Pacific Gas and Electric Company
Gas Pipeline Facilities Strength Test Pressure Report
(For Pipeline Facilities Designed to Operate over 100 PSIG)

62-4921 (12/2012)
Use in Accordance with
Numbered Document A-34, A-37,
and GO 112-E
Sheet 1 of 4
Test Number 2 of 4
STPR Revision Number 0

PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)

Test Description

Line Number or Station Name L-191A	**Division/District** DIABLO	**Job Number** 41918944
Purpose of Test T-343-14: TEST EXISTING 6" & 8" L-191A	**MAOP to be Established by this Test** 283 **PSIG**	

Description of Pipe being Tested (include reference drawings, field stationing, and mile points)
EXPENSE PORTION OF HYDROSTATIC TEST OF NEW 6" & 8" LINE 191A FROM BRIONES REGIONAL PARK TO [redacted]
INCLUDING TIE-IN PIECE AND HYDROTEST PIPING, MP 0.002 TO MP ~~2.97~~ 3.29
(REFER TO DWG 41918944-SHEETS 1-12). TO BE TESTED IN CONJUNCTION W/ 31018614 TEST 2.

☐ **New Facility** (no spike test required) ☒ **Existing Facility**
Will spike test be performed? ☒ **Yes** ☐ **No** (explain on right)

If no spike test for existing facility, explain:

Static Head Calculation

Maximum Elevation	1370	FT
Minimum Elevation	691	FT
Elevation Difference	679	FT

For Water 679 **(Elev. Diff.) x 0.433 =** 295 **PSIG**

For Other Test Medium 0
Contact the responsible engineer for guidance on completing this field.

Pipe to be Tested

Size OD (in.)	Size WT (in.)	API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS At MAOP	% of SMYS At Min. Test Press.	% of SMYS At Max. Test Press.
8.625"	0.322"	API 5L	35,000	SMLS	1.0	~~16'6"~~	22.90'	1	0.5	10.83	26.02	42.86
6.625"	0.280"	API 5L	35,000	SMLS	1.0	~~11'6"~~	21.74'	3	0.5	9.57	22.98	37.86
8.625"	0.250"		42,000	HFW			15.01'					

101, 111, 112
104, 115, 116, 161, 0
102

All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe ☒
*Assumed values per PG&E technical specification, Resolving Unknown Pipeline Features 12/5/2012

Pipe specs verified in field ☒ **Signature of person supervising test** GUIDA

Component(s) limiting test pressure/Control Point exceptions

Test Specifications (include a spike test when testing existing facilities)

Test Factor 2.4	[1A]	**Min. Test Pressure at Max. Elev.** 680 **PSIG**	[1B]	**Max. Test Pressure at Min. Elev.** 1120 **PSIG**
Spike Test (complete only for spike test)	[1C]	**Spike Factor** 1.20	[1D]	**Spike Pressure at Max. Elev.** Box [1A] X [1C] = 816 **PSIG**
	[1E]	**Spike Pressure at Min. Elev.** 1111 **PSIG**	[1F]	**Max. Post-Spike Pressure at Min. Elev.** Box [1E] X 0.90 = 999 **PSIG**

Test Medium to be Used WATER

Minimum Test Duration 1 **Hours**

- Under 30% SMYS: 1 hour minimum
- 30% SMYS and over: 8 hours minimum
- Pre-installation Test: Refer to A-34, Attachment A
- Spike Test: 30 minutes minimum (included in test)

Signatures

Prepared by (signature)	**Print Name and Phone Number** MILES CRONIN (925) 914-0095	**Date** 7-2-14	**LAN ID** MTCO
Approved by (signature) Don Fink	**Print Name** DONAVON FINK	**Date** 7-2-14	**LAN ID** D1F7

Test Supervised by (signature) 11-11-2014 GIAN CERVONE GPCC	**Time and Date Test Pressure Reached** (from Part 2) 1543 11-11-2014	**Time and Date Test Ended** (from Part 2) 1648 11-11-2014	**Actual Duration of Test** (from Part 2) 1 HR 5 MIN

Pacific Gas and Electric Company
Gas Pipeline Facilities Strength Test Pressure Report
(For Pipeline Facilities Designed to Operate over 100 PSIG)

62-4921 (12/2012)
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Sheet 2 of 4
Test Number 2 of 4
STPR Revision Number 0

PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)

Test Description

Line Number or Station Name L-191A	**Division/District** DIABLO — **Job Number** 41918944
Purpose of Test T-343-14: TEST EXISTING 6" & 8" L-191A	**MAOP to be Established by this Test** 283 **PSIG**

Description of Pipe being Tested (include reference drawings, field stationing, and mile points)
TEST EXISTING 6" & 8" LINE 191A FROM BRIONES REGIONAL PARK TO [redacted] MP 0.002 TO MP ~~2.97~~ 3.29
(REFER TO DWG 41918944-SHEETS 1-12). TO BE TESTED IN CONJUNCTION W/ 31018614 TEST 2.

☐ **New Facility** (no spike test required) ☒ **Existing Facility**
Will spike test be performed? ☒ **Yes** ☐ **No** (explain on right)

If no spike test for existing facility, explain:

Static Head Calculation

Maximum Elevation	1370	FT
Minimum Elevation	700	FT
Elevation Difference	670	FT

For Water 670 **(Elev. Diff.) x 0.433 =** 291 **PSIG**

For Other Test Medium 0
Contact the responsible engineer for guidance on completing this field.

Pipe to be Tested

	Size OD (in.)	Size WT (in.)	API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS At MAOP	% of SMYS At Min. Test Press.	% of SMYS At Max. Test Press.
1	8.625"	0.322"	API 5LX	42,000	ERW	1.0	~~9956'-0"~~	9959.32'	3	0.5	9.02	21.68	35.71
2	8.625"	0.322"	API 5L	35,000	SMLS	1.0	~~79'-0"~~	76.92'	1	0.5	10.83	26.02	42.86
5	6.625"	0.280"	API 5L	35,000	SMLS	1.0	~~5575'-0"~~	5748.43'	3	0.5	9.57	22.98	37.86
6	6.625"	0.188"	API 5LX	42,000	ERW	1.0	~~85'-0"~~	78.10'	3	0.5	11.87	28.53	46.99
16	1.050"	0.113"	API 5L	35,000	SMLS	1.0	60'-0"	MOR	3	0.5	3.76	9.03	14.87
4	8.625"	0.172"	API5LX	42000	ERW			1501.12'	3	0.5	17.37	40.59	66.86

All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe ☒
*Assumed values per PG&E technical specification, Resolving Unknown Pipeline Features 12/5/2012

Pipe specs verified in field ☐ **Signature of person supervising test**

Component(s) limiting test pressure/Control Point exceptions

Test Specifications (include a spike test when testing existing facilities)

Test Factor 2.4	[1A]	**Min. Test Pressure at Max. Elev.** 680 **PSIG**	[1B]	**Max. Test Pressure at Min. Elev.** 1120 **PSIG**
Spike Test (complete only for spike test)	[1C]	**Spike Factor** 1.20	[1D]	**Spike Pressure at Max. Elev.** Box [1A] X [1C] = 816 **PSIG**
	[1E]	**Spike Pressure at Min. Elev.** ~~1107~~ 1111 **PSIG**	[1F]	**Max. Post-Spike Pressure at Min. Elev.** Box [1E] X 0.90 = 996 **PSIG**

Test Medium to be Used WATER — **Minimum Test Duration** 1 Hours

- Under 30% SMYS: 1 hour minimum
- 30% SMYS and over: 8 hours minimum
- Pre-Installation Test: Refer to A-34, Attachment A
- Spike Test: 30 minutes minimum (included in test)

Signatures

Prepared by (signature)	**Print Name and Phone Number** MILES CRONIN (925) 914-0095	**Date** 7-2-14	**LAN ID** MTCO
Approved by (signature)	**Print Name** DONAVON FINK	**Date** 7-2-14	**LAN ID** D1F7

Test Supervised by (signature) PG&E GIAN CERVONE GPCC 11-11-2014	**Time and Date Test Pressure Reached** (from Part 2) 1543 11-11-2014	**Time and Date Test Ended** (from Part 2) 1648 11-11-2014	**Actual Duration of Test** (from Part 2) 1 HR 5 MIN

Pacific Gas and Electric Company
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Test Number 2 of 4
STPR Revision Number 0

PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)

Test Description

Line Number or Station Name L-191A	**Division/District** DIABLO	**Job Number** 41918944
Purpose of Test T-343-14: TEST EXISTING 6" & 8" L-191A	**MAOP to be Established by this Test** 283 **PSIG**	

Description of Pipe being Tested (include reference drawings, field stationing, and mile points)
TEST EXISTING 6" & 8" LINE 191A FROM PRIORITY [redacted]GIONAL PARK TO
[redacted] MP 0.002 TO MP ~~2.97.~~ 3.29
(REFER TO DWG 41918944-SHEETS 1-12). TO BE TESTED IN CONJUNCTION W/ 31018614 TEST 2.

☐ **New Facility** (no spike test required) ☒ **Existing Facility**
Will spike test be performed? ☒ **Yes** ☐ **No** (explain on right)

If no spike test for existing facility, explain:

Static Head Calculation

Maximum Elevation 1370 FT
Minimum Elevation 700 FT
Elevation Difference 670 FT

For Water 670 **(Elev. Diff.) x 0.433 =** 291 **PSIG**

For Other Test Medium 0
Contact the responsible engineer for guidance on completing this field.

Pipe to be Tested

	Size									% of SMYS		
	OD (in.)	WT (in.)	API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	At MAOP	At Min. Test Press.	At Max. Test Press.
14	1.050"	0.113"*		28,000*	FBW*	0.6	41'-0"	MOR	3	0.5	4.70	11.28	18.58
15	1.050"	0.113"*		25,000*	FBW*	0.6	18'-0"	MOR	3	0.5	5.26	12.64	20.81
8	8.625"	0.322"*		30,000*	ELBOW	1.0	25 EA	MOR	1	0.5	12.63	30.36	50.00
11	6.625"	0.280"*		30,000*	ELBOW	1.0	~~3 EA~~	5 EA.	3	0.5	11.16	26.82	44.17
12	8.625"	0.322"*		30,000*	REDUCER	1.0	1 EA	MOR	1	0.5	12.63	30.36	50.00

All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe ☒
*Assumed values per PG&E technical specification, Resolving Unknown Pipeline Features 12/5/2012

Pipe specs verified in field ☐ **Signature of person supervising test**

Component(s) limiting test pressure/Control Point exceptions

Test Specifications (include a spike test when testing existing facilities)

Test Factor 2.4	[1A]	**Min. Test Pressure at Max. Elev.** 680 **PSIG**	[1B]	**Max. Test Pressure at Min. Elev.** 1120 **PSIG**
Spike Test (complete only for spike test)	[1C]	**Spike Factor** 1.20	[1D]	**Spike Pressure at Max. Elev. Box** [1A] **X** [1C] **=** 816 **PSIG**
	[1E]	**Spike Pressure at Min. Elev.** ~~1107~~ **PSIG** RC 1111	[1F]	**Max. Post-Spike Pressure at Min. Elev.** Box [1E] X 0.90 = 996 **PSIG**

Test Medium to be Used WATER
Minimum Test Duration 1 **Hours**

- Under 30% SMYS: 1 hour minimum
- 30% SMYS and over: 8 hours minimum
- Pre-installation Test: Refer to A-34, Attachment A
- Spike Test: 30 minutes minimum (included in test)

Signatures

Prepared by (signature)	**Print Name and Phone Number** MILES CRONIN (925) 914-0095	**Date** 7-2-14	**LAN ID** MTCO
Approved by (signature)	**Print Name** DONAVON FINK	**Date** 7-2-14	**LAN ID** D1F7
Test Supervised by (signature) 11-11-2014 GIAN CERVONE GPCC	**Time and Date Test Pressure Reached** (from Part 2) 1543 11-11-2014	**Time and Date Test Ended** (from Part 2) 1648 11-11-2014	**Actual Duration of Test** (from Part 2) 1HR 5 MIN

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Sheet 4 of 4
Test Number 2 of 4
STPR Revision Number 0

PART 2 – TEST DATA (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)

Test Elevation

Elevation at Test Point 726 FT	Max. Elevation in Test Section 1370 FT			Min. Elevation in Test Section 691 FT	
	[2A]	Static Head b/t Test Point and Max. Elev. 279 PSIG		[2B]	Static Head b/t Test Point and Min. Elev. 16 PSIG

No Spike Test: Calculations and Test Results (complete for strength test without a spike test)

Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = _____ PSIG		Max. Allowable Test Pressure at Test Point Box [1B] – Box [2B] = _____ PSIG		Pressure Range During Test _____ PSIG	
[2C]	Min. Test Pressure Indicated _____ PSIG	[2D]	Max. Test Pressure Indicated _____ PSIG		
Calculated Min. Test Pressure at Max. Elev. Box [2C] – Box [2A] = _____ PSIG		Calculated Max. Test Pressure at Min. Elev. Box [2D] + Box [2B] = _____ PSIG			

Spike Test: Calculations and Test Results (complete for strength test with a spike test)

Spike Pressure at Test Point Box [1E] – Box [2B] = 1095 PSIG		Min. Required Test Pressure at Test Point Box [1A] + Box [2A] = 959 PSIG		Max. Post-Spike Pressure at Test Point Box [1F] – Box [2B] = 983 PSIG	Pressure Range After Spike Test 24 PSIG
[2E]	Spike Pressure Indicated 1095 PSIG	[2F]	Min. Test Pressure Indicated 969 PSIG	[2G]	Max. Post-Spike Test Pressure Indicated 970 PSIG
Calculated Spike Pressure at Min. Elev. Box [2E] + Box [2B] = 1111 PSIG		Calculated Min. Test Pressure at Max. Elev. Box [2F] – Box [2A] = 690 PSIG		Calculated Max. Post-Spike Pressure at Min. Elev. Box [2G] + Box [2B] = 986 PSIG	

Test Acceptance

Were Leaks Observed? ☐ Yes ☒ No		If yes, explain:	
Acceptable Strength Test? ☒ Yes ☐ No Report strength test failures to Regulatory Compliance		If no, explain:	
Test Medium Used WATER	Time and Date Test Pressure Reached 1543 11-11-2014	Time and Date Test Ended 1648 11-11-2014	Actual Duration of Test 1 HR 5 MIN

Test Instruments

Make, Range, and Serial No. of Pressure Recording Device TECH-CAL, 0-2000#, 04346	Date Last Calibrated 10/16/2014
Make, Range and Serial No. of Dead Weight Tester A dead weight tester and/or an electronic pressure recorder is required for tests of any pipe segment equal to or greater than 90% of SMYS. AMETEK, 25-3000#, HL6413	Date Last Calibrated 3/18/2014

Signatures

Test Supervised by (signature)	Print Name GIAN CERVONE	Date 11-11-2014	LAN ID GPCC
Testing Contractor (if third party) ARB			
Approved by (signature)	Print Name AZIZH TARIN	Date 11-22-14	LAN ID AXTB

Attachments
- Test chart
- Schematic piping sketch
- Test log with pressure noted every 15 minutes

Distribution
- Gas Job Closeout Desk, 6121 Bollinger Canyon Road, Building Z1, San Ramon, CA 94583

Pacific Gas and Electric Company
Gas Pipeline Facilities Strength Test Pressure Report
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Sheet 1 **of** 2
Test Number 2 **of** 4
STPR Revision Number 0

PART 1 – TEST DESIGN DATA (TO BE PREPARED BY PROJECT ENGINEER/ESTIMATOR)

Test Description

Line Number or Station Name L-191A | **Division/District** DIABLO | **Job Number** 31018614

Purpose of Test T-343-14: TEST EXISTING 6" & 8" L-191A | **MAOP to be Established by this Test** 283 **PSIG**

Description of Pipe being Tested (include reference drawings, field stationing, and mile points)
CAPITAL PORTION OF HYYDROSTATIC TEST OF EXISTING 6" & 8" LINE 191A TO MAKE LINE PIGGABLE, (REFER TO DWG 41918944-SHEETS 4-5 & 10 OF 12). TO BE TESTED IN CONJUCTION W/ 41918944 TEST 2.
- LINE VALVE ASSEMBLY AT LOCATION O, MP 3.29

☒ **New Facility** (no spike test required) ☐ **Existing Facility**
Will spike test be performed? ☒ **Yes** ☐ **No** (explain on right)

If no spike test for existing facility, explain:

Static Head Calculation

Maximum Elevation	1370	FT
Minimum Elevation	691	FT
Elevation Difference	679	FT

For Water 679 **(Elev. Diff.) x 0.433 =** 295 **PSIG**

For Other Test Medium 0
Contact the responsible engineer for guidance on completing this field.

