



RCP, Inc

801 Louisiana, Ste.200
Houston, Texas 77002

Redacted

November 5, 2011

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

Test Contractor:	ARB -- T-32 11/04/11
Asset Owner:	Pacific Gas and Electric Company -- 41497353
Construction Contractor:	ARB -- 0629-53-3500 T-32
Test Section:	PG&E T-32 , L-132 , MP 23.1638 - 25.5957
Test Date:	November 4, 2011
Certificate Number:	RCP 61362 - T-32, L-132, MP 23.1638 - 25.5957

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 ARB met the requirements of the Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3).

The test segment was subjected to a spike pressure test of 797 psig for 30 minutes, without observed leakage or yielding of the pipe segment. The 30 minute spike test and subsequent pressure reduction with vent to bleed was included and is part of the 8.18 hour test duration period.

This hydrostatic test was completed successfully. Pressure was maintained on the test facilities in excess of 8.18 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 609 psig and the MAOP per 49 CFR Part 192, Subpart J can be as high as 406 psig. The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 400 psig.

Pressure decreased 52 psi during the test. 45,792.00 ounces of fluid was intentionally released from the test section. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 30,160.19 ounces, gain, which is equivalent to a 9.36 °F change in pipe temperature and larger than the anticipated error attributed to the temperature measurement instrumentation utilized.

Test pressure did not remain steady even though no leaks were observed. The volumetric gain is attributed to the the expansion of the large volume of air trapped in the test section. Release of water volume while reducing test pressure, from spike to final test pressure, resulted in an unmeasurable expansion of the trapped air in opposition to the anticipated and measurable release of relatively incompressible water. As a result, the volumetric balance calculation did not accurately represent the physical characteristics of the test.

Sincerely,

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Hydrostatic Test Certification

Company	Pacific Gas and Electric Company	Job Number	41497353
Construction Co.	ARB	Job Number	0629 53 3500 T-32
Hydro. Test Co.	ARB	Project No.	T-32 11/04/11
Test Section	PG&E T-32, L-132, MP 23.1638 - 25.5957		
File Name	RCP 61362 - T-32, L-132, MP 23.1638 - 25.5957		

Hydrostatic Test Pressure

APPLICABLE CODE FOR CERTIFICATION: Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3) Test Date: 4-Nov-11

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-32, L-132, MP 23.1638 - 25.5957

From: 0+00 To: 127+15

Pipe Data

Segment	Length	Diameter	Wall Thickness	Specification	100% SMYS
1	14.96 ft	30.000 in.	0.375 in.	API5L-X65, DSAW, Arc Weld, Steel	1,625 psi
2	28.65 ft	24.000 in.	0.375 in.	API5L-X60, DSAW, Arc Weld, Steel	1,875 psi
3	2,850.30 ft	30.000 in.	0.298 in.	API5L-X60, DSAW, Arc Weld, Steel	1,192 psi
4	9,801.00 ft	24.000 in.	0.281 in.	45ksmys, SM, Arc Weld, Steel	1,054 psi
5	142.00 ft	24.000 in.	0.312 in.	API5L-X60, SM, Arc Weld, Steel	1,560 psi
6	11.00 ft	30.000 in.	0.500 in.	API5L-X65, DSAW, Arc Weld, Steel	2,167 psi
7	11.00 ft	24.000 in.	0.500 in.	API5L-X65, DSAW, Arc Weld, Steel	2,708 psi

Initial Test Conditions

Pressure at Test Point:	798 psig	Date/Time:	11/4/11 9:34 PM	Pipe Temperature	
Ambient Temperature:	47.0 °F	Elevation @ Test Point:	555.0 ft	Unrestrained:	58.0 °F
Pressure @ High Point (Cal/Measure):	661 psig	Elevation @ High Point:	873.0 ft	Restrained:	64.0 °F
Pressure @ Low Point (Cal/Measure):	849 psig	Elevation @ Low Point:	438.0 ft	Location:	0+00
				Location:	28+51
				Location:	111+74

Final Test Conditions

Pressure at Test Point:	746 psig	Date/Time:	11/5/11 5:45 AM	Pipe Temperature	
Ambient Temperature:	49.0 °F	Elevation @ Test Point:	556.0 ft	Unrestrained:	55.0 °F
Pressure @ High Point (Cal/Measure):	609 psig	Elevation @ High Point:	873.0 ft	Restrained:	65.0 °F
Pressure @ Low Point (Cal/Measure):	797 psig	Elevation @ Low Point:	438.0 ft	Location:	0+00
				Location:	28+51
				Location:	111+74

Total Fluid Injected:		Total Fluid Withdrawn:		45792.00 fluid ounces	Volume gain	
Net Change in Volume of the Test Section ± (+ Gain, - Loss):	30,160.19 oz	gain	0.0721%	9.364 °F equivalent		

Test Duration: 8.18 hours

Minimum Test Pressure:	745 psig	Max Elevation	608 psig	Min Elevation	796 psig
Maximum Test Pressure:	798 psig		561 psig		849 psig
% SMYS:	29.5%		62.7%		71.2%
Test Segment Observed % SMYS:	Minimum	29.5%	Maximum	75.7%	

Minimum Test Pressure (Calculated/Measured): 609 psig

Maximum Allowable Operating Pressure: DOT Part 192 Test Factor= 1.50 406 psig

The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 400 psig.

