NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
BETTY RIVERA
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

September 14, 2002

Nance Petroleum Corporation
550 N 31st Street, Suite 500
Billings, Montana 59101

Attn: Mr. Thackeray

RE: Injection Pressure Increase – 187
Parkway Delaware Unit Well No. 601
(API No. 30-015-26433)
Eddy County, New Mexico

Dear Mr. Thackeray:

Reference is made to your request received in our office on September 3, 2002, to increase the surface injection pressure on the above referenced well. This request is based on a step rate test conducted on the well. We have reviewed the test results and feel an increase in injection pressure on this well is justified at this time.

You are therefore authorized to increase the surface injection pressure on the following well:

Well and Location	*Maximum Surface Injection Pressure*
Parkway Delaware Unit Well No. 601	1225 PSIG
Located in Lot 2 of Section 2, Township 20 South, Range 29 East, Eddy County, New Mexico.	

The Division Director may rescind this injection pressure increase if it becomes apparent that the injected water is not being confined to the injection zone or is endangering any fresh water aquifers.

Sincerely,

Lori Wrotenbery (WVJJ)

Lori Wrotenbery
Director

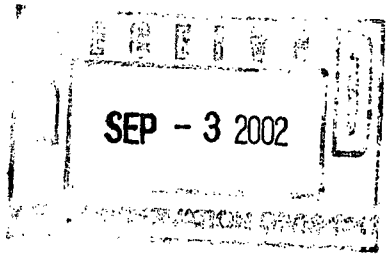
LW/wvjj
cc: Oil Conservation Division - Artesia
Files: R-9822; PSI-X-2002

22483 1311 IPI NA

NANCE PETROLEUM CORPORATION

A Subsidiary of
St. Mary Land & Exploration Co.

P.O. BOX 7168 • BILLINGS, MT 59103
550 N. 31ST ST, SUITE 500 • BILLINGS, MT 59101
PHONE: (406) 245-6248 • FAX: (406) 245-9106



August 29, 2002

Mr. David Catanach
New Mexico Oil Conservation Division
1220 South Francis Drive
Sante Fe, NM 87505

Re: Request for Increase in Permitted Injection Pressure
Parkway Delaware Unit
Eddy Co., NM

Dear Mr. Catanach:

We spoke a while back following the OCD field inspector requiring us to shut-in two water injectors that were exceeding what his records showed as the permitted pressure limit of +/- 840 psi. We were unable to find any documentation confirming what his and my predecessors believed the allowable surface pressure was: 1100 psi for the original peripheral injectors and 1500 psi for the new drill infill injectors.

I mentioned that our injection system pressure, which typically is 1000-1100 psi, had been reported monthly on the C-115's for years and that I had several wireline tracer surveys which showed that the injected water was staying within the unitized interval. You requested I obtain step rate data in order to grant an increase in the permitted pressure.

Attached is the analysis of a step rate test we performed on PDU #601 prior to a recent fracture stimulation. It indicates that 1275 psi was required at the surface to frac the formation. I have also attached copies of the RA Tracer – SI Temperature surveys we ran on wells # 205, 302, 303, 304, 505, 507, 509 & 703. All these surveys show that the water is staying within the unitized interval (unitized interval is typically from a few feet below the bottom perf to ~200' above the top perf – we are currently only waterflooding the bottom 1/3, the Delaware "C" zone). These profile surveys do indicate some growth upward from the top perf but still maintained well within the unitized interval and the target for a current study to expanding the flood to the "A" and "B" zones.

The PDU waterflood has been extremely successful as evidenced by it's 900 BOPD increase in production. However as the flood has matured, the reservoir has filled up and higher injection pressure is required to continue putting the water in the ground. To avoid future confusion with different pressure limits on each well we request that **all Parkway Delaware Unit water injection pressure limits be increased to 1250 psi.**

We feel the attachments substantiate that this increase in permitted pressure will not result in migration of water outside the Delaware formation and is in fact necessary for the continued success of the project. Our injection facilities are currently only capable of 1150 psi but by having the cushion slightly higher at 1250 psi we have a bit of room to grow should continued reservoir fill up increase the frac gradient above what we discovered it to be on the step-rate test of #601. We will continue to monitor the waterflood with periodic tracer surveys to ensure the injected water remains in zone.

Your early attention to this request would be greatly appreciated.

Sincerely,

Herb Thackeray

Herb Thackeray
Operations Engineer

Attachments: IPT Step Rate Analysis of PDU #601
Cardinal Surveys Injection Profiles PDU # 205, 302, 303, 304, 505, 507, 509 & 703

IPT
Integrated Petroleum Technologies, Inc. ***Since 1991***

July 30, 2002

Gary Hughes

Mr. Herb Thackeray
Nance Petroleum Corporation
550 North 35th; Suite 500
Billings, Montana 59101

RE: Preliminary Step Rate and Closure Pressure Analysis
PDU #601
Parkman Delaware Unit
Delaware Formation
Eddy County, New Mexico

Dear Mr. Thackeray:

Attached is the preliminary analysis of the step rate injection and closure pressure data which was obtained in conjunction with the fracture treatment on the PDU #601 are displayed in Figures 1-5.

Figure 5 shows the results of the step rate test analysis. There is a clear break-over in the data which indicates that the fracture propagation pressure (surface) is 1,275 psi. This equates to a gradient of 0.734 psi/ft when utilizing the mid-perforation depth of 4,331'.

I will call to discuss this data and the preliminary analysis, and to determine appropriate documentation.

IPT appreciates the opportunity to work with you and Nance Petroleum Corporation on this stimulation design. Please do not hesitate to call if you have any questions or if we can be of any additional assistance.

Sincerely,

(received via email)

Paul W. Sauer
Senior Petroleum Engineer

14062 Denver West Parkway • Suite 220 • Golden, CO 80401, U.S.A. • Phone: (303) 216-0703 • Fax: (303) 216-2139
2525 NW Expressway • Suite 432 • Oklahoma City, OK 73112, U.S.A. • Phone: (405) 842-2576 • Fax: (405) 842-2586

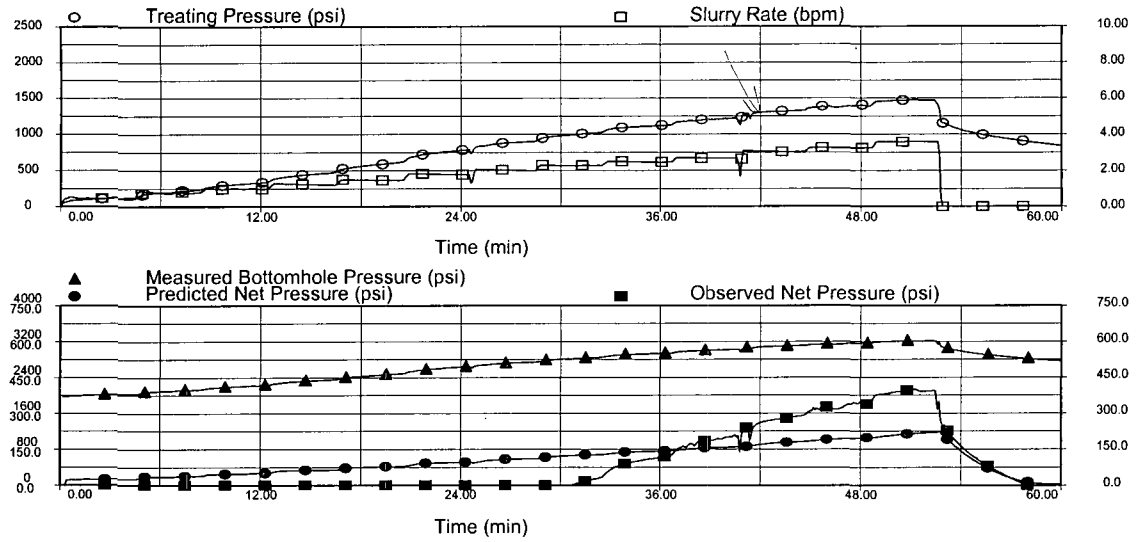


Figure 1: Pump-in diagnostic data and net pressure history match.

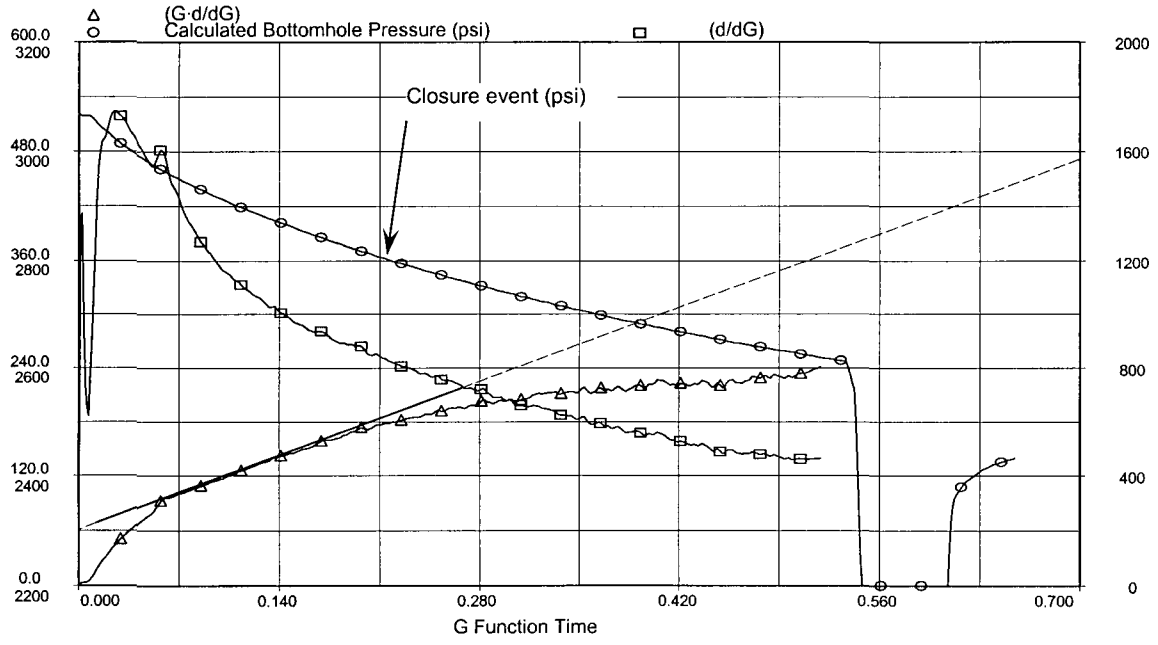


Figure 2: Pressure falloff analysis following diagnostic pump-in, G-Function plot.

