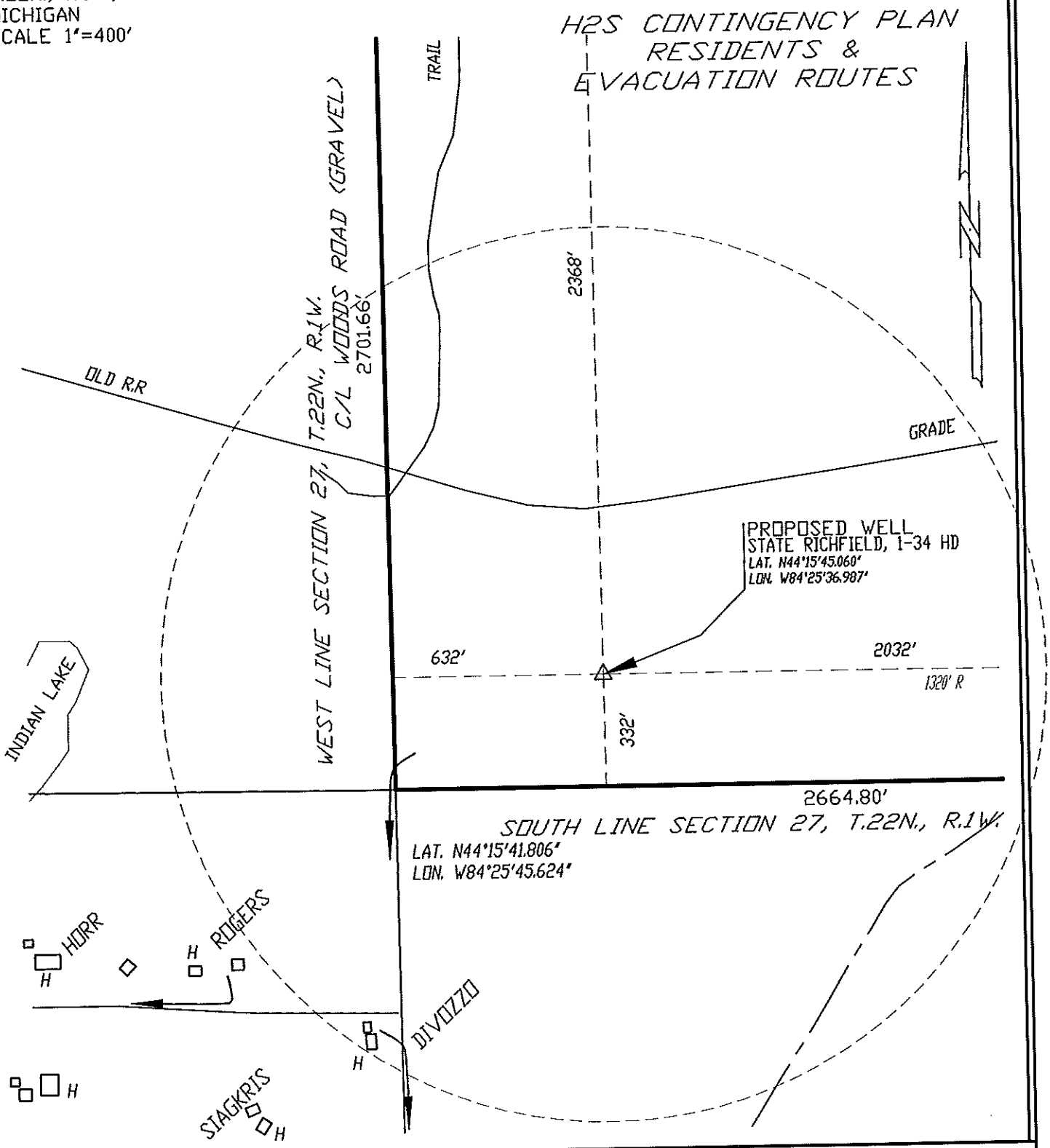
Nearest public phone:

There are no public telephones near the site, however, several cell phones will be on site.

Residents within 1320 feet of well:

Name	Address	Phone	City/State
David & Gerald Divozzo	36269 Oakshire Ct.	586-791-1179	Clinton, MI 48035
Michael & Darn Rogers	8272 Chinavare Road	734-782-0575	Newport, MI 48166
Thomas & Linda Horr	8812 Spring Lake Road	989-387-1120	St. Helen, MI 48656

Devon Energy Production Company, L.P.
STATE RICHFIELD, 1-34 HD
S.W. 1/4 of S.W. 1/4 of S.W. 1/4 of SECTION 27,
T.22N., R.1W., RICHFIELD TOWNSHIP, ROSCOMMON COUNTY,
MICHIGAN
SCALE 1"=400'



