RCP, Inc

801 Louisiana, Ste.200
Houston, Texas 77002
Redacted

November 3, 2011

Pacific Gas and Electric Company
350 N. Wiget
Walnut Creek, CA 94598
Attention: Redacted

Test Contractor:	Milbar Hydro-Test Inc. -- FY12-112
Asset Owner:	Pacific Gas and Electric Company -- 41497325 -T68
Construction Contractor:	Snelson -- 0629-53-3500 T-68
Test Section:	PG&E T-68 L-300A, MP 480.7432 - 483.7562
Test Date:	November 3, 2011
Certificate Number:	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562

To whom it may concern,

This letter is to certify that the hydrostatic test performed on pipe owned by Pacific Gas and Electric Company and tested by Milbar Hydro-Test Inc. met the requirements of the Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3).

This hydrostatic test was completed successfully. Pressure was maintained on the test facilities in excess of 8.27 continuous hours without evidence of a leak failure. Water was the test medium. At the highest elevation point in the test section, the calculated test pressure was 970 psig and the MAOP per 49 CFR Part 192, Subpart J can be as high as 646 psig. The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 631 psig.

Pressure increased 1 psi during the test. 3,666.12 ounces of fluid was intentionally injected into the test section Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 321.24 ounces, gain, which is equivalent to a 0.04 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized.

Test pressure remained steady and no leaks were observed. The volumetric gain is attributed to the error characteristic of the temperature measurement instrumentation utilized.

Sincerely,

Redacted

cc. file

Hydrostatic Test Certification

Company	Pacific Gas and Electric Company	Job Number	41497325 -T68
Construction Co.	Shelson	Job Number	0629-53-3500 T-68
Hydro. Test Co.	Milbar Hydro-Test Inc.	Project No.	FY12-112
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562		
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562		

Hydrostatic Test Pressure

APPLICABLE CODE FOR CERTIFICATION: Test Date: 3-Nov-11

Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3)

This is to certify that the pipeline or pipeline section(s) described below was hydrostatically pressure tested in accordance with the following procedure:

Pipeline:	PG&E T-68 L-300A, MP 480.7432 - 483.7562		
From:	163+89	To:	0+00

Pipe Data

Segment	Length	Diameter	Wall Thickness	Specification	100% SMYS
1	10 ft	2.375 in.	0.154 in.	API5L-Grade B, SM, Arc Weld, Steel	4,539 psi
2	10 ft	1.315 in.	0.140 in.	API5L-Grade B, SM, Arc Weld, Steel	7,452 psi
3	37 ft	34.000 in.	0.375 in.	API5L-X65, DSAW, Arc Weld, Steel	1,434 psi
4	337 ft	34.000 in.	0.507 in.	API5L-X60, DSAW, Arc Weld, Steel	1,789 psi
5	3,107 ft	34.000 in.	0.406 in.	API5L-X60, DSAW, Arc Weld, Steel	1,433 psi
6	12,280 ft	34.000 in.	0.344 in.	API5L-X52, DSAW, Arc Weld, Steel	1,052 psi
7	108 ft	12.750 in.	0.500 in.	API5L-Grade B, SM, Arc Weld, Steel	2,745 psi
8	40 ft	34.000 in.	0.500 in.	API5L-X65, DSAW, Arc Weld, Steel	1,912 psi
9	34 ft	34.000 in.	0.500 in.	API5L-X65, DSAW, Arc Weld, Steel	1,912 psi
10	1,010 ft	34.000 in.	0.344 in.	API5L-X52, DSAW, Arc Weld, Steel	1,052 psi

Initial Test Conditions

Pressure at Test Point:	1,030 psig	Date/Time:	11/3/11 10:44 AM	Pipe Temperature Unrestrained:	65.0 °F
Ambient Temperature:	68.0 °F			Restrained:	65.0 °F
		Elevation @ Test Point:	309.0 ft	Location:	163+89
Pressure @ High Point (Cal/Measure):	970 psig	Elevation @ High Point:	448.0 ft	Location:	121+69
Pressure @ Low Point (Cal/Measure):	1,030 psig	Elevation @ Low Point:	309.0 ft	Location:	163+89

Final Test Conditions

Pressure at Test Point:	1,031 psig	Date/Time:	11/3/11 7:00 PM	Pipe Temperature Unrestrained:	58.0 °F
Ambient Temperature:	49.0 °F			Restrained:	65.0 °F
		Elevation @ Test Point:	309.0 ft	Location:	163+89
Pressure @ High Point (Cal/Measure):	971 psig	Elevation @ High Point:	448.0 ft	Location:	121+69
Pressure @ Low Point (Cal/Measure):	1,031 psig	Elevation @ Low Point:	309.0 ft	Location:	163+89
	Total Fluid Injected:	3666.12 fluid ounces		Volume gain	
	Total Fluid Withdrawn:				
Net Change in Volume of the Test Section ± (+ Gain, - Loss):		321.24 oz	gain	0.0003%	0.042 °F equivalent

Test Duration: 8.27 hours

Minimum Test Pressure:	Test Point	1,030 psig	Max Elevation	970 psig	Min Elevation 1,030 psig
Maximum Test Pressure:		1,034 psig		974 psig	1,034 psig
% SMYS :		35.9%		67.9%	54.1%
Test Segment Observed % SMYS :			Minimum	13.7%	Maximum 98.0%

Minimum Test Pressure (Calculated/Measured):			970 psig
Maximum Allowable Operating Pressure:	DOT Part 192	Test Factor= 1.50	646 psig

The MAOP established by this test is *sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 631 psig.*