Were leaks observed?	No	Explain:
Acceptable Hydrostatic Test?	Yes	<p>The test segment was subjected to a spike pressure test of 797 psig for 30 minutes, without observed leakage or yielding of the pipe segment. The 30 minute spike test and subsequent pressure reduction with volume bleed was included and is part of the 8.18 hour test duration period.</p> <p>No leaks were observed during the test period. The test section included 12,803 feet of buried and 66 feet of exposed pipe. Pressure lost 52 psi during the test. The buried pipe segment gained 1°F fluid temperature and the exposed pipe segment lost 3°F.</p> <p>45,792.00 ounces of fluid was intentionally released from the test section. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 30,160.19 ounces, gain, which is equivalent to a 9.36 °F change in pipe temperature and larger than the anticipated error attributed to the temperature measurement instrumentation utilized.</p> <p>Test pressure did not remain steady even though no leaks were observed. The volumetric gain is attributed to the the expansion of the large volume of air trapped in the test section. Release of water volume while reducing test pressure, from spike to final test pressure, resulted in an unmeasurable expansion of the trapped air in opposition to the anticipated and measurable release of relatively incompressible water. As a result, the volumetric balance calculation did not accurately represent the physical characteristics of the test.</p>

Remarks: It was determined that this test segment contained an unmeasurable quantity of air during this test.

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Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41497353
Construction Co.	ARB	Job Number	0629-53-3500 T-32
Testing Co.	ARB	Project No.	T-32 11/04/11
Test Section	PG&E T-32, L-132, MP 23.1638 - 25.5957		
File Name	RCP 61362 - T-32, L-132, MP 23.1638 - 25.5957		

Date		4-Nov-11		Test Log					
Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
1	11/4/11	7:38 PM	553 psig	49 °F	58 °F	63 °F	Start Spike		
2	11/4/11	7:43 PM	563 psig	49 °F	58 °F	63 °F	Inject		12,560 oz.
3	11/4/11	7:48 PM	573 psig	48 °F	58 °F	63 °F	Inject		11,718 oz.
4	11/4/11	7:53 PM	583 psig	48 °F	58 °F	63 °F	Inject		11,265 oz.
5	11/4/11	7:58 PM	593 psig	48 °F	58 °F	63 °F	Inject		10,682 oz.
6	11/4/11	8:03 PM	603 psig	48 °F	58 °F	63 °F	Inject		10,456 oz.
7	11/4/11	8:08 PM	613 psig	48 °F	58 °F	63 °F	Inject		10,132 oz.
8	11/4/11	8:13 PM	623 psig	48 °F	58 °F	63 °F	Inject		9,808 oz.
9	11/4/11	8:18 PM	633 psig	48 °F	58 °F	63 °F	Inject		9,533 oz.
10	11/4/11	8:23 PM	643 psig	48 °F	58 °F	63 °F	Inject		9,080 oz.
11	11/4/11	8:28 PM	653 psig	48 °F	58 °F	63 °F	Inject		8,967 oz.
12	11/4/11	8:33 PM	663 psig	48 °F	58 °F	63 °F	Inject		8,805 oz.
13	11/4/11	8:38 PM	673 psig	47 °F	58 °F	63 °F	Inject		8,384 oz.
14	11/4/11	8:43 PM	683 psig	47 °F	58 °F	63 °F	Inject		8,190 oz.
15	11/4/11	8:48 PM	693 psig	48 °F	58 °F	63 °F	Inject		8,060 oz.
16	11/4/11	8:53 PM	703 psig	48 °F	58 °F	63 °F	Inject		11,071 oz.
17	11/4/11	8:57 PM	713 psig	48 °F	58 °F	63 °F	Inject		4,273 oz.
18	11/4/11	9:01 PM	723 psig	48 °F	58 °F	63 °F	Inject		7,380 oz.
19	11/4/11	9:05 PM	733 psig	48 °F	58 °F	63 °F	Inject		7,154 oz.
20	11/4/11	9:09 PM	743 psig	48 °F	58 °F	63 °F	Inject		6,927 oz.
21	11/4/11	9:13 PM	753 psig	48 °F	58 °F	63 °F	Inject		6,733 oz.
22	11/4/11	9:17 PM	763 psig	48 °F	58 °F	63 °F	Inject		6,782 oz.
23	11/4/11	9:21 PM	773 psig	48 °F	58 °F	63 °F	Inject		6,426 oz.
24	11/4/11	9:25 PM	783 psig	48 °F	58 °F	63 °F	Inject		6,426 oz.
25	11/4/11	9:29 PM	793 psig	48 °F	58 °F	63 °F	Inject		6,037 oz.
26	11/4/11	9:33 PM	798 psig	48 °F	58 °F	63 °F	Inject		3,969 oz.
27	11/4/11	9:34 PM	798 psig	47 °F	58 °F	64 °F		On Test	
28	11/4/11	9:44 PM	796 psig	47 °F	58 °F	64 °F			
29	11/4/11	9:54 PM	795 psig	48 °F	58 °F	64 °F			
30	11/4/11	10:04 PM	795 psig	47 °F	58 °F	64 °F	End Spike		
31	11/4/11	10:19 PM	785 psig	47 °F	58 °F	64 °F			8,640 oz.
32	11/4/11	10:34 PM	780 psig	47 °F	58 °F	64 °F			4,320 oz.
33	11/4/11	10:49 PM	774 psig	47 °F	58 °F	64 °F			5,184 oz.
34	11/4/11	10:55 PM	765 psig	47 °F	58 °F	64 °F			7,776 oz.
35	11/4/11	11:10 PM	750 psig	47 °F	58 °F	64 °F			12,960 oz.
36	11/4/11	11:15 PM	750 psig	47 °F	58 °F	64 °F	Cool		
37	11/4/11	11:30 PM	750 psig	47 °F	58 °F	64 °F			
38	11/4/11	11:45 PM	752 psig	46 °F	58 °F	64 °F			
39	11/5/11	12:00 AM	752 psig	46 °F	58 °F	64 °F			
40	11/5/11	12:15 AM	752 psig	46 °F	58 °F	64 °F			
41	11/5/11	12:30 AM	753 psig	46 °F	58 °F	64 °F			
42	11/5/11	12:45 AM	745 psig	46 °F	57 °F	64 °F	Bleed		6,912 oz.
43	11/5/11	1:00 AM	746 psig	47 °F	57 °F	64 °F			
44	11/5/11	1:15 AM	746 psig	47 °F	57 °F	64 °F			
45	11/5/11	1:30 AM	746 psig	47 °F	57 °F	64 °F	Cool		
46	11/5/11	1:45 AM	746 psig	47 °F	56 °F	64 °F			
47	11/5/11	2:00 AM	746 psig	47 °F	56 °F	64 °F			