Pipe to be Tested

Size OD (in.)	Size WT (in.)	API or ASTM Spec	SMYS (psi)	Long Seam (ERW, DSAW, SMLS etc.)	JF (E)	Footage to be Tested	Actual Footage	Location Class	Most Restrictive Design Factor	% of SMYS At MAOP	% of SMYS At Min. Test Press.	% of SMYS At Max. Test Press.
8.625"	0.322"	API 5L	35,000	SMLS	1.0	~~7'6"~~	17.98'	1	0.5	10.83	26.02	42.86
6.625"	0.280"	API 5L	35,000	SMLS	1.0	~~31'6"~~	141.79'	3	0.5	9.57	22.98	37.86
8.625"	0.250"		42,000	HFW			2.97'	3	0.5	10.93	26.02	42.96
3.500"	0.216"		35,000	SMLS			2.88'	3	0.5	6.55	15.74	25.92
2.375"	0.154"		35,000	SMLS			9.48'	3	0.5	6.23	14.98	24.68
1.050"	0.154"		35,000	SMLS			13.80'	3	0.5	2.76	6.62	10.91

01, 111, 112, 23, 126, 201
04, 115, 116, 0 102
05, 122, 124
06, C, 162
07, 117, 05, 169, 163, 168

All fittings included in the test (except those listed above) are the same wall thickness and grade as the pipe ☒

Pipe specs verified in field ☒ **Signature of person supervising test** GUIDA

Component(s) limiting test pressure/Control Point exceptions

Test Specifications (include a spike test when testing existing facilities)

Test Factor 2.4	[1A]	**Min. Test Pressure at Max. Elev.** 680 **PSIG**	[1B]	**Max. Test Pressure at Min. Elev.** 1120 **PSIG**
Spike Test (complete only for spike test)	[1C]	**Spike Factor** 1.20	[1D]	**Spike Pressure at Max. Elev. Box [1A] X [1C] =** 816 **PSIG**
	[1E]	**Spike Pressure at Min. Elev.** 1111 **PSIG**	[1F]	**Max. Post-Spike Pressure at Min. Elev. Box [1E] X 0.90 =** 999 **PSIG**

Test Medium to be Used WATER | **Minimum Test Duration** 1 **Hours**

- Under 30% SMYS: 1 hour minimum
- 30% SMYS and over: 8 hours minimum
- Pre-installation Test: Refer to A-34, Attachment A
- Spike Test: 30 minutes minimum (included in test)

Signatures

Prepared by (signature)	**Print Name and Phone Number** MILES CRONIN (925) 914-0095	**Date** 7-2-14	**LAN ID** MTCO
Approved by (signature) Don Fink	**Print Name** DONAVON FINK	**Date** 7-2-14	**LAN ID** D1F7

Test Supervised by (signature) 11-11-2014 GIAN CERVONE GPCC	**Time and Date Test Pressure Reached** (from Part 2) 1543 11-11-2014	**Time and Date Test Ended** (from Part 2) 11-11-2014	**Actual Duration of Test** (from Part 2) 1 HR MIN

Pacific Gas and Electric Company
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Test Number 2 of 4
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PART 2 – TEST DATA (TO BE PREPARED BY PERSON SUPERVISING TEST AT TIME OF TEST)

Test Elevation

Elevation at Test Point 726 FT	Max. Elevation in Test Section 1370 FT	Min. Elevation in Test Section 691 FT
	[2A] Static Head b/t Test Point and Max. Elev. 279 PSIG	[2B] Static Head b/t Test Point and Min. Elev. 16 PSIG

No Spike Test: Calculations and Test Results (complete for strength test without a spike test)

Min. Required Test Pressure at Test Point	Max. Allowable Test Pressure at Test Point	Pressure Range During Test
Box [1A] + Box [2A] = ~~959~~ PSIG 8C	Box [1B] – Box [2B] = _____ PSIG	_____ PSIG

[2C] Min. Test Pressure Indicated	[2D] Max. Test Pressure Indicated
_____ PSIG	_____ PSIG

Calculated Min. Test Pressure at Max. Elev.	Calculated Max. Test Pressure at Min. Elev.
Box [2C] – Box [2A] = _____ PSIG	Box [2D] + Box [2B] = _____ PSIG

Spike Test: Calculations and Test Results (complete for strength test with a spike test)

Spike Pressure at Test Point	Min. Required Test Pressure at Test Point	Max. Post-Spike Pressure at Test Point	Pressure Range After Spike Test
Box [1E] – Box [2B] = 1095 PSIG	Box [1A] + Box [2A] = 959 PSIG	Box [1F] – Box [2B] = 983 PSIG	24 PSIG

[2E] Spike Pressure Indicated	[2F] Min. Test Pressure Indicated	[2G] Max. Post-Spike Test Pressure Indicated
1095 PSIG	969 PSIG	970 PSIG

Calculated Spike Pressure at Min. Elev.	Calculated Min. Test Pressure at Max. Elev.	Calculated Max. Post-Spike Pressure at Min. Elev.
Box [2E] + Box [2B] = 1111 PSIG	Box [2F] – Box [2A] = 690 PSIG	Box [2G] + Box [2B] = 986 PSIG

Test Acceptance

Were Leaks Observed?	If yes, explain:
☐ Yes ☒ No	
Acceptable Strength Test? ☒ Yes ☐ No Report strength test failures to Regulatory Compliance	If no, explain:

Test Medium Used	Time and Date Test Pressure Reached	Time and Date Test Ended	Actual Duration of Test
WATER	1543 11-11-2014	1648 11-11-2014	1 HR 5 MIN

Test Instruments

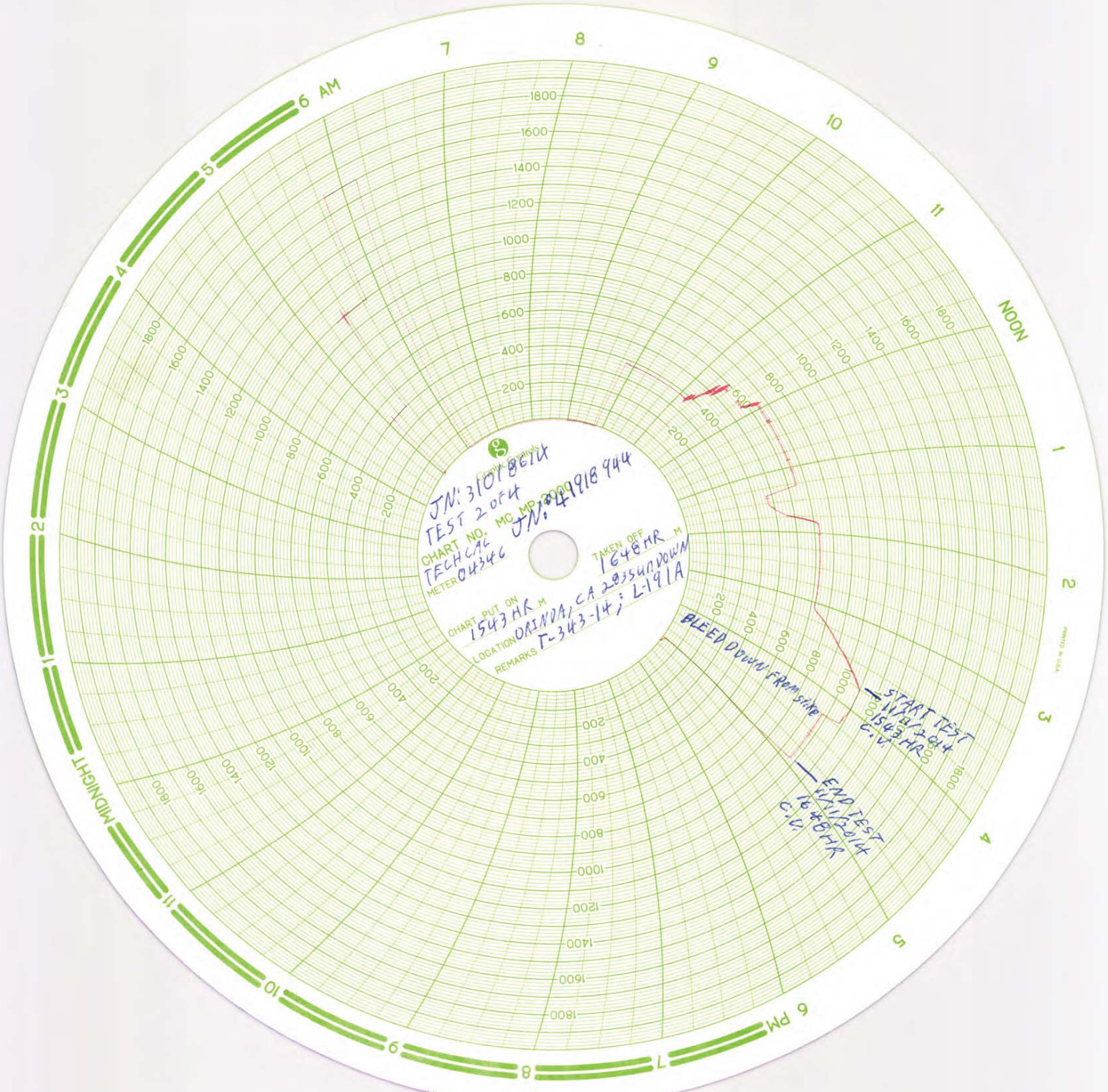
Make, Range, and Serial No. of Pressure Recording Device	Date Last Calibrated
TECH-CAL, 0-2000, 04346	10/16/2014
Make, Range and Serial No. of Dead Weight Tester A dead weight tester and/or an electronic pressure recorder is required for tests of any pipe segment equal to or greater than 90% of SMYS. AMETEK, 25-3000#, HL6413	**Date Last Calibrated** 3/18/2014

Signatures

Test Supervised by (signature)	Print Name	Date	LAN ID
	GIAN CERVONE	11-11-2014	GPCC
Testing Contractor (if third party) ARB			
Approved by (signature)	Print Name AZIZ TARIN	Date 11-22-14	LAN ID AXTB

Attachments
- Test chart
- Schematic piping sketch
- Test log with pressure noted every 15 minutes

Distribution
- Gas Job Closeout Desk, 6121 Bollinger Canyon Road, Building Z1, San Ramon, CA 94583


JN: 3107961H
TEST 2 OF 4
CHART NO.
TECH CAL
METER 04346
MO. MP. 2009
JN: 41918 944
CHART PUT ON
1543 HR M
TAKEN OFF
1648 HR M
LOCATION ORINDA, CA 2935 HUNDOWN
REMARKS T-343-14; L-191A
BLEED DOWN FROM SIM
START TEST
11/12/2014
1543 HRS
C.V.
END TEST
11/12/2014
1648 HR
C.V.
6 AM
NOON
6 PM
MIDNIGHT

STRENGTH TEST INFORMATION REV. 1

1
2. JOB # 31018614 TEST 2 OF 4 - 4191894414
3. LOCATION ORLANDA, CA 283 SUNPOWER TERRACE
4. DATE 11/11/2014 MIN. PRESSURE 969 PSI
5. TIME 1543HR-1648HR DURATION 1HR - 5MIN
6. RECORDING GA. MFG. TECHCAL SER.# 044346
7. RANGE 0-2000 PSI LAST CALIBRATED 10/16/2014
8. DEAD WGT MFG. AMETEK SER.# HL6413
9. RANGE 25-2000 PSI LAST CALIBRATED 3/18/2014
10. TEST FLUID WATER
11. SIZE 8.625" W.T. 0.322" PIPE SPEC. API 5L 35000 SMLS LENGTH 12.98'
12. SUPERVISED [signature] SEAN CERVONE SPEC. LENGTH 44.29
13. APPROVED [signature] AXTS DATE 11-11-2014 DATE 11-22-14

14. SIZE 8.625" W.T. 0.250" PIPE SPEC. API 5L 42000 HFW LENGTH 2.97'
15. SIZE 3.500 W.T. 0.216 PIPE SPEC. API 5L 35000 SMLS LENGTH 2.88'
16. SIZE 2.375 W.T. 0.154 PIPE SPEC. API 5L 35000 SMLS LENGTH 9.48'
17. SIZE 1.050 W.T. 0.154 PIPE SPEC. API 5L 35000 SMLS LENGTH 13.80
18. SIZE 8.625 W.T. 0.322 PIPE SPEC. API 5L 35000 SMLS LENGTH 22.80
19. SIZE 8.625 W.T. 0.280 PIPE SPEC. API 5L 35000 SMLS LENGTH 21.74
20. SIZE 8.625 W.T. 0.250 PIPE SPEC. API 5L 42000 HFW LENGTH 15.01
21. SIZE 8.625 W.T. 0.322 PIPE SPEC. API 5LX 42000 ERW LENGTH 9959.32
22. SIZE 8.625 W.T. 0.322 PIPE SPEC. API 5L 35000 SMLS LENGTH 26.93
23. SIZE 6.625 W.T. 0.280 PIPE SPEC. API 5LX 42000 ERW LENGTH 5748.43
24. SIZE 6.625 W.T. 0.188 PIPE SPEC. API 5L 35000 SMLS LENGTH 28.10
25. SIZE 1.050 W.T. 0.133 PIPE SPEC. API 5L 42000 ERW LENGTH MOR
26. SIZE 8.625 W.T. 0.322 PIPE SPEC. API 5L 42000 ERW LENGTH 1501.12
27. SIZE 1.050 W.T. 0.133 PIPE SPEC. 2" 3000 FBW LENGTH MOR

14. SIZE [illegible] W.T. [illegible] PIPE SPEC. [illegible] LENGTH [illegible]
15. SIZE [illegible] W.T. [illegible] PIPE SPEC. [illegible] LENGTH [illegible]
16. SIZE 1.050 W.T. 0.133 PIPE SPEC. 2500 FBW LENGTH MOR
17. SIZE 8.625 W.T. 0.322 PIPE SPEC. 3000 ELBOW LENGTH MOR
18. SIZE 6.625 W.T. 0.280 PIPE SPEC. 3000 ELBOW LENGTH MOR
19. SIZE 8.625 W.T. 0.322 PIPE SPEC. 2000 HELICER LENGTH MOR
20. SIZE [illegible] W.T. [illegible] PIPE SPEC. [illegible] LENGTH [illegible]

COPY

SAFETY

SAFETY PLEDGE

I ALWAYS PUT SAFETY FIRST.
I LOOK FOR AND ACT TO RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE OTHERS TO ACT SAFELY.

GTS

575 Lennon Ln, #200
Walnut Creek, CA (925) 478-6030
www.gtsinc.us
Project No. 10166

REGISTERED PROFESSIONAL ENGINEER
GORDON D. [illegible]
No. M33704
Exp. 06-30-203
MECHANICAL
STATE OF CALIFORNIA

NOTICE
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811 Know what's below. Call before you dig.

NO.	DATE	DESCRIPTION	SUP/SPEC	DWN	CHKD	SUPV	APVD BY
1	7-30-14	ADDED EE-443, 2D, 2A, 2B & LOCATION CAD	41918944	MJM	MTC	CRS	DF
0	7-2-14	ISSUED FOR CONSTRUCTION	41918944	MJM	MTC	CRS	DF

REVISIONS

BY	SUPV
CKD	DSGN
	DWN MJM
	CHKD MTC
	DR. DRG. [illegible] CRS
	DATE 7-2-14
DF	SCALES AS SHOWN

HYDROTEST T-543-14
L-191A
MP 0.002 – 4.84
ORINDA, CALIFORNIA

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

BILL OF MATL SHEET 12	
DWG LIST	
SUPSDS	
SUPSD BY	
SHEET NO. 42 OF 12 SHEETS	
41918944	1

SAFETY

SAFETY PLEDGE

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I LOOK FOR AND ACT TO
RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE
OTHERS TO ACT SAFELY.

GTS

879 Lawrence Ln. #200
Walnut Creek, CA (925) 478-9000
www.gtsinc.us
Project No. 15165

REGISTERED PROFESSIONAL ENGINEER
GORDON D. PURKISS
No. M35704
Exp. 06-30-2015
MECHANICAL
STATE OF CALIFORNIA

811 Know what's below. Call before you dig.

NO.	DATE	DESCRIPTION	DWN BY	CHK BY	SUPV	APVD BY
1	1-30-14	ADDED DETAILS 20, 24, 28 & LOCATION GAS	MJM	MTC	DRG	DP
0	7-2-14	ISSUED FOR CONSTRUCTION	MJM	MTC	DRG	GH DP

REVISIONS

DRAWN
CHKD
SUPV.
APVD.
DWN NUM
CHKD MTC
DK DRG | DRD
DATE 7-2-14
SCALES
AS SHOWN

HYDROTEST 7-34.3-14
L-191A
MP 0.002 - 4.84
ORINDA, CALIFORNIA

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SHEET OF MAPS SHEET 12
DWG LIST
SUPSDS
SUPSD BY
SHEET NO. 09 OF 12 SHEETS

41918944 | 1

SAFETY

SAFETY PLEDGE

I ALWAYS PUT SAFETY FIRST.
I LOOK FOR AND ACT TO RESOLVE UNSAFE SITUATIONS.
I HELP AND ENCOURAGE OTHERS TO ACT SAFELY.

