



**RCP, Inc**

801 Louisiana, Ste.200  
Houston, Texas 77002  
(713)655-8080

Redacted

July 28, 2011

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

Test Contractor:	Contra Costa Inspection Co. -- T# 47A-1 7/28/2011
Asset Owner:	Pacific Gas and Electric Company -- 41497363
Construction Contractor:	ARB -- 0629-53-3500
Test Section:	PG&E T-47A-1 Line 153, MP 17.65- 18.01
Test Date:	July 28, 2011
Certificate Number:	RCP 61362 - T-47A-1, L-153 MP 17.65 -18.01

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 Contra Costa Inspection Co. 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 790 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 hour test duration period.

This hydrostatic test was completed successfully. Pressure was maintained on the test facilities in excess of 8 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 730 psig and the established MAOP is 487 psig.

Pressure decreased 55 psi during the test. 3,590.40 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 1,102.29 ounces, gain, which is equivalent to a 1.51 °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 inherent error associated with physically attempting to measure the average temperature of 1,705 feet of buried and 76 feet of exposed pipe from a single point on the line.

Sincerely,

Redacted

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cc. file

C:\Users\Redact\Documents\PG&E test 47A\  
Master\_Standard\_Hydrostatic\_Test\_Plan\_7.20.2011  
Letter



# Hydrostatic Test Certification

Company	Pacific Gas and Electric Company	Job Number	41497363
Construction Co.	ARB	Job Number	0629-53-3500
Hydro. Test Co.	Contra Costa Inspection Co.	Project No.	T# 47A-1 7/28/2011
Test Section	PG&E T-47A-1 Line 153, MP 17.65- 18.01		
File Name	RCP 61362 - T-47A-1, L-153 MP 17.65 - 18.01		

## Hydrostatic Test Pressure

APPLICABLE CODE FOR CERTIFICATION:	Test Date:	28-Jul-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-47A-1 Line 153, MP 17.65- 18.01	
From:	17+40.5	To: 0+00

## Pipe Data

Segment	Length	Diameter	Wall Thickness	Specification	100% SMYS
1	58 ft	30.000 in.	0.375 in.	API5L-X65, DSAW, Arc Weld, Steel	1,625 psi
2	1,703 ft	30.000 in.	0.375 in.	API5L-X52, DSAW, Arc Weld, Steel	1,300 psi
3	2 ft	2.375 in.	0.154 in.	API5L-Grade B, SM, Arc Weld, Steel	4,539 psi
4	18 ft	30.000 in.	0.500 in.	API5L-X65, DSAW, Arc Weld, Steel	2,167 psi

## Initial Test Conditions

Pressure at Test Point:	790 psig	Date/Time:	7/28/11 11:50 AM	Pipe Temperature	
Ambient Temperature:	71.0 °F	Elevation @ Test Point:	18.0 ft	Unrestrained:	65.0 °F
Pressure @ High Point (Cal/Measure):	786 psig	Elevation @ High Point:	28.0 ft	Restrained:	64.0 °F
Pressure @ Low Point (Cal/Measure):	790 psig	Elevation @ Low Point:	18.0 ft	Location:	0+00
				Location:	14+90
				Location:	0+00

## Final Test Conditions

Pressure at Test Point:	735 psig	Date/Time:	7/28/11 7:50 PM	Pipe Temperature	
Ambient Temperature:	64.0 °F	Elevation @ Test Point:	18.0 ft	Unrestrained:	68.0 °F
Pressure @ High Point (Cal/Measure):	731 psig	Elevation @ High Point:	28.0 ft	Restrained:	64.0 °F
Pressure @ Low Point (Cal/Measure):	735 psig	Elevation @ Low Point:	18.0 ft	Location:	0+00
				Location:	14+90
				Location:	0+00

Total Fluid Injected:			Volume gain	
Total Fluid Withdrawn:	3590.40 fluid ounces			
Net Change in Volume of the Test Section ± (+ Gain, - Loss):	1,102.29 oz	gain	0.0138%	1.513 °F equivalent

Test Duration: 8.00 hours

Minimum Test Pressure:	724 psig	Max Elevation	720 psig	Min Elevation	724 psig
Maximum Test Pressure:	790 psig		786 psig		790 psig
% SMYS:	60.8%		60.4%		60.8%

Minimum Test Pressure (Calculated/Measured): 731 psig

Maximum Allowable Operating Pressure: 487 psig

Were leaks observed?	No	Explain:
Acceptable Hydrostatic Test?	Yes	<p>The test segment was subjected to a spike pressure test of 790 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 hour test duration period.</p> <p>No leaks were observed during the test period. The test section included 1,705 feet of buried and 76 feet of exposed pipe. Pressure lost 55 psi during the test. The buried pipe segment fluid temperature remained steady and the exposed pipe segment gained 3°F.</p> <p>3,590.40 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 1,102.29 ounces, gain, which is equivalent to a 1.51 °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 inherent error associated with physically attempting to measure the average temperature of 1,705 feet of buried and 76 feet of exposed pipe from a single point on the line.</p>