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Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company	Job Number	41497353
Construction Co.	ARB	Job Number	0629-53-3500 T-32
Hydro. Test Co.	ARB	Project No.	T-32 11/04/11
Test Section	PG&E T-32, L-132, MP 23.1638 - 25.5957		
File Name	RCP 61362 - T-32, L-132, MP 23.1638 - 25.5957		
WATER			

General Pipe Data

Description	Segment						
	1	2	3	4	5	6	7
Restrained or Unrestrained?	Unrestrained	Unrestrained	Restrained	Restrained	Restrained	Unrestrained	Unrestrained
Outside Diameter	30.000 in.	24.000 in.	30.000 in.	24.000 in.	24.000 in.	30.000 in.	24.000 in.
Wall Thickness	0.375 in.	0.375 in.	0.298 in.	0.281 in.	0.312 in.	0.500 in.	0.500 in.
Inside Diameter	29.250 in.	23.250 in.	29.404 in.	23.438 in.	23.376 in.	29.000 in.	23.000 in.
Spec./Grade	API5L-X65	API5L-X60	API5L-X60	45ksmys	API5L-X60	API5L-X65	API5L-X65
Length Unrestrained	15 ft	29 ft				11 ft	11 ft
Length Restrained			2,860 ft	9,801 ft	142 ft		
Temperature -- On Test	58 °F	58 °F	64.0 °F	64.0 °F	64.0 °F	58.0 °F	58.0 °F
Temperature -- End of Test	55 °F	55 °F	65.0 °F	65.0 °F	65.0 °F	55.0 °F	55.0 °F
Pressure -- On Test	798 psig	798 psig	798 psig	798 psig	798 psig	798 psig	798 psig
Pressure -- End of Test	746 psig	746 psig	746 psig	746 psig	746 psig	746 psig	746 psig

Unrestrained Pipe

Vo	1,768.93 gal		Vip1	1,777.27 gal		Vip2	1,777.03 gal	
	226,424 oz.			227,491 oz.			227,460 oz.	
Vo Unrestrained	522 gal	632 gal				377 gal	237 gal	
Fwp 1	1.002444	1.002444				1.002444	1.002444	
Fpp 1	1.002594	1.002062				1.001929	1.001530	
Fpt 1	0.999964	0.999964				0.999964	0.999964	
Fwt 1	0.999819	0.999819				0.999819	0.999819	
Fpwt 1 = Fpt/Fwt	1.000145	1.000145				1.000145	1.000145	
Vip 1 = Vo(Fwp)(Fpp)(Fpwt)	524.92 gal	634.81 gal				379.15 gal	238.39 gal	
Fwp 2	1.002284	1.002284				1.002284	1.002284	
Fpp 2	1.002426	1.001927				1.001803	1.001430	
Fpt 2	0.999909	0.999909				0.999909	0.999909	
Fwt 2	0.999605	0.999605				0.999605	0.999605	
Fpwt = Fpt/Fwt	1.000305	1.000305				1.000305	1.000305	
Vip = Vo(Fwp)(Fpp)(Fpwt)	524.83 gal	634.73 gal				379.10 gal	238.37 gal	