DRAWN BY:	AWA
DATE:	13-APR-12
DWG. NO.:	
APPROVED BY:	

WORTH SURVEYING

P.O. BOX 4003
JACKSON, MI 49204
(517)788-9806

WORTH SURVEYING
P.O. Box 4003
Jackson, MI 49204
Telephone 517-788-9806
Fax 517-788-9937
e-mail worthsurveying@sbcglobal.net

April 13, 2012

Ms. Ann M. Bonk
Roscommon County Clerk
500 Lake Street
Roscommon, MI 48653-7690

re: Proposed drilling operations

Dear Ms. Bonk:

Contingent upon the Michigan Department of Environmental Quality (MDEQ) issuing a drilling permit, Devon Energy Production Company, L.P. plans to drill a hydrocarbon production well to be located 332 feet from the South line and 632 feet from the West line of the Southwest quarter of Section 27, Town 22 North, Range 1 West, Richfield Township, Roscommon County, Michigan.

The well will be known as the State Richfield, 1-27 P and State Richfield, 1-34 HD. (See the drilling permit application enclosed herewith.)

Should you have any questions regarding these proposed drilling operations, please feel free to contact me at 517-788-9806.

Respectfully,

Thomas F. Worth, P.S.
Worth Surveying

cc: MDEQ Office of Oil, Gas and Minerals
Devon Energy Production Co., L.P.

WORTH SURVEYING
P.O. Box 4003
Jackson, MI 49204
Telephone 517-788-9806
Fax 517-788-9937
e-mail worthsurveying@sbcglobal.net

April 13, 2012

Michigan Department of Natural Resources
Forest Management Division
P.O. Box 30452
Lansing, MI 48909-7952

re: Proposed drilling operations

To Whom It May Concern:

Contingent upon the Michigan Department of Environmental Quality (MDEQ) issuing a drilling permit, Devon Energy Production Company, L.P. plans to drill a hydrocarbon production well to be located 332 feet from the South line and 632 feet from the West line of the Southwest quarter of Section 27, Town 22 North, Range 1 West, Richfield Township, Roscommon County, Michigan.

The well will be known as the State Richfield, 1-27 P and State Richfield, 1-34 HD. (See the drilling permit application enclosed herewith.) Enclosed herewith also please find a check in the amount of $300.00, made payable to the State of Michigan, for the Well Site Surface Use Permit

Should you have any questions regarding these proposed drilling operations, please feel free to contact me at 517-788-9806.

Respectfully,

Thomas F. Worth, P.S.
Worth Surveying

cc: MDEQ Office of Oil, Gas and Minerals
Devon Energy Production Co., L.P.

WORTH SURVEYING
P.O. Box 4003
Jackson, MI 49204
Telephone 517-788-9806
Fax 517-788-9937
e-mail worthsurveying@sbcglobal.net

April 13, 2012

Mr. Kent Forst
Roscommon County Emergency Coordinator
101 South Second Street
Roscommon, MI 48653

re: Proposed drilling operations

Dear Mr. Forst:

Contingent upon the Michigan Department of Environmental Quality (MDEQ) issuing a drilling permit, Devon Energy Production Company, L.P. plans to drill a hydrocarbon production well to be located 332 feet from the South line and 632 feet from the West line of the Southwest quarter of Section 27, Town 22 North, Range 1 West, Richfield Township, Roscommon County, Michigan.

The well will be known as the State Richfield, 1-27 P and State Richfield, 1-34 HD (See the drilling permit application enclosed herewith), and has the potential for producing hydrogen sulfide gas. The H2S Contingency Plan for this proposed well is attached hereto.

Should you have any questions regarding these proposed drilling operations, please feel free to contact me at 517-788-9806.

Respectfully,

Thomas F. Worth, P.S.
Worth Surveying

cc: MDEQ Office of Oil, Gas and Minerals
Devon Energy Production Company, L.P.

WORTH SURVEYING
P.O. Box 4003
Jackson, MI 49204
Telephone 517-788-9806
Fax 517-788-9937
e-mail worthsurveying@sbcglobal.net

April 13, 2012

Sheridan Cole
Roscommon County CEA
500 Lake Street
Roscommon, MI 48653

re: Proposed drilling operations

Dear Mr. Cole:

Contingent upon the Michigan Department of Environmental Quality (MDEQ) issuing a drilling permit, Devon Energy Production Company, L.P. plans to drill a hydrocarbon production well to be located 332 feet from the South line and 632 feet from the West line of the Southwest quarter of Section 27, Town 22 North, Range 1 West, Richfield Township, Roscommon County, Michigan.

The well will be known as the State Richfield, 1-27 P and State Richfield, 1-34 HD. (See the drilling permit application enclosed herewith.)

Should you have any questions regarding these proposed drilling operations, please feel free to contact me at 517-788-9806.