Remarks	Redacted
	Redacted
	28-Jul-11



# Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41497363
Construction Co.	ARB	Job Number	0629-53-3500
Testing Co.	Contra Costa Inspection Co.	Project No.	# 47A-1 7/28/2011
Test Section	PG&E T-47A-1 Line 153, MP 17.65- 18.01		
File Name	RCP 61362 - T-47A-1, L-153 MP 17.65 -18.01		

Date 28-Jul-11

## Test Log

Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
1	7/28/11	11:30 AM	538 psig	71 °F	65 °F	64 °F	Start Spike		
2	7/28/11	11:31 AM	548 psig	71 °F	65 °F	64 °F	Inject		428 oz.
3	7/28/11	11:32 AM	558 psig	71 °F	65 °F	64 °F	Inject		428 oz.
4	7/28/11	11:32 AM	568 psig	71 °F	65 °F	64 °F	Inject		428 oz.
5	7/28/11	11:33 AM	578 psig	71 °F	65 °F	64 °F	Inject		428 oz.
6	7/28/11	11:34 AM	588 psig	71 °F	65 °F	64 °F	Inject		428 oz.
7	7/28/11	11:35 AM	598 psig	71 °F	65 °F	64 °F	Inject		428 oz.
8	7/28/11	11:36 AM	608 psig	71 °F	65 °F	64 °F	Inject		428 oz.
9	7/28/11	11:37 AM	618 psig	71 °F	65 °F	64 °F	Inject		428 oz.
10	7/28/11	11:38 AM	628 psig	71 °F	65 °F	64 °F	Inject		428 oz.
11	7/28/11	11:38 AM	638 psig	71 °F	65 °F	64 °F	Inject		428 oz.
12	7/28/11	11:39 AM	648 psig	71 °F	65 °F	64 °F	Inject		428 oz.
13	7/28/11	11:40 AM	658 psig	71 °F	65 °F	64 °F	Inject		428 oz.
14	7/28/11	11:40 AM	668 psig	71 °F	65 °F	64 °F	Inject		428 oz.
15	7/28/11	11:41 AM	678 psig	71 °F	65 °F	64 °F	Inject		428 oz.
16	7/28/11	11:42 AM	688 psig	71 °F	65 °F	64 °F	Inject		428 oz.
17	7/28/11	11:43 AM	698 psig	71 °F	65 °F	64 °F	Inject		428 oz.
18	7/28/11	11:44 AM	708 psig	71 °F	65 °F	64 °F	Inject		428 oz.
19	7/28/11	11:45 AM	718 psig	71 °F	65 °F	64 °F	Inject		428 oz.
20	7/28/11	11:45 AM	728 psig	71 °F	65 °F	64 °F	Inject		428 oz.
21	7/28/11	11:46 AM	738 psig	71 °F	65 °F	64 °F	Inject		428 oz.
22	7/28/11	11:47 AM	748 psig	71 °F	65 °F	64 °F	Inject		428 oz.
23	7/28/11	11:47 AM	758 psig	71 °F	65 °F	64 °F	Inject		428 oz.
24	7/28/11	11:48 AM	768 psig	71 °F	65 °F	64 °F	Inject		428 oz.
25	7/28/11	11:48 AM	778 psig	71 °F	65 °F	64 °F	Inject		428 oz.
26	7/28/11	11:49 AM	788 psig	71 °F	65 °F	64 °F	Inject		428 oz.
27	7/28/11	11:49 AM	790 psig	71 °F	65 °F	64 °F	Inject		86 oz.
28	7/28/11	11:50 AM	790 psig	71 °F	65 °F	64 °F	On Test		
29	7/28/11	12:00 PM	790 psig	72 °F	65 °F	64 °F			
30	7/28/11	12:10 PM	790 psig	69 °F	65 °F	64 °F			
31	7/28/11	12:20 PM	790 psig	71 °F	66 °F	64 °F	End Spike		
32	7/28/11	12:22 PM	780 psig	73 °F	66 °F	64 °F		544 oz.	
33	7/28/11	12:26 PM	770 psig	73 °F	66 °F	64 °F		544 oz.	
34	7/28/11	12:29 PM	760 psig	73 °F	66 °F	64 °F		544 oz.	
35	7/28/11	12:30 PM	724 psig	70 °F	67 °F	64 °F		1,958 oz.	
36	7/28/11	12:45 PM	725 psig	75 °F	67 °F	64 °F			
37	7/28/11	1:00 PM	726 psig	73 °F	68 °F	64 °F			
38	7/28/11	1:15 PM	726 psig	73 °F	68 °F	64 °F			
39	7/28/11	1:30 PM	727 psig	73 °F	69 °F	64 °F			
40	7/28/11	1:45 PM	727 psig	73 °F	69 °F	64 °F			
41	7/28/11	2:00 PM	728 psig	76 °F	70 °F	64 °F			
42	7/28/11	2:15 PM	729 psig	76 °F	70 °F	64 °F			
43	7/28/11	2:30 PM	729 psig	75 °F	70 °F	64 °F			



# Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41497363
Construction Co.	ARB	Job Number	0629-53-3500
Testing Co.	Contra Costa Inspection Co.	Project No.	# 47A-1 7/28/2011
Test Section	PG&E T-47A-1 Line 153, MP 17.65- 18.01		
File Name	RCP 61362 - T-47A-1, L-153 MP 17.65 -18.01		

Date 28-Jul-11

## Test Log

Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
44	7/28/11	2:45 PM	730 psig	75 °F	71 °F	64 °F			
45	7/28/11	3:00 PM	730 psig	79 °F	71 °F	64 °F			
46	7/28/11	3:15 PM	731 psig	79 °F	72 °F	64 °F			
47	7/28/11	3:30 PM	731 psig	79 °F	72 °F	64 °F			
48	7/28/11	3:45 PM	732 psig	79 °F	72 °F	64 °F			
49	7/28/11	4:00 PM	732 psig	79 °F	72 °F	64 °F			
50	7/28/11	4:15 PM	733 psig	78 °F	73 °F	64 °F			
51	7/28/11	4:30 PM	733 psig	78 °F	73 °F	64 °F			
52	7/28/11	4:45 PM	733 psig	77 °F	73 °F	64 °F			
53	7/28/11	5:00 PM	734 psig	74 °F	73 °F	64 °F			
54	7/28/11	5:15 PM	734 psig	74 °F	73 °F	64 °F			
55	7/28/11	5:30 PM	734 psig	73 °F	73 °F	64 °F			
56	7/28/11	5:45 PM	734 psig	70 °F	72 °F	64 °F			
57	7/28/11	6:00 PM	734 psig	70 °F	72 °F	64 °F			
58	7/28/11	6:15 PM	735 psig	69 °F	71 °F	64 °F			
59	7/28/11	6:30 PM	735 psig	69 °F	70 °F	64 °F			
60	7/28/11	6:45 PM	735 psig	67 °F	70 °F	64 °F			
61	7/28/11	7:00 PM	735 psig	67 °F	70 °F	64 °F			
62	7/28/11	7:15 PM	735 psig	66 °F	70 °F	64 °F			
63	7/28/11	7:30 PM	735 psig	65 °F	69 °F	64 °F			
64	7/28/11	7:45 PM	735 psig	64 °F	68 °F	64 °F			
65	7/28/11	7:50 PM	735 psig	64 °F	68 °F	64 °F	End of Test		
66	7/28/11	8:00 PM	735 psig	63 °F	68 °F	64 °F			

Spike Test

10,795.7 oz.

Hydrostatic Test

3,590.4 oz.

Were leaks observed during the test period?

Exposed and buried pipe,  
no leaks observed.

High Test Pressure: 790 psig

Low Test Pressure: 724 psig



## Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company	Job Number	41497363
Construction Co.	ARB	Job Number	0629-53-3500
Hydro. Test Co.	Contra Costa Inspection Co.	Project No.	T# 47A-1 7/26/2011
Test Section	PG&E T-47A-1 Line 153, MP 17.65- 18.01	WATER	
File Name	RCP 61362 - T-47A-1, L-153 MP 17.65 -18.01		

General Pipe Data									
Description	Segment								
	1	2	3	4					
Restrained or Unrestrained?	Unrestrained	Restrained	Restrained	Unrestrained					
Outside Diameter	30.000 in.	30.000 in.	2.375 in.	30.000 in.					
Wall Thickness	0.375 in.	0.375 in.	0.154 in.	0.500 in.					
Inside Diameter	29.250 in.	29.250 in.	2.067 in.	29.000 in.					
Spec./Grade	API5L-X65	API5L-X52	API5L-Grade B	API5L-X65					
Length Unrestrained	58 ft			18 ft					
Length Restrained		1,703 ft	2 ft						
Temperature -- On Test	65 °F	64 °F	64.0 °F	65.0 °F					
Temperature -- End of Test	68 °F	64 °F	64.0 °F	68.0 °F					
Pressure -- On Test	790 psig	790 psig	790 psig	790 psig					
Pressure -- End of Test	735 psig	735 psig	735 psig	735 psig					

Unrestrained Pipe									
Sum:	Vo	2,642.23 gal		Vtp1	2,654.01 gal		Vtp2		2,652.38 gal
		338,205 oz.			339,714 oz.				339,504 oz.
Vo Unrestrained	2,025 gal			618 gal					
Fwp 1	1.002419			1.002419					
Fpp 1	1.002566			1.001909					
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)	2,033.94 gal			620.07 gal					
Fwp 2	1.002250			1.002250					
Fpp 2	1.002389			1.001776					
Fpt 2	1.000146			1.000146					
Fwt 2	1.000803			1.000803					
Fpwt = Fpt/Fwt	0.999343			0.999343					
Vtp = Vo(Fwp)(Fpp)(Fpwt)	2,032.67 gal			619.71 gal					