Restrained Pipe

Vo	323,734.01 gal		Vip1	325,115.72 gal		Vip2	324,993.84 gal	
	41,437,953 oz.			41,614,812 oz.			41,599,211 oz.	
Vo Unrestrained			100,898 gal	219,670 gal	3,166 gal			
Fwp 1			1.002444	1.002444	1.002444			
Fpp 1			1.002403	1.002033	1.001828			
Fpt 1			1.000048	1.000048	1.000048			
Fwt 1			1.000375	1.000375	1.000375			
Fpwt 1 = Fpt/Fwt			0.999674	0.999674	0.999674			
Vip 1 = Vo(Fwp)(Fpp)(Fpwt)			101,355 gal	220,583 gal	3,178 gal			
Fwp 2			1.002284	1.002284	1.002284			
Fpp 2			1.002251	1.001905	1.001713			
Fpt 2			1.000061	1.000061	1.000061			
Fwt 2			1.000467	1.000467	1.000467			
Fpwt = Fpt/Fwt			0.999593	0.999593	0.999593			
Vip = Vo(Fwp)(Fpp)(Fpwt)			101,315 gal	220,502 gal	3,177 gal			

Combined Pipe

Vo	325,502.94 gal		Vip1	326,892.99 gal		Vip2	326,770.87 gal	
	41,664,377 oz.			41,842,303 oz.			41,826,671 oz.	

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Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company	Job Number	41497353
Construction Co.	ARB	Job Number	0629-53-3500 T-32
Hydro. Test Co.	ARB	Project No.	T-32 11/04/11
Test Section	PG&E T-32, L-132, MP 23.1638 - 25.5957	WATER	
File Name	RCP 61362 - T-32, L-132, MP 23.1638 - 25.5957		

General Pipe Data

Description	Segment							
	1	2	3	4	5	6	7	
Restrained or Unrestrained?	Unrestrained	Unrestrained	Restrained	Restrained	Restrained	Unrestrained	Unrestrained	
Outside Diameter	30.000 in.	24.000 in.	30.000 in.	24.000 in.	24.000 in.	30.000 in.	24.000 in.	
Wall Thickness	0.375 in.	0.375 in.	0.298 in.	0.281 in.	0.312 in.	0.500 in.	0.500 in.	
Inside Diameter	29.250 in.	23.250 in.	29.404 in.	23.438 in.	23.376 in.	29.000 in.	23.000 in.	
Spec./Grade	API5L-X65	API5L-X60	API5L-X60	45krmys	API5L-X60	API5L-X65	API5L-X65	
Length Unstrained	1.5 ft	29 ft				11 ft	11 ft	
Length Restrained			2,860 ft	9,801 ft	142 ft			
Temperature -- On Test	56 °F	56 °F	64 °F	64 °F	64 °F	56 °F	56 °F	
Temperature -- End of Test	57 °F	57 °F	65 °F	65 °F	65 °F	57 °F	57 °F	
Pressure -- On Test	772 psig	772 psig	772 psig	772 psig	772 psig	772 psig	772 psig	
Pressure -- End of Test	772 psig	772 psig	772 psig	772 psig	772 psig	772 psig	772 psig	

Unrestrained Pipe

Vo	1,768.93 gal		Vtp1	1,777.21 gal		Vtp2	1,777.10 gal	
	226,424 oz.			227,483 oz.			227,469 oz.	
Vo Unrestrained	522 gal	632 gal			377 gal		237 gal	
Fwp 1	1.002364	1.002364			1.002364		1.002364	
Fpp 1	1.002509	1.001994			1.001866		1.001480	
Fpt 1	0.999927	0.999927			0.999927		0.999927	
Fwt 1	0.999668	0.999668			0.999668		0.999668	
Fpwt 1 = Fpt/Fwt	1.000259	1.000259			1.000259		1.000259	
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	524.89 gal	634.79 gal			379.14 gal		238.39 gal	
Fwp 2	1.002364	1.002364			1.002364		1.002364	
Fpp 2	1.002509	1.001994			1.001866		1.001480	
Fpt 2	0.999945	0.999945			0.999945		0.999945	
Fwt 2	0.999749	0.999749			0.999749		0.999749	
Fpwt = Fpt/Fwt	1.000197	1.000197			1.000197		1.000197	
Vtp = Vo(Fwp)(Fpp)(Fpwt)	524.86 gal	634.75 gal			379.11 gal		238.37 gal	

Restrained Pipe

Vo	323,734.01 gal		Vtp1	325,067.30 gal		Vtp2	325,042.25 gal	
	41,437,953 oz.			41,608,614 oz.			41,605,408 oz.	
Vo Restrained			100,898 gal	219,670 gal	3,166 gal			
Fwp 1			1.002364	1.002364	1.002364			
Fpp 1			1.002325	1.001968	1.001769			
Fpt 1			1.000048	1.000048	1.000048			
Fwt 1			1.000375	1.000375	1.000375			
Fpwt 1 = Fpt/Fwt			0.999674	0.999674	0.999674			
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)			101,339 gal	220,551 gal	3,178 gal			
Fwp 2			1.002364	1.002364	1.002364			
Fpp 2			1.002329	1.001971	1.001772			
Fpt 2			1.000061	1.000061	1.000061			
Fwt 2			1.000467	1.000467	1.000467			
Fpwt = Fpt/Fwt			0.999593	0.999593	0.999593			
Vtp = Vo(Fwp)(Fpp)(Fpwt)			101,331 gal	220,534 gal	3,178 gal			