GTS

675 Lennon Ln. #200
Walnut Creek, CA (925) 473-9100
www.gtsinc.us
Project No: 12185

REGISTERED PROFESSIONAL ENGINEER
DONALD O. TIM
No. M33704
Exp. 06-30-2015
MECHANICAL
STATE OF CALIFORNIA

811 Know what's below. Call before you dig.

NO.	DATE	DESCRIPTION	ORI/SPEC	DWN	CHKD	APVD/DIR
1	7-30-14	ADDED DETAILS 23, 24, 28 & LOCATION E&O	#1918944	MJM	MTC	CWS
0	7-2-14	ISSUED FOR CONSTRUCTION	#1918944	MJM	MTC	CWS

REVISIONS

BY	
ORIG	DJPV
	DSDN
	DWN: M.M
	CHKD MTC
	DF CHK: CWS
	DATE 7-2-14
	SCALE AS SHOWN
DF	

HYDROTEST T-343-14
L-191A
MP 0.002 - 4.64
ORINDA, CALIFORNIA

PACIFIC GAS AND ELECTRIC COMPANY
SAN FRANCISCO, CALIFORNIA

SHT OF MAPS SHEET 12	
DWG LIST	
TAPSDS	
TAPSB BY	
SHEET NO. 1/8 OF 12 SHEETS	
41918944	1

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: at@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PGE PG&E JOB #: 41918944/31018614 SKETCH PREPARED DATE: 11-9-2014 SHEET: 1 OF 14

JOB NAME: HYDROTEST T-343-14, L-191A, MP 0.002 - 4.84 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI / JOE VARGAS

[redacted]

GUIDA SURVEYING INC.
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Pleasanton, CA 94588
(925) 398-0805
EMAIL: at@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PGE PG&E JOB #: 41918944/31018614 SKETCH PREPARED DATE: 11-9-2014 SHEET: 2 OF 14

JOB NAME: HYDROTEST T-343-14, L-191A, MP 0.002 - 4.84 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI / JOE VARGAS

[redacted]

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: st@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PGE PG&E JOB #: 41918944/31018614 SKETCH PREPARED DATE: 11-9-2014 SHEET: 3 OF 14

JOB NAME: HYDROTEST T-343-14, L-191A, MP 0.002 - 4.84 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI / JOE VARGAS

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: at@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PGE PG&E JOB #: 41918944/31018614 SKETCH PREPARED DATE: 11-9-2014 SHEET: 4 OF 14

JOB NAME: HYDROTEST T-343-14, L-191A, MP 0.002 - 4.84 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI / JOE VARGAS

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: at@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PGE PG&E JOB #: 41918944/31018614 SKETCH PREPARED DATE: 11-9-2014 SHEET: 5 OF 14

JOB NAME: HYDROTEST T-343-14, L-191A, MP 0.002 - 4.84 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI / JOE VARGAS

[redacted]

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-6805
EMAIL: at@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PGE PG&E JOB #: 41918944/31018614 SKETCH PREPARED DATE: 11-9-2014 SHEET: 6 OF 14

JOB NAME: HYDROTEST T-343-14, L-191A, MP 0.002 - 4.84 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI / JOE VARGAS

[redacted]

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: all@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PGE PG&E JOB #: 41918944/31018614 SKETCH PREPARED DATE: 11-9-2014 SHEET: 7 OF 14

JOB NAME: HYDROTEST T-343-14, L-191A, MP 0.002 - 4.84 GSI J.N.: 0214-00199.0001 CREW NAME: JOHN LANFRANKI / JOE VARGAS

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: all@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PG&E PG&E JOB #: 31018614 SKETCH PREPARED DATE: 11/09/2014 SHEET: 8 OF 14

JOB NAME: LOCATION F, DETAIL 12 GSI J.N.: 0214-00199.0001 CREW NAME: MAJEED HASHIMI

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: all@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PG&E PG&E JOB #: 41918944 SKETCH PREPARED DATE: 11/09/2014 SHEET: 9 OF 14

JOB NAME: LOCATION F, DETAIL B GSI J.N.: 0214-00199.0001 CREW NAME: MAJEED HASHIMI

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: all@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PG&E PG&E JOB #: 31018614 SKETCH PREPARED DATE: 11/09/2014 SHEET: 10 OF 14

JOB NAME: LOCATION G, DETAIL 13 GSI J.N.: 0214-00199.0001 CREW NAME: MAJEED HASHIMI

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: all@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PG&E PG&E JOB #: 31018614 SKETCH PREPARED DATE: 11/09/2014 SHEET: 11 OF 14

JOB NAME: LOCATION O, TEST HEAD GSI J.N.: 0214-00199.0001 CREW NAME: MAJEED HASHIMI

[redacted]

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: al@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PG&E PG&E JOB #: 41918944 SKETCH PREPARED DATE: 11/09/2014 SHEET: 12 OF 14

JOB NAME: LOCATION O, TEST HEAD GSI J.N.: 0214-00199.0001 CREW NAME: MAJEED HASHIMI

GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: at@guidasurveying.com

PROJECT DESCRIPTION: T-343 CONTRACTOR: PG&E PG&E JOB #: 41918944 SKETCH PREPARED DATE: 11/09/2014 SHEET: 13 OF 14

JOB NAME: TEST BULLET GSI J.N.: 0214-00199.0001 CREW NAME: MAJEED HASHIMI

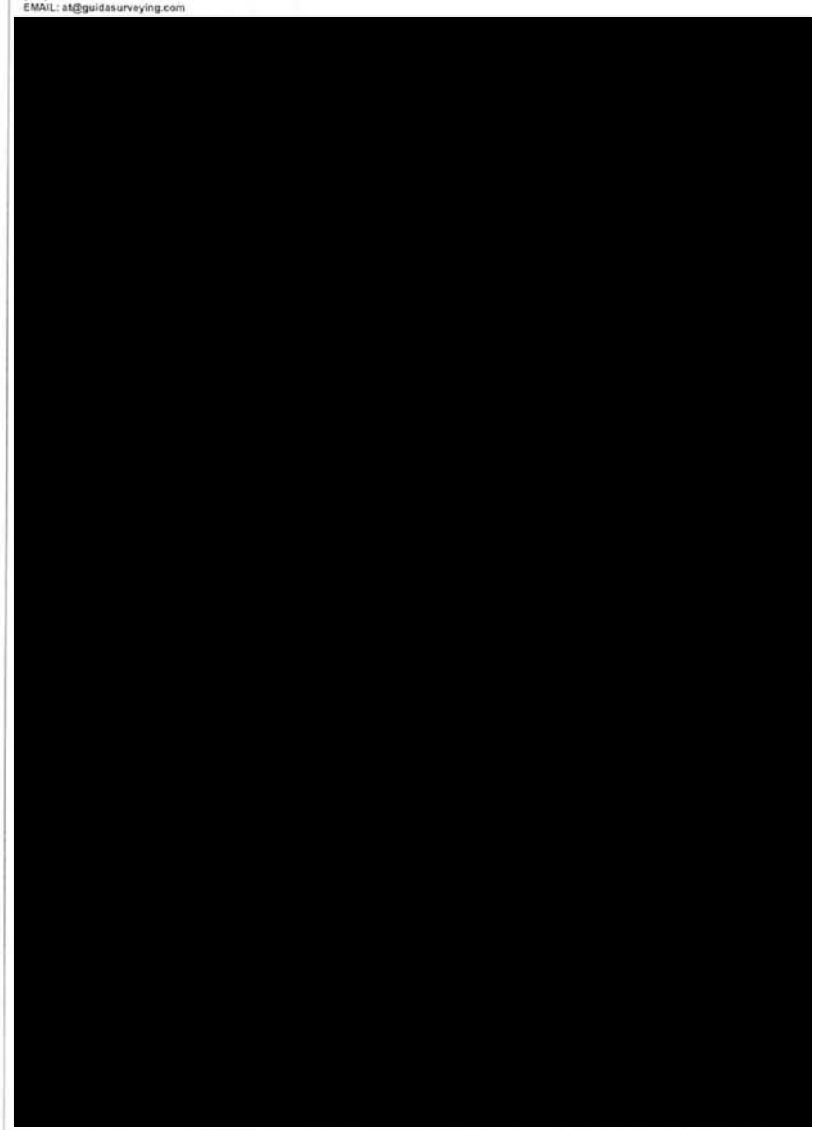
GUIDA SURVEYING INC.
4695 Chabot Suite 115
Pleasanton, CA 94588
(925) 398-0805
EMAIL: at@guidasurveying.com

PROJECT DESC.: T-343-14 HYDROTEST LOCATION: T-343, LOC. O, DET. 20

PG&E JOB #: 41918944/31018614 GSI JOB #: 0214-00199.0001

CONTRACTOR: PGE DATE: 11-9-14

CREW NAME: JOE VARGAS / DON THOMPSON SHEET: 14 OF 14



HYDROSTATIC TEST LOG SHEET

Date
11/11/2014

Owner Company:	PG&E	Job Number:	41918944
Construction Co:	ARB INC	Job Number:	31018614 TEST 2 OF 4
Testing Co:	ARB INC	Job Number:	

Test Section

	Name:	COREY VINCENT 65075 ; 0628-046C T-343-14 , L-191A	
		Station (0+00)	Elevation (Feet)
	Test Location:	LOC. O 172+37	726
	Begin:	LOC. A 0+00	1316
	End:	172+37	726
	High Elevation:	4+65	1370
	Low Elevation:	151+09	691

Pipe Data

Section	Length (ft.)	O.D. (in.)	W.T. (in.)	Restrained (ft.)	Unrestrained (ft.)	Grade	Seam/Joint Type
1.	17.98	8.625	0.322	17.98		API-5L 35000	SMLS
2.	141.79	6.625	0.280	141.79		API-5L 35000	SMLS
3.	2.97	8.625	0.250	2.97		API-5L 42000	HFW
4.	2.88	3.500	0.216	2.88		API-5L 35000	SMLS
5.	9.48	2.375	0.154	9.48		API-5L 35000	SMLS
6.	13.80	1.050	0.154	13.80		API-5L 35000	SMLS
7.	22.90	8.625	0.322	22.90		API-5L 35000	SMLS
8.	21.74	8.625	0.280	21.74		API-5L 35000	SMLS
9.	15.01	8.625	0.250	15.01		API-5L 42000	HFW
10.	9959.32	8.625	0.322	99.59		API-5LX 42000	ERW
11.	76.92	8.625	0.322	76.92		API-5L 35000	SMLS
12.	5748.43	6.625	0.280	5748.43		API-5L 35000	SMLS
13.	78.10	6.625	0.188	78.10		API-5LX 42000	ERW
14.	MOR	1.050	0.113	MOR		API-5L 35000	SMLS
15.	1501.12	8.625	0.172	1501.12		API-5L 42000	ERW
16.	MOR	1.050	0.133	MOR		28000	FBW
17.	MOR	1.050	0.133	MOR		25000	FBW
18.	MOR	8.625	0.322	MOR		30000	ELBOW
19.	SEA	6.625	0.280	MOR		30000	ELBOW
20.	MOR	8.625	0.322	MOR		30000	REDUCER
21.							
22.							
23.							
24.							
25.							
26.							
27.							
28.							

Test Period		Date	Time	Test Medium		
	Begin:	11/11/2014	1543		Water:	☒
	End:	11/11/2014	1648		Nitrogen:	☐
					Other:	☐

Test Instrumentation

Description	Calibration Checked		Serial Number	Date Calibrated/Certified	Installation Correct?	
Dead Weight Pressure Tester:	☒	Yes	HL6413	3/18/2014	☒	Yes
Pressure Recorder:	☒	Yes	04346	10/16/2014	☒	Yes
Ambient Temperature Recorder:	☒	Yes	02099	8/28/2014	☒	Yes
Restrained Pipe Temperature Recorder:	☒	Yes	02100	10/1/2014	☒	Yes
Unrestrained Pipe Temperature Recorder:	☒	Yes	02101	5/23/2014	☒	Yes

DEAD WEIGHT TEST LOG

ARB Job Number: 0628-046C

Log No.	Time 24HR	Test Pressure (psig)	Temperature (°F)			Volume		Comments:	Stroke Count
			Ambient	Pipe		☐ Ounces ☒ Gallons			
				Restrained	Unrestrained	Bleed	Inject		
1.	1352	720	60	61	67			75% , 1 HOUR HOLD	0
2.	1500	716	60	61	67				
3.	1543	1095	60	61	67			SPIKE / ON TEST	944
4.	1548	1094	60	61	67				
5.	1553	1093	59	61	67				
6.	1558	1093	59	61	67				
7.	1601	1093	59	61	67	START			
8.	1605	1083	59	61	67	STOP			
9.	1609	1083	59	61	67	1.75			
10.	1615	970	58	61	68				
11.	1620	970	58	62	68				
12.	1625	970	58	62	68				
13.	1630	970	58	62	68				
14.	1635	970	58	62	68				
15.	1640	970	58	62	68				
16.	1645	969	58	62	67				
17.	1648	969	58	62	67				
18.									
19.									
20.									
21.									
22.									
23.									
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30.									
31.									
32.									
33.									
34.									
35.									
36.									
37.									
38.									
39.									
40.									

Was a leak observed during Test Period? ☐ Yes ☒ No

31018614 TEST 2 OF 4 : 41918944

If "Yes", Explain:

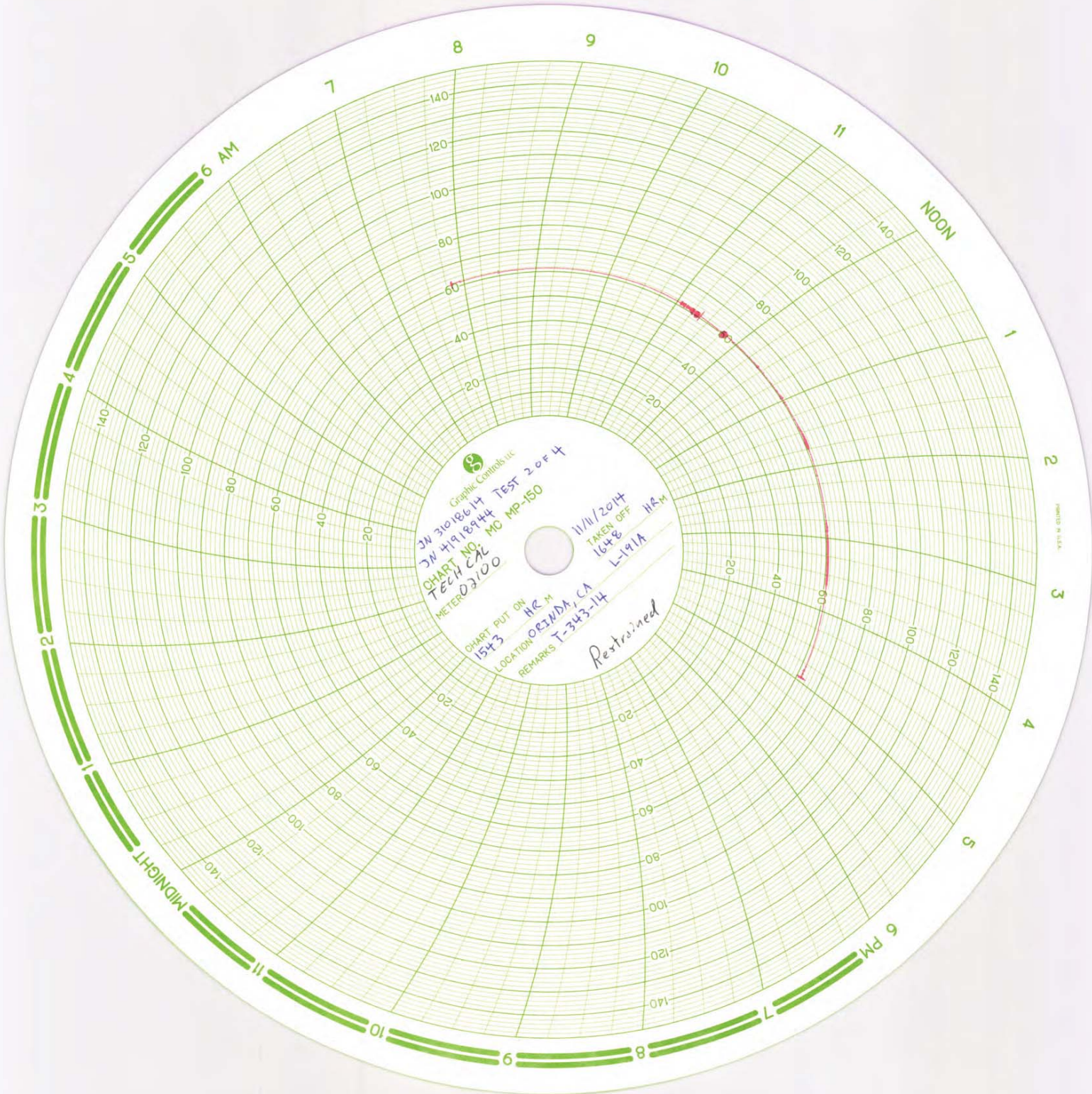
High Test Pressure: 970

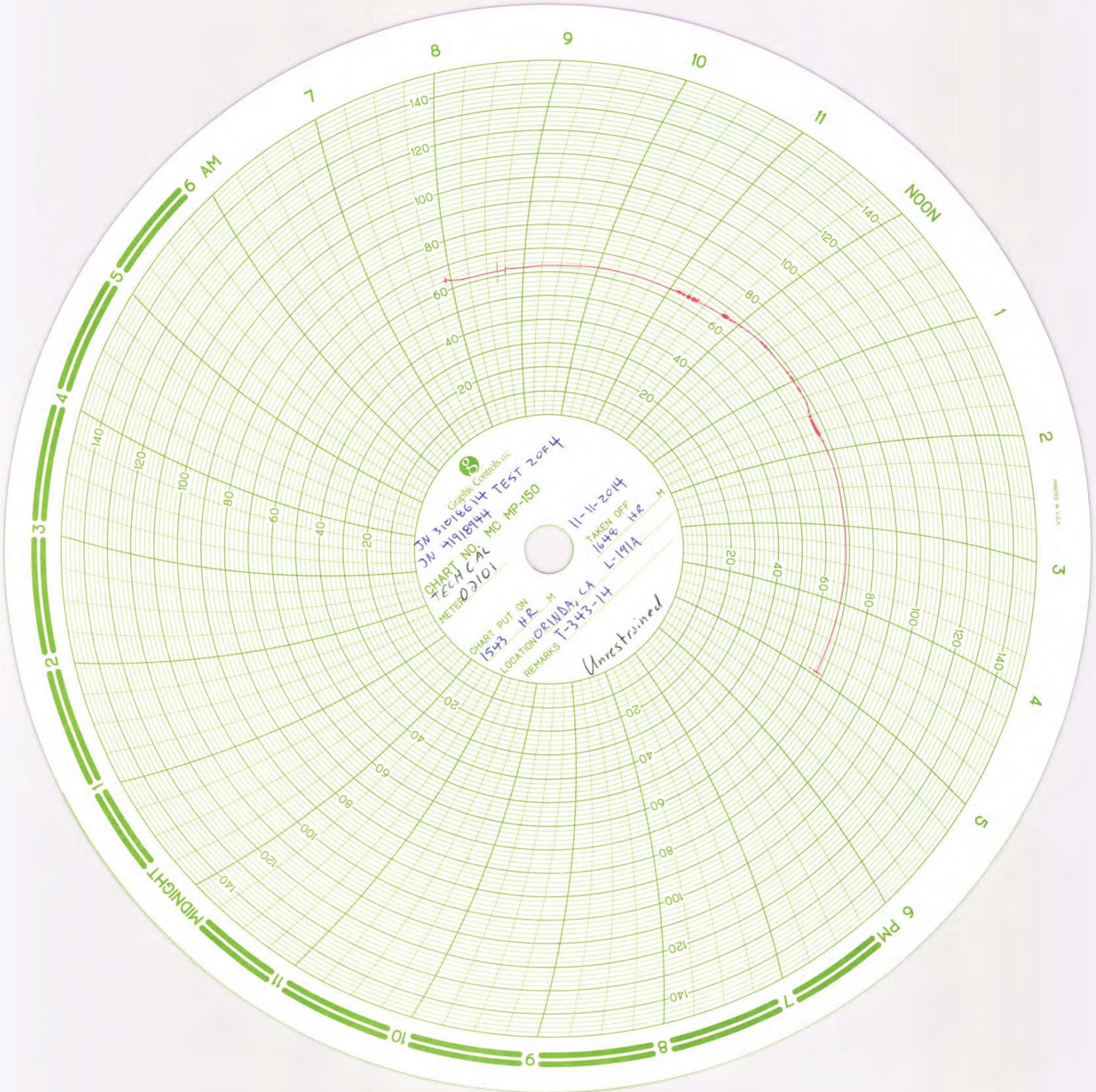
Low Test Pressure: 969

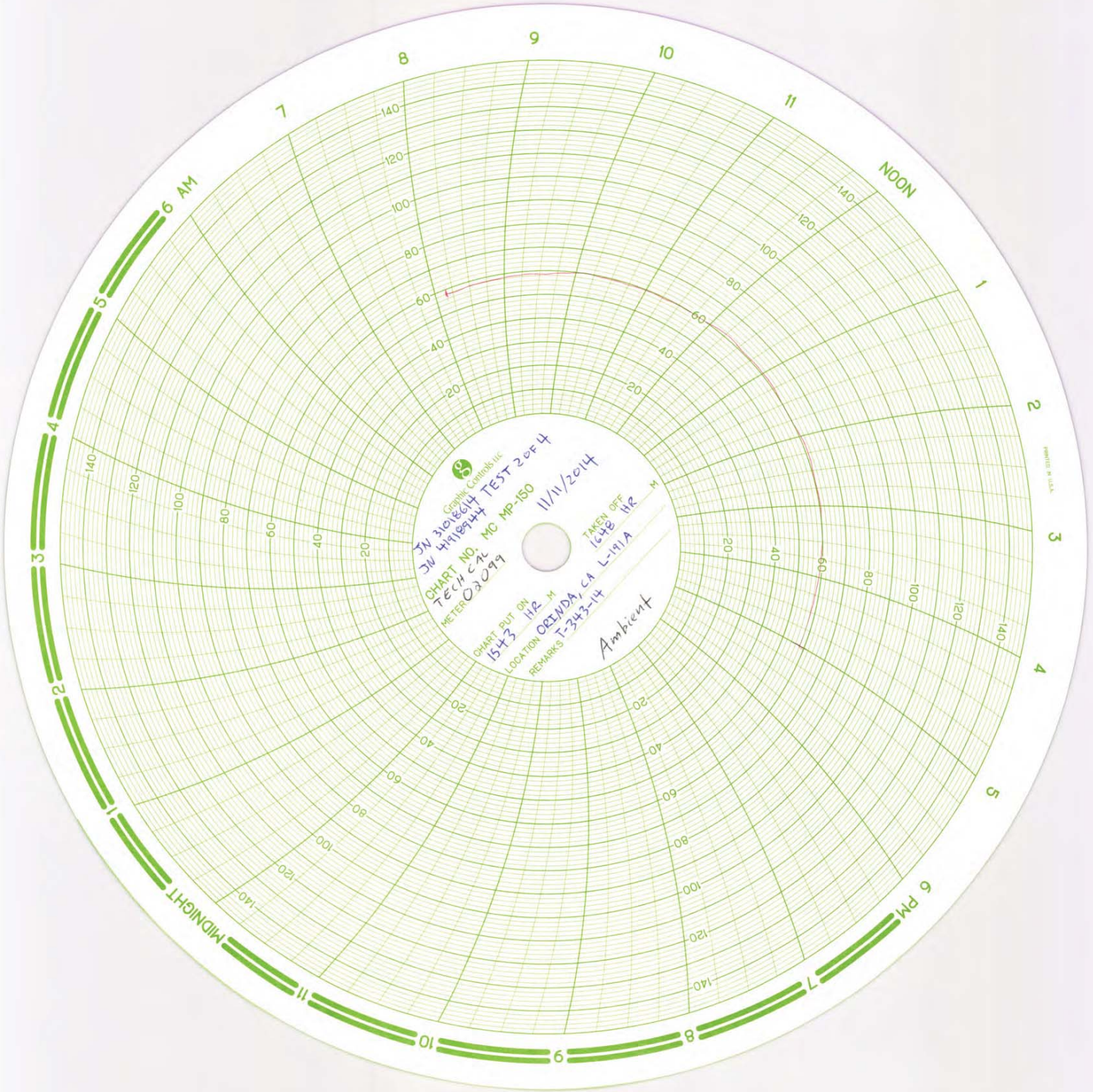
Certification: **Date:** 11/11/2014

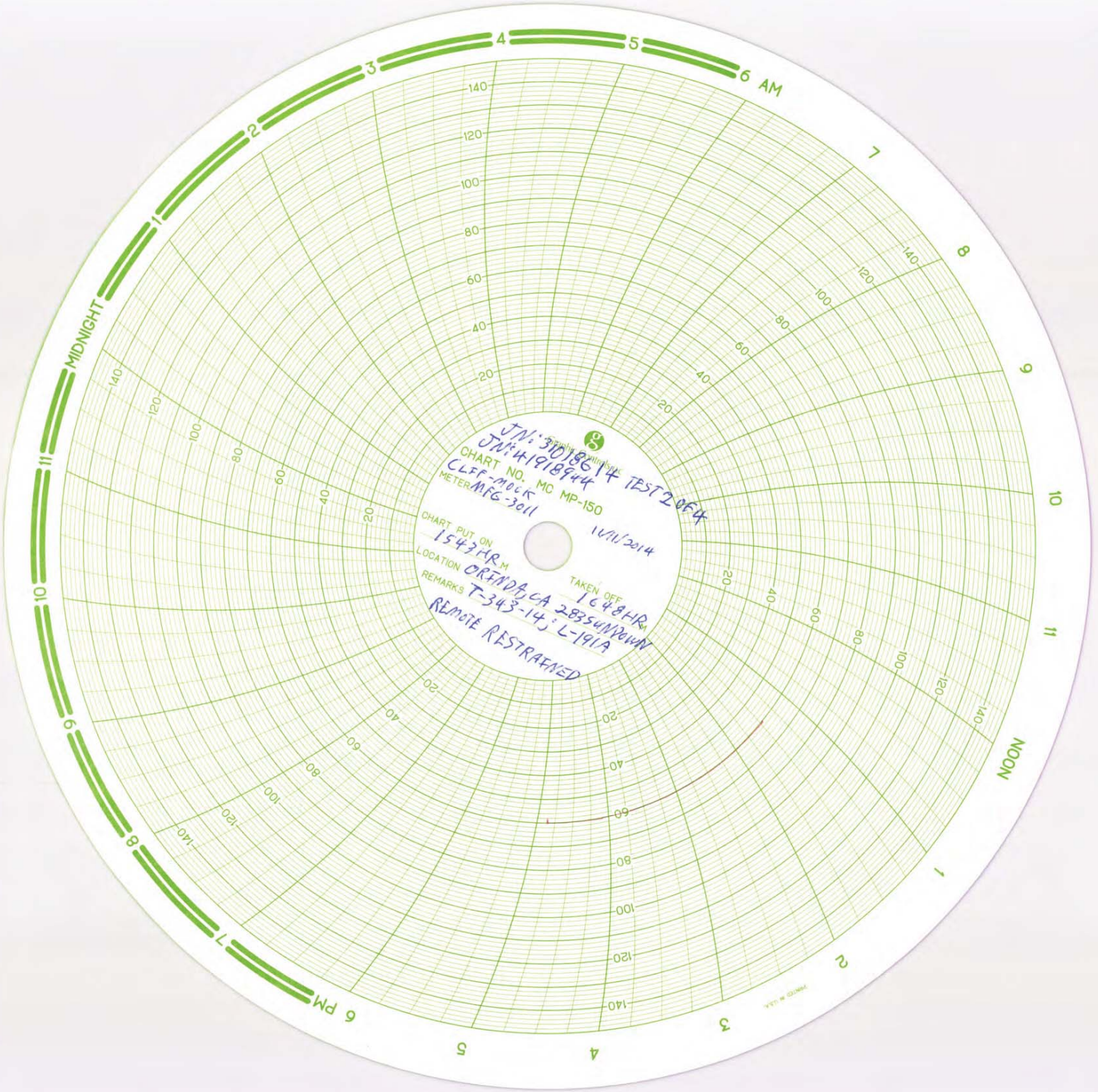
Test Supervisor: [signature] Company Representative: [signature]

cl_rev_3-21-14 Signature Signature


Graphic Controls LLC
JN 31018614 TEST 2 OF 4
JN 41918944
CHART NO. MC MP-150
TECHCAL
METER 0100
11/11/2014
TAKEN OFF 1648 HRM
L-191A
CHART PUT ON 1543 HR M
LOCATION ORINDA, CA
REMARKS T-343-14
Restrained
MIDNIGHT
6 AM
NOON
6 PM
PRINTED IN U.S.A.


Graphic Controls, LLC
JN 31018614 TEST 2 OF 4
JN 41918944
CHART NO. TECH CAL
METER 0101
MC MP-150
11-11-2014
TAKEN OFF
1646 HR M
L-1914
CHART PUT ON
1543 HR M
LOCATION ORINDA, CA
REMARKS T-343-14
Unrestrained
6 AM
7
8
9
10
11
NOON
1
2
3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
1
2
3
4
5
6
20
40
60
80
100
120
140
PRINTED IN U.S.A.


Graphic Controls LLC
JN 31016614 TEST 2 OF 4
JW 41918944 MC MP-150
CHART NO. 11/11/2014
TECH CAL
METER 03099
CHART PUT ON 1543 HR M
TAKEN OFF 1648 HR M
LOCATION ORINDA, CA L-1911A
REMARKS T-343-14
Ambient
6 AM
7
8
9
10
11
NOON
1
2
3
4
5
6 PM
7
8
9
10
11
MIDNIGHT
1
2
3
4
5
20
40
60
80
100
120
140


MIDNIGHT
6 AM
NOON
6 PM
JN: 310186 14 TEST 2 OF 4
JN#: 4191894 4
CHART NO. MC MP-150
CLFF-MOCK
METER MFG-3011
11/11/2014
CHART PUT ON 1543 HR M
TAKEN OFF 1648 HR M
LOCATION ORTNDA, CA 28354 N Down
REMARKS T-343-14; L-191A
REMOTE RESTRAINED

TOTALS BY LOCATION

					LOCATION:	LOC A TEST HEAD, ORINDA	LOC A, DET 3, ORINDA	LOC D ADDED SITE 1, ORINDA	LOC D ADDED SITE 2, ORINDA	LOC D, DET 24, ORINDA	LOC E, DET 9, ORINDA	LOC F ANOMALY, ORINDA	LOC F, DET 12, ORINDA	LOC F, SEC B, ORINDA	LOC G, DET 13, ORINDA	LOC O, ORINDA	LOC O TEST HEAD, ORINDA	TEST BULLET, ORINDA	V-1 GAUGE LINES, ORINDA
Order#	Item#	Description	TOTAL SUM:	UNIT		Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
31018614	101	8" x 0.322", GR-B, SMLS, BARE	11.07	ft.		0	6.03	0	0	0	0	0	0	0	0	5.04	0	0	0
31018614	102	8" x 0.250", X-42, HFW, BARE	2.97	ft.		0	0	0	0	0	0	0	0	0	1.55	1.42	0	0	0
31018614	104	6" x 0.280", GR-B, SMLS, BARE	24.23	ft.		0	0	0	0	0	13.50	0	6.94	3.79	0	0	0	0	0
31018614	105	3" x 0.216", GR-B, SMLS, BARE	1.16	ft.		0	0	0	0	0	0	0	0	0	0	1.16	0	0	0
31018614	106	2" x 0.154", GR-B, SMLS, BARE	9.14	ft.		0	0	0	0	0	0	0	0	0	0	9.14	0	0	0
31018614	107	3/4" x 0.154", GR-B, SMLS, BARE	12.34	ft.		0	0	0	0	0	0	0	0	0	0	0	0	0	12.34
31018614	111	ELL 90°, 8" x 0.322", GR-B	2.00	ft.		0	2.00	0	0	0	0	0	0	0	0	0	0	0	0
31018614	112	ELL 45°, 8" x 0.322", GR-B	0.40	ft.		0	0.40	0	0	0	0	0	0	0	0	0	0	0	0
31018614	115	ELL 90°, 6" x 0.280", GR-B	7.62	ft.		0	0	1.01	2.78	0	0.46	0	0	3.00	0.37	0	0	0	0
31018614	115S	ELL 90°, 6" x 0.280", GR-B	0.42	ft.		0	0	0	0	0	0.42	0	0	0	0	0	0	0	0
31018614	116	ELL 45°, 6" x 0.280", GR-B	3.08	ft.		0	0	0	0	2.48	0.30	0	0	0	0.30	0	0	0	0
31018614	116S	ELL 45°, 6" x 0.280", GR-B	0.60	ft.		0	0	0.30	0	0	0.30	0	0	0	0	0	0	0	0
31018614	117	ELL 45°, 3/4" x 0.154", #3000	0.96	ft.		0	0	0	0	0	0	0	0	0	0	0	0	0	0.96
31018614	121	RED, 8" x 6", STD WT, GR-B	0.50	ft.		0	0	0	0	0	0	0	0	0	0.50	0	0	0	0
31018614	122	RED, 3" x 2", STD WT, GR-B	0.56	ft.		0	0	0	0	0	0	0	0	0	0	0.56	0	0	0
31018614	126	TEE, 8" x 3", STD WT, GR-B	2.34	ft.		0	0	0	0	0	0	0	0	0	0	2.34	0	0	0
31018614	126S	TEE, 8" x 3" STD, BRANCH, GR-B	1.16	ft.		0	0	0	0	0	0	0	0	0	0	1.16	0	0	0
31018614	165	NIPPLE, 3/4" x 1/2" x 3", GR-B	0.50	ft.		0	0	0	0	0	0	0	0	0	0	0	0	0	0.50
31018614	201	8" BALL VALVE, ANSI 300	1.67	ft.		0	0	0	0	0	0	0	0	0	0	1.67	0	0	0
31018614	C	2" COUPLING, SOCKETWELD	0.34	ft.		0	0	0	0	0	0	0	0	0	0	0.34	0	0	0
31018614	D	6" x 0.280", GR-B, SMLS, FBE	105.84	ft.		0	0	5.07	7.42	87.13	0	0	0	0	6.22	0	0	0	0
41918944	101	8" x 0.322", GR-B, SMLS, BARE	14.74	ft.		13.71	0	0	0	0	0	0	0	0	0	0	1.03	0	0
41918944	102	8" x 0.250", X-42, HFW, BARE	15.01	ft.		0	0	0	0	0	0	0	0	0	0	0	15.01	0	0
41918944	104	6" x 0.280", GR-B, SMLS, BARE	2.86	ft.		0	0	0	0	0	0	0	0	0	0	0	0	2.86	0
41918944	111	ELL 90°, 8" x 0.322", GR-B	8.00	ft.		4.00	0	0	0	0	0	0	0	0	0	0	4	0	0
41918944	112	ELL 45°, 8" x 0.322", GR-B	0.16	ft.		0.16	0	0	0	0	0	0	0	0	0	0	0	0	0
41918944	115	ELL 90°, 6" x 0.280", GR-B	0.62	ft.		0	0	0	0	0	0	0	0	0	0	0	0	0.62	0
41918944	115S	ELL 90°, 6" x 0.280", GR-B	0.62	ft.		0	0	0	0	0	0	0	0	0	0	0	0	0.62	0
41918944	116	ELL 45°, 6" x 0.280", GR-B	1.24	ft.		0	0	0	0	0	0	0	0	0	0	0	0	1.24	0
41918944	161	CAP, 6" x 0.280", GR-B	0.58	ft.		0	0	0	0	0	0	0	0	0	0	0	0	0.58	0
41918944	D	6" x 0.280", GR-B, SMLS, FBE	15.82	ft.		0	0	0	0	0	0	5.38	0	0	0	0	0	10.44	0

RCP, Inc

801 Louisiana, Ste.200
Houston, Texas 77002
(713)655-8080
ldecker@rcp.com

November 11, 2014

Pacific Gas and Electric Company
6121 Bollinger Canyon RD
San Ramon CA 94583
Attention: Mark Cabral, Aziza Tarin

Test Contractor:	ARB -- 41918944 Test 2 31018614 Test 2
Asset Owner:	Pacific Gas and Electric Company -- 41918944 Test 2 31018614 Test 2
Construction Contractor:	ARB -- 41918944 Test 2 31018614 Test 2
Test Section:	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97
Test Date:	November 11, 2014
Certificate Number:	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97

To whom it may concern,

This letter is to certify that the Water 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 1095 psig (at the test point) for 15 minutes, without observed leakage or yielding of the pipe segment. The 15 minute spike test and subsequent pressure reduction with volume bleed was included and is part of the 1.08 hour test duration period.