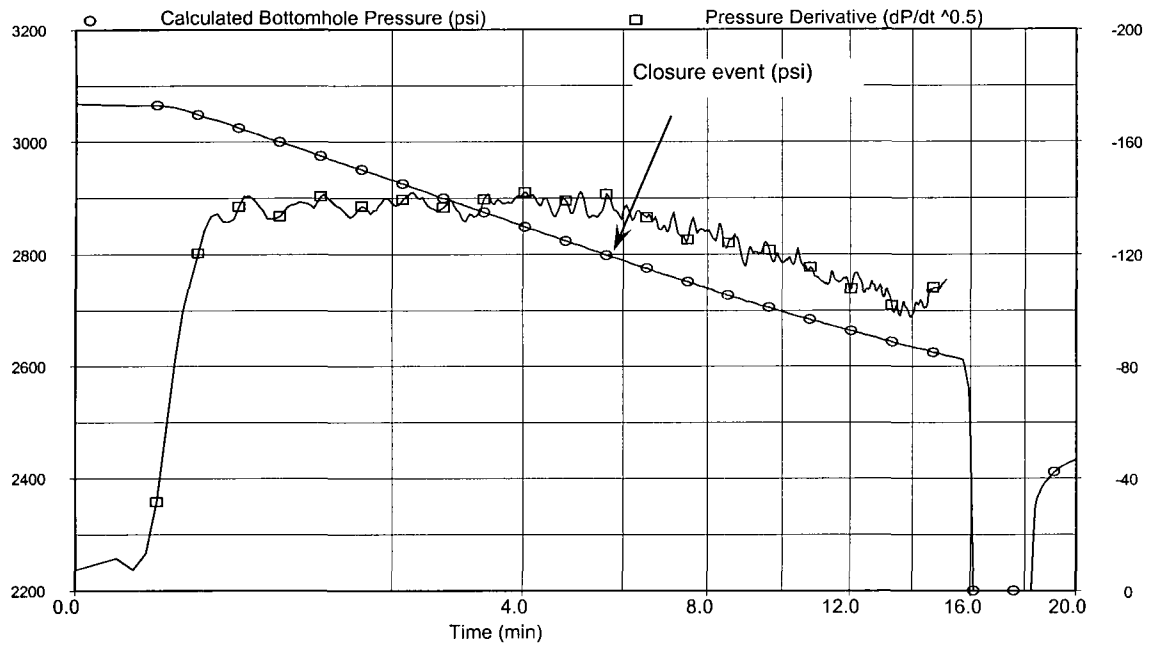


Figure 3: Pressure falloff analysis following diagnostic pump-in, square-root-of-time.

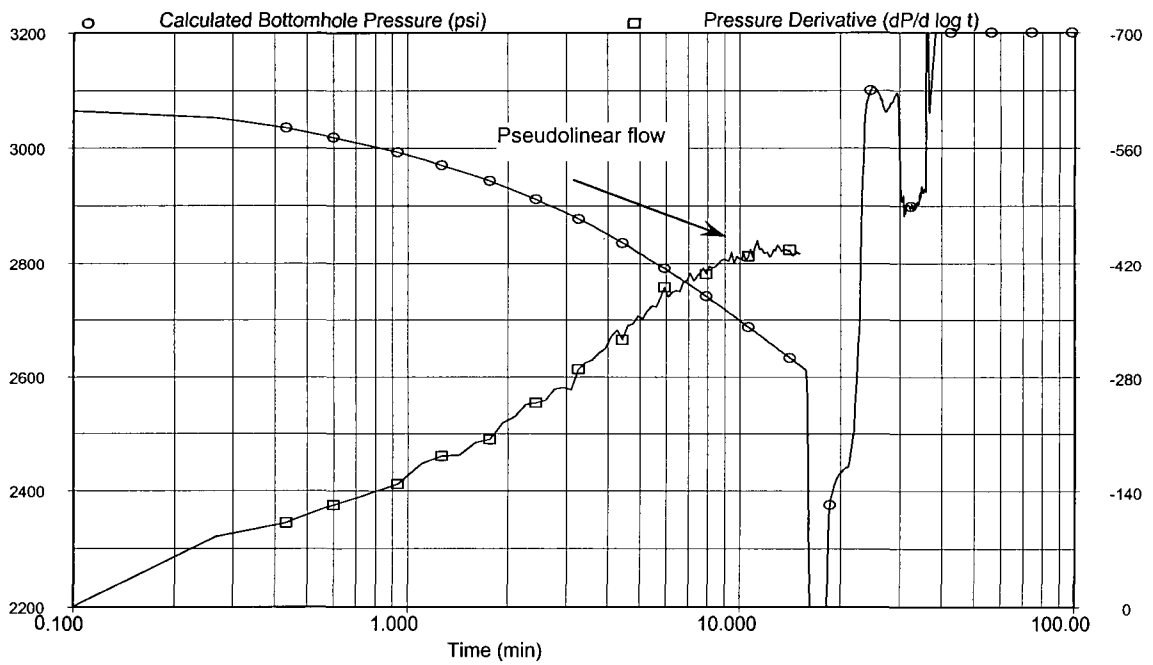


Figure 4: Pressure falloff analysis following diagnostic pump-in, semi-log plot.

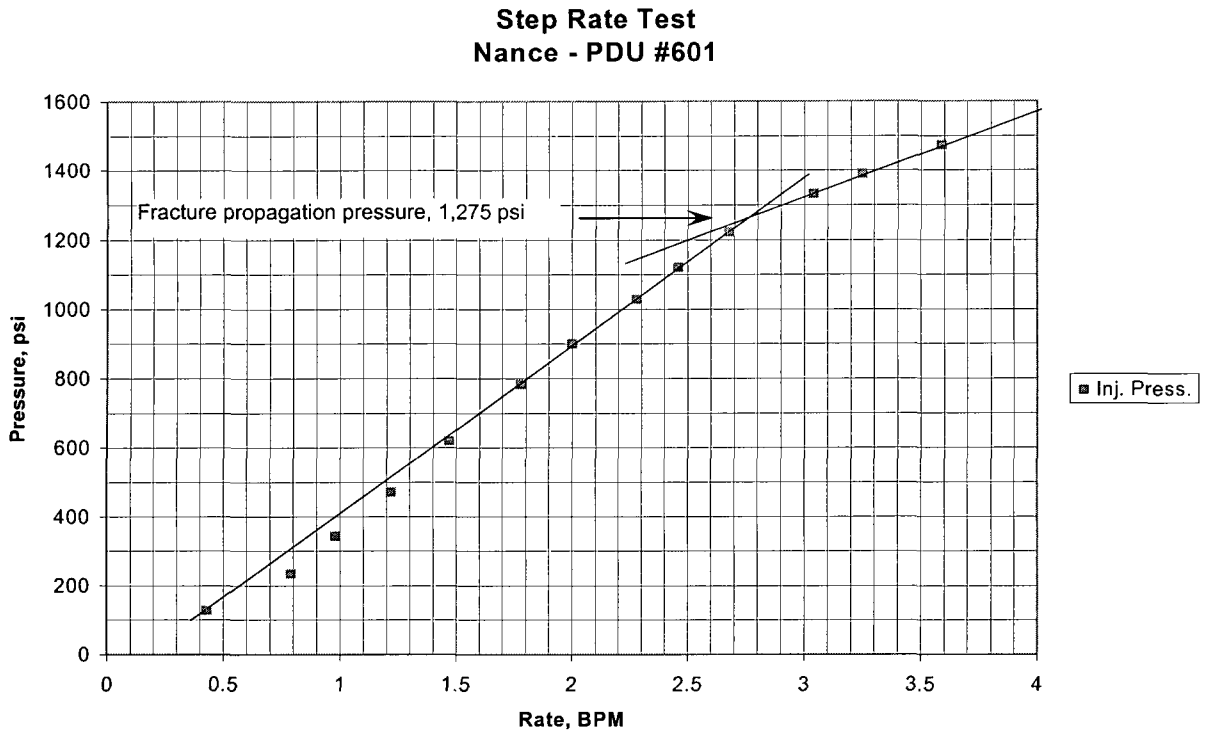


Figure 5: Step rate test analysis.