Were leaks observed?	**No**	Explain:
Acceptable Hydrostatic Test?	**Yes**	No leaks were observed during the test period. The test section included 15,862 feet of buried and 1,121 feet of exposed pipe. Pressure gained 1 psi during the test. The buried pipe segment fluid temperature remained steady and the exposed pipe segment lost 7°F. 3,666.12 ounces of fluid was intentionally injected into the test section. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 321.24 ounces, gain, which is equivalent to a 0.04 °F change in pipe temperature and within the error attributed to the temperature measurement instrumentation utilized. Test pressure remained steady and no leaks were observed. The volumetric gain is attributed to the error characteristic of the *temperature measurement instrumentation utilized.*
Remarks		

Redacted

3-Nov-11

Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41497325 -T68
Construction Co.	Snelson	Job Number	0629-53-3500 T-68
Testing Co.	Milbar Hydro-Test Inc.	Project No.	FY12-112
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562		
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562		

Date **3-Nov-11**

Test Log

Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe				
					Unrestrained	Restrained	Comment	Bleed	Inject
1	11/3/11	10:15 AM	755 psig	61 °F	62 °F	65 °F			
2	11/3/11	10:16 AM	765 psig	61 °F	62 °F	65 °F	Inject		5,852 oz.
3	11/3/11	10:17 AM	775 psig	61 °F	62 °F	65 °F	Inject		6,063 oz.
4	11/3/11	10:18 AM	785 psig	61 °F	62 °F	65 °F	Inject		5,852 oz.
5	11/3/11	10:19 AM	795 psig	61 °F	62 °F	65 °F	Inject		6,204 oz.
6	11/3/11	10:20 AM	805 psig	61 °F	62 °F	65 °F	Inject		5,993 oz.
7	11/3/11	10:21 AM	815 psig	61 °F	62 °F	65 °F	Inject		5,922 oz.
8	11/3/11	10:22 AM	825 psig	61 °F	62 °F	65 °F	Inject		5,852 oz.
9	11/3/11	10:23 AM	835 psig	61 °F	62 °F	65 °F	Inject		5,852 oz.
10	11/3/11	10:24 AM	845 psig	61 °F	62 °F	65 °F	Inject		6,134 oz.
11	11/3/11	10:25 AM	855 psig	61 °F	62 °F	65 °F	Inject		5,993 oz.
12	11/3/11	10:26 AM	865 psig	61 °F	62 °F	65 °F	Inject		5,922 oz.
13	11/3/11	10:27 AM	875 psig	61 °F	62 °F	65 °F	Inject		5,922 oz.
14	11/3/11	10:28 AM	885 psig	61 °F	62 °F	65 °F	Inject		6,134 oz.
15	11/3/11	10:29 AM	895 psig	61 °F	65 °F	65 °F	Inject		6,063 oz.
16	11/3/11	10:30 AM	905 psig	61 °F	65 °F	65 °F	Inject		5,640 oz.
17	11/3/11	10:31 AM	915 psig	61 °F	65 °F	65 °F	Inject		6,345 oz.
18	11/3/11	10:32 AM	925 psig	61 °F	65 °F	65 °F	Inject		5,922 oz.
19	11/3/11	10:33 AM	935 psig	61 °F	65 °F	65 °F	Inject		5,852 oz.
20	11/3/11	10:34 AM	945 psig	61 °F	65 °F	65 °F	Inject		6,204 oz.
21	11/3/11	10:35 AM	955 psig	61 °F	65 °F	65 °F	Inject		5,922 oz.
22	11/3/11	10:37 AM	965 psig	61 °F	65 °F	65 °F	Inject		5,922 oz.
23	11/3/11	10:38 AM	975 psig	61 °F	65 °F	65 °F	Inject		6,134 oz.
24	11/3/11	10:39 AM	985 psig	61 °F	65 °F	65 °F	Inject		6,134 oz.
25	11/3/11	10:40 AM	995 psig	61 °F	65 °F	65 °F	Inject		5,781 oz.
26	11/3/11	10:41 AM	1,005 psig	61 °F	65 °F	65 °F	Inject		5,993 oz.
27	11/3/11	10:42 AM	1,015 psig	61 °F	65 °F	65 °F	Inject		5,922 oz.
28	11/3/11	10:43 AM	1,030 psig	61 °F	65 °F	65 °F	Inject		6,063 oz.
29	11/3/11	10:44 AM	1,030 psig	68 °F	65 °F	65 °F	On Test		3,666 oz.
30	11/3/11	10:45 AM	1,030 psig	68 °F	65 °F	65 °F			
31	11/3/11	11:00 AM	1,030 psig	68 °F	66 °F	65 °F			
32	11/3/11	11:15 AM	1,030 psig	70 °F	66 °F	65 °F			
33	11/3/11	11:30 AM	1,030 psig	70 °F	66 °F	65 °F			
34	11/3/11	11:45 AM	1,030 psig	70 °F	67 °F	65 °F			
35	11/3/11	12:00 PM	1,030 psig	71 °F	68 °F	65 °F			
36	11/3/11	12:15 PM	1,030 psig	71 °F	68 °F	65 °F			
37	11/3/11	12:30 PM	1,030 psig	72 °F	68 °F	65 °F			
38	11/3/11	12:45 PM	1,031 psig	73 °F	69 °F	65 °F			
39	11/3/11	1:00 PM	1,031 psig	70 °F	69 °F	65 °F			
40	11/3/11	1:15 PM	1,031 psig	71 °F	69 °F	65 °F			
41	11/3/11	1:30 PM	1,031 psig	72 °F	69 °F	65 °F			
42	11/3/11	1:45 PM	1,032 psig	73 °F	69 °F	65 °F			
43	11/3/11	2:00 PM	1,032 psig	74 °F	70 °F	65 °F			
44	11/3/11	2:15 PM	1,033 psig	71 °F	69 °F	65 °F			
45	11/3/11	2:30 PM	1,033 psig	71 °F	69 °F	65 °F			
46	11/3/11	2:45 PM	1,033 psig	67 °F	68 °F	65 °F			
47	11/3/11	3:00 PM	1,033 psig	66 °F	68 °F	65 °F			

Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41497325 -T68
Construction Co.	Snelson	Job Number	0629-53-3500 T-68
Testing Co.	Milbar Hydro-Test Inc.	Project No.	FY12-112
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562		
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562		

Date **3-Nov-11**

Test Log

Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe				
					Unrestrained	Restrained	Comment	Bleed	Inject
48	11/3/11	3:15 PM	1,033 psig	62 °F	67 °F	65 °F			
49	11/3/11	3:30 PM	1,033 psig	58 °F	65 °F	65 °F			
50	11/3/11	3:45 PM	1,034 psig	57 °F	64 °F	65 °F			
51	11/3/11	4:00 PM	1,034 psig	56 °F	64 °F	66 °F			
52	11/3/11	4:15 PM	1,034 psig	56 °F	63 °F	66 °F			
53	11/3/11	4:30 PM	1,034 psig	56 °F	63 °F	65 °F			
54	11/3/11	4:45 PM	1,033 psig	56 °F	63 °F	65 °F			
55	11/3/11	5:00 PM	1,033 psig	55 °F	62 °F	65 °F			
56	11/3/11	5:15 PM	1,033 psig	54 °F	62 °F	66 °F			
57	11/3/11	5:30 PM	1,033 psig	51 °F	61 °F	65 °F			
58	11/3/11	5:45 PM	1,033 psig	50 °F	59 °F	66 °F			
59	11/3/11	6:00 PM	1,032 psig	50 °F	59 °F	66 °F			
60	11/3/11	6:15 PM	1,032 psig	50 °F	59 °F	66 °F			
61	11/3/11	6:30 PM	1,032 psig	50 °F	59 °F	66 °F			
62	11/3/11	6:45 PM	1,031 psig	49 °F	58 °F	65 °F			
63	11/3/11	7:00 PM	1,031 psig	49 °F	58 °F	65 °F	End of Test		
							Spike Test		
							Hydrostatic Test		3,666.1 oz.

Were leaks observed during the test period? Exposed and buried pipe, no leaks observed.

High Test Pressure:	1,034 psig
Low Test Pressure:	1,030 psig

Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company	Job Number	41497325 -T68
Construction Co.	Shelson	Job Number	0629-53-3500 T-68
Hydro. Test Co.	Milbar Hydro-Test Inc.	Project No.	FY12-112
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562	WATER	
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562		

General Pipe Data

Description	Segment 1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Restrained	Restrained	Unrestrained	Restrained	Restrained	Restrained	Restrained	Unrestrained
Outside Diameter	2.375 in.	1.315 in.	34.000 in.	34.000 in.	34.000 in.	34.000 in.	12.750 in.	34.000 in.
Wall Thickness	0.154 in.	0.140 in.	0.375 in.	0.507 in.	0.406 in.	0.344 in.	0.500 in.	0.500 in.
Inside Diameter	2.067 in.	1.035 in.	33.250 in.	32.986 in.	33.188 in.	33.312 in.	11.750 in.	33.000 in.
Spec./Grade	API5L-Grade B	API5L-Grade B	API5L-X65	API5L-X60	API5L-X60	API5L-X52	API5L-Grade B	API5L-X65
Length Unrestrained			37 ft					40 ft
Length Restrained	10 ft	10 ft		337 ft	3,107 ft	12,290 ft	108 ft	
Temperature -- On Test	65 °F	65 °F	65.0 °F	65.0 °F	65.0 °F	65.0 °F	65.0 °F	65.0 °F
Temperature -- End of Test	65 °F	65 °F	58.0 °F	65.0 °F	65.0 °F	65.0 °F	65.0 °F	58.0 °F
Pressure – On Test	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig
Pressure – End of Test	1,031 psig	1,031 psig	1,031 psig	1,031 psig	1,031 psig	1,031 psig	1,031 psig	1,031 psig

Unrestrained Pipe

Vo	50,684.83 gal / 6,487,658 oz.		Vtp1	51,031.96 gal / 6,532,092 oz.		Vtp2	51,058.91 gal / 6,535,540 oz.	
Vo Unrestrained			1,669 gal					1,777 gal
Fwp 1			1.003157					1.003157
Fpp 1			1.003805					1.002833
Fpt 1			1.000091					1.000091
Fwt 1			1.000467					1.000467
Fpwt 1 = Fpt/Fwt			0.999624					0.999624
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)			1,679.96 gal					1,787.23 gal
Fwp 2			1.003160					1.003160
Fpp 2			1.003809					1.002835
Fpt 2			0.999964					0.999964
Fwt 2			0.999819					0.999819
Fpwt = Fpt/Fwt			1.000145					1.000145
Vtp = Vo(Fwp)(Fpp)(Fpwt)			1,680.85 gal					1,788.17 gal