Combined Pipe

Vo	325,502.94 gal		Vtp1	326,844.51 gal		Vtp2	326,619.35 gal	
	41,664,377 oz.			41,836,097 oz.			41,832,876 oz.	
1 °F Change	25.16 gal		3,220.79 oz.					

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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	14.96 ft	Unrestrained	30.000 in.	0.3750 in.	API5L-X65	1,625 psig	Steel	Arc Weld	DSAW
2	28.65 ft	Unrestrained	24.000 in.	0.3750 in.	API5L-X60	1,875 psig	Steel	Arc Weld	DSAW
3	2,860.30 ft	Restrained	30.000 in.	0.2980 in.	API5L-X60	1,192 psig	Steel	Arc Weld	DSAW
4	9,801.00 ft	Restrained	24.000 in.	0.2810 in.	45ksmys	1,054 psig	Steel	Arc Weld	SM
5	142.00 ft	Restrained	24.000 in.	0.3120 in.	API5L-X60	1,560 psig	Steel	Arc Weld	SM
6	11.00 ft	Unrestrained	30.000 in.	0.5000 in.	API5L-X65	2,167 psig	Steel	Arc Weld	DSAW
7	11.00 ft	Unrestrained	24.000 in.	0.5000 in.	API5L-X65	2,708 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 Attention: Redacted	41497353
Construction Company	ARB	Job Number
Address	1875 Loveridge Road Pittsburg, CA 94565 Attention: Redacted	0629-53-3500 T-32
Hydrostatic Test Co.	ARB	Project No.
Address	1875 Loveridge Road Pittsburg, CA 94565 Attention: Redacted	T-32 11/04/11
Test Section	PG&E T-32, L-132, MP 23.1638 - 25.5957 From: 0+00 To: 127+15	
File Name	RCP 61362 - T-32, L-132, MP 23.1638 - 25.5957	

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	11/4/11 9:34 PM	Elevation at Test Point	556 ft	Min. Required Test Press At Test Point (1)	737.37 psig	Max. Allowable Test Press at Test Point (4)	803.87 psig
Time and Date Test Ended	11/5/11 5:45 AM	Max. Elevation in Test Section	873 ft	Min. Indicated Test Pressure (2)	745.00 psig	Max. Indicated Test Pressure (5)	798.00 psig
Actual Duration of Test	8 hours 11 minutes	Min. Elevation in Test Section	438 ft	Min. Test Pressure at Max. Elevation (3)	607.63 psig	Max. Test Pressure at Min. Elevation (6)	849.13 psig

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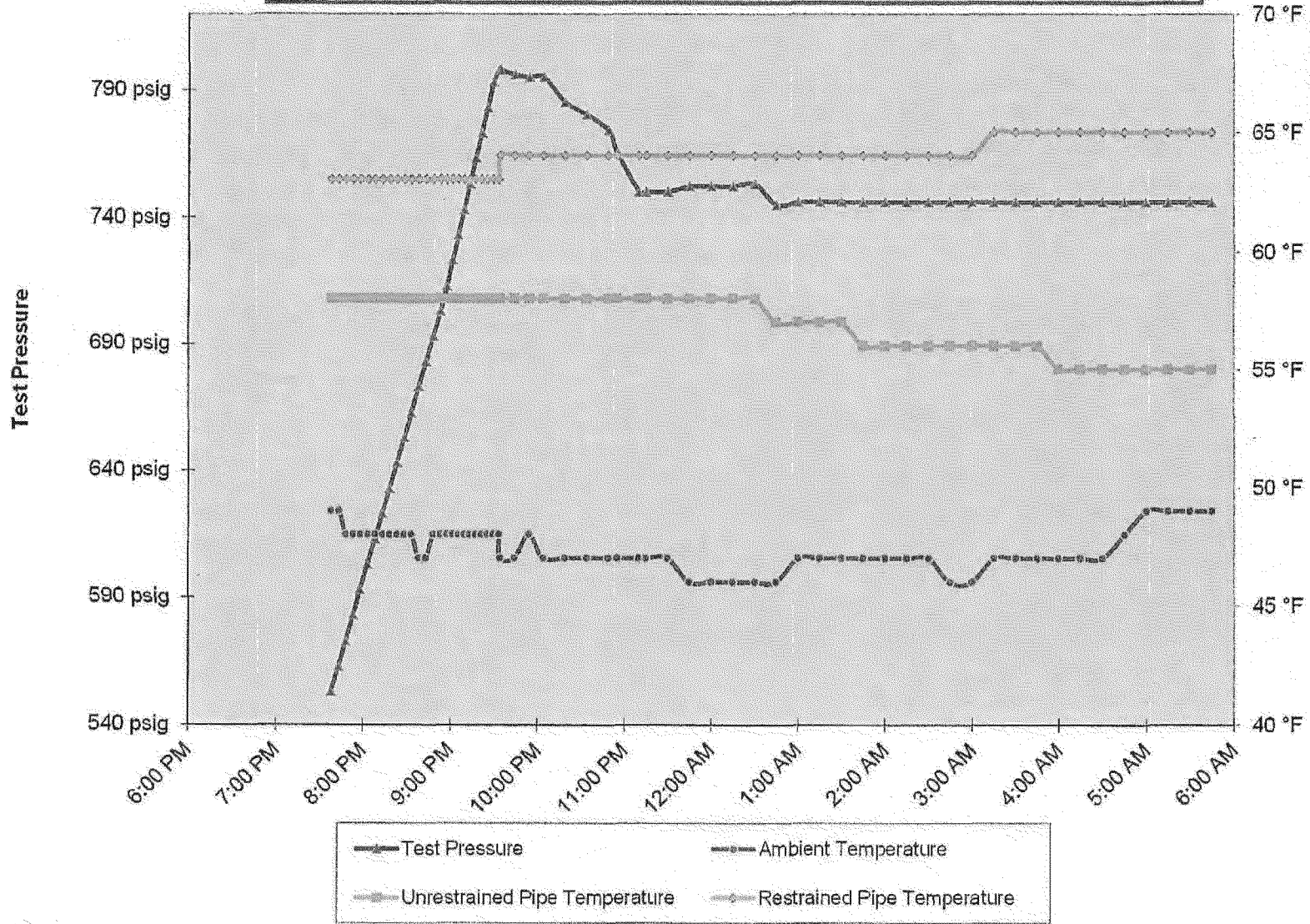
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PG&E T-32 , L-132 , MP 23.1638 - 25.5957