Restrained Pipe									
Sum:	Vo	59,446.75 gal		Vtp1	59,683.34 gal		Vtp2		59,665.54 gal
		7,609,183 oz.			7,639,467 oz.				7,637,189 oz.
Vo Unrestrained		59,446 gal	0 gal						
Fwp 1		1.002419	1.002419						
Fpp 1		1.001684	1.000336						
Fpt 1		1.000048	1.000048						
Fwt 1		1.000375	1.000375						
Fpwt 1 = Fpt/Fwt		0.999674	0.999674						
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		59,683 gal	0 gal						
Fwp 2		1.002250	1.002250						
Fpp 2		1.001753	1.000314						
Fpt 2		1.000048	1.000048						
Fwt 2		1.000375	1.000375						
Fpwt = Fpt/Fwt		0.999674	0.999674						
Vtp = Vo(Fwp)(Fpp)(Fpwt)		59,665 gal	0 gal						

Combined Pipe									
Sum:	Vo	62,088.97 gal		Vtp1	62,337.35 gal		Vtp2		62,317.91 gal
		7,947,389 oz.			7,979,181 oz.				7,976,693 oz.



## Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company	Job Number	41497363
Construction Co.	ARB	Job Number	0629-53-3500
Hydro. Test Co.	Contra Costa Inspection Co.	Project No.	T# 47A-1 7/28/2011
Test Section	PG&E T-47A-1 Line 153, MP 17.65- 18.01		
File Name	RCP 61362 - T-47A-1, L-153 MP 17.65 -18.01		WATER

### General Pipe Data

Description	Segment								
	1	2	3	4					
Restrained or Unrestrained?	Unrestrained	Restrained	Restrained	Unrestrained					
Outside Diameter	30.000 in.	30.000 in.	2.375 in.	30.000 in.					
Wall Thickness	0.375 in.	0.375 in.	0.154 in.	0.500 in.					
Inside Diameter	29.250 in.	29.250 in.	2.067 in.	29.000 in.					
Spec./Grade	API5L-X65	API5L-X52	API5L-Grade B	API5L-X65					
Length Unstrained	58.00 ft			18 ft					
Length Restrained		1,703 ft	2 ft						
Temperature -- On Test	66 °F	63 °F	63 °F	66 °F					
Temperature -- End of Test	67 °F	64 °F	64 °F	67 °F					
Pressure -- On Test	762 psig	762 psig	762 psig	762 psig					
Pressure -- End of Test	762 psig	762 psig	762 psig	762 psig					

### Unrestrained Pipe

Sum:	Vo	2,642.23 gal 338,205 oz.	Vtp1	2,653.30 gal 339,623 oz.	Vtp2	2,653.09 gal 339,595 oz.
Vo Unrestrained	2,025 gal		618 gal			
Fwp 1	1.002333		1.002333			
Fpp 1	1.002477		1.001842			
Fpt 1	1.000109		1.000109			
Fwt 1	1.000582		1.000582			
Fpwt 1 = Fpt/Fwt	0.999527		0.999527			
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	2,033.39 gal		619.92 gal			
Fwp 2	1.002333		1.002333			
Fpp 2	1.002477		1.001842			
Fpt 2	1.000127		1.000127			
Fwt 2	1.000681		1.000681			
Fpwt = Fpt/Fwt	0.999447		0.999447			
Vtp = Vo(Fwp)(Fpp)(Fpwt)	2,033.22 gal		619.87 gal			

### Restrained Pipe

Sum:	Vo	59,446.75 gal 7,609,183 oz.	Vtp1	59,679.75 gal 7,639,008 oz.	Vtp2	59,674.27 gal 7,638,307 oz.
Vo Restrained		59,446 gal	0 gal			
Fwp 1		1.002333	1.002333			
Fpp 1		1.001814	1.000321			
Fpt 1		1.000036	1.000036			
Fwt 1		1.000267	1.000267			
Fpwt 1 = Fpt/Fwt		0.999769	0.999769			
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		59,679 gal	0 gal			
Fwp 2		1.002333	1.002333			
Fpp 2		1.001817	1.000325			
Fpt 2		1.000048	1.000046			
Fwt 2		1.000375	1.000375			
Fpwt = Fpt/Fwt		0.999674	0.999674			
Vip = Vo(Fwp)(Fpp)(Fpwt)		59,674 gal	0 gal			

### Combined Pipe

Sum:	Vo	62,088.97 gal 7,947,389 oz.	Vtp1	62,333.05 gal 7,978,631 oz.	Vtp2	62,327.36 gal 7,977,902 oz.
1 °F Change	5.69 gal		728.37 oz.			