This Hydrostatic Pressure test was completed successfully. Pressure was maintained on the test facilities in excess of 1.08 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 689 psig and the MAOP supported by the test, per DOT Part 192 Subpart J, can be as high as 459 psig. The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 283 psig.

Pressure decreased 126 psi during the test. After conclusion of the spike test, 2,755.2 ounces of fluid was intentionally released from the test section, reducing pressure by 123 psig. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 140.87 ounces, loss, which is equivalent to a 0.33 °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 loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.

Sincerely,

Ryan A. Maurer

cc. file

Hydrostatic Pressure Test Certification

Company	Pacific Gas and Electric Company	Job Number	41918944 Test 231018614 Test 2
Construction Co.	ARB	Job Number	41918944 Test 231018614 Test 2
Hydro. Test Co.	ARB	Project No.	41918944 Test 231018614 Test 2
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97	Test Fluid = Water	
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97		

Water Test Pressure

APPLICABLE CODE FOR CERTIFICATION: Test Date: 11-Nov-14

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-343-14 Test 2, L-191A, MP 0.002 - 2.97
From: MP 0.00 To: MP 2.97

Pipe Data

Segment		Length	Diameter	Wall Thickness	Specification	100% SMYS
1	101	17.98 ft	8.625 in.	0.322 in.	API5L-Grade B, SM, Arc Weld, Steel	2,613 psi
2	104	141.79 ft	6.625 in.	0.280 in.	API5L-Grade B, SM, Arc Weld, Steel	2,958 psi
3	102	2.97 ft	8.625 in.	0.250 in.	API5L-X42, ERW-HF, Arc Weld, Steel	2,435 psi
4	105	2.88 ft	3.500 in.	0.216 in.	API5L-Grade B, SM, Arc Weld, Steel	4,320 psi
5	106	9.48 ft	2.375 in.	0.154 in.	API5L-Grade B, SM, Arc Weld, Steel	4,539 psi
6	107	13.80 ft	1.050 in.	0.154 in.	API5L-Grade B, SM, Arc Weld, Steel	10,267 psi
7	101	22.90 ft	8.625 in.	0.322 in.	API5L-Grade B, SM, Arc Weld, Steel	2,613 psi
8	104	21.74 ft	6.625 in.	0.280 in.	API5L-Grade B, SM, Arc Weld, Steel	2,958 psi
9	102	15.01 ft	8.625 in.	0.250 in.	API5L-X42, ERW-HF, Arc Weld, Steel	2,435 psi
10	1	9959.32 ft	8.625 in.	0.322 in.	API5L-X42, ERW-LF, Arc Weld, Steel	3,136 psi
11	2	76.92 ft	8.625 in.	0.322 in.	API5L-Grade B, SM, Arc Weld, Steel	2,613 psi
12	5	5748.43 ft	6.625 in.	0.280 in.	API5L-Grade B, SM, Arc Weld, Steel	2,958 psi
13	6	78.10 ft	6.625 in.	0.188 in.	API5L-X42, ERW-LF, Arc Weld, Steel	2,384 psi
14	16	60.00 ft	1.050 in.	0.113 in.	API5L-Grade B, SM, Arc Weld, Steel	7,533 psi
15	4	1501.12 ft	8.625 in.	0.172 in.	API5L-X42, ERW-LF, Arc Weld, Steel	1,675 psi
16	14	41.00 ft	1.050 in.	0.113 in.	28ksmys, FBW, Arc Weld, Steel	6,027 psi
17	15	18.00 ft	1.050 in.	0.113 in.	25ksmys, FBW, Arc Weld, Steel	5,381 psi
18	TH	6.50 ft	8.625 in.	0.500 in.	API5L-Grade B, SM, Arc Weld, Steel	4,058 psi
19	TH	6.50 ft	8.625 in.	0.500 in.	API5L-Grade B, SM, Arc Weld, Steel	4,058 psi

Initial Test Conditions

Pressure at Test Point:	1,095 psig	Date/Time:	11-Nov-2014 15:43	Pipe Temperature	
Ambient Temperature:	60.0 °F			Unrestrained:	68.0 °F
				Restrained:	61.0 °F
		Elevation @ Test Point:	726.0 ft	Location:	172+37
Pressure @ High Point (Cal/Measure):	816 psig	Elevation @ High Point:	1,370.0 ft	Location:	04+65
Pressure @ Low Point (Cal/Measure):	1,110 psig	Elevation @ Low Point:	691.0 ft	Location:	151+09

Final Test Conditions

Pressure at Test Point:	969 psig	Date/Time:	11-Nov-2014 16:48	Pipe Temperature	
Ambient Temperature:	58.0 °F			Unrestrained:	67.0 °F
				Restrained:	62.0 °F
		Elevation @ Test Point:	726.0 ft	Location:	172+37
Pressure @ High Point (Cal/Measure):	690 psig	Elevation @ High Point:	1,370.0 ft	Location:	04+65
Pressure @ Low Point (Cal/Measure):	984 psig	Elevation @ Low Point:	691.0 ft	Location:	151+09
Total Fluid Injected:					
Total Fluid Withdrawn:		2755.20 fluid ounces		Volume loss	
Net Change in Volume of the Test Section ± (+ Gain, - Loss):		(140.67) oz	loss	(0.0028)%	(0.326) °F equivalent

Test Duration: 1.08 hours

Minimum Test Pressure:	Test Point	969 psig	Max Elevation	689 psig	Min Elevation	984 psig
Maximum Test Pressure:		1,095 psig		815 psig		1,111 psig
% SMYS :		27.0%		7.9%		66.3%
Test Segment Observed % SMYS :			Minimum	7.9%	Maximum	66.3%

DOT Part 192 Maximum Allowable Operating Pressure	D_f	Design MAOP	T_f	Minimum Test Pressure (Calculated/Measured)	Test MAOP	MAOP
	0.5	838 psig	1.5	689 psig	459 psig	459 psig

The MAOP established by this test is sufficient to qualify for Pacific Gas and Electric Company's desired MAOP of 283 psig.

Is Test to Yield Utilized to Establish MAOP?	No	TTY MAOP @ High Elevation		TTY MAOP @ Test Point	
ASME B31.8S – Integrity Assessment Interval	10 years	Desired MAOP % SMYS	16.89%	ASME B31.8S Minimum Test Factor	2.20

Were leaks observed?	No	Explain:
Acceptable Hydrostatic Test?	Yes	The test segment was subjected to a spike pressure test of 1095 psig (at the test point) for 15 minutes, without observed leakage or yielding of the pipe segment. The 15 minute spike test and subsequent pressure reduction with volume bleed was included and is part of the 1.08 hour test duration period. No leaks were observed during the test period. The test section included 17,543 feet of buried and 202 feet of exposed pipe. Pressure lost 126 psi during the test. The buried pipe segment gained 1°F fluid temperature and the exposed pipe segment lost 1°F. After conclusion of the spike test, 2,755.2 ounces of fluid was intentionally released from the test section, reducing pressure by 123 psig. Net corrected volumetric change from beginning of the test to the end of the test is calculated to be 140.87 ounces, loss, which is equivalent to a 0.33 °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 loss is attributed to the error characteristic of the temperature measurement instrumentation utilized.
Remarks		

Ryan A. Maurer
11-Nov-14

Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41918944 Test 2 31018614 Test 2
Construction Co.	ARB	Job Number	41918944 Test 2 31018614 Test 2
Testing Co.	ARB	Project No.	)18944 Test 231018614 Test
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97	Test Fluid = Water	
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97		

Date 11-Nov-14

Test Log

Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe				
					Unrestrained	Restrained	Comment	Bleed	Inject
1	11-Nov-2014	15:02	716 psig	60 °F	68 °F	61 °F	Start Spike		
2	11-Nov-2014	15:03	726 psig	60 °F	68 °F	61 °F	Inject		234 oz.
3	11-Nov-2014	15:04	736 psig	60 °F	68 °F	61 °F	Inject		225 oz.
4	11-Nov-2014	15:05	746 psig	60 °F	68 °F	61 °F	Inject		216 oz.
5	11-Nov-2014	15:06	756 psig	60 °F	68 °F	61 °F	Inject		216 oz.
6	11-Nov-2014	15:07	766 psig	60 °F	68 °F	61 °F	Inject		216 oz.
7	11-Nov-2014	15:08	776 psig	60 °F	68 °F	61 °F	Inject		216 oz.
8	11-Nov-2014	15:09	786 psig	60 °F	68 °F	61 °F	Inject		216 oz.
9	11-Nov-2014	15:10	796 psig	60 °F	68 °F	61 °F	Inject		225 oz.
10	11-Nov-2014	15:11	806 psig	60 °F	68 °F	61 °F	Inject		225 oz.
11	11-Nov-2014	15:13	816 psig	60 °F	68 °F	61 °F	Inject		234 oz.
12	11-Nov-2014	15:14	826 psig	60 °F	68 °F	61 °F	Inject		225 oz.
13	11-Nov-2014	15:15	836 psig	60 °F	68 °F	61 °F	Inject		243 oz.
14	11-Nov-2014	15:16	846 psig	60 °F	68 °F	61 °F	Inject		225 oz.
15	11-Nov-2014	15:17	856 psig	60 °F	68 °F	61 °F	Inject		234 oz.
16	11-Nov-2014	15:18	866 psig	60 °F	68 °F	61 °F	Inject		234 oz.
17	11-Nov-2014	15:19	876 psig	60 °F	68 °F	61 °F	Inject		225 oz.
18	11-Nov-2014	15:20	886 psig	60 °F	68 °F	61 °F	Inject		234 oz.
19	11-Nov-2014	15:21	896 psig	60 °F	68 °F	61 °F	Inject		225 oz.
20	11-Nov-2014	15:22	906 psig	60 °F	68 °F	61 °F	Inject		234 oz.
21	11-Nov-2014	15:24	916 psig	60 °F	68 °F	61 °F	Inject		234 oz.
22	11-Nov-2014	15:25	926 psig	60 °F	68 °F	61 °F	Inject		216 oz.
23	11-Nov-2014	15:26	936 psig	60 °F	68 °F	61 °F	Inject		207 oz.
24	11-Nov-2014	15:27	946 psig	60 °F	68 °F	61 °F	Inject		216 oz.
25	11-Nov-2014	15:28	956 psig	60 °F	68 °F	61 °F	Inject		225 oz.
26	11-Nov-2014	15:29	966 psig	60 °F	68 °F	61 °F	Inject		216 oz.
27	11-Nov-2014	15:30	976 psig	60 °F	68 °F	61 °F	Inject		225 oz.
28	11-Nov-2014	15:31	986 psig	60 °F	68 °F	61 °F	Inject		216 oz.
29	11-Nov-2014	15:32	996 psig	60 °F	68 °F	61 °F	Inject		225 oz.
30	11-Nov-2014	15:33	1,006 psig	60 °F	68 °F	61 °F	Inject		225 oz.
31	11-Nov-2014	15:35	1,016 psig	60 °F	68 °F	61 °F	Inject		198 oz.
32	11-Nov-2014	15:36	1,026 psig	60 °F	68 °F	61 °F	Inject		243 oz.
33	11-Nov-2014	15:37	1,036 psig	60 °F	68 °F	61 °F	Inject		234 oz.
34	11-Nov-2014	15:38	1,046 psig	60 °F	68 °F	61 °F	Inject		216 oz.
35	11-Nov-2014	15:39	1,056 psig	60 °F	68 °F	61 °F	Inject		234 oz.
36	11-Nov-2014	15:40	1,066 psig	60 °F	68 °F	61 °F	Inject		225 oz.
37	11-Nov-2014	15:41	1,076 psig	60 °F	68 °F	61 °F	Inject		225 oz.
38	11-Nov-2014	15:42	1,086 psig	60 °F	68 °F	61 °F	Inject		216 oz.
39	11-Nov-2014	15:43	1,095 psig	60 °F	68 °F	61 °F	Inject		198 oz.
40	11-Nov-2014	15:43	1,095 psig	60 °F	68 °F	61 °F	On Test		
41	11-Nov-2014	15:48	1,094 psig	60 °F	68 °F	61 °F			
42	11-Nov-2014	15:53	1,093 psig	59 °F	68 °F	61 °F			
43	11-Nov-2014	15:58	1,093 psig	59 °F	68 °F	61 °F	End Spike		
44	11-Nov-2014	15:58	970 psig	59 °F	68 °F	61 °F	Bleed Spike	2,755 oz.	
45	11-Nov-2014	16:15	970 psig	58 °F	68 °F	61 °F			
46	11-Nov-2014	16:20	970 psig	58 °F	68 °F	62 °F			
47	11-Nov-2014	16:25	970 psig	58 °F	68 °F	62 °F			
48	11-Nov-2014	16:30	970 psig	58 °F	68 °F	62 °F			
49	11-Nov-2014	16:35	970 psig	58 °F	68 °F	62 °F			
50	11-Nov-2014	16:40	970 psig	58 °F	68 °F	62 °F			
51	11-Nov-2014	16:45	970 psig	58 °F	67 °F	62 °F			
52	11-Nov-2014	16:48	969 psig	58 °F	67 °F	62 °F	End of Test		

Dead Weight Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41918944 Test 2 31018614 Test 2
Construction Co.	ARB	Job Number	41918944 Test 2 31018614 Test 2
Testing Co.	ARB	Project No.	)18944 Test 231018614 Test
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97	Test Fluid = Water	
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97		

Date 11-Nov-14

Test Log

Log No.	Test Period		Test Pressure	Temperature °F			Remarks		
	Date	Time		Ambient	Pipe		Comment	Bleed	Inject
					Unrestrained	Restrained			
							Spike Test		8,490 oz.
							Hydrostatic Test	2,755.2 oz.	

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

High Test Pressure:	1,095 psig
Low Test Pressure:	969 psig

Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company	Job Number	41918944 Test 231018614 Test 2
Construction Co.	ARB	Job Number	41918944 Test 2 31018614 Test 2
Hydro. Test Co.	ARB	Project No.	41918944 Test 231018614 Test 2
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97	WATER	
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97		

General Pipe Data

Description	Segment 1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Restrained	Restrained
Outside Diameter	8.625 in.	6.625 in.	8.625 in.	3.500 in.	2.375 in.	1.050 in.	8.625 in.	6.625 in.
Wall Thickness	0.322 in.	0.280 in.	0.250 in.	0.216 in.	0.154 in.	0.154 in.	0.322 in.	0.280 in.
Inside Diameter	7.981 in.	6.065 in.	8.125 in.	3.068 in.	2.067 in.	0.742 in.	7.981 in.	6.065 in.
Spec./Grade	API5L-Grade B	API5L-Grade B	API5L-X42	API5L-Grade B	API5L-Grade B	API5L-Grade B	API5L-Grade B	API5L-Grade B
Length Unrestrained	18 ft	142 ft	3 ft	3 ft	9 ft	14 ft		
Length Restrained							23 ft	22 ft
Temperature -- On Test	68 °F	68 °F	68.0 °F	68.0 °F	68.0 °F	68.0 °F	61.0 °F	61.0 °F
Temperature -- End of Test	67 °F	67 °F	67.0 °F	67.0 °F	67.0 °F	67.0 °F	62.0 °F	62.0 °F
Pressure -- On Test	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig
Pressure -- End of Test	969 psig	969 psig	969 psig	969 psig	969 psig	969 psig	969 psig	969 psig

Unrestrained Pipe

Vo	301.43 gal 38,583 oz.	Vtp1	302.54 gal 38,725 oz.	Vtp2	302.42 gal 38,710 oz.