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company ST. MARY'S LAND & EXP. CO.
Well PARKWAY DELAWARE UNIT #205
Field DELAWARE
County EDDY State NEW MEXICO
Location 1330' FNL & 180' FEL SEC. 35, TWP. 19-S, RGE. 29-E
File Number 15,641

Company St. Mary's Land & Exp. Co.
Well Parkway Delaware Unit #205
Field Delaware
County Eddy
State New Mexico

Date			Permanent Datum	G.L.	Elevation 3338'
Depth Driller	5-16 & 17-01		Log Measured From	K.B. 13' Above Perm. Datum	K.B. 3351'
Plug Back	4400'		Drilling Measured From	K.B.	D.F. 3350'
Depth Logger	4382'				G.L. 3338'
Bottom Logged Interval	4344'				
Top Log Interval	4344'				
Recorded By	4000'				
Witnessed By	PAT WARDEN				
Base Location	JACKIE HERRON				
Unit No.	HOBBS, NM				
Equipment Operator	3724				
Type Of Well	G. ALVARADO				
Status	INJECTION				
Type Of Fluid	INJECTING				
Fluid Level	WATER				
Rate	FULL				
Pressure	428 BPD				
	940 PSI				

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
				2 3/8"		SURFACE	4196'

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	13 3/8"	48#	SURFACE	315'
Intermed. String	9 5/8"	36#	SURFACE	1520'
Production String	7"	20#	SURFACE	2939'
Liner	4 1/2"	10.5#	SURFACE	4400'

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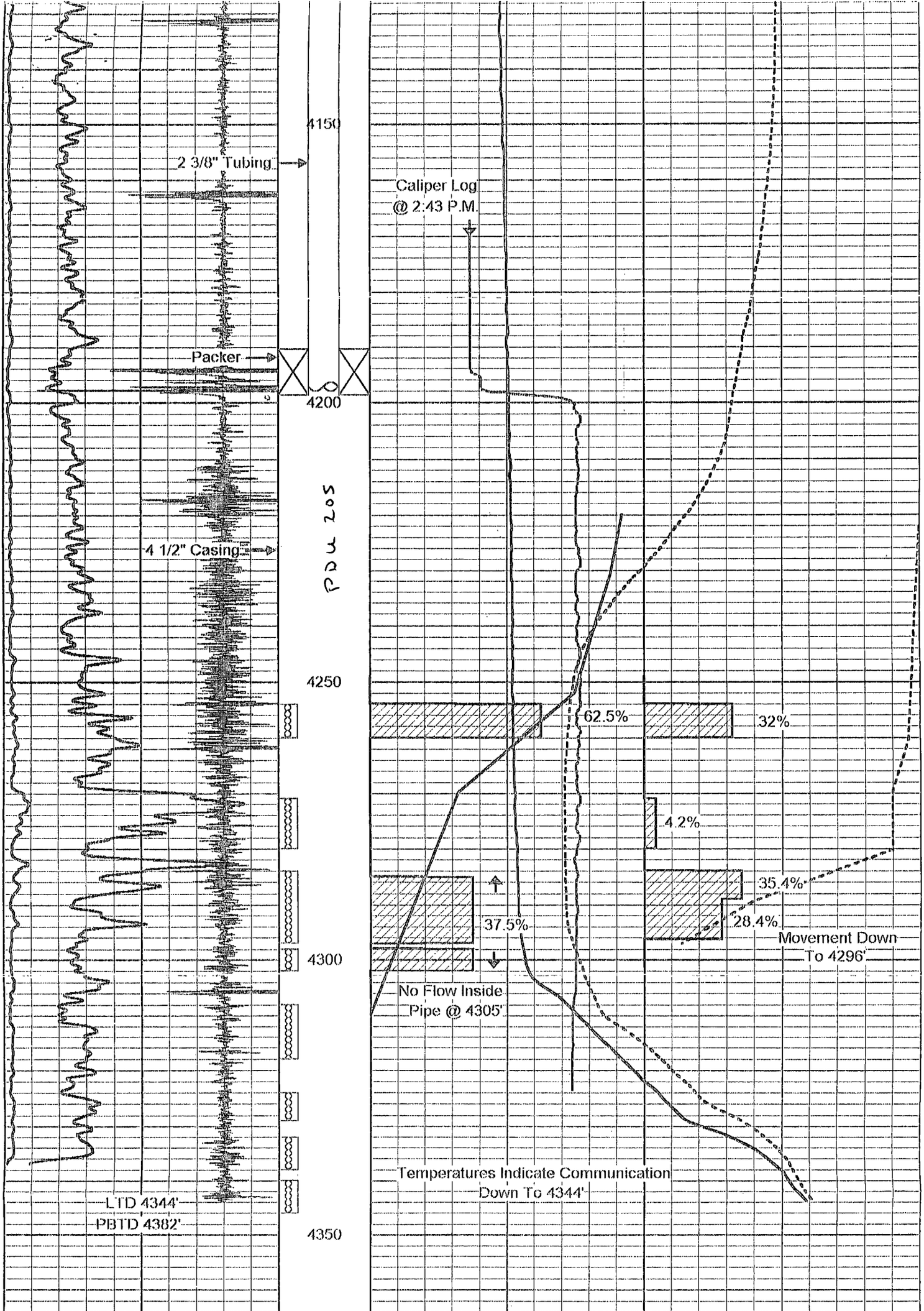
Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL, (1 1/4") SCINTILLATION DETECTOR
CORRELATED TO: COMPUTALOG, 3-5-98
PERFORATIONS: 4254'-60', 71'-80', 84'-97', 98'-4302', 08'-18', 24'-29', 32'-38', 40'-46'

CONCLUSION: Reported injection rate 428 BPD @ 940 PSI.
Averaged slug no's. 5-8 to obtain 100% rate. Used rate obtained, 473.2 BPD, to calculate velocity profile.
Averaged runs 1-3 to obtain 100% area. Used runs 4, 6 and 7 to plot intensity profile.
Temperatures indicate possible channel up to 4040'.
Intensities indicate movement down to 4296'.
No flow inside pipe @ 4305'. Slug no. 2.
Temperatures indicate communication down to 4344'.
No channel up from top of perfs indicated. Slug no. 5.
No packer leak indicated. Slug no. 9.
No crossflow indicated. Slug no's. 10-13.



-2	Collar Log	0.5
-10	Base Gamma Ray, CPS	1000
-10	Depth Control Log, CPS	100

80	Injection Temperature (degF)			90
80	Overnight Shut In Temperature (degF)			90
0	Caliper Log			10
0	Velocity Flow, (b/d)	550	0 Intensity Flow, (%)	100
0	Velocity Loss, %	100	0 Intensity Loss, %	100

CARDINAL

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company Nance Petroleum Corporation
Well Parkway Delaware Unit No. 302
Field Parkway Delaware
County Eddy
State New Mexico

Company NANCE PETROLEUM CORPORATION

Well PARKWAY DELAWARE UNIT NO. 302

Field PARKWAY DELAWARE

County EDDY State NEW MEXICO

Location

2230' FSL & 760' FWL
SEC. 35, TWP. 19-S, RGE. 29-E

File Number 15,883

Elevation
K.B. 3319'
D.F. 3318'
G.L. 3312'

Permanent Datum	G.L.	Elevation	3312'
Log Measured From	K.B. 7' Above Perm. Datum		
Drilling Measured From	K.B.		

Date	3-19 & 20-02		
Depth Driller	5000'		
Plug Back	4405'		
Depth Logger	4355'		
Bottom Logged Interval	4355'		
Top Log Interval	3800'		
Recorded By	WARDEN		
Witnessed By	JACKIE HERRON		
Base Location	HOBBS, NM		
Unit No.	8724		
Equipment Operator	ALVARADO		
Type Of Well	INJECTION		
Status	INJECTING		
Type Of Fluid	WATER		
Fluid Level	FULL		
Rate	156-320 BPD		
Pressure	1050 PSI		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
				2 3/8"		SURFACE	4024'

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	13 3/8"	48#	SURFACE	363'
Intermed. String	8 5/8"	24#	SURFACE	3202'
Production String	5 1/2"	15.5#	SURFACE	5000'
Liner				