## Hydrostatic Test Pipe Data Table

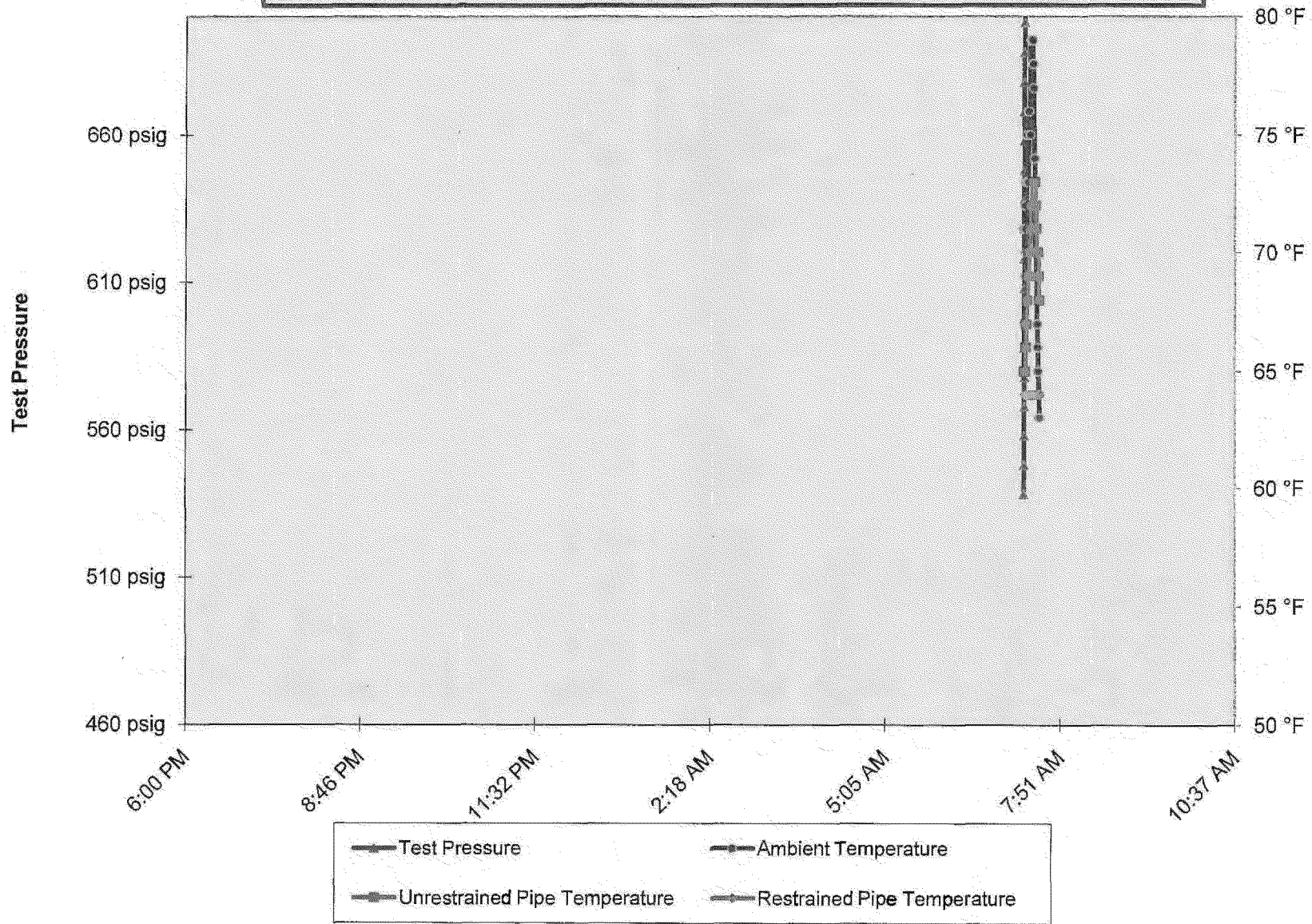
Pipe Type	Length	Restrained / Unrestrained	Outside Diameter	Wall Thickness	Specification & Grade	Pipe Yield Pressure	Material	Joint Type	Seam Type
1	58 ft	Unrestrained	30.000 in.	0.3750 in.	API5L-X65	1,625 psig	Steel	Arc Weld	DSAW
2	1,703 ft	Restrained	30.000 in.	0.3750 in.	API5L-X52	1,300 psig	Steel	Arc Weld	DSAW
3	2 ft	Restrained	2.375 in.	0.1540 in.	API5L-Grade B	4,539 psig	Steel	Arc Weld	SM
4	18 ft	Unrestrained	30.000 in.	0.5000 in.	API5L-X65	2,167 psig	Steel	Arc Weld	DSAW

### Hydrostatic Test Project Owner & Participants

Owner Company	Pacific Gas and Electric Company	Job Number
Address	350 N. Wiget	41497363
	Walnut Creek, CA 94598	
	Attention: Redacted	
Construction Company	ARB	Job Number
Address	1875 Loveridge Road	0629-53-3500
	Pittsburg, CA 94565	
	Attention: Redacted	
Hydrostatic Test Co.	Contra Costa Inspection Co.	Project No.
Address	2820 LaJolla Drive	T# 47A-1 7/28/2011
	Antioch, Ca. 94531	
	Attention: Redacted	
Test Section	PG&E T-47A-1 Line 153, MP 17.65- 18.01	
	From: 17+40.5	
	To: 0+00	
File Name	RCP 61362 - T-47A-1, L-153 MP 17.65 -18.01	