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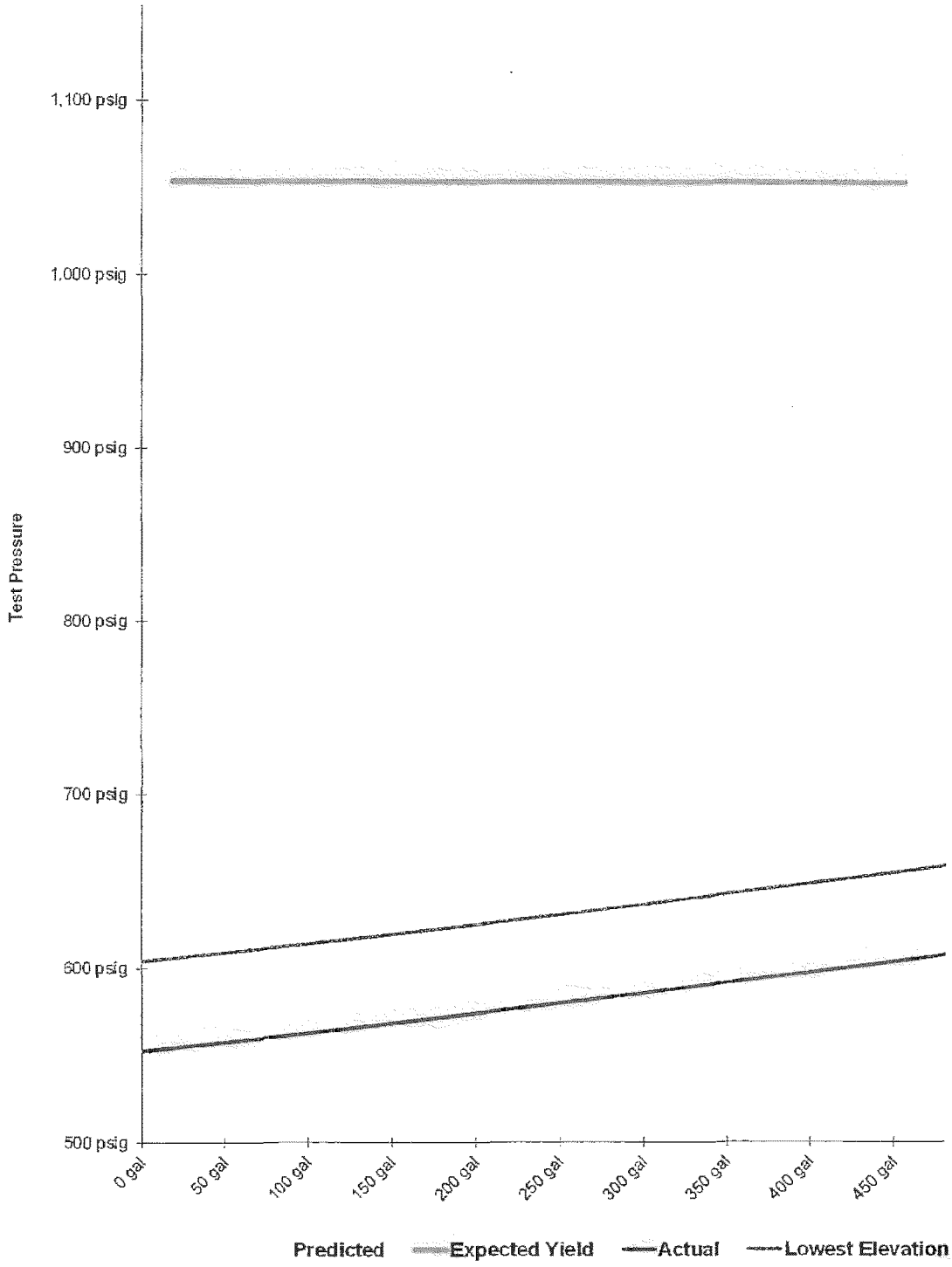
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Test 32
PlotT