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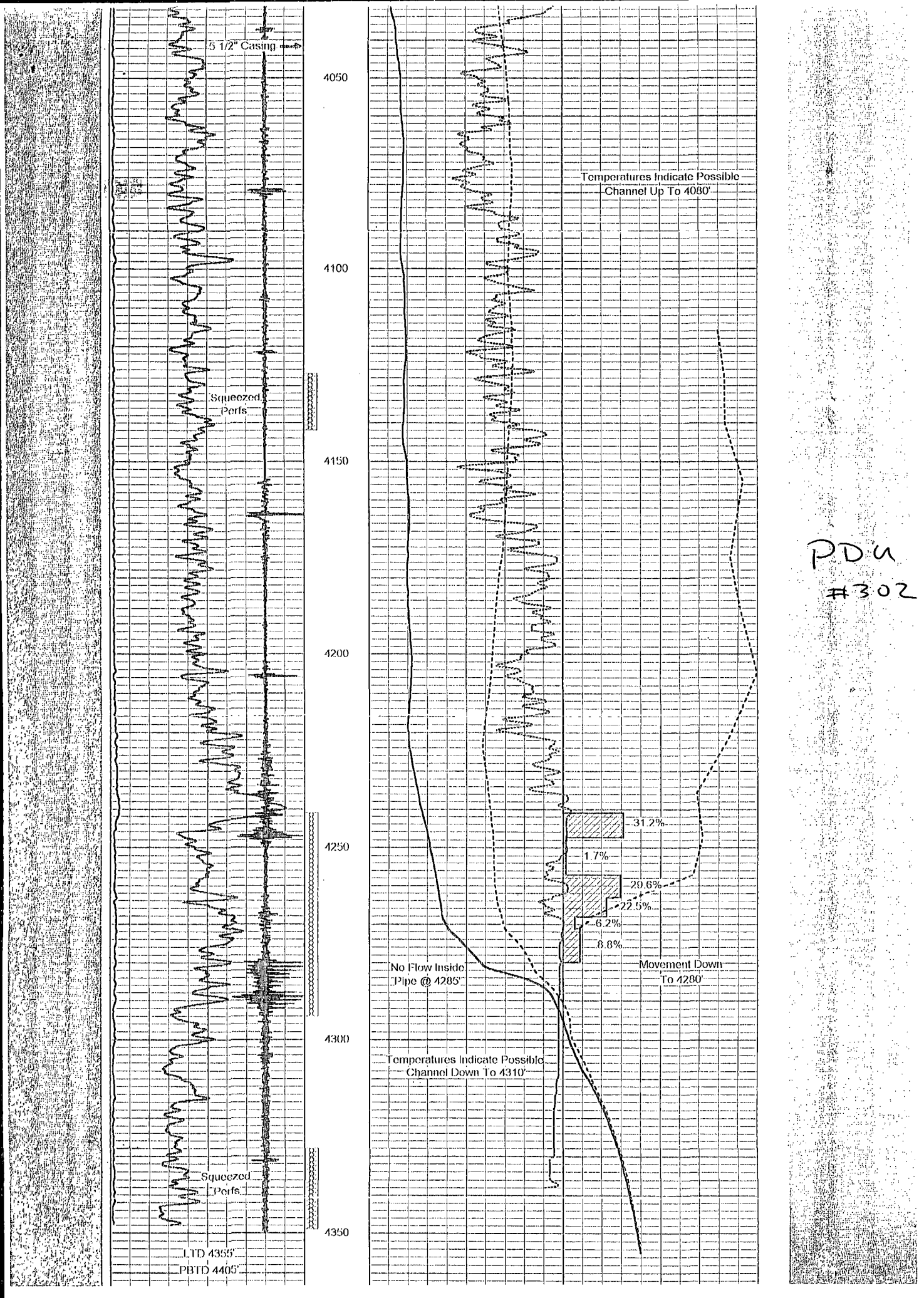
Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL, (1 3/8") SCINTILLATION DETECTOR
CORRELATED TO: NO CORRELATION LOG
PERFORATIONS: 4241'-4294'
SQUEEZED PERFORATIONS: 4127'-4142', 4328'-4349', 4557'-4578'

CONCLUSION: Reported injection rate from Halliburton rate meter, 156-320 BPD @ 1050 PSI.
Used run 1 for 100% area. Used runs 7-13 to plot intensity profile.
Temperatures indicate possible channel up to 4080' and possible channel down to 4310'
Intensities indicate movement down to 4280'.
No flow inside pipe @ 4285'. Slug no. 2.
Unable to shoot velocity shots due to unstable rate.
No crossflow indicated. Slug no's. 3-5.


5 1/2" Casing
4050
4100
Squeezed Perfs
4150
4200
4250
4300
Squeezed Perfs
4350
LTD 4355'
PBTD 4405'
Temperatures Indicate Possible Channel Up To 4080'
31.2%
1.7%
29.6%
22.5%
6.2%
8.8%
No Flow Inside Pipe @ 4285'
Movement Down To 4280'
Temperatures Indicate Possible Channel Down To 4310'

PDU
#302

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company St. Mary's Land & Exp. Co.
Well Parkway Delaware Unit #303
Field Delaware
County Eddy
State New Mexico

Company ST. MARY'S LAND & EXP. CO.

Well PARKWAY DELAWARE UNIT #303

Field DELAWARE

County EDDY State NEW MEXICO

Location

2500' FWL & 1420' FNL
SEC. 35, TWP. 19-S, RGE. 29-E

File Number 15,639

Elevation
K.B. 3311'
D.F. 3317'
G.L. 3311'

Permanent Datum	G.L.	Elevation	3311'
Log Measured From	K.B. 7' Above Perm. Datum		
Drilling Measured From	K.B.		

Date	5-15 & 16-01		
Depth Driller	4800'		
Plug Back	4754'		
Depth Logger	4275'		
Bottom Logged Interval	4275'		
Top Log Interval	3900'		
Recorded By	PAT WARDEN		
Witnessed By	JACKIE HERRON		
Base Location	HOBBS, NM		
Unit No.	8724		
Equipment Operator	G. ALVARADO		
Type Of Well	INJECTION		
Status	INJECTING		
Type Of Fluid	WATER		
Fluid Level	FULL		
Rate	1257 BPD		
Pressure	900 PSI		

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
				2 3/8"		SURFACE	4101'

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	20"		SURFACE	258'
Intermed. String	13 3/8"	48#	SURFACE	1180'
Production String	8 5/8"	24# & 32#	SURFACE	3200'
Liner	5 1/2"	17#	SURFACE	4808'

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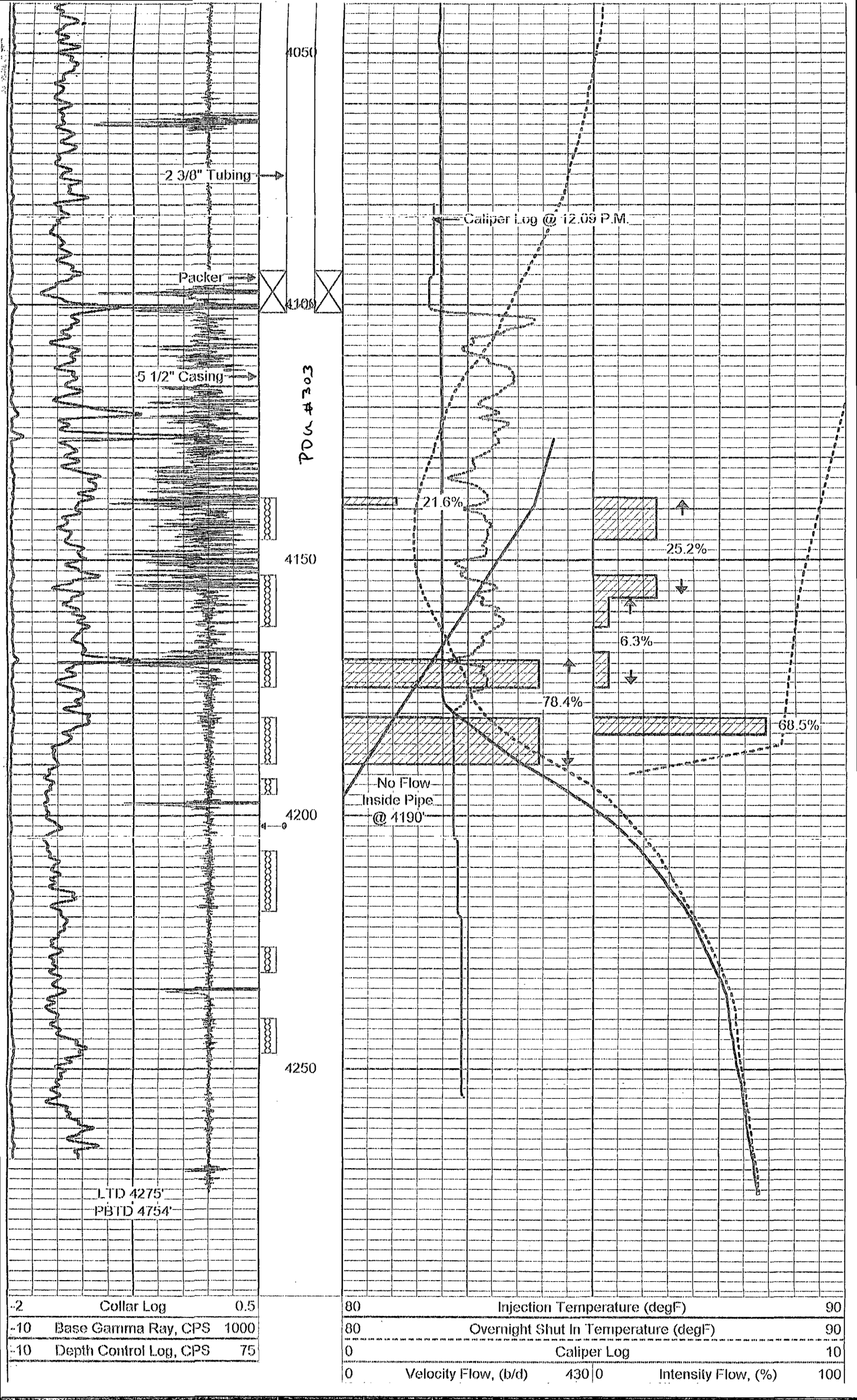
Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL, (1 1/4") SCINTILLATION DETECTOR
CORRELATED TO: SCHLUMBERGER, 9-6-93
PERFORATIONS: 4138'-45', 53'-63', 68'-75', 81'-90', 93'-96', 4202', 07'-19', 26'-31', 40'-47'

CONCLUSION: Reported injection rate 1257 BPD @ 900 PSI.
Averaged slug no's. 8 & 9 to obtain 100% rate. Used rate obtained, 421.3 BPD, to calculate velocity profile.
Averaged runs 1 & 2 to obtain 100% area. Used runs 3 & 4 to plot intensity profile.
Temperatures indicate possible channel up to 4010'.
Intensities indicate movement down to 4184'.
No flow inside pipe @ 4190'. Slug no. 2.
No channel up from top of perfs indicated. Slug no. 6.
No packer leak indicated. Slug no. 10.
No crossflow indicated. Slug no's. 11-14.