Restrained Pipe

Vo	711,628.36 gal / 91,088,430 oz.		Vtp1	715,673.81 gal / 91,606,248 oz.		Vtp2	715,678.02 gal / 91,606,787 oz.	
Vo Unrestrained	2 gal	0 gal		14,961 gal	139,625 gal	556,432 gal	608 gal	
Fwp 1	1.003157	1.003157		1.003157	1.003157	1.003157	1.003157	
Fpp 1	1.000437	1.000249		1.002051	1.002572	1.003044	1.000752	
Fpt 1	1.000061	1.000061		1.000061	1.000061	1.000061	1.000061	
Fwt 1	1.000467	1.000467		1.000467	1.000467	1.000467	1.000467	
Fpwt 1 = Fpt/Fwt	0.999593	0.999593		0.999593	0.999593	0.999593	0.999593	
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	2 gal	0 gal		15,032 gal	140,369 gal	559,660 gal	610 gal	
Fwp 2	1.003160	1.003160		1.003160	1.003160	1.003160	1.003160	
Fpp 2	1.000438	1.000249		1.002053	1.002574	1.003046	1.000753	
Fpt 2	1.000061	1.000061		1.000061	1.000061	1.000061	1.000061	
Fwt 2	1.000467	1.000467		1.000467	1.000467	1.000467	1.000467	
Fpwt = Fpt/Fwt	0.999593	0.999593		0.999593	0.999593	0.999593	0.999593	
Vtp = Vo(Fwp)(Fpp)(Fpwt)	2 gal	0 gal		15,033 gal	140,369 gal	559,663 gal	610 gal	

Combined Pipe

Vo	762,313.19 gal / 97,576,088 oz.		Vtp1	766,705.78 gal / 98,138,340 oz.		Vtp2	766,736.93 gal / 98,142,327 oz.	

Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company
Construction Co.	Snelson
Hydro. Test Co.	Milbar Hydro-Test Inc.
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562

General Pipe Data

Description	9	10						
Restrained or Unrestrained?	Unrestrained	Unrestrained						
Outside Diameter	34.000 in.	34.000 in.						
Wall Thickness	0.500 in.	0.344 in.						
Inside Diameter	33.000 in.	33.312 in.						
Spec./Grade	API5L-X65	API5L-X52						
Length Unrestrained	34 ft	1,010 ft						
Length Restrained								
Temperature -- On Test	65.0 °F	65.0 °F						
Temperature -- End of Test	58.0 °F	58.0 °F						
Pressure -- On Test	1,030 psig	1,030 psig						
Pressure -- End of Test	1,031 psig	1,031 psig						

Unrestrained Pipe

Vo								
Vo Unrestrained	1,511 gal	45,728 gal						
Fwp 1	1.003157	1.003157						
Fpp 1	1.002833	1.004156						
Fpt 1	1.000091	1.000091						
Fwt 1	1.000467	1.000467						
Fpwt 1 = Fpt/Fwt	0.999624	0.999624						
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	1,519.15 gal	46,045.63 gal						
Fwp 2	1.003160	1.003160						
Fpp 2	1.002835	1.004160						
Fpt 2	0.999964	0.999964						
Fwt 2	0.999819	0.999819						
Fpwt = Fpt/Fwt	1.000145	1.000145						
Vtp = Vo(Fwp)(Fpp)(Fpwt)	1,519.95 gal	46,069.94 gal						

Restrained Pipe

Vo								
Vo Unrestrained								
Fwp 1								
Fpp 1								
Fpt 1								
Fwt 1								
Fpwt 1 = Fpt/Fwt								
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)								
Fwp 2								
Fpp 2								
Fpt 2								
Fwt 2								
Fpwt = Fpt/Fwt								
Vtp = Vo(Fwp)(Fpp)(Fpwt)								

Combined Pipe

Vo	

Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company	Job Number	41497325 -T68
Construction Co.	Snelson	Job Number	0629-53-3500 T-68
Hydro. Test Co.	Milbar Hydro-Test Inc.	Project No.	FY12-112
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562	WATER	
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562		

General Pipe Data

Description	Segment 1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Restrained	Restrained	Unrestrained	Restrained	Restrained	Restrained	Restrained	Unrestrained
Outside Diameter	2.375 in.	1.315 in.	34.000 in.	34.000 in.	34.000 in.	34.000 in.	12.750 in.	34.000 in.
Wall Thickness	0.154 in.	0.140 in.	0.375 in.	0.507 in.	0.406 in.	0.344 in.	0.500 in.	0.500 in.
Inside Diameter	2.067 in.	1.035 in.	33.250 in.	32.986 in.	33.188 in.	33.312 in.	11.750 in.	33.000 in.
Spec./Grade	API5L-Grade B	API5L-Grade B	API5L-X65	API5L-X60	API5L-X60	API5L-X52	API5L-Grade B	API5L-X65
Length Unstrained			37 ft					40 ft
Length Restrained	10 ft	10 ft		337 ft	3,107 ft	12,290 ft	108 ft	
Temperature -- On Test	64 °F	64 °F	61 °F	64 °F	64 °F	64 °F	64 °F	61 °F
Temperature -- End of Test	65 °F	65 °F	62 °F	65 °F	65 °F	65 °F	65 °F	62 °F
Pressure -- On Test	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig
Pressure -- End of Test	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig	1,030 psig

Unrestrained Pipe

Vo	50,684.83 gal / 6,487,658 oz.		Vtp1	51,048.00 gal / 6,534,144 oz.		Vtp2	51,043.82 gal / 6,533,609 oz.	
Vo Unrestrained			1,669 gal					1,777 gal
Fwp 1			1.003157					1.003157
Fpp 1			1.003805					1.002833
Fpt 1			1.000018					1.000018
Fwt 1			1.000080					1.000080
Fpwt 1 = Fpt/Fwt			0.999938					0.999938
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)			1,680.49 gal					1,787.79 gal
Fwp 2			1.003157					1.003157
Fpp 2			1.003805					1.002833
Fpt 2			1.000036					1.000036
Fwt 2			1.000181					1.000181
Fpwt = Fpt/Fwt			0.999856					0.999856
Vtp = Vo(Fwp)(Fpp)(Fpwt)			1,680.35 gal					1,787.65 gal