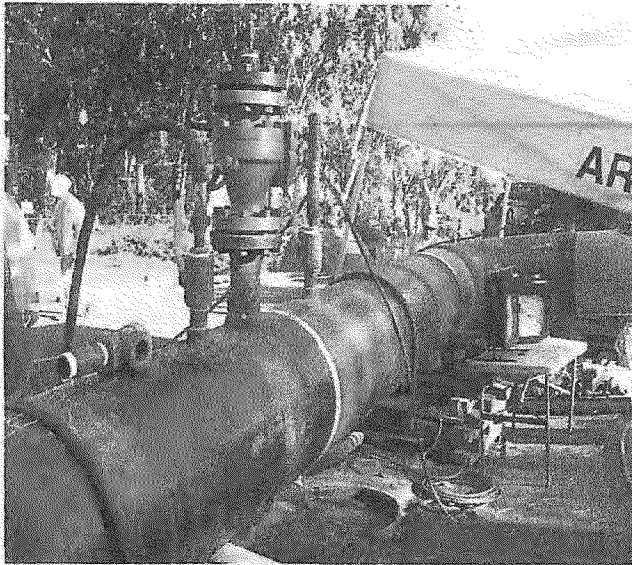
Spike Pressure Test
Stress Strain Curve -- PG&E T-32 , L-132 , MP 23.1638 - 25.5957



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Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-32, L-132, MP 23.1638 - 25.5957	
Pressure	Strokes	Gallons	Gallons	Actual	Predicted		
553 psig	0	0.00 gal		0	0.000	39250	0.054 gal/stroke
563 psig	3880	98.12 gal	18.70 gal	9.812	1.870	Pump Piston Diameter	1.225 in
573 psig	7500	189.67 gal	37.40 gal	9.155	1.870	Pump Piston Stroke	3.50 in
583 psig	10980	277.68 gal	56.10 gal	8.801	1.870	Pump Cylinders	3 ea
593 psig	14280	361.13 gal	74.81 gal	8.346	1.870	Volume check gal per stroke	0.025 gal/stroke
603 psig	17510	442.82 gal	93.51 gal	8.168	1.870	Volume Released (gallons)	67.50 gal
613 psig	20640	521.97 gal	112.22 gal	7.916	1.871	Pressure Reduced (psi)	10 psi
623 psig	23670	598.60 gal	130.93 gal	7.663	1.871	Maximum2	1,730 gal
633 psig	26615	673.08 gal	149.63 gal	7.448	1.871	Minimum2	0 gal
643 psig	29420	744.02 gal	168.34 gal	7.094	1.871	Maximum1	1,154 psig
653 psig	32190	814.07 gal	187.05 gal	7.005	1.871	Minimum1	500 psig
663 psig	34910	882.85 gal	205.77 gal	6.879	1.871	Gallons/Stroke Used	0.025 gal/stroke
673 psig	37500	948.35 gal	224.48 gal	6.550	1.871	Predicted Gallons/Stroke	0.007 gal/stroke
683 psig	40030	1,012.34 gal	243.19 gal	6.398	1.871	Pressure Increment	10 psi
693 psig	42520	1,075.31 gal	261.91 gal	6.297	1.872		
703 psig	45940	1,161.80 gal	280.62 gal	6.649	1.872	Max Pressure	797 psig
713 psig	47260	1,195.18 gal	299.34 gal	3.338	1.872		
723 psig	49540	1,252.84 gal	318.06 gal	5.766	1.872	Buried Pipe Temperature	63 °F
733 psig	51750	1,308.73 gal	336.78 gal	5.589	1.872		
743 psig	53890	1,362.85 gal	355.50 gal	5.412	1.872	Exposed Pipe Temperature	60 °F
753 psig	55970	1,415.45 gal	374.22 gal	5.260	1.872		
763 psig	58065	1,468.43 gal	392.95 gal	5.298	1.872	ASME B31.8 Appendix N-5	
773 psig	60050	1,518.63 gal	411.67 gal	5.020	1.872		
783 psig	62035	1,568.83 gal	430.40 gal	5.020	1.873	Average Actual Elastic Slope	6.774
793 psig	63900	1,616.00 gal	449.12 gal	4.716	1.873	Average Predicted Elastic Slope	1.871
797 psig	65126	1,647.00 gal	456.61 gal	7.751	1.873		
797 psig		1,647.00 gal	456.61 gal	0.000	0.000	Code Prescribed Minimum Yield Slope (less 10%) B31.8 N-5 (c)(2)	12.871
797 psig		1,647.00 gal	456.61 gal	0.000	0.000		
797 psig		1,647.00 gal	456.61 gal	0.000	0.000	Established Minimum Yield Pressure B31.8 N-5 (c)(2)	797 psig
797 psig		1,647.00 gal	456.61 gal	0.000	0.000	Maximum Allowed Volume (After Slope Deviation) B31.6 N-5 (c)(2)	418 gal
797 psig		1,647.00 gal	456.61 gal	0.000	0.000		
797 psig		1,647.00 gal	456.61 gal	0.000	0.000	Volume (After Slope Deviation) B31.8 N-5 (c)(2)	0 gal
797 psig		1,647.00 gal	456.61 gal	0.000	0.000	<div style="border: 1px solid black; padding: 5px; display: inline-block;">Redacted</div> <div style="text-align: right; margin-top: 10px;"> <i>11/5/11</i> Date </div>	
797 psig		1,647.00 gal	456.61 gal	0.000	0.000		
797 psig		1,647.00 gal	456.61 gal	0.000	0.000		
797 psig		1,647.00 gal	456.61 gal	0.000	0.000		
797 psig		1,647.00 gal	456.61 gal	0.000	0.000		
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797 psig		1,647.00 gal	456.61 gal	0.000	0.000		
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797 psig		1,647.00 gal	456.61 gal	0.000	0.000		