4050
2 3/8" Tubing
Caliper Log @ 12.09 P.M.
Packer
4100
5 1/2" Casing
POA #303
21.6%
25.2%
4150
6.3%
78.4%
68.5%
No Flow
Inside Pipe
@ 4190'
4200
4250
LTD 4275'
PBTD 4754'
-2 Collar Log 0.5
-10 Base Gamma Ray, CPS 1000
-10 Depth Control Log, CPS 75
80 Injection Temperature (degF) 90
80 Overnight Shut In Temperature (degF) 90
0 Caliper Log 10
0 Velocity Flow, (b/d) 430
0 Intensity Flow, (%) 100

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company NANCE PETROLEUM CORPORATION
Well PARKWAY DELAWARE UNIT NO. 304
Field DELAWARE
County EDDY State NEW MEXICO
Location 1485' FNL & 1485' FEL SEC. 35, TWP. 19-S, RGE. 29-E
File Number 15,885

Elevation: K.B. 3348' D.F. 3347' G.L. 3334'

Permanent Datum	G.L.	Elevation	3334'	
Log Measured From	K.B. 14' Above Perm. Datum			
Drilling Measured From	K.B.			

Date	3-21 & 22-02
Depth Driller	4430'
Plug Back	4378'
Depth Logger	4358'
Bottom Logged Interval	4358'
Top Log Interval	3900'
Recorded By	WARDENSHELTON
Witnessed By	JACKIE HERRON
Base Location	HOBBS, NM.
Unit No.	8724
Equipment Operator	ALVARADO
Type Of Well	INJECTION
Status	INJECTING
Type Of Fluid	WATER
Fluid Level	FULL
Rate	649 BPD
Pressure	950 PSI

Borehole Record					Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To	
				2 3/8"		SURFACE	4033'	

Casing Record	Size	Wt/Ft	Top	Bottom
Surface String	13 3/8"	48#	SURFACE	356'
Intermed. String	9 5/8"	36#	SURFACE	1500'
Production String	7"	20#	SURFACE	3045'
Liner	4 1/2"	10.5#	SURFACE	4422'

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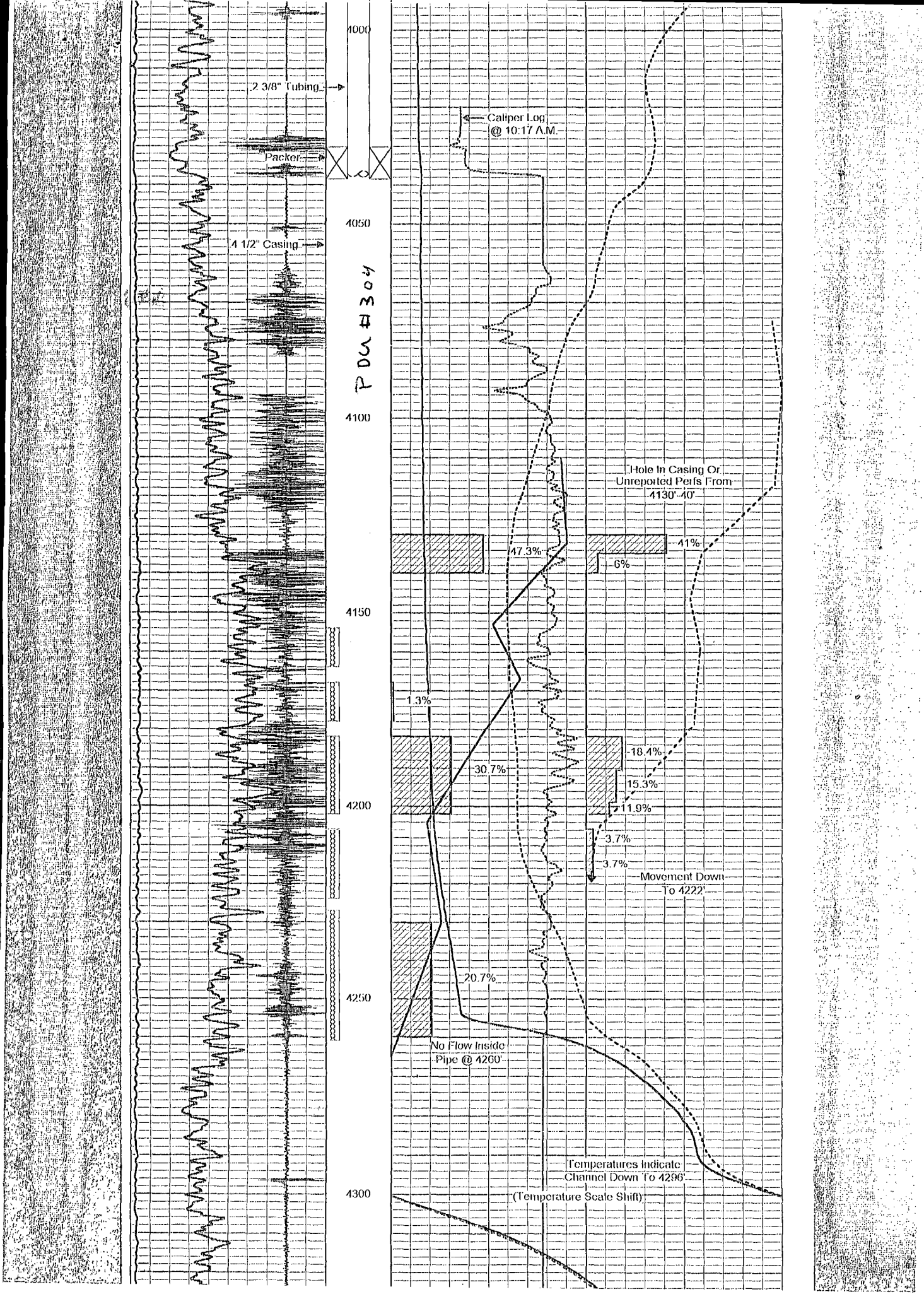
Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL. (1 3/8") SCINTILLATION DETECTOR
CORRELATED TO: COMPUTALOG, 5-8-97
PERFORATIONS: 4154'-4164', 4168'-4178', 4182'-4202', 4206'-4224', 4227'-4261'

CONCLUSION: Reported injection rate 649 BPD @ 950 PSI.
Averaged slug no's. 9 & 10 to obtain 100% rate. Used rate obtained, 710.8 BPD, to calculate velocity profile.
Averaged runs 1-3 to obtain 100% area. Used runs 4, 5, 7-10 & 12 to plot intensity profile.
Intensities indicate movement down to 4222'.
No flow inside pipe @ 4260'. Slug no. 3.
Tracer, crossflow and temperatures indicate hole in casing or unreported perfs from 4130'-40'. Slug no's. 7 & 8.
No channel up from top of perfs indicated. Slug no. 7.
No packer leak indicated. Slug no. 11.
Downward crossflow from 4130'-40' to 5256'-4261'. Slug no's. 13-15.
Temperatures indicate possible channel up to 3940' and channel down to 4296'.


4000
2 3/8" Tubing
Packer
4050
4 1/2" Casing
PDA #304
4100
4150
4200
4250
4300
Caliper Log
@ 10:17 A.M.
Hole In Casing Or
Unreported Perfs From
4130'-40'
47.3%
41%
6%
1.3%
18.4%
30.7%
15.3%
11.9%
3.7%
3.7%
Movement Down
To 4222'
20.7%
No Flow Inside
Pipe @ 4260'
Temperatures Indicate
Channel Down To 4296'
(Temperature Scale Shift)

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company Nance Petroleum Corporation
Well Parkway Delaware Unit No. 505
Field Parkway Delaware
County Eddy
State New Mexico

Company NANCE PETROLEUM CORPORATION
Well PARKWAY DELAWARE UNIT NO. 505
Field PARKWAY DELAWARE
County EDDY State NEW MEXICO

Location
1980' FSL & 760' FWL
SEC. 35, TWP. 19-S, RGE. 29-E

File Number
15,882

Elevation
K.B. 3328'
D.F. 3327'
G.L. 3319'

Permanent Datum	G.L.	Elevation	3319'
Log Measured From	K.B. 9' Above Perm. Datum		
Drilling Measured From	K.B.		

Date	3-19 & 20-02		
Depth Driller	5000'		
Plug Back	4958'		
Depth Logger	4834'		
Bottom Logged Interval	4834'		
Top Log Interval	4000'		
Recorded By	WARDEN		
Witnessed By	JACKIE HERRON		
Base Location	HOBBS, NM		
Unit No.	8724		
Equipment Operator	ALVARADO		
Type Of Well	INJECTION		
Status	INJECTING		
Type Of Fluid	WATER		
Fluid Level	FULL		
Rate	86 BPD		
Pressure	1050 PSI		