Restrained Pipe

Vo	711,628.36 gal / 91,088,430 oz.		Vtp1	715,728.97 gal / 91,613,309 oz.		Vtp2	715,673.81 gal / 91,606,248 oz.	
Vo Restrained	2 gal	0 gal		14,961 gal	139,625 gal	556,432 gal	608 gal	
Fwp 1	1.003157	1.003157		1.003157	1.003157	1.003157	1.003157	
Fpp 1	1.000434	1.000245		1.002047	1.002568	1.003040	1.000749	
Fpt 1	1.000048	1.000048		1.000048	1.000048	1.000048	1.000048	
Fwt 1	1.000375	1.000375		1.000375	1.000375	1.000375	1.000375	
Fpwt 1 = Fpt/Fwt	0.999674	0.999674		0.999674	0.999674	0.999674	0.999674	
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	2 gal	0 gal		15,034 gal	140,379 gal	559,703 gal	611 gal	
Fwp 2	1.003157	1.003157		1.003157	1.003157	1.003157	1.003157	
Fpp 2	1.000437	1.000249		1.002051	1.002572	1.003044	1.000752	
Fpt 2	1.000061	1.000061		1.000061	1.000061	1.000061	1.000061	
Fwt 2	1.000467	1.000467		1.000467	1.000467	1.000467	1.000467	
Fpwt = Fpt/Fwt	0.999593	0.999593		0.999593	0.999593	0.999593	0.999593	
Vtp = Vo(Fwp)(Fpp)(Fpwt)	2 gal	0 gal		15,032 gal	140,369 gal	559,660 gal	610 gal	

Combined Pipe

Vo	762,313.19 gal / 97,576,088 oz.		Vtp1	766,776.97 gal / 98,147,453 oz.		Vtp2	766,717.63 gal / 98,139,857 oz.	
1 °F Change	59.35 gal		7,596.25 oz.					

Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company
Construction Co.	Snelson
Hydro. Test Co.	Milbar Hydro-Test Inc.
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562

General Pipe Data								
Description	9	10						
Restrained or Unrestrained?	Unrestrained	Unrestrained						
Outside Diameter	34.000 in.	34.000 in.						
Wall Thickness	0.500 in.	0.344 in.						
Inside Diameter	33.000 in.	33.312 in.						
Spec./Grade	API5L-X65	API5L-X52						
Length Unstrained	34 ft	1,010 ft						
Length Restrained								
Temperature -- On Test	61 °F	61 °F						
Temperature -- End of Test	62 °F	62 °F						
Pressure -- On Test	1,030 psig	1,030 psig						
Pressure -- End of Test	1,030 psig	1,030 psig						
Unrestrained Pipe								
Vo								
Vo Unrestrained	1,511 gal	45,728 gal						
Fwp 1	1.003157	1.003157						
Fpp 1	1.002833	1.004156						
Fpt 1	1.000018	1.000018						
Fwt 1	1.000080	1.000080						
Fpwt 1 = Fpt/Fwt	0.999938	0.999938						
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	1,519.62 gal	46,060.10 gal						
Fwp 2	1.003157	1.003157						
Fpp 2	1.002833	1.004156						
Fpt 2	1.000036	1.000036						
Fwt 2	1.000181	1.000181						
Fpwt = Fpt/Fwt	0.999856	0.999856						
Vtp = Vo(Fwp)(Fpp)(Fpwt)	1,519.50 gal	46,056.32 gal						
Restrained Pipe								
Vo								
Vo Restrained								
Fwp 1								
Fpp 1								
Fpt 1								
Fwt 1								
Fpwt 1 = Fpt/Fwt								
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)								
Fwp 2								
Fpp 2								
Fpt 2								
Fwt 2								
Fpwt = Fpt/Fwt								
Vtp = Vo(Fwp)(Fpp)(Fpwt)								
Combined Pipe								
Vo								
1 °F Change								

RCP

Hydrostatic Test Pipe Data Table

Pipe Type	Length	Restrained / Unrestrained	Outside Diameter	Wall Thickness	Specification & Grade	Pipe Yield Pressure	Material	Joint Type	Seam Type
1	10 ft	Restrained	2.375 in.	0.1540 in.	API5L-Grade B	4,539 psig	Steel	Arc Weld	SM
2	10 ft	Restrained	1.315 in.	0.1400 in.	API5L-Grade B	7,452 psig	Steel	Arc Weld	SM
3	37 ft	Unrestrained	34.000 in.	0.3750 in.	API5L-X65	1,434 psig	Steel	Arc Weld	DSAW
4	337 ft	Restrained	34.000 in.	0.5070 in.	API5L-X60	1,789 psig	Steel	Arc Weld	DSAW
5	3,107 ft	Restrained	34.000 in.	0.4060 in.	API5L-X60	1,433 psig	Steel	Arc Weld	DSAW
6	12,290 ft	Restrained	34.000 in.	0.3440 in.	API5L-X52	1,052 psig	Steel	Arc Weld	DSAW
7	108 ft	Restrained	12.750 in.	0.5000 in.	API5L-Grade B	2,745 psig	Steel	Arc Weld	SM
8	40 ft	Unrestrained	34.000 in.	0.5000 in.	API5L-X65	1,912 psig	Steel	Arc Weld	DSAW
9	34 ft	Unrestrained	34.000 in.	0.5000 in.	API5L-X65	1,912 psig	Steel	Arc Weld	DSAW
10	1,010 ft	Unrestrained	34.000 in.	0.3440 in.	API5L-X52	1,052 psig	Steel	Arc Weld	DSAW