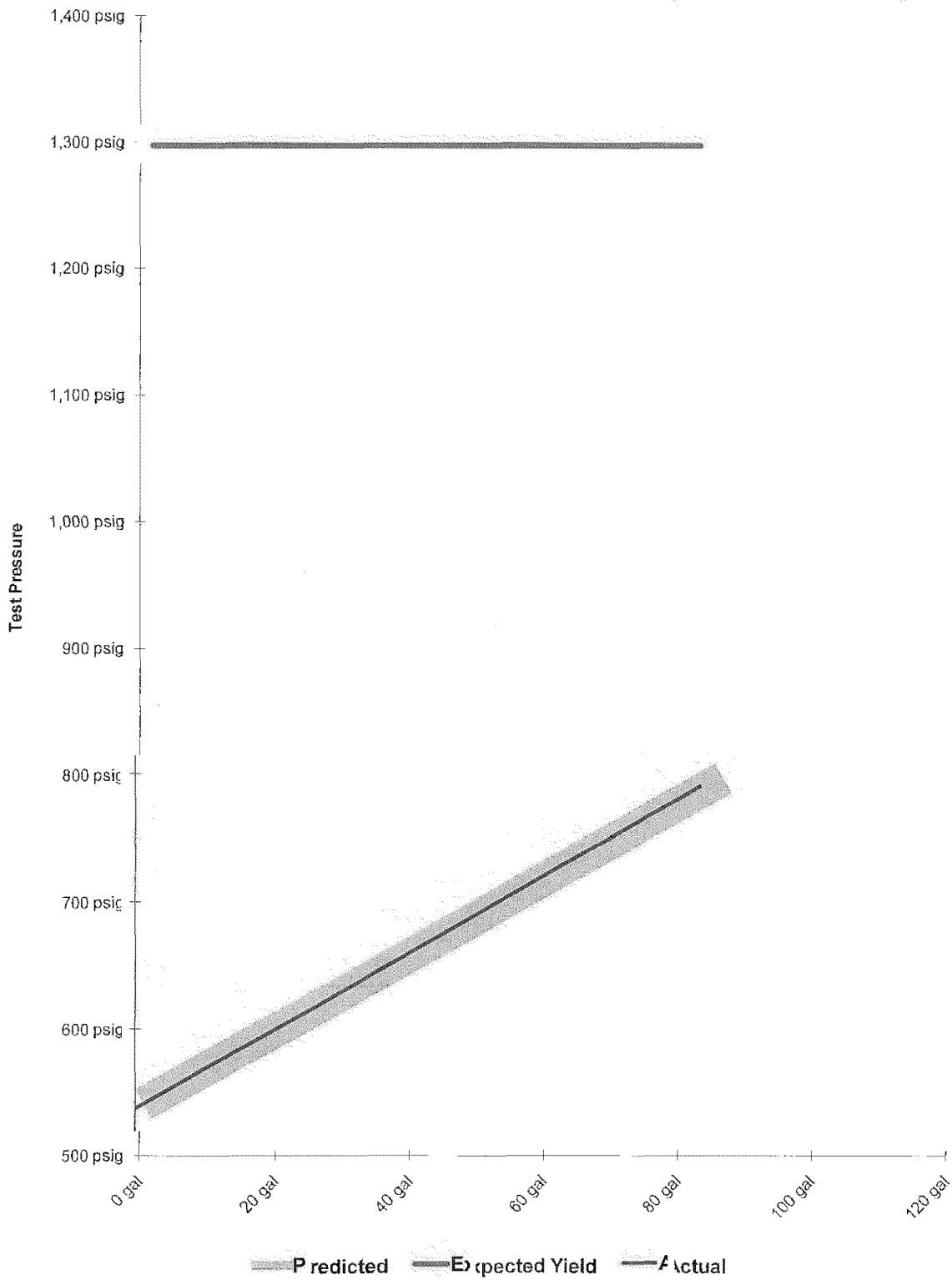
<b>Part II – Test Data (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)</b>				Note: Minimum test pressure and duration are not to be charged without written approval.			
Time and Date Test Pressure Reached	7/28/11 11:50 AM	Elevation at Test Point	18 ft	Min. Required Test Press At Test Point (1)	719 psig	Max. Allowable Test Press at Test Point (4)	790 psig
Time and Date Test Ended	7/28/11 7:50 PM	Max. Elevation in Test Section	28 ft	Min. Indicated Test Pressure (2)	724 psig	Max. Indicated Test Pressure (5)	790 psig
Actual Duration of Test	8.00 hrs	Min. Elevation in Test Section	18 ft	Min. Test Pressure at Max. Elevation (3)	720 psig	Max. Test Pressure at Min. Elevation (6)	790 psig