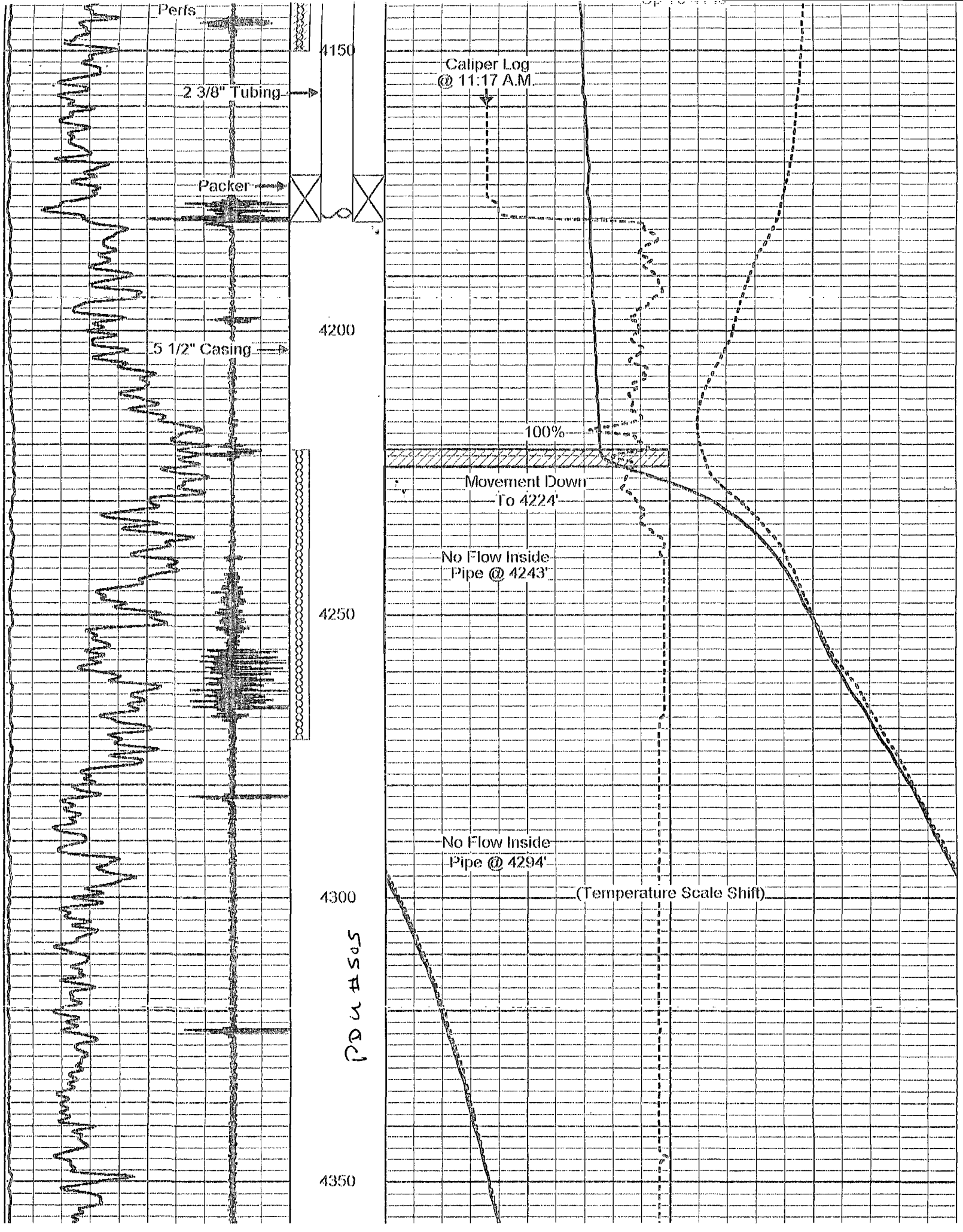
Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
				2 3/8"		SURFACE	4180'

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	20"	133#	SURFACE	172'
Intermed. String	8 5/8"	24#	SURFACE	3200'
Production String	5 1/2"	15.5#	SURFACE	5000'
Liner				

Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL (1 3/8") SCINTILLATION DETECTOR
CORRELATED TO: NO CORRELATION LOG
PERFORATIONS: 4221'-4272'
SQUEEZED PERFORATIONS: 4135'-4150'

CONCLUSION: Reported injection rate from Halliburton rate meter, 86 BPD @ 1050 PSI.
Used slug no. 1 185 BPD, for 100% rate to calculate velocity profile.
Temperatures indicate possible channel up to 4140'.
Tracer indicates movement down to 4224'.
No flow inside pipe @ 4243'. Slug no. 2.


Perfs
4150
2 3/8" Tubing
Packer
4200
5 1/2" Casing
4250
4300
4350
Caliper Log
@ 11:17 A.M.
100%
Movement Down
To 4224'
No Flow Inside
Pipe @ 4243'
No Flow Inside
Pipe @ 4294'
(Temperature Scale Shift)
PDU #505

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company ST. MARY'S LAND & EXP. CO.
Well PARKWAY DELAWARE UNIT #507
Field DELAWARE
County EDDY State NEW MEXICO
Location 2628' FSL & 1485' FEL SEC. 35, TWP. 19-S, RGE. 29-E
File Number 15,538

Elevation: K.B. 3348' D.F. 3347' G.L. 3334'

Permanent Datum G.L. Elevation 3334'
Log Measured From K.B. 14' Above Perm. Datum
Drilling Measured From K.B.

Date	5-14 & 15-01
Depth Driller	4400'
Plug Back	4365'
Depth Logger	4375'
Bottom Logged Interval	4375'
Top Log Interval	3900'
Recorded By	PAT WARDEN
Witnessed By	JACKIE HERRON
Base Location	HOBBS, NM
Unit No.	8724
Equipment Operator	G. ALVARADO
Type Of Well	INJECTION
Status	INJECTING
Type Of Fluid	WATER
Fluid Level	FULL
Rate	
Pressure	900 PSI

Borehole Record

Run Number	Bit	From	To

Tubing Record

Size	From	To
2 3/8"	SURFACE	4085'

Casing Record

	Size	Wgt/Ft	Top	Bottom
Surface String	13 3/8"	48#	SURFACE	354'
Intermed. String	9 5/8"	36#	SURFACE	1366'
Production String	7"	20#	SURFACE	2996'
	4 1/2"	10.5#	SURFACE	4400'

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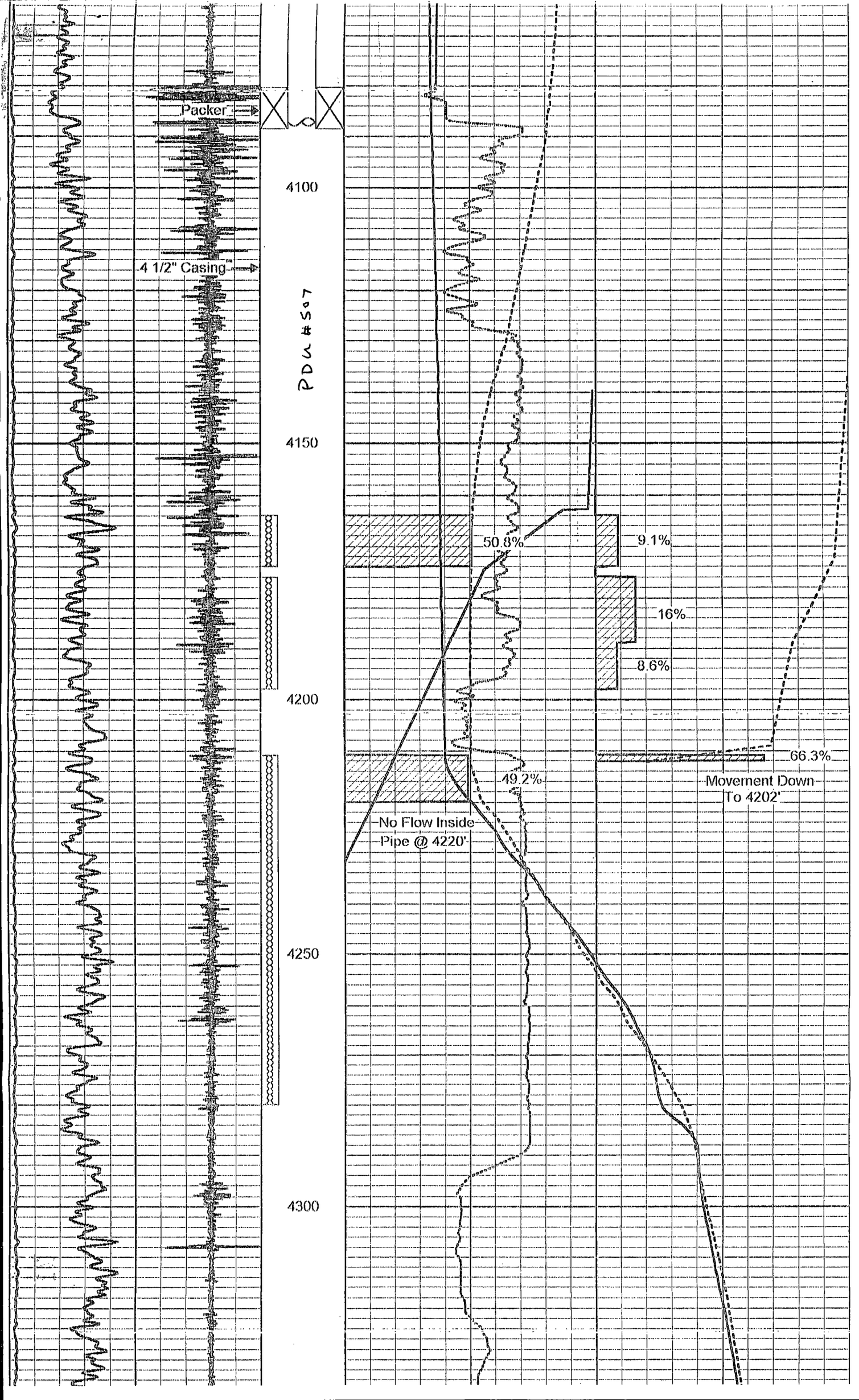
Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL, (1 1/4") SCINTILLATION DETECTOR
CORRELATED TO: COMPUTALOG, 5-7-97
PERFORATIONS: 4164'-74', 76'-98', 4211'-80'

CONCLUSION: Injection rate not reported. Surface pressure @ 900 PSI.
Averaged slug no's. 6-8 to obtain 100% rate. Used rate obtained, 165 BPD to calculate velocity profile.
Averaged runs 1 & 2 to obtain 100% area. Used runs 3-6 to plot intensity profile.
Temperatures indicate possible channel up to 4030'.
Intensities indicate movement down to 4202'.
No flow inside pipe @ 4220'. Slug no. 3.
No channel up from top of perfs indicated. Slug no. 6.
No packer leak indicated. Slug no. 10.
Downward crossflow from 4164'-74' to 4211'-14'. Slug no's. 12 & 13.