Respectfully,

Thomas F. Worth, P.S.
Worth Surveying

cc: MDEQ Office of Oil, Gas and Minerals
Devon Energy Production Co., L.P.

WORTH SURVEYING
P.O. Box 4003
Jackson, MI 49204
Telephone 517-788-9806
Fax 517-788-9937
e-mail worthsurveying@sbcglobal.net

April 13, 2012

Michigan Department of Natural Resources
Forest Management Division
Grayling Field Office
attn: Ken Phillips
1955 Hartwick Pines Road
Grayling, MI 49738

re: Proposed drilling operations

Dear Mr. Phillips:

Contingent upon the Michigan Department of Environmental Quality (MDEQ) issuing a drilling permit, Devon Energy Production Company, L.P. plans to drill a hydrocarbon production well to be located 332 feet from the South line and 632 feet from the West line of the Southwest quarter of Section 27, Town 22 North, Range 1 West, Richfield Township, Roscommon County, Michigan.

The well will be known as the State Richfield, 1-27 P and State Richfield, 1-34 HD. (See the drilling permit application enclosed herewith.)

Should you have any questions regarding these proposed drilling operations, please feel free to contact me at 517-788-9806.

Respectfully,

Thomas F. Worth, P.S.
Worth Surveying

cc: MDEQ Office of Oil, Gas and Minerals
Devon Energy Production Co., L.P.

WATER WITHDRAWAL ASSESSMENT TOOL

Print

Withdrawal Report - 4/13/2012 1:21:52 PM

The proposed withdrawal has 'PASSED' the screening process.

RESULTS:
The proposed withdrawal has passed the screening process. The projected impact of the withdrawal lies within 'Zone A' and is not likely to cause an adverse resource impact.

REGISTRATION:
A large quantity withdrawal (LQW) with a capacity of 70 GPM or greater must be registered with the Michigan Department of Environmental Quality, or with the Michigan Department of Agriculture if the LQW is for an agricultural purpose, before the withdrawal can begin. A registration is valid for 18 months. The withdrawal capacity must be installed within this time period or the registration becomes void. Registration may be done at this time through the button at the right.

You may register at this time, or come back to this site at a later time, or you may obtain a form to register the withdrawal by contacting Andrew LeBaron at 517-241-1435, or on-line at: www.michigan.gov/deqwateruse

Summary

Watershed ID:	21949
Pumping Capacity (GPM):	70
Estimated Removal (GPM):	10
Well Depth (FT):	76
Well Type:	Ground Water
Aquifer Type:	Glacial
Pumping Frequency:	Continuous
Latitude:	44.26233
Longitude:	-84.426692

DISCLAIMER:
The Water Withdrawal Assessment Tool is designed to estimate the likely impact of a proposed water withdrawal on nearby streams. It is not an indication of how much groundwater may be available for your use. The quantity and quality of groundwater varies greatly with depth and location. You should consult with a water resources professional or a local well driller about groundwater availability at your location.

devon

Devon Energy Corporation
1200 Smith Street
Houston, TX 77002

713-286-5700 Phone
www.devonenergy.com

April 11, 2012

Permits and Bonding Unit
Office of Oil, Gas and Minerals
Michigan Department of Environmental Quality
P. O. Box 30256
Lansing, MI 48909-7756

RE: Devon Energy Production Co., LP; State Richfield 1-27P & 1-34HD

Gentlemen:

Devon Energy plans to drill a gas well in Section 34,T22N R1W, Richfield Township, Roscommon County, Michigan. The State Richfield 1-27P will be drilled as a pilot hole to TD in the Trenton Carbonate below the Utica/Collingwood formations. It will then be plugged back and a horizontal drain hole, State Richfield 1-34HD will be drilled into the Utica/Collingwood. The well will then be completed with a multi-stage stimulation in the Utica/Collingwood. The surface location is located in the SW/SW/SW of Section 27, 332' FSL and 632' FWL of Section 27 and the planned BHL of horizontal drain hole is 461' FSL and 2082' FEL of the SW/SW/SE of Section 34.

Attached are permit application to drill the State Richfield 1-27P pilot hole and the State Richfield 1-34HD horizontal drain hole. The unit has been ratified by the state, see declaration of pooling attached.

Also note that the pilot hole will not be completed in any formation and no portion of the horizontal drain hole in the Utica/Collingwood will be completed (perforated) closer than 330' from the drill unit/pool boundary.

A directional drilling plan is attached to the drain hole permit application.

Should you need additional information, please call Greg Sibley (drilling engineer) at 713.265.6815 or myself at 713.265.6834.

Very truly yours,

Jeanie McMillan

Jeanie McMillan
Regulatory Supervisor
Devon Energy – Southern Division

Enclosures