	1	2	3	4	5	6	7	8
Vo Unrestrained	47 gal	213 gal	8 gal	1 gal	2 gal	0 gal		
Fwp 1	1.003356	1.003356	1.003356	1.003356	1.003356	1.003356		
Fpp 1	1.001131	1.000988	1.001483	1.000648	1.000612	1.000220		
Fpt 1	1.000146	1.000146	1.000146	1.000146	1.000146	1.000146		
Fwt 1	1.000803	1.000803	1.000803	1.000803	1.000803	1.000803		
Fpwt 1 = Fpt/Fwt	0.999343	0.999343	0.999343	0.999343	0.999343	0.999343		
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	46.91 gal	213.58 gal	8.03 gal	1.11 gal	1.66 gal	0.31 gal		
Fwp 2	1.002969	1.002969	1.002969	1.002969	1.002969	1.002969		
Fpp 2	1.001001	1.000875	1.001312	1.000573	1.000542	1.000195		
Fpt 2	1.000127	1.000127	1.000127	1.000127	1.000127	1.000127		
Fwt 2	1.000681	1.000681	1.000681	1.000681	1.000681	1.000681		
Fpwt = Fpt/Fwt	0.999447	0.999447	0.999447	0.999447	0.999447	0.999447		
Vtp = Vo(Fwp)(Fpp)(Fpwt)	46.89 gal	213.50 gal	8.03 gal	1.11 gal	1.66 gal	0.31 gal		

Restrained Pipe

Vo	39,169.65 gal 5,013,715 oz.	Vtp1	39,333.34 gal 5,034,668 oz.	Vtp2	39,310.84 gal 5,031,787 oz.

	1	2	3	4	5	6	7	8
Vo Unrestrained							60 gal	33 gal
Fwp 1							1.003356	1.003356
Fpp 1							1.000827	1.000723
Fpt 1							1.000012	1.000012
Fwt 1							1.000080	1.000080
Fpwt = Fpt/Fwt							0.999932	0.999932
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)							60 gal	33 gal
Fwp 2							1.002969	1.002969
Fpp 2							1.000736	1.000644
Fpt 2							1.000024	1.000024
Fwt 2							1.000181	1.000181
Fpwt = Fpt/Fwt							0.999844	0.999844
Vtp = Vo(Fwp)(Fpp)(Fpwt)							60 gal	33 gal

Combined Pipe

Vo	39,471.08 gal 5,052,298 oz.	Vtp1	39,635.88 gal 5,073,393 oz.	Vtp2	39,613.26 gal 5,070,497 oz.

Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company
Construction Co.	ARB
Hydro. Test Co.	ARB
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97

General Pipe Data								
Description	Segment							
	9	10	11	12	13	14	15	16
Restrained or Unrestrained?	Restrained	Restrained	Restrained	Restrained	Restrained	Restrained	Restrained	Restrained
Outside Diameter	8.625 in.	8.625 in.	8.625 in.	6.625 in.	6.625 in.	1.050 in.	8.625 in.	1.050 in.
Wall Thickness	0.250 in.	0.322 in.	0.322 in.	0.280 in.	0.188 in.	0.113 in.	0.172 in.	0.113 in.
Inside Diameter	8.125 in.	7.981 in.	7.981 in.	6.065 in.	6.249 in.	0.824 in.	8.281 in.	0.824 in.
Spec./Grade	API5L-X42	API5L-X42	API5L-Grade B	API5L-Grade B	API5L-X42	API5L-Grade B	API5L-X42	28ksmys
Length Unrestrained								
Length Restrained	15 ft	9,959 ft	77 ft	5,748 ft	78 ft	60 ft	1,501 ft	41 ft
Temperature -- On Test	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F
Temperature -- End of Test	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F
Pressure -- On Test	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig	1,095 psig
Pressure -- End of Test	969 psig	969 psig	969 psig	969 psig	969 psig	969 psig	969 psig	969 psig
Unrestrained 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)								
Restrained Pipe								
Vo								
Vo Unrestrained	40 gal	25,882 gal	200 gal	8,627 gal	124 gal	2 gal	4,200 gal	1 gal
Fwp 1	1.003356	1.003356	1.003356	1.003356	1.003356	1.003356	1.003356	1.003356
Fpp 1	1.001083	1.000827	1.000827	1.000723	1.001108	1.000246	1.001603	1.000246
Fpt 1	1.000012	1.000012	1.000012	1.000012	1.000012	1.000012	1.000012	1.000012
Fwt 1	1.000080	1.000080	1.000080	1.000080	1.000080	1.000080	1.000080	1.000080
Fpwt 1 = Fpt/Fwt	0.999932	0.999932	0.999932	0.999932	0.999932	0.999932	0.999932	0.999932
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	41 gal	25,989 gal	201 gal	8,662 gal	125 gal	2 gal	4,220 gal	1 gal
Fwp 2	1.002969	1.002969	1.002969	1.002969	1.002969	1.002969	1.002969	1.002969
Fpp 2	1.000962	1.000736	1.000736	1.000644	1.000984	1.000222	1.001422	1.000222
Fpt 2	1.000024	1.000024	1.000024	1.000024	1.000024	1.000024	1.000024	1.000024
Fwt 2	1.000181	1.000181	1.000181	1.000181	1.000181	1.000181	1.000181	1.000181
Fpwt = Fpt/Fwt	0.999844	0.999844	0.999844	0.999844	0.999844	0.999844	0.999844	0.999844
Vtp = Vo(Fwp)(Fpp)(Fpwt)	41 gal	25,974 gal	201 gal	8,657 gal	125 gal	2 gal	4,218 gal	1 gal
Combined Pipe								
Vo								

Pipe Segment Volume Calculations

Company	Pacific Gas and Electric Company
Construction Co.	ARB
Hydro. Test Co.	ARB
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97

General Pipe Data								
Description	Segment							
	17	18	19					
Restrained or Unrestrained?	Restrained	Unrestrained	Unrestrained					
Outside Diameter	1.050 in.	8.625 in.	8.625 in.					
Wall Thickness	0.113 in.	0.500 in.	0.500 in.					
Inside Diameter	0.824 in.	7.625 in.	7.625 in.					
Spec./Grade	25ksmys	API5L-Grade B	API5L-Grade B					
Length Unrestrained		7 ft	7 ft					
Length Restrained	18 ft							
Temperature -- On Test	61.0 °F	68.0 °F	68.0 °F					
Temperature -- End of Test	62.0 °F	67.0 °F	67.0 °F					
Pressure -- On Test	1,095 psig	1,095 psig	1,095 psig					
Pressure -- End of Test	969 psig	969 psig	969 psig					
Unrestrained Pipe								
Vo								
Vo Unrestrained		15 gal	15 gal					
Fwp 1		1.003356	1.003356					
Fpp 1		1.000696	1.000696					
Fpt 1		1.000146	1.000146					
Fwt 1		1.000803	1.000803					
Fpwt 1 = Fpt/Fwt		0.999343	0.999343					
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		15.47 gal	15.47 gal					
Fwp 2		1.002969	1.002969					
Fpp 2		1.000616	1.000616					
Fpt 2		1.000127	1.000127					
Fwt 2		1.000681	1.000681					
Fpwt = Fpt/Fwt		0.999447	0.999447					
Vtp = Vo(Fwp)(Fpp)(Fpwt)		15.47 gal	15.47 gal					
Restrained Pipe								
Vo								
Vo Unrestrained	0 gal							
Fwp 1	1.003356							
Fpp 1	1.000246							
Fpt 1	1.000012							
Fwt 1	1.000080							
Fpwt 1 = Fpt/Fwt	0.999932							
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	1 gal							
Fwp 2	1.002969							
Fpp 2	1.000222							
Fpt 2	1.000024							
Fwt 2	1.000181							
Fpwt = Fpt/Fwt	0.999844							
Vtp = Vo(Fwp)(Fpp)(Fpwt)	1 gal							
Combined Pipe								
Vo								

Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company	Job Number	41918944 Test 231018614 Test 2
Construction Co.	ARB	Job Number	41918944 Test 2
Hydro. Test Co.	ARB	Project No.	41918944 Test 231018614 Test 2
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97	WATER	
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97		

General Pipe Data

Description	Segment 1	2	3	4	5	6	7	8
Restrained or Unrestrained?	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Unrestrained	Restrained	Restrained
Outside Diameter	8.625 in.	6.625 in.	8.625 in.	3.500 in.	2.375 in.	1.050 in.	8.625 in.	6.625 in.
Wall Thickness	0.322 in.	0.280 in.	0.250 in.	0.216 in.	0.154 in.	0.154 in.	0.322 in.	0.280 in.
Inside Diameter	7.981 in.	6.065 in.	8.125 in.	3.068 in.	2.067 in.	0.742 in.	7.981 in.	6.065 in.
Spec./Grade	API5L-Grade B	API5L-Grade B	API5L-X42	API5L-Grade B	API5L-Grade B	API5L-Grade B	API5L-Grade B	API5L-Grade B
Length Unstrained	18 ft	142 ft	3 ft	3 ft	9 ft	14 ft		
Length Restrained							23 ft	22 ft
Temperature -- On Test	67.0 °F	67.0 °F	67.0 °F	67.0 °F	67.0 °F	67.0 °F	61.0 °F	61.0 °F
Temperature -- End of Test	68.0 °F	68.0 °F	68.0 °F	68.0 °F	68.0 °F	68.0 °F	62.0 °F	62.0 °F
Pressure -- On Test	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig
Pressure -- End of Test	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig

Unrestrained Pipe

Vo	301.43 gal		Vtp1	302.50 gal		Vtp2	302.47 gal	
	38,583 oz.			38,720 oz.			38,716 oz.	
Vo Unrestrained	47 gal	213 gal	8 gal	1 gal	2 gal	0 gal		
Fwp 1	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163		
Fpp 1	1.001066	1.000931	1.001398	1.000611	1.000577	1.000207		
Fpt 1	1.000127	1.000127	1.000127	1.000127	1.000127	1.000127		
Fwt 1	1.000681	1.000681	1.000681	1.000681	1.000681	1.000681		
Fpwt 1 = Fpt/Fwt	0.999447	0.999447	0.999447	0.999447	0.999447	0.999447		
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	46.90 gal	213.55 gal	8.03 gal	1.11 gal	1.66 gal	0.31 gal		
Fwp 2	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163		
Fpp 2	1.001066	1.000931	1.001398	1.000611	1.000577	1.000207		
Fpt 2	1.000146	1.000146	1.000146	1.000146	1.000146	1.000146		
Fwt 2	1.000803	1.000803	1.000803	1.000803	1.000803	1.000803		
Fpwt = Fpt/Fwt	0.999343	0.999343	0.999343	0.999343	0.999343	0.999343		
Vtp = Vo(Fwp)(Fpp)(Fpwt)	46.89 gal	213.53 gal	8.03 gal	1.11 gal	1.66 gal	0.31 gal		

Restrained Pipe

Vo	39,169.65 gal		Vtp1	39,323.75 gal		Vtp2	39,320.43 gal	
	5,013,715 oz.			5,033,440 oz.			5,033,014 oz.	
Vo Restrained							60 gal	33 gal
Fwp 1							1.003163	1.003163
Fpp 1							1.000779	1.000682
Fpt 1							1.000012	1.000012
Fwt 1							1.000080	1.000080
Fpwt 1 = Fpt/Fwt							0.999932	0.999932
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)							60 gal	33 gal
Fwp 2							1.003163	1.003163
Fpp 2							1.000783	1.000685
Fpt 2							1.000024	1.000024
Fwt 2							1.000181	1.000181
Fpwt = Fpt/Fwt							0.999844	0.999844
Vtp = Vo(Fwp)(Fpp)(Fpwt)							60 gal	33 gal

Combined Pipe

Vo	39,471.08 gal		Vtp1	39,626.25 gal		Vtp2	39,622.89 gal	
	5,052,298 oz.			5,072,159 oz.			5,071,730 oz.	
1 °F Change	3.35 gal		429.27 oz.					

Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company
Construction Co.	ARB
Hydro. Test Co.	ARB
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97

General Pipe Data								
Description	Segment							
	9	10	11	12	13	14	15	16
Restrained or Unrestrained?	Restrained	Restrained	Restrained	Restrained	Restrained	Restrained	Restrained	Restrained
Outside Diameter	8.625 in.	8.625 in.	8.625 in.	6.625 in.	6.625 in.	1.050 in.	8.625 in.	1.050 in.
Wall Thickness	0.250 in.	0.322 in.	0.322 in.	0.280 in.	0.188 in.	0.113 in.	0.172 in.	0.113 in.
Inside Diameter	8.125 in.	7.981 in.	7.981 in.	6.065 in.	6.249 in.	0.824 in.	8.281 in.	0.824 in.
Spec./Grade	API5L-X42	API5L-X42	API5L-Grade B	API5L-Grade B	API5L-X42	API5L-Grade B	API5L-X42	28ksmys
Length Unstrained								
Length Restrained	15 ft	9,959 ft	77 ft	5,748 ft	78 ft	60 ft	1,501 ft	41 ft
Temperature -- On Test	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F	61.0 °F
Temperature -- End of Test	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F	62.0 °F
Pressure -- On Test	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig
Pressure -- End of Test	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig	1,032 psig
Unrestrained 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)								
Restrained Pipe								
Vo								
Vo Restrained	40 gal	25,882 gal	200 gal	8,627 gal	124 gal	2 gal	4,200 gal	1 gal
Fwp 1	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163
Fpp 1	1.001021	1.000779	1.000779	1.000682	1.001044	1.000232	1.001511	1.000232
Fpt 1	1.000012	1.000012	1.000012	1.000012	1.000012	1.000012	1.000012	1.000012
Fwt 1	1.000080	1.000080	1.000080	1.000080	1.000080	1.000080	1.000080	1.000080
Fpwt 1 = Fpt/Fwt	0.999932	0.999932	0.999932	0.999932	0.999932	0.999932	0.999932	0.999932
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	41 gal	25,983 gal	201 gal	8,660 gal	125 gal	2 gal	4,219 gal	1 gal
Fwp 2	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163	1.003163
Fpp 2	1.001025	1.000783	1.000783	1.000685	1.001048	1.000235	1.001514	1.000235
Fpt 2	1.000024	1.000024	1.000024	1.000024	1.000024	1.000024	1.000024	1.000024
Fwt 2	1.000181	1.000181	1.000181	1.000181	1.000181	1.000181	1.000181	1.000181
Fpwt = Fpt/Fwt	0.999844	0.999844	0.999844	0.999844	0.999844	0.999844	0.999844	0.999844
Vtp = Vo(Fwp)(Fpp)(Fpwt)	41 gal	25,980 gal	201 gal	8,659 gal	125 gal	2 gal	4,219 gal	1 gal
Combined Pipe								
Vo								
1 °F Change								

Pipe Segment Volume Allowance Calculations

Company	Pacific Gas and Electric Company
Construction Co.	ARB
Hydro. Test Co.	ARB
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97

General Pipe Data								
Description	Segment							
	17	18	19					
Restrained or Unrestrained?	Restrained	Unrestrained	Unrestrained					
Outside Diameter	1.050 in.	8.625 in.	8.625 in.					
Wall Thickness	0.113 in.	0.500 in.	0.500 in.					
Inside Diameter	0.824 in.	7.625 in.	7.625 in.					
Spec./Grade	25ksmys	API5L-Grade B	API5L-Grade B					
Length Unstrained		7 ft	7 ft					
Length Restrained	18 ft							
Temperature -- On Test	61.0 °F	67.0 °F	67.0 °F					
Temperature -- End of Test	62.0 °F	68.0 °F	68.0 °F					
Pressure -- On Test	1,032 psig	1,032 psig	1,032 psig					
Pressure -- End of Test	1,032 psig	1,032 psig	1,032 psig					
Unrestrained Pipe								
Vo								
Vo Unrestrained		15 gal	15 gal					
Fwp 1		1.003163	1.003163					
Fpp 1		1.000656	1.000656					
Fpt 1		1.000127	1.000127					
Fwt 1		1.000681	1.000681					
Fpwt 1 = Fpt/Fwt		0.999447	0.999447					
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)		15.47 gal	15.47 gal					
Fwp 2		1.003163	1.003163					
Fpp 2		1.000656	1.000656					
Fpt 2		1.000146	1.000146					
Fwt 2		1.000803	1.000803					
Fpwt = Fpt/Fwt		0.999343	0.999343					
Vtp = Vo(Fwp)(Fpp)(Fpwt)		15.47 gal	15.47 gal					
Restrained Pipe								
Vo								
Vo Restrained	0 gal							
Fwp 1	1.003163							
Fpp 1	1.000232							
Fpt 1	1.000012							
Fwt 1	1.000080							
Fpwt 1 = Fpt/Fwt	0.999932							
Vtp 1 = Vo(Fwp)(Fpp)(Fpwt)	1 gal							
Fwp 2	1.003163							
Fpp 2	1.000235							
Fpt 2	1.000024							
Fwt 2	1.000181							
Fpwt = Fpt/Fwt	0.999844							
Vtp = Vo(Fwp)(Fpp)(Fpwt)	1 gal							
Combined Pipe								
Vo								
1 °F Change								