Packer
4 1/2" Casing
PDA #507
4100
4150
4200
4250
4300
50.8%
9.1%
16%
8.6%
66.3%
49.2%
Movement Down
To 4202'
No Flow Inside
Pipe @ 4220'

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company ST. MARY'S LAND & EXP. CO.
Well PARKWAY DELAWARE UNIT #509
Field DELAWARE
County EDDY State NEW MEXICO
Location 1210' FSL & 1210' FEL SEC. 35, TWP. 19-S, RGE. 29-E
File Number 15,642

Permanent Datum G.L. Elevation 3322'
Log Measured From K.B. 12' Above Perm. Datum
Drilling Measured From K.B.

Elevation: K.B. 3334' D.F. 3333' G.L. 3322'

Company St. Mary's Land & Exp. Co.
Well Parkway Delaware Unit #509
Field Delaware
County Eddy
State New Mexico

Date	5-16 & 17-01
Depth Driller	4400'
Plug Back	4344'
Depth Logger	4341'
Bottom Logged Interval	4341'
Top Log Interval	3900'
Recorded By	PAT WARDEN
Witnessed By	JACKIE HERRON
Base Location	HOBBS, NM
Unit No.	8724
Equipment Operator	G. ALVARADO
Type Of Well	INJECTION
Status	INJECTING
Type Of Fluid	WATER
Fluid Level	FULL
Rate	482 BPD
Pressure	870 PSI

Borehole Record

Run Number	Bit	From	To

Tubing Record

Size	Wgt/Ft	Top	Bottom
2 3/8"	4.7#	SURFACE	4062'

Casing Record

	Size	Wgt/Ft	Top	Bottom
Surface String	13 3/8"	48#	SURFACE	314'
Intermed. String	9 5/8"	36#	SURFACE	1465'
Production String	7"	20#	SURFACE	3000'
Liner	4 1/2"	10.5#	SURFACE	4394'

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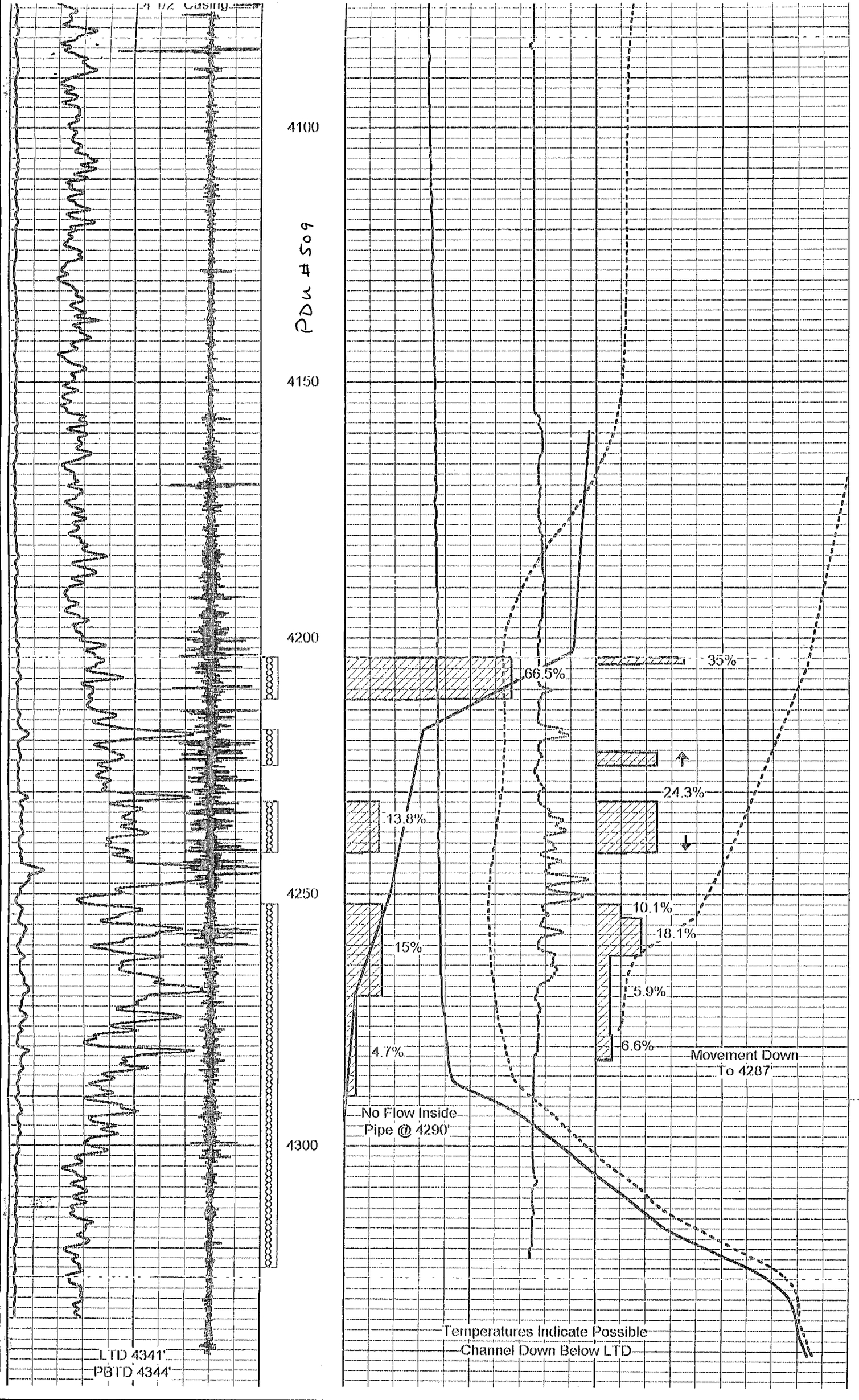
Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL, (1 1/4") SCINTILLATION DETECTOR
CORRELATED TO: COMPUTALOG, 1-28-98
PERFORATIONS: 4204'-12', 18'-25', 32'-42', 52'-4324'

CONCLUSION: Reported injection rate 482 BPD @ 870 PSI.
Averaged slug no's. 7-10 to obtain 100% rate. Used rate obtained, 537 BPD to calculate velocity profile.
Averaged runs 1-3 to obtain 100% area. Used runs 4, 6-9 and 14 to plot intensity profile.
Intensities indicate movement down to 4287'.
No flow inside pipe @ 4290'. Slug no. 2.
Temperatures indicate possible channel down below LTD.
No channel up from top of perfs indicated. Slug no. 7.
No packer leak indicated. Slug no. 11.
No crossflow indicated. Slug no's. 12-15.


4 1/2 Casing
4100
4150
4200
4250
4300
PDu #509
66.5%
35%
24.3%
13.8%
10.1%
18.1%
15%
5.9%
6.6%
4.7%
Movement Down
To 4287'
No Flow Inside
Pipe @ 4290'
Temperatures Indicate Possible
Channel Down Below LTD
LTD 4341'
PBTD 4344'

CARDINAL SURVEYS COMPANY

INJECTION PROFILE W/CALIPER

Company NANCE PETROLEUM CORPORATION
Well PARKWAY DELAWARE UNIT NO. 703
Field PARKWAY DELAWARE
County EDDY State NEW MEXICO

Location
2610' FSL & 430' FEL
SEC. 35, TWP. 19-S, RGE. 26-E

File Number 15,884

Elevation
K.B. 3346'
D.F. 3345'
G.L. 3333'

Permanent Datum G.L. Elevation 3333'
Log Measured From K.B. 13' Above Perm. Datum
Drilling Measured From K.B.

Company	Nance Petroleum Corporation
Well	Parkway Delaware Unit No. 703
Field	Parkway Delaware
County	Eddy
State	New Mexico

Date	3-20 & 21-02
Depth Driller	4400'
Plug Back	4347'
Depth Logger	4236'
Bottom Logged Interval	4236'
Top Log Interval	4000'
Recorded By	WARDEN
Witnessed By	JACKIE HERRON
Base Location	HOBBS, NM
Unit No.	8724
Equipment Operator	ALVARADO
Type Of Well	INJECTION
Status	INJECTING
Type Of Fluid	WATER
Fluid Level	FULL
Rate	87 BPD
Pressure	1150 PSI

Borehole Record

Run Number	Bit	From	To

Tubing Record

Size	Wgt/Ft	Top	Bottom
2 3/8"		From SURFACE	To 4154.5'

Casing Record

	Size	Wgt/Ft	Top	Bottom
Surface String	13 3/8"	48#	SURFACE	362'
Intermed. String	9 5/8"	36#	SURFACE	1600'
Production String	7"	20#	SURFACE	3000'
Liner	4 1/2"	10.5#	SURFACE	4400'