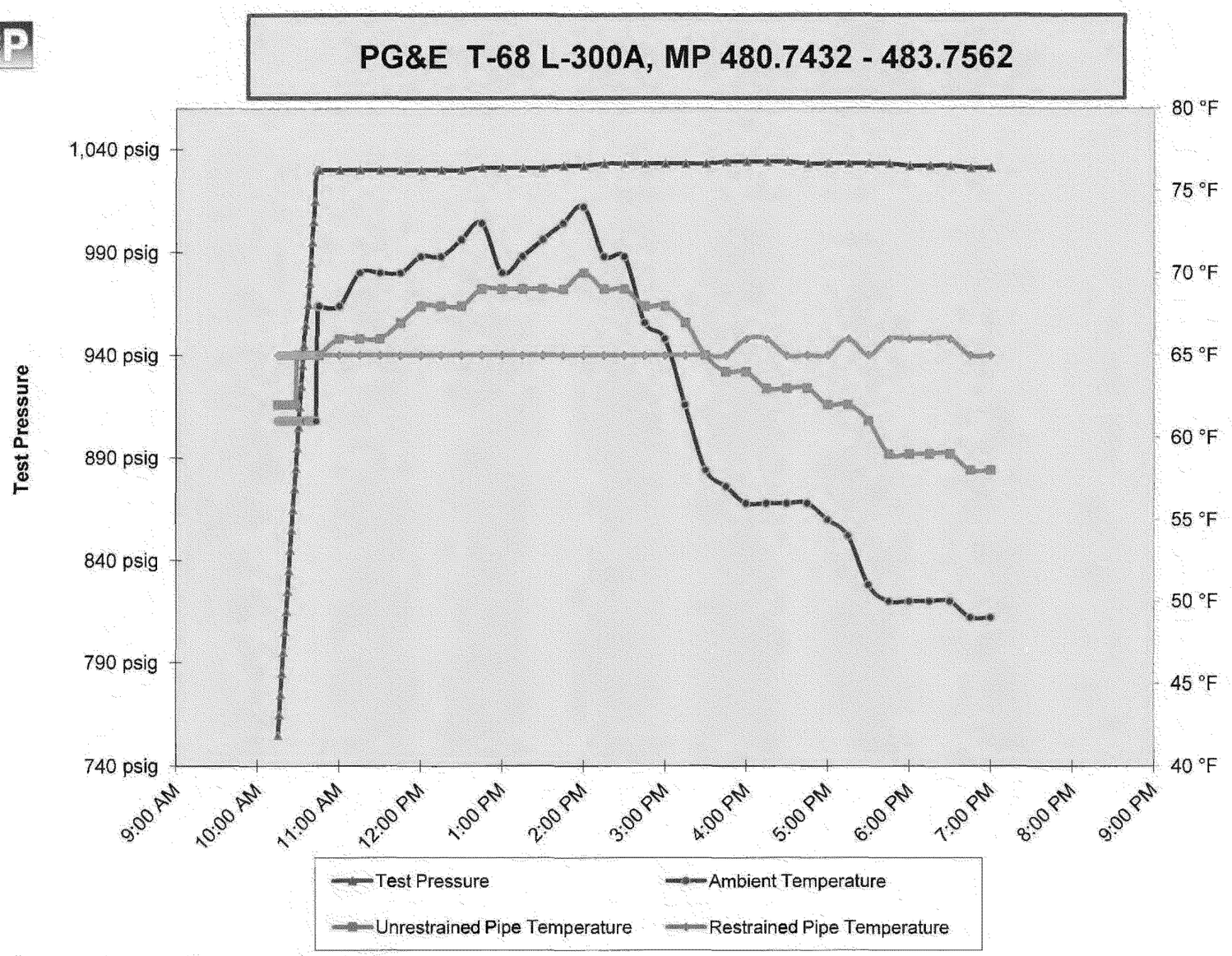
Hydrostatic Test Project Owner & Participants

Owner Company	Pacific Gas and Electric Company	Job Number
Address	350 N. Wiget	
	Walnut Creek, CA 94598	41497325 -T68
	Attention: Redacted	
Construction Company	Snelson	Job Number
Address	601 West State Street	
	Sedro-Wooley, WA 98284	0629-53-3500 T-68
	Attention: Redacted	
Hydrostatic Test Co.	Milbar Hydro-Test Inc.	Project No.
Address	P O Box 7701	
	Shreveport, La. 71137-7701	FY12-112
Test Section	PG&E T-68 L-300A, MP 480.7432 - 483.7562	
	From: 163+89	
	To: 0+00	
File Name	RCP 61362 - T-68 L-300A, MP 480.7432 - 483.7562	

Part II – Test Data (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)