PG&E T-47A-1 Line 153, MP 17.65- 18.01





**Spike Pressure Test**  
**Stress Strain Curve -- PG&E T-47A-1 Line 153, MP 17.65- 18.01**



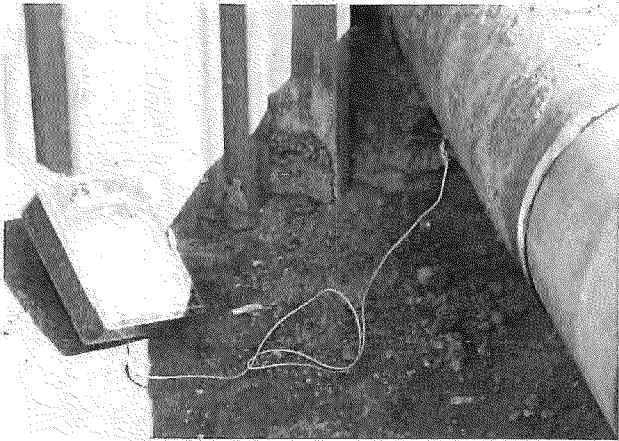
Actual Pressure Volume Plot Data			Predicted Pressure Volume Plot Data	Slope		Spike Pressure Test Stress Strain Curve -- PG&E T-47A-1 Line 153, MP 17.65-18.01	
Pressure	Strokes	Gallons	Gallons	Actual	Predicted		
538 psig	0	0.00 gal		0	0.00 gal	Pump gal per stroke	0.056 gal/stroke
548 psig	60	3.35 gal	3.40 gal	0.335	0.340	Pump Piston Diameter	1.250 in
558 psig	120	6.69 gal	6.79 gal	0.335	0.340	Pump Piston Stroke	3.50 in
568 psig	180	10.04 gal	10.19 gal	0.335	0.340	Pump Cylinders	3 ea
578 psig	240	13.39 gal	13.58 gal	0.335	0.340	Volume check gal per stroke	0.071 gal/stroke
588 psig	300	16.73 gal	16.98 gal	0.335	0.340	Volume Released (gallons)	4.25 gal
598 psig	360	20.08 gal	20.37 gal	0.335	0.340	Pressure Reduced (psi)	10 psi
608 psig	420	23.43 gal	23.77 gal	0.335	0.340	Maximum2	90 gal
618 psig	480	26.77 gal	27.17 gal	0.335	0.340	Minimum2	0 gal
628 psig	540	30.12 gal	30.56 gal	0.335	0.340	Maximum1	1,400 psig
638 psig	600	33.47 gal	33.96 gal	0.335	0.340	Minimum1	500 psig
648 psig	660	36.82 gal	37.36 gal	0.335	0.340	Gallons/Stroke Used	0.056 gal/stroke
658 psig	720	40.16 gal	40.75 gal	0.335	0.340	Predicted Gallons/Stroke	0.057 gal/stroke
668 psig	780	43.51 gal	44.15 gal	0.335	0.340	1160	10 psi
678 psig	840	46.86 gal	47.55 gal	0.335	0.340	Max Pressure	790 psig
688 psig	900	50.20 gal	50.95 gal	0.335	0.340	Buried Pipe Temperature	70 °F
698 psig	960	53.55 gal	54.35 gal	0.335	0.340	Exposed Pipe Temperature	70 °F
708 psig	1020	56.90 gal	57.74 gal	0.335	0.340	ASME B31.8 Appendix N-5	
718 psig	1080	60.24 gal	61.14 gal	0.335	0.340	Average Actual Elastic Slope	0.335
728 psig	1140	63.59 gal	64.54 gal	0.335	0.340	Average Predicted Elastic Slope	0.340
738 psig	1200	66.94 gal	67.94 gal	0.335	0.340	Code Prescribed Minimum Yield Slope (less 10%) B31.8 N-5 (c)(2)	0.636
748 psig	1260	70.28 gal	71.34 gal	0.335	0.340	Established Minimum Yield Pressure B31.8 N-5 (c)(2)	790 psig
758 psig	1320	73.63 gal	74.74 gal	0.335	0.340	Maximum Allowed Volume (After Slope Deviation) B31.8 N-5 (c)(2)	418 gal
768 psig	1380	76.98 gal	78.14 gal	0.335	0.340	Volume (After Slope Deviation) B31.8 N-5 (c)(2)	0 gal
778 psig	1440	80.32 gal	81.54 gal	0.335	0.340		
788 psig	1500	83.67 gal	84.94 gal	0.335	0.340		
790 psig	1512	84.34 gal	85.62 gal	0.335	0.340		
790 psig		84.34 gal	85.62 gal	0.000	0.000		
790 psig		84.34 gal	85.62 gal	0.000	0.000		
790 psig		84.34 gal	85.62 gal	0.000	0.000		
790 psig		84.34 gal	85.62 gal	0.000	0.000		
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790 psig		84.34 gal	85.62 gal	0.000	0.000		
790 psig		84.34 gal	85.62 gal	0.000	0.000		
790 psig		84.34 gal	85.62 gal	0.000	0.000		