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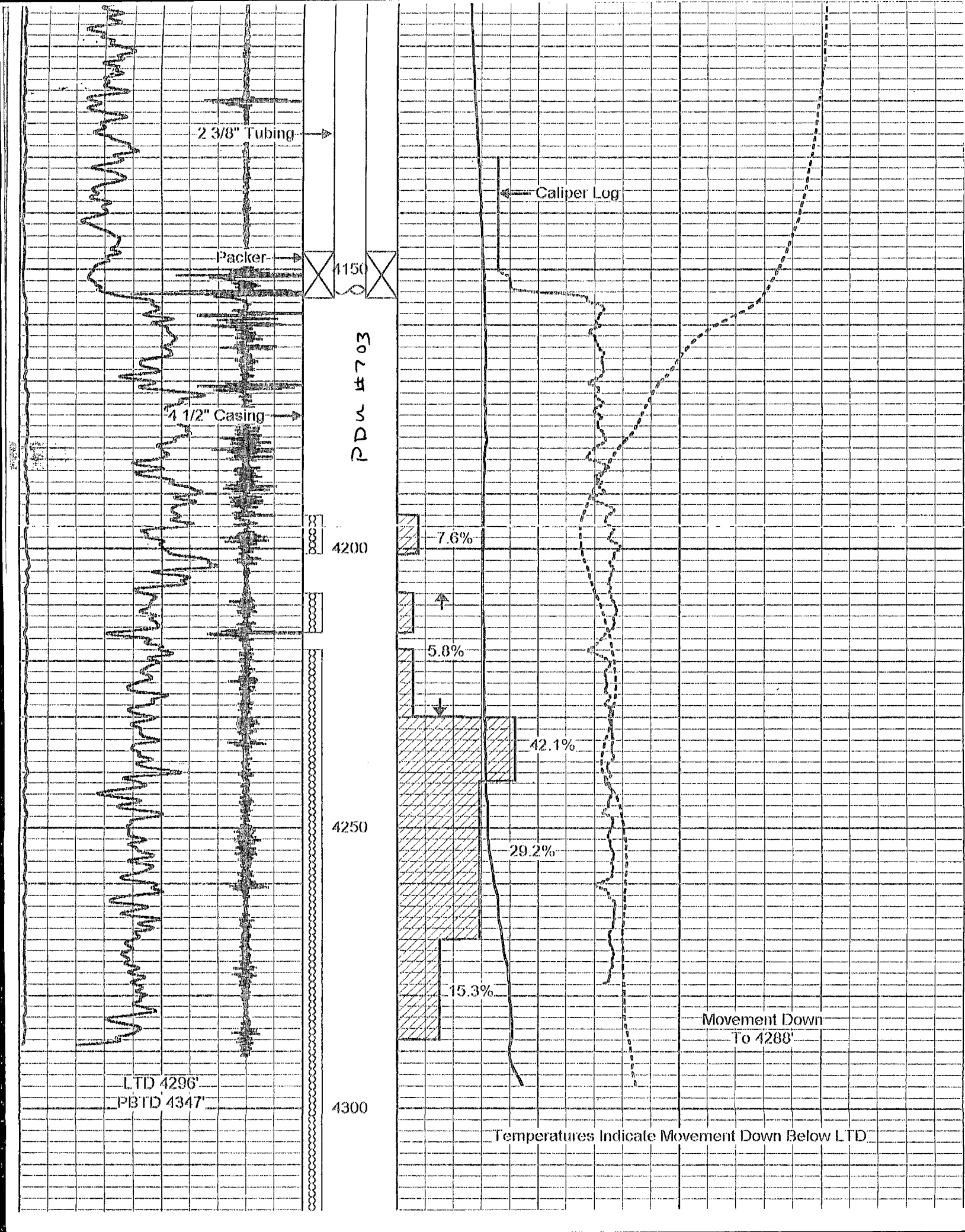
Comments

TOOL CONFIGURATION: TEMP, CCL, DET, EJECT, CAL, (1 3/8") SCINTILLATION DETECTOR
CORRELATED TO: COMPUTALOG, 2-27-98
PERFORATIONS: 4194'-4201', 4208'-4215', 4218'-4319'

CONCLUSION: Reported injection rate from Halliburton rate meter, 87 BPD @ 1150 PSI.
Averaged slug no. 1 to obtain 100% rate. Used rate obtained, 86 BPD, to calculate velocity profile.
Temperatures indicate possible channel up to 4100' and movement down below LTD.
Tracer indicates movement down to 4288'.
Downward crossflow from 4194'-4201' to 4232'-42'. Slug no. 5.
Upward crossflow from 4265' and below to 4232'-42'. Slug no. 6.


2 3/8" Tubing
Packer
4150
4 1/2" Casing
PDV #703
Caliper Log
4200
7.6%
5.8%
42.1%
4250
29.2%
15.3%
LTD 4296'
PBTD 4347'
4300
Movement Down
To 4288'
Temperatures Indicate Movement Down Below LTD

API	WELL NAME	Short Operator	OGRID	NS FTG	EW FTG	UL1	UL2	Sec	Tsp	Rge	TVD	LAND TYPE	WELL TYPE	Orig Form.(or Notes)	Last	Status	P. Code	Latest Pool	PROP NBR	WATER INJ 2002	WATER INJ 2001	WATER INJ 2000
30-015-27445	PARKWAY DELAWARE UNIT #303	ST. MARY	154903	1420N	2500W	F	F	35	19S	29E		F	I		05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	178102	457923	512091
30-015-27464	PARKWAY DELAWARE UNIT #506	ST. MARY	154903	2635S	2640E	J	J	35	19S	29E	4750	F	I	DELAWARE	05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	131456	347657	629453
30-015-29503	PARKWAY DELAWARE UNIT #304	ST. MARY	154903	1485N	1485E	G	G	35	19S	29E	4430	F	I	DELAWARE	05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	130729	53338	205478
30-015-30026	PARKWAY DELAWARE UNIT #205	ST. MARY	154903	1330N	180E	H	H	35	19S	29E	4400	F	I	DELAWARE	05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	66256	173009	13557
30-015-30028	PARKWAY DELAWARE UNIT #704	ST. MARY	154903	1450S	330E	I	I	35	19S	29E	4400	F	I	DELAWARE	05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	61003	160638	224186
30-015-30027	PARKWAY DELAWARE UNIT #703	ST. MARY	154903	2610S	430E	I	I	35	19S	29E	4400	F	I	DELAWARE	05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	54035	123393	21362
30-015-30029	PARKWAY DELAWARE UNIT #508	ST. MARY	154903	1350S	2520E	J	J	35	19S	29E	4400	F	I	DELAWARE	05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	52773	186748	67522
30-015-30030	PARKWAY DELAWARE UNIT #509	ST. MARY	154903	1210S	1210E	P	P	35	19S	29E	4400	F	I	DELAWARE	05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	39150	129078	17792
30-015-29504	PARKWAY DELAWARE UNIT #507	ST. MARY	154903	2628S	1485E	G	G	35	19S	29E	4400	F	I	DELAWARE	04-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	10693	50341	140810
30-015-26006	PARKWAY DELAWARE UNIT #302	ST. MARY	154903	2230N	760W	E	E	35	19S	29E		F	I		05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	9465	0	33509
30-015-26029	PARKWAY DELAWARE UNIT #505	ST. MARY	154903	1980S	760W	L	L	35	19S	29E		F	I		05-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	6637	13450	28546
30-015-26433	PARKWAY DELAWARE UNIT #601	ST. MARY	154903	330N	1650E	B	2	2	20S	29E		S	I		03-2002	ACTIVE	49625	PARKWAY;DELAWARE	19265	863	0	505
30-015-26143	PARKWAY DELAWARE UNIT #204	ST. MARY	154903	990N	940W	D	D	35	19S	29E		F	I		05-2001	ACTIVE	0		19265	0	402	44774

1,250 BWIPD

350 BWIPD

approved procedures

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner	UL	Sec	Twp	N/S	Rng	W/E	Feet	NS	Ft	EW	Order_No
30-015-26433-00-00	PARKWAY DELAWARE UNIT	601	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	S	2	2	20	S	29	E	330	N	1650	E	R-
30-015-26143-00-00	PARKWAY DELAWARE UNIT	204	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	D	35	19	S	29	E	990	N	940	W	
30-015-26006-00-00	PARKWAY DELAWARE UNIT	302	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	E	35	19	S	29	E	2230	N	760	W	R-9822
30-015-27445-00-00	PARKWAY DELAWARE UNIT	303	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	F	35	19	S	29	E	1420	N	2500	W	WFX-685
30-015-29503-00-00	PARKWAY DELAWARE UNIT	304	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	G	35	19	S	29	E	1485	N	1485	E	
30-015-29504-00-00	PARKWAY DELAWARE UNIT	507	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	G	35	19	S	29	E	2628	S	1485	E	PMX-186
30-015-30026-00-00	PARKWAY DELAWARE UNIT	205	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	H	35	19	S	29	E	1330	N	180	E	PMX-196
30-015-30027-00-00	PARKWAY DELAWARE UNIT	703	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	I	35	19	S	29	E	2610	S	430	E	PMX-196
30-015-30028-00-00	PARKWAY DELAWARE UNIT	704	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	I	35	19	S	29	E	1450	S	330	E	PMX-196
30-015-27464-00-00	PARKWAY DELAWARE UNIT	506	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	J	35	19	S	29	E	2635	S	2640	E	
30-015-30029-00-00	PARKWAY DELAWARE UNIT	508	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	J	35	19	S	29	E	1350	S	2520	E	PMX-196
30-015-26029-00-00	PARKWAY DELAWARE UNIT	505	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	L	35	19	S	29	E	1980	S	760	W	R-
30-015-30030-00-00	PARKWAY DELAWARE UNIT	509	ST. MARY LAND & EXPLORATION COMPANY	I	A	Eddy	F	P	35	19	S	29	E	1210	S	1210	E	PMX-196

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