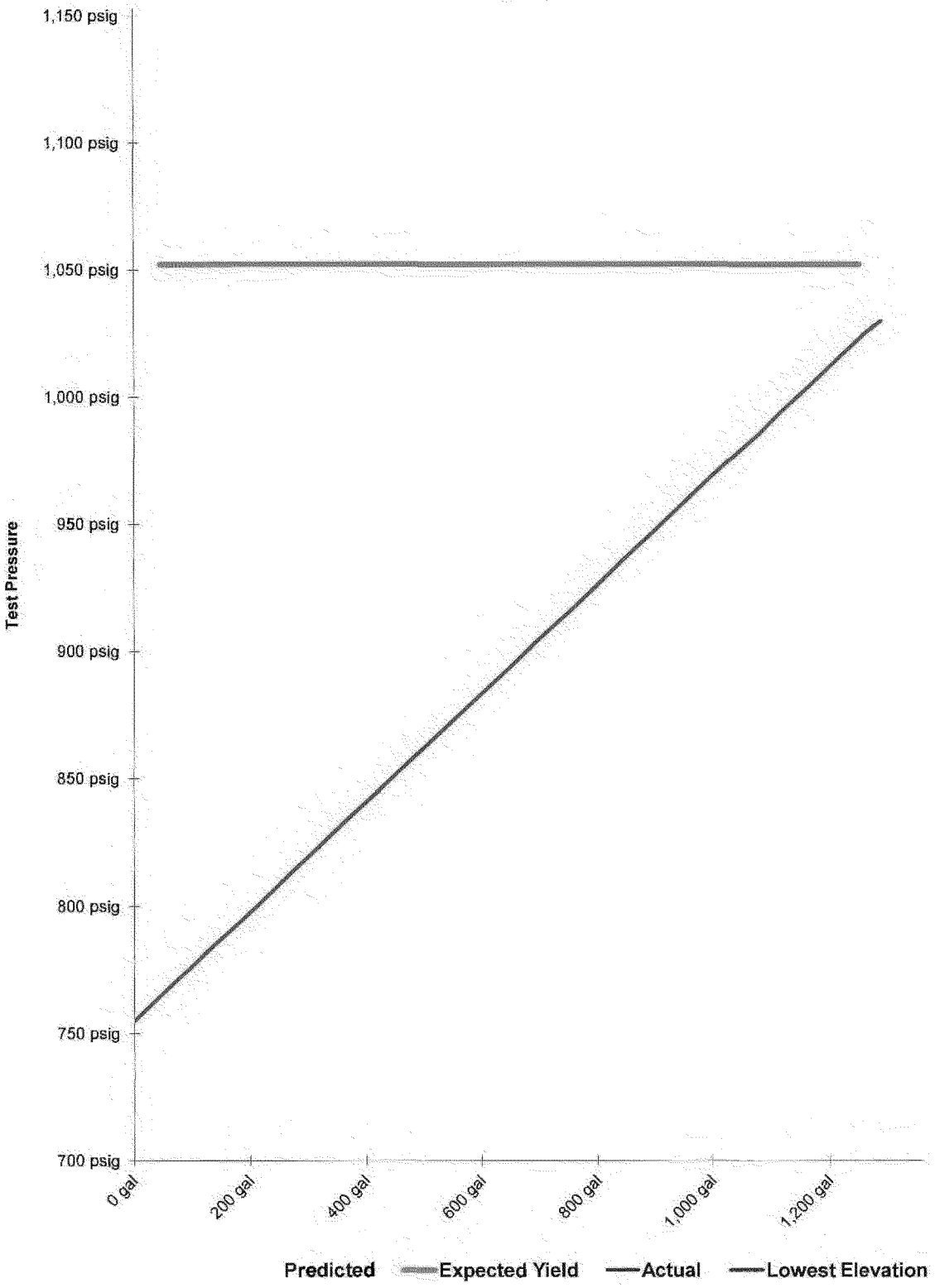
Note: Minimum test pressure and duration are not to be changed without written approval.

Time and Date Test Pressure Reached	11/3/11 10:44 AM	Elevation at Test Point	309 ft	Min. Required Test Press At Test Point (1)	1,007.23 psig	Max. Allowable Test Press at Test Point (4)	1,045.00 psig
Time and Date Test Ended	11/3/11 7:00 PM	Max. Elevation in Test Section	448 ft	Min. Indicated Test Pressure (2)	1,030.00 psig	Max. Indicated Test Pressure (5)	1,034.00 psig
Actual Duration of Test	8 hours 16 minutes	Min. Elevation in Test Section	309 ft	Min. Test Pressure at Max. Elevation (3)	969.77 psig	Max. Test Pressure at Min. Elevation (6)	1,034.00 psig



RCP

Spike Pressure Test
Stress Strain Curve -- PG&E T-68 L-300A, MP 480.7432 - 483.7562



RCP

Spike Pressure Test
Stress Strain Curve -- PG&E T-68 L-300A, MP 480.7432 - 483.7562

Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope	
Pressure	Strokes	Gallons	Gallons	Actual	Predicted
755 psig	0	0.00 gal		0	0.000
765 psig	83	45.72 gal	45.54 gal	4.572	4.554
775 psig	169	93.08 gal	91.08 gal	4.737	4.554
785 psig	252	138.80 gal	136.62 gal	4.572	4.554
795 psig	340	187.27 gal	182.17 gal	4.847	4.555
805 psig	425	234.09 gal	227.72 gal	4.682	4.555
815 psig	509	280.36 gal	273.27 gal	4.627	4.555
825 psig	592	326.07 gal	318.82 gal	4.572	4.555
835 psig	675	371.79 gal	364.38 gal	4.572	4.556
845 psig	762	419.71 gal	409.94 gal	4.792	4.556
855 psig	847	466.53 gal	455.50 gal	4.682	4.556
865 psig	931	512.79 gal	501.07 gal	4.627	4.557
875 psig	1015	559.06 gal	546.64 gal	4.627	4.557
885 psig	1102	606.98 gal	592.21 gal	4.792	4.557
895 psig	1188	654.35 gal	637.78 gal	4.737	4.557
905 psig	1268	698.41 gal	683.36 gal	4.406	4.558
915 psig	1358	747.98 gal	728.94 gal	4.957	4.558
925 psig	1442	794.25 gal	774.52 gal	4.627	4.558
935 psig	1525	839.97 gal	820.11 gal	4.572	4.559
945 psig	1613	888.44 gal	865.69 gal	4.847	4.559
955 psig	1697	934.71 gal	911.29 gal	4.627	4.559
965 psig	1781	980.97 gal	956.88 gal	4.627	4.559
975 psig	1868	1,028.89 gal	1,002.48 gal	4.792	4.560
985 psig	1955	1,076.81 gal	1,048.08 gal	4.792	4.560
995 psig	2037	1,121.98 gal	1,093.68 gal	4.517	4.560
1,005 psig	2122	1,168.79 gal	1,139.28 gal	4.682	4.560
1,015 psig	2206	1,215.06 gal	1,184.89 gal	4.627	4.561
1,025 psig	2292	1,262.43 gal	1,230.50 gal	4.737	4.561
1,030 psig	2344	1,291.07 gal	1,253.31 gal	5.728	4.561
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000
1,030 psig		1,291.07 gal	1,253.31 gal	0.000	0.000