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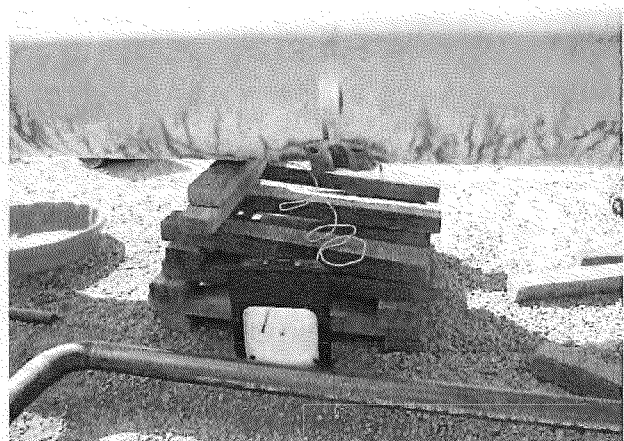
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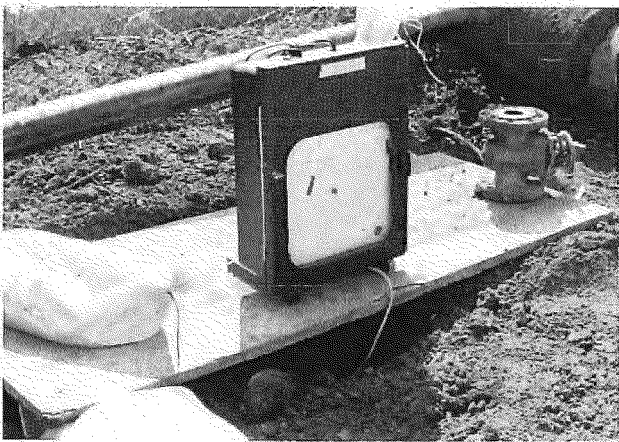
July 27, 2011



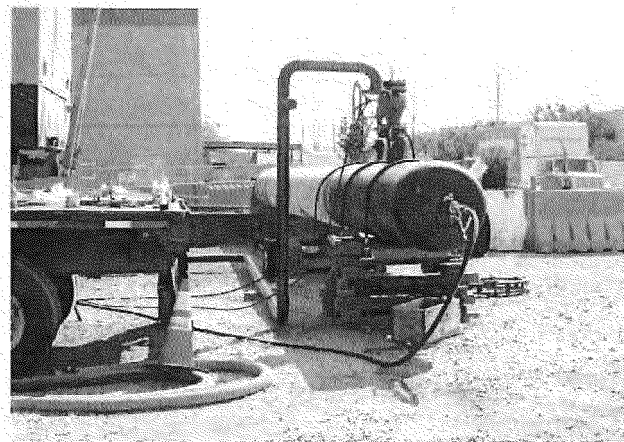
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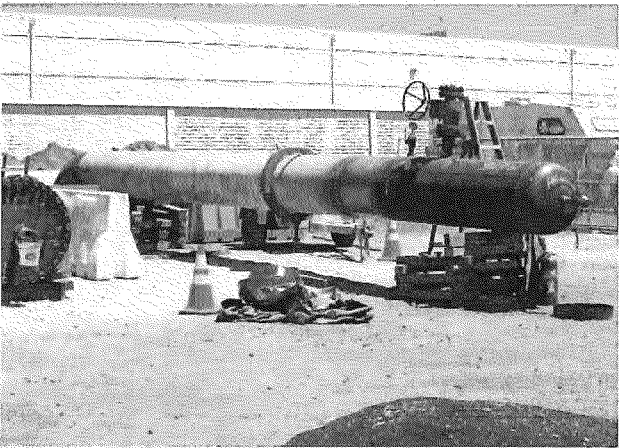
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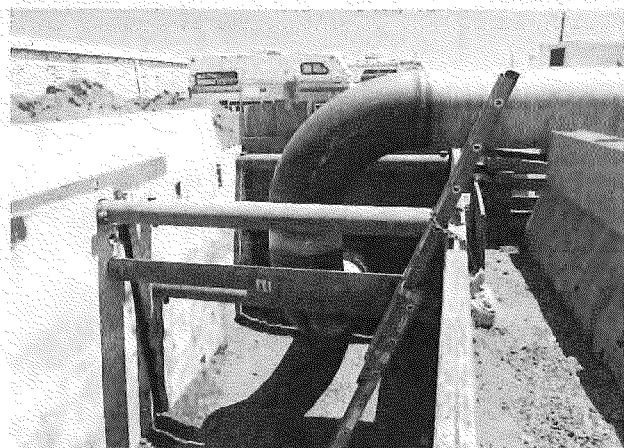
test 47A1, location C remote temp. recorder



test 47A1 location C test head



test47A1 test head at location A



bell hole and riser at Test 47A1 location A