Hydrostatic Pressure Test Pipe Data Table

Pipe Type		Length	Restrained / Unrestrained	Outside Diameter	Wall Thickness	Specification & Grade	Pipe Yield Pressure	Material	Joint Type	Seam Type
1	101	17.98 ft	Unrestrained	8.625 in.	0.3220 in.	API5L-Grade B	2,613 psig	Steel	Arc Weld	SM
2	104	141.79 ft	Unrestrained	6.625 in.	0.2800 in.	API5L-Grade B	2,958 psig	Steel	Arc Weld	SM
3	102	2.97 ft	Unrestrained	8.625 in.	0.2500 in.	API5L-X42	2,435 psig	Steel	Arc Weld	ERW-HF
4	105	2.88 ft	Unrestrained	3.500 in.	0.2160 in.	API5L-Grade B	4,320 psig	Steel	Arc Weld	SM
5	106	9.48 ft	Unrestrained	2.375 in.	0.1540 in.	API5L-Grade B	4,539 psig	Steel	Arc Weld	SM
6	107	13.80 ft	Unrestrained	1.050 in.	0.1540 in.	API5L-Grade B	10,267 psig	Steel	Arc Weld	SM
7	101	22.90 ft	Restrained	8.625 in.	0.3220 in.	API5L-Grade B	2,613 psig	Steel	Arc Weld	SM
8	104	21.74 ft	Restrained	6.625 in.	0.2800 in.	API5L-Grade B	2,958 psig	Steel	Arc Weld	SM
9	102	15.01 ft	Restrained	8.625 in.	0.2500 in.	API5L-X42	2,435 psig	Steel	Arc Weld	ERW-HF
10	1	9,959.32 ft	Restrained	8.625 in.	0.3220 in.	API5L-X42	3,136 psig	Steel	Arc Weld	ERW-LF
11	2	76.92 ft	Restrained	8.625 in.	0.3220 in.	API5L-Grade B	2,613 psig	Steel	Arc Weld	SM
12	5	5,748.43 ft	Restrained	6.625 in.	0.2800 in.	API5L-Grade B	2,958 psig	Steel	Arc Weld	SM
13	6	78.10 ft	Restrained	6.625 in.	0.1880 in.	API5L-X42	2,384 psig	Steel	Arc Weld	ERW-LF
14	16	60.00 ft	Restrained	1.050 in.	0.1130 in.	API5L-Grade B	7,533 psig	Steel	Arc Weld	SM
15	4	1,501.12 ft	Restrained	8.625 in.	0.1720 in.	API5L-X42	1,675 psig	Steel	Arc Weld	ERW-LF
16	14	41.00 ft	Restrained	1.050 in.	0.1130 in.	28ksmys	6,027 psig	Steel	Arc Weld	FBW
17	15	18.00 ft	Restrained	1.050 in.	0.1130 in.	25ksmys	5,381 psig	Steel	Arc Weld	FBW
18	TH	6.50 ft	Unrestrained	8.625 in.	0.5000 in.	API5L-Grade B	4,058 psig	Steel	Arc Weld	SM
19	TH	6.50 ft	Unrestrained	8.625 in.	0.5000 in.	API5L-Grade B	4,058 psig	Steel	Arc Weld	SM

Hydrostatic Test Project Owner & Participants

Owner Company	Pacific Gas and Electric Company	Job Number
Address	6121 Bollinger Canyon RD San Ramon CA 94583 Attention: Mark Cabral, Aziza Tarin	41918944 Test 2 31018614 Test 2
Construction Company	ARB	Job Number
Address	1875 Loveridge Road Pittsburg, CA 94565 Attention: T. Barnes	41918944 Test 2 31018614 Test 2
Hydrostatic Test Co.	ARB	Project No.
Address	1875 Loveridge Road Pittsburg, CA 94565	41918944 Test 2 31018614 Test 2
Test Section	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97 From: 0+00 MP 0.00 To: 172+37 MP 2.97	
File Name	RCP J00110 - T-343-14 Test 2, L-191A, MP 0.002 - 2.97	

Test Specifications

Test Factor	1.5	[1A]Minimum Test Pressure at Maximum Elevation		680 psig	[1B]Maximum Test Pressure at Minimum Elevation				1,120 psig
ASME B31.8S -- Integrity Assessment Interval			10 years	Desired MAOP % SMYS		16.89%	ASME B31.8S Minimum Test Factor		2.20
Spike Test	Yes	[1C]Spike Factor	1.2	[1D]Spike Pressure at Maximum Elevation	816 psig	[1E]Spike Pressure at Minimum Elevation	1,111 psig	[1F]Max. Post-Spike Pressure at Minimum Elevation @	90%	999 psig
Test Medium to Be Used		Water	Minimum Test Duration	1.00 hours	Spike Duration		15 minutes			

Test Elevation

Elevation @ Test Point	726 ft	Location	172+37		
Maximum Elevation in Test Section	1,370 ft	Location	04+65	[2A]Static Head Between Test Point and Maximum Elevation	(280) psi
Minimum Elevation in Test Section	691 ft	Location	151+09	[2B]Static Head Between Test Point and Minimum Elevation	16 psi

No Spike Test: Calculations and Test Results

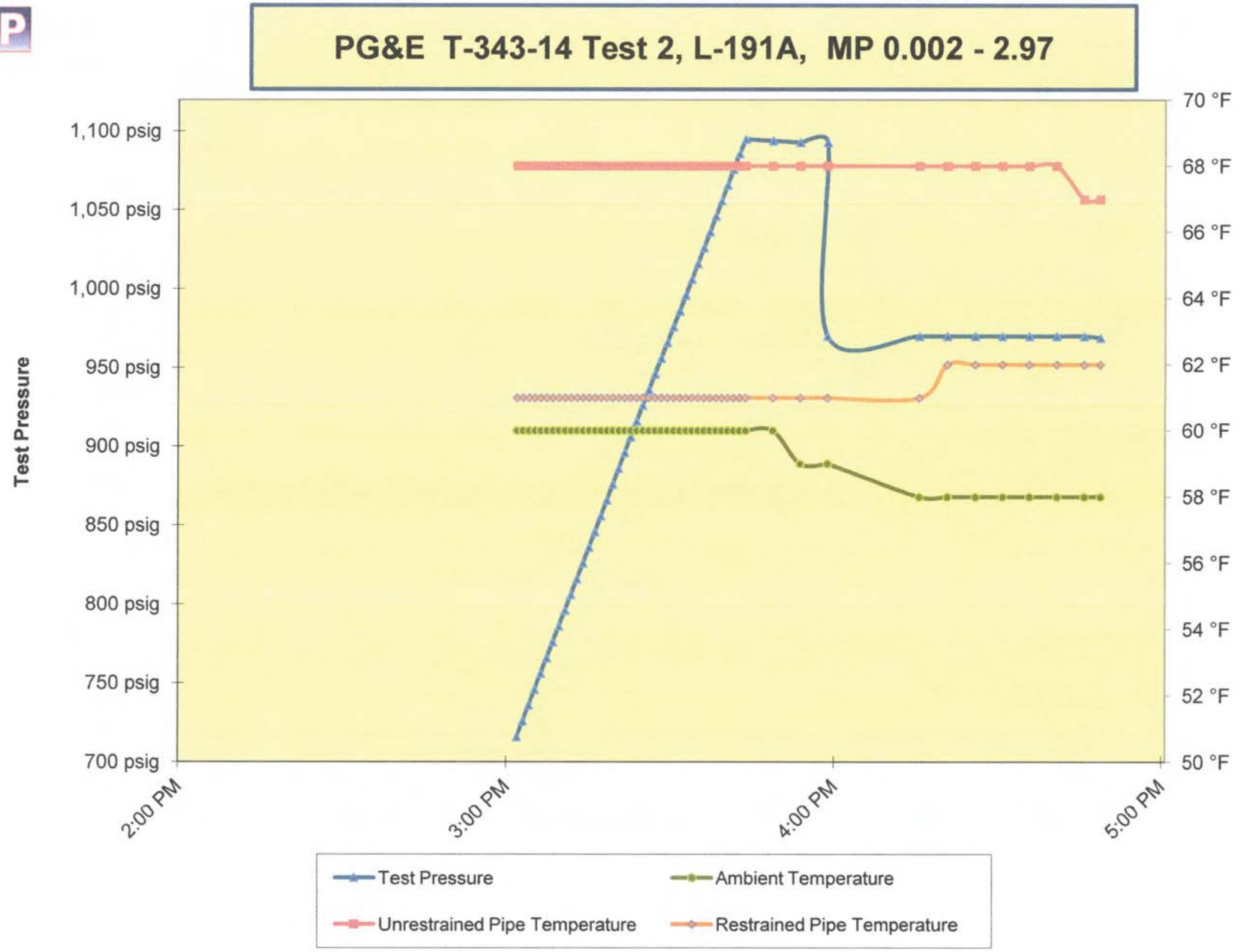
Min. Required Test Press At Test Point	NA	Max. Allowable Test Press at Test Point	NA	Pressure Range During Test	NA
[2C]Minimum Test Pressure Indicated	NA	[2D]Maximum Test Pressure Indicated	NA		
Calculated Min. Test Pressure at Max. Elevation	NA	Calculated Max. Test Pressure at Min. Elevation	NA		

Spike Test: Calculations and Test Results

Spike Pressure at Test point	1,095 psig	Min. Required Test Press At Test Point	960 psig	Max. Post-Spike Pressure at Test Point	983 psig	Pressure Range After Spike Test	23 psig
[2E]Spike Pressure Indicated	1,095 psig	[2F]Minimum Test Pressure Indicated	969 psig	[2G]Max. Post-Spike Test Pressure Indicated		970 psig	
Calculated Spike Pressure at Min. Elevation	1,111 psig	Calculated Min. Test Pressure at Max. Elevation	689 psig	Calculated Max. Post Spike Pressure at Min. Elevation		986 psig	

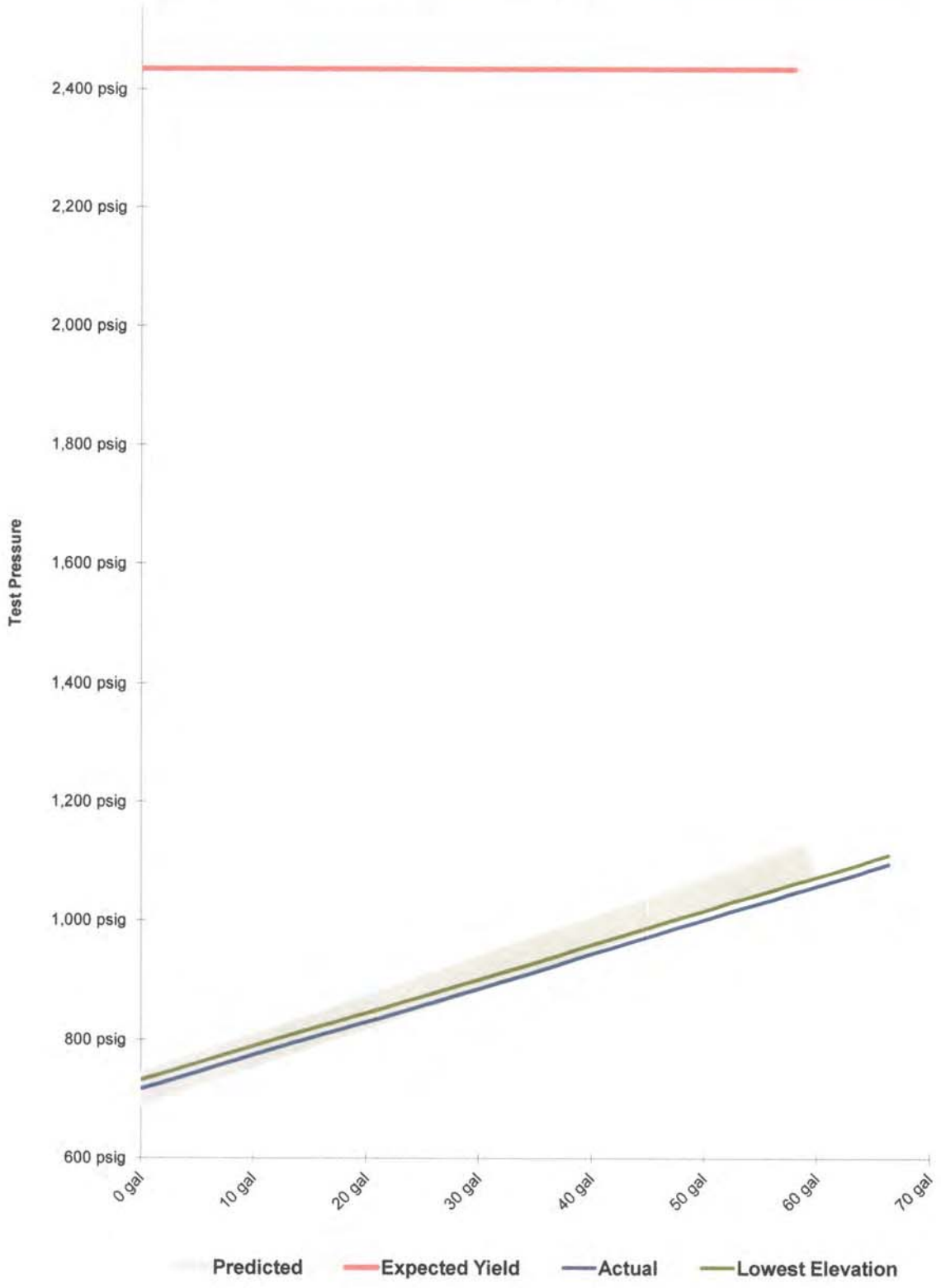
Test Acceptance

	Time and Date Test Pressure Reached	11-Nov-2014 15:43	Time and Date Test Ended	11-Nov-2014 16:48	Actual Duration of Test	1 hours 5 minutes	
Hydrostatic Test Date:	11-Nov-2014 15:02	Code of Federal Regulations, Title 49, Part 192, Subpart J (Class 3)					
Test Fluid Density	62.40 lb/ft³	Pacific Gas and Electric Company's desired MAOP				283 psig	
Ramp Hold Pressure	720 psig	Target Test Pressure	970 psig				


PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97
Test Pressure
1,100 psig
1,050 psig
1,000 psig
950 psig
900 psig
850 psig
800 psig
750 psig
700 psig
70 °F
68 °F
66 °F
64 °F
62 °F
60 °F
58 °F
56 °F
54 °F
52 °F
50 °F
2:00 PM
3:00 PM
4:00 PM
5:00 PM
Test Pressure
Ambient Temperature
Unrestrained Pipe Temperature
Restrained Pipe Temperature

RCP

Spike Pressure Test
Stress Strain Curve -- PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97



RCP

Actual Pressure Volume Plot Data		
Pressure	Pump Strokes	Gallons
716 psig	0	0.00 gal
726 psig	26	1.83 gal
736 psig	51	3.58 gal
746 psig	75	5.27 gal
756 psig	99	6.96 gal
766 psig	123	8.64 gal
776 psig	147	10.33 gal
786 psig	171	12.01 gal
796 psig	196	13.77 gal
806 psig	221	15.53 gal
816 psig	247	17.35 gal
826 psig	272	19.11 gal
836 psig	299	21.01 gal
846 psig	324	22.76 gal
856 psig	350	24.59 gal
866 psig	376	26.42 gal
876 psig	401	28.17 gal
886 psig	427	30.00 gal
896 psig	452	31.76 gal
906 psig	478	33.58 gal
916 psig	504	35.41 gal
926 psig	528	37.10 gal
936 psig	551	38.71 gal
946 psig	575	40.40 gal
956 psig	600	42.16 gal
966 psig	624	43.84 gal
976 psig	649	45.60 gal
986 psig	673	47.28 gal
996 psig	698	49.04 gal
1,006 psig	723	50.80 gal
1,016 psig	745	52.34 gal
1,026 psig	772	54.24 gal
1,036 psig	798	56.07 gal
1,046 psig	822	57.75 gal
1,056 psig	848	59.58 gal
1,066 psig	873	61.34 gal
1,076 psig	898	63.09 gal
1,086 psig	922	64.78 gal
1,095 psig	944	66.33 gal

Spike Pressure Test
Stress Strain Curve -- PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97

Gallons per Pump Strokes @ Efficiency	2.55%	0.07026 gal
Pump Piston Diameter		13.110 in
Pump Piston Stroke		4.72 in
Pump Cylinders per Stroke		1 ea
Volume check gal per Pump Strokes		0.07026 gal
Volume Released (gallons)		1.75 gal
Pressure Reduced (psi)		10 psi
Maximum2		70 gal
Minimum2		0 gal
Maximum		2,535 psig
Minimum1		600 psig
Gallons per Pump Strokes Used		0.0703 gal
Predicted Gallons per Pump Strokes		0.0615 gal
Pressure Increment		10 psi
Max Pressure		1,095 psig
Buried Pipe Temperature		61.0 °F
Exposed Pipe Temperature		68.0 °F