39250	0.551 gal/stroke
Pump Piston Diameter	3.000 in
Pump Piston Stroke	6.00 in
Pump Cylinders	3 ea
Volume check gal per stroke	0.000 gal/stroke
Volume Released (gallons)	0.00 gal
Pressure Reduced (psi)	10 psi
Maximum2	1,360 gal
Minimum2	0 gal
Maximum1	1,153 psig
Minimum1	700 psig
Gallons/Stroke Used	0.551 gal/stroke
Predicted Gallons/Stroke	0.535 gal/stroke
Pressure Increment	10 psi
Max Pressure	1,030 psig
Buried Pipe Temperature	74 °F
Exposed Pipe Temperature	84 °F

ASME B31.8 Appendix N-5

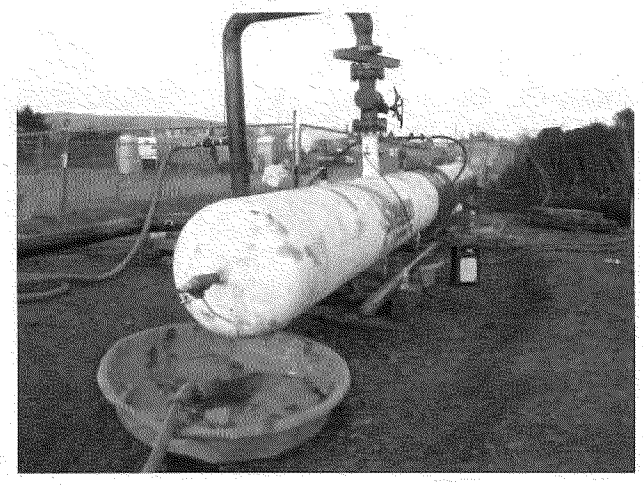
Average Actual Elastic Slope	4.676
Average Predicted Elastic Slope	4.558
Code Prescribed Minimum Yield Slope (less 10%) B31.8 N-5 (c)(2)	8.884
Established Minimum Yield Pressure B31.8 N-5 (c)(2)	1,030 psig
Maximum Allowed Volume (After Slope Deviation) B31.8 N-5 (c)(2)	418 gal
Volume (After Slope Deviation) B31.8 N-5 (c)(2)	0 gal

Redacted

11/3/2011
Date

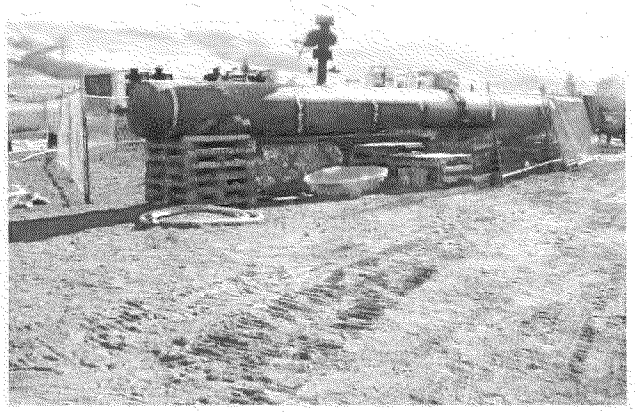
SB_GT&S_0503083

T-68 Test Header

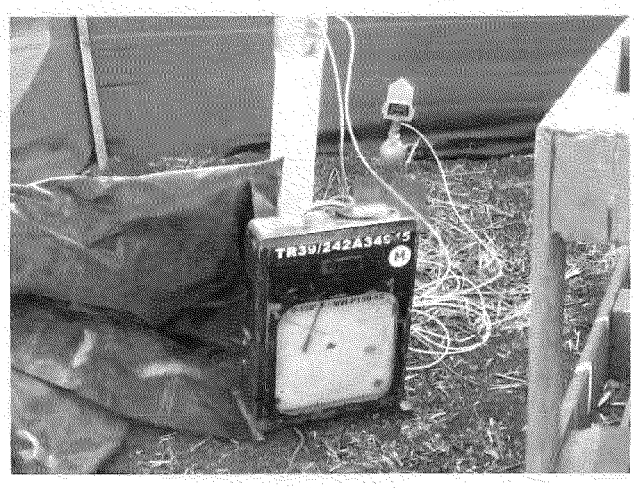


Tie-in pipe included in test.

Main Line Pipe Connect



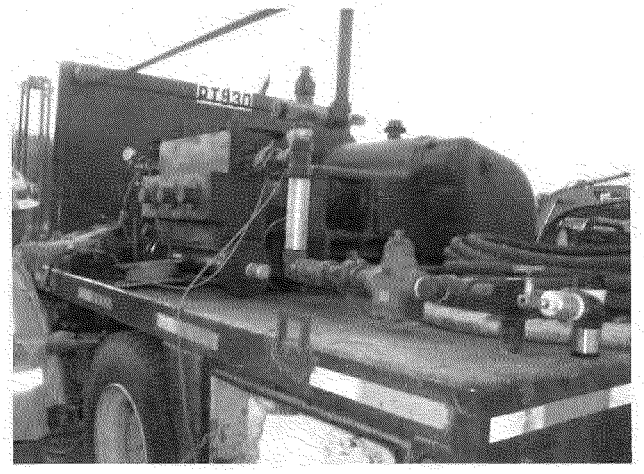
Test End



Restrained Temp Recorder (Back Up)

Unrestrained Temp Recorder

Deadweght Test Equipment



Presure Pump.