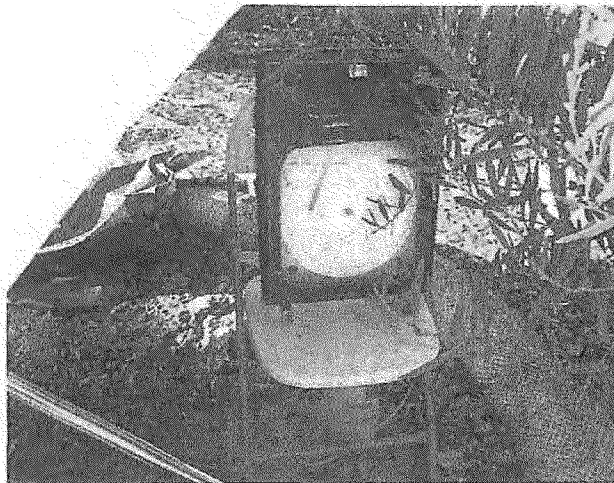
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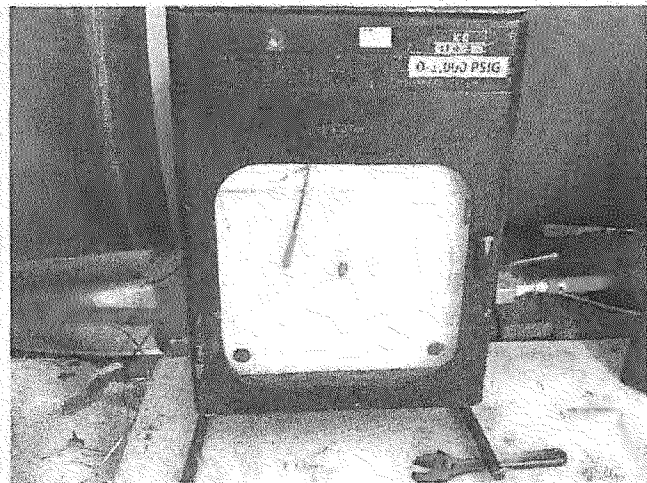
Test Head at Location B



Deadweight Testing Equipment

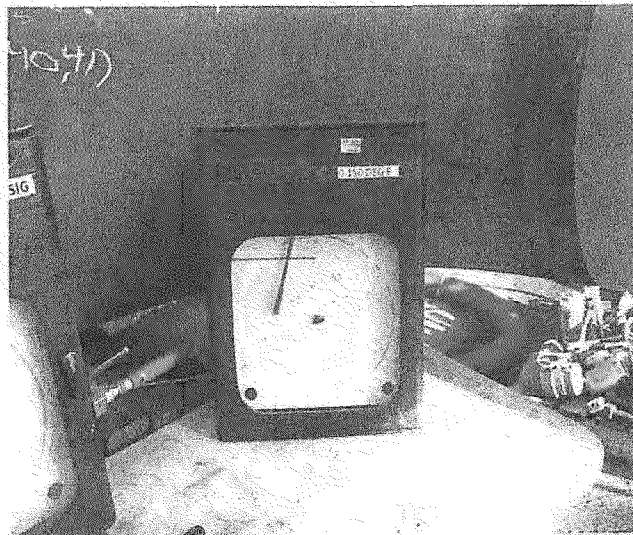


Restrained Temp. Recorder and Chart



Pressure Recorder and Chart

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Unrestrained Tem. Recorder and Chart



Pressure Pump

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