Predicted Volume of Air in Test Segment	23.8 gal
	0.06 % of Fill

Ryan A. Maurer

11-Nov-2014
Date

Test Head Location O

WIWA Pump

ARB Test Trailer

Frack Tanks

Deadweights

Pressure & Ambient Temperature Recorders

Restrained Temperature Recorder

Unrestrained Temperature Recorder

RCP

Hydrostatic Test Log Sheet

Owner Company	Pacific Gas and Electric Company	Job Number	41918944 Test 2 31018614 Test 2
Construction Co.	ARB	Job Number	41918944 Test 2 31018614 Test 2
Testing Co.	ARB	Job Number	41918944 Test 2

Test Section

Name	PG&E T-343-14 Test 2, L-191A, MP 0.002 - 2.97	
	Station (0+00)	Elevation (Feet)
Test Location	172+37	726 ft
Begin	0+00	1,316 ft
End	172+37	726 ft
High Elevation	04+65	1,370 ft
Low Elevation	151+09	691 ft

Pipe Data

Section	Length (ft.)	O. D. (in.)	W.T. (in.)	Unrestrained (ft.)	Restrained (ft.)	Grade	Seam/Joint Type
101	18.0 ft	8.625 in.	0.322 in.	18.0 ft		API5L-Grade B	SM, Arc Weld
104	141.8 ft	6.625 in.	0.280 in.	141.8 ft		API5L-Grade B	SM, Arc Weld
102	3.0 ft	8.625 in.	0.250 in.	3.0 ft		API5L-X42	ERW-HF, Arc Weld
105	2.9 ft	3.500 in.	0.216 in.	2.9 ft		API5L-Grade B	SM, Arc Weld
106	9.5 ft	2.375 in.	0.154 in.	9.5 ft		API5L-Grade B	SM, Arc Weld
107	13.8 ft	1.050 in.	0.154 in.	13.8 ft		API5L-Grade B	SM, Arc Weld
101	22.9 ft	8.625 in.	0.322 in.		22.9 ft	API5L-Grade B	SM, Arc Weld
104	21.7 ft	6.625 in.	0.280 in.		21.7 ft	API5L-Grade B	SM, Arc Weld
102	15.0 ft	8.625 in.	0.250 in.		15.0 ft	API5L-X42	ERW-HF, Arc Weld
1	9,959.3 ft	8.625 in.	0.322 in.		9,959.3 ft	API5L-X42	ERW-LF, Arc Weld
2	76.9 ft	8.625 in.	0.322 in.		76.9 ft	API5L-Grade B	SM, Arc Weld
5	5,748.4 ft	6.625 in.	0.280 in.		5,748.4 ft	API5L-Grade B	SM, Arc Weld
6	78.1 ft	6.625 in.	0.188 in.		78.1 ft	API5L-X42	ERW-LF, Arc Weld
16	60.0 ft	1.050 in.	0.113 in.		60.0 ft	API5L-Grade B	SM, Arc Weld
4	1,501.1 ft	8.625 in.	0.172 in.		1,501.1 ft	API5L-X42	ERW-LF, Arc Weld
14	41.0 ft	1.050 in.	0.113 in.		41.0 ft	28ksmys	FBW, Arc Weld
15	18.0 ft	1.050 in.	0.113 in.		18.0 ft	25ksmys	FBW, Arc Weld
TH	6.5 ft	8.625 in.	0.500 in.	6.5 ft		API5L-Grade B	SM, Arc Weld
TH	6.5 ft	8.625 in.	0.500 in.	6.5 ft		API5L-Grade B	SM, Arc Weld

Test Period	Date	Time	Test Medium	
Begin	11-Nov-14	15:43	Water	☑
End	11-Nov-14	16:48		☐
				☐

Test Instrumentation

Description	Calibration Checked	Serial Number	Date Calibrated / Certified	Installation Correct
Dead Weight Pressure Tester		HL6413	3/18/2014	☑ Yes
Pressure Recorder	☑ Yes	4346	10/16/2014	☑ Yes
Ambient Temperature Recorder	☑ Yes	2099	8/28/2014	☑ Yes
Restrained Pipe Temperature Recorder	☑ Yes	MFG-3011	8/28/2014	☑ Yes
Unrestrained Pipe Temperature Recorder	☑ Yes	2101	5/23/2014	☑ Yes

Hydrostatic Test Log

Log No.	Time	Test Pressure (psig)	Temperature (°F) Ambient	Pipe Unrestrained	Pipe Restrained	Volume ☑ Ounces ☐ Gallons Bleed	Volume Inject	Comments	Model Check: Is test good?
1	11/11/14 3:43 PM	1,095 psig	60 °F	68 °F	61 °F			On Test	
2	11/11/14 3:48 PM	1,094 psig	60 °F	68 °F	61 °F				☑ Yes ☐ No
3	11/11/14 3:53 PM	1,093 psig	59 °F	68 °F	61 °F				☑ Yes ☐ No
4	11/11/14 3:58 PM	1,093 psig	59 °F	68 °F	61 °F				☑ Yes ☐ No
5	11/11/14 3:58 PM	970 psig	59 °F	68 °F	61 °F	2,755.2 oz.			☑ Yes ☐ No
6	11/11/14 4:15 PM	970 psig	58 °F	68 °F	61 °F				☑ Yes ☐ No
7	11/11/14 4:20 PM	970 psig	58 °F	68 °F	62 °F				☑ Yes ☐ No
8	11/11/14 4:25 PM	970 psig	58 °F	68 °F	62 °F				☑ Yes ☐ No
9	11/11/14 4:30 PM	970 psig	58 °F	68 °F	62 °F				☑ Yes ☐ No
10	11/11/14 4:35 PM	970 psig	58 °F	68 °F	62 °F				☑ Yes ☐ No
11	11/11/14 4:40 PM	970 psig	58 °F	68 °F	62 °F				☑ Yes ☐ No
12	11/11/14 4:45 PM	970 psig	58 °F	67 °F	62 °F				☑ Yes ☐ No
13	11/11/14 4:48 PM	969 psig	58 °F	67 °F	62 °F			End of Test	☑ Yes ☐ No
Was a leak observed during test Period?				☐ Yes	☑ No	2,755.2 oz.	0.0 oz.		☑ ☐
If "Yes", Explain:						High Test Pressure:		1,095 psig	
						Low Test Pressure:		969 psig	

Certification:

Pacific Gas and Electric Company Field Engineer: _____ Date: 11-Nov-14

Signature

TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

Certificate of Calibration

ARB, INC. PITTSBURG
1875 LOVRIDGE ROAD
PITTSBURG
CALIFORNIA 94565

Customer ID #	**3773**
File #	**1329**
Instrument Type	**RECORDER, PRESSURE**
Range	**0-2000**
Units	**PSIG**
Resolution	**20**
Mfg.	**TECH-CAL**
Model	**1B200**
Cal By	**MIKE MCCONNELL 90765**
Curent Cal Cycle (Months	**6**
Previous Cal Cycle	**N/A**
Standards Used	**AMETEK DM-T-150 S/N 8681 DUE 3/29/2016 NIST 45204.001**

Certificate Number:	**2402359**
Rated Accuracy	**1%**
Pass/Fail as Found	**PASS**
Pass/Fail as Left	**PASS**
1st (Mfg) S/N	**04346**
2nd S/N	**N/A**
Cal Date	**10/16/2014**
Cal Due	**4/16/2015**
Notes	

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASURMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.

CALIBRATION DATA SHEET
PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER	TSG JOB & ITEM #	CERTIFICATE NO.	CAL DATE	CAL DUE
ARB	3773	2402359	10/16/2014	4/16/2015

MFG.	MODEL	CAL BY	MFG S/N
TECH CAL	1B200	Mike McConnell	04346

RANGE MIN	MAX	UNITS	RESOLUTION	RATED ACCURACY, % FULL SCALE	2ND S/N
0	2,000	PSIG	20	1.00 %	N/A

INSTRUMENT DISCRIPTION

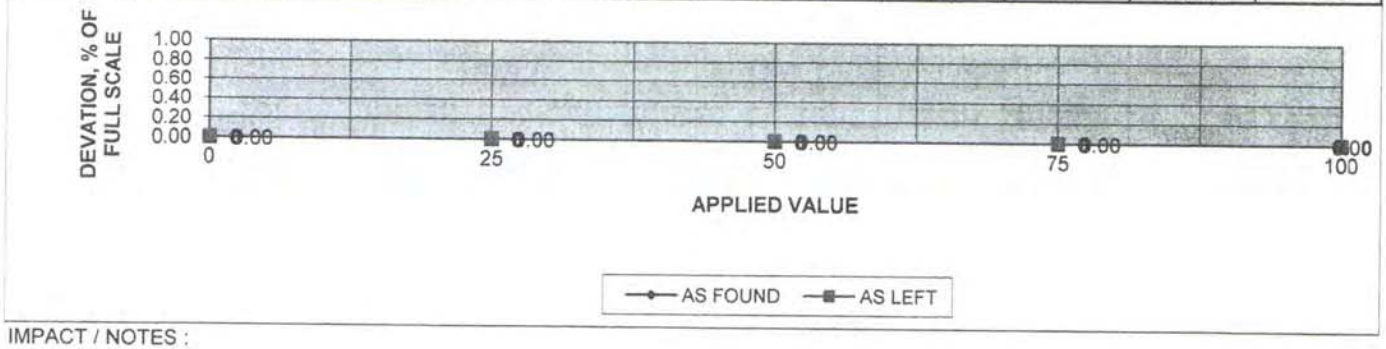
PRESS.	TEMP.	VACUUM	CASE SIZE	CONN. SIZE	CONN. LOCATION	THREAD TYPE
X			RECORDER	N/A	N/A	N/A

STANDARDS USED

	MFG.	MODEL	S/N	RECAL	N.I.S.T #
X	AMATEK	DM-T-150	8681	3/29/2016	4520.001
X	EUTECNICS	139200-1.2	10049	8/7/2015	TE188, TE192, TE195

CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVATION		PASS / FAIL	
	PSIG	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	500.00	500.00	500.00	0.00	0.00	0.00	0.00	PASS	PASS
50	1,000.00	1000.00	1000.00	0.00	0.00	0.00	0.00	PASS	PASS
75	1,500.00	1500.00	1500.00	0.00	0.00	0.00	0.00	PASS	PASS
100	2,000.00	2000.00	2000.00	0.00	0.00	0.00	0.00	PASS	PASS



IMPACT / NOTES :

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TSG CALIBRATION / Q.A. SUPERVISOR

AMBIENT

TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

Certificate of Calibration

ARB, INC. PITTSBURG
1875 LOVRIDGE ROAD
PITTSBURG
CALIFORNIA 94565

Customer ID =	3773
File =	1329
Instrument Type	RECORDER, TEMPERATURE
Range	0-150
Units	DEG F
Resolution	2
Mfg.	TECH CAL
Model	1BT00
Cal By	MIKE MCCONNELL 90765
Current Cal Cycle (Months)	6
Previous Cal Cycle	6
Standards Used	FLUKE 515A SN 10520 5/29/2016 NIST F27829

Certificate Number	2402199
Rated Accuracy	1%
Pass/Fail as Found	PASS
Pass/Fail as Left	PASS
1st Chg S/N	02099
2nd S/N	TC-02
Cal Date	8/28/2014
Cal Due	2/28/2015

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASURMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.

CALIBRATION DATA SHEET
PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER	TSG JOB & ITEM #	CERTIFICATE NO	CAL DATE	CAL DUE
ARB	3773	2402199	8/28/2014	2/28/2015

MFG	MODEL	CAL BY	MFG S/N
TECH CAL	1BT00	Mike McConnell	02093

RANGE MIN	MAX	UNITS	RESOLUTION	RATED ACCURACY, % FULL SCALE	2ND S/N
0	150	DEG F	2	1.00 %	TC-02

INSTRUMENT DISCRIPTION

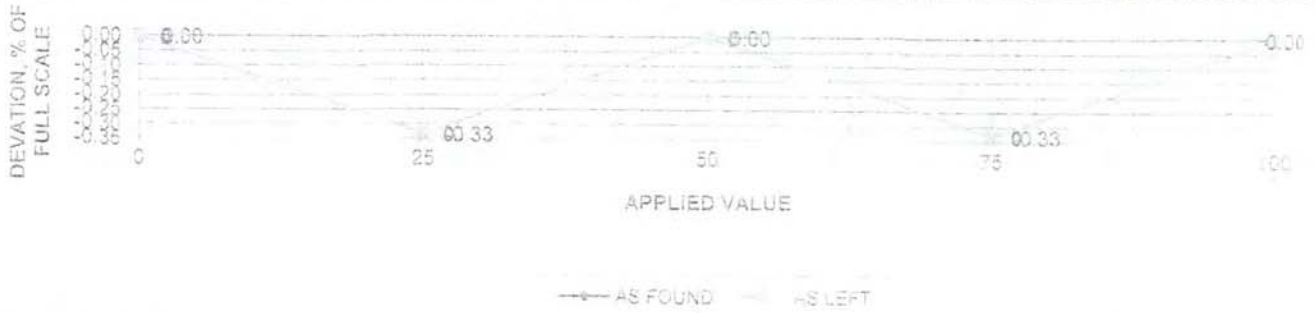
PRESS	TEMP	VACUUM	CASE SIZE	CONN SIZE	CONN LOCATION	THREAD TYPE
	X		N/A	N/A	N/A	N/A

STANDARDS USED

	MFG.	MODEL	S/N	RECAL	N.I.S.T.#
X	AMATEK	DM-T-150	3681	3/29/2016	4520.001
X	FLUKE	515A	10520	5/29/2016	F27829

CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVIATION		PASS / FAIL	
	DEG F	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	37.50	37.00	37.00	-0.50	-0.50	-0.33	-0.33	PASS	PASS
50	75.00	75.00	75.00	0.00	0.00	0.00	0.00	PASS	PASS
75	112.50	112.00	112.00	-0.50	-0.50	-0.33	-0.33	PASS	PASS
100	150.00	150.00	150.00	0.00	0.00	0.00	0.00	PASS	PASS



IMPACT / NOTES :

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TSG CALIBRATION / Q.A. SUPERVISOR

UNRESTRAINED

TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

Certificate of Calibration

ARB, INC. PITTSBURG
1875 LOVRIDGE ROAD
PITTSBURG
CALIFORNIA 94565

Customer ID #	3773
File #	1329
Instrument Type	RECORDER, TEMPERATURE
Range	0-150
Units	DEG F
Resolution	2
Mfg	TECHCAL
Model	1BT00
Cal By	J.P. 082277
Curent Cal Cycle (Months)	12
Previous Cal Cycle	12
Standards Used	EUTECHNICS 139200-1.2 S/N 100049 DUE 7/31/2014 NIST TE188, TE192, TE195

Certificate Number:	2802953
Rated Accuracy	1%
Pass/Fail as Found	PASS
Pass/Fail as Left	PASS
1st (Mfg) S/N	02101
2nd S/N	N/A
Cal Date	5/23/2014
Cal Due	5/23/2015
Notes	

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASURMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.

CALIBRATION DATA SHEET
PRESSURE / TEMPERATURE

TECHNICAL SERVICES GROUP

2900 MAIN ST ALAMEDA CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

LAST REVISION: 4/16/2014

CUSTOMER	TSG JOB	TSG ITEM	CUST. P. O. #	SHIPPING #	DESCRIPTION: PRESS [ ] TEMP [✓] TEST GAGE [ ] RECORDER [✓] OTHER	ASSIGNED G.T #
ARB						2802953

1ST SERIAL #	2ND SERIAL #	MANUFACTURER	MODEL	RANGE	RESOLUTION	DIGITAL	ANALOG
02101	—	Tech Cal	18 T00	0-150	2		✓

CASE SIZE	CONNECTION TYPE BOTTOM [ ] BACK [ ]	CONNECTION SIZE 1/8" [ ] 1/4" [ ] 1/2" [ ] OTHER ___	THREAD TYPE NPT [ ] TUBE [ ] JIC [ ] ISO [ ]	RATED ACCURACY %	NIST TRACEABLE #
				1%	PRESSURE: 45209.001 TEMPERATURE: TE188, TE192, TE195

EXISTING CAL CYCLE	CAL CYCLE UPDATE	LAST CAL DATE	CAL DATE	RECALIBRATE
12 mo	—	1/14	5-23-14	5-23-15

TECHNICIAN	BADGE #	TEMPERATURE DEG. F	RELATIVE HUMIDITY %	CALIBRATION PROCEDURE
J.P.	082277	68 - 72	< 60 %	G-A1 , SCP-01 , SCP-02 , SCP-03

CONDITION

AS RECEIVED		AS RETURNED	
GOOD ✓	DAMAGED	IN TOL. ✓	OUT OF TOL.
IN TOL. ✓	OUT OF TOL.	LIMITED	B.E.R.
		REPAIRED BEFORE TEST	PCS. CALIB. 1

STANDARDS USED

MFG.	MODEL	SERIAL #	RECALIBRATE
AMETEK	DM-T-50	8681	3/29/2016
EUTECHNICS	4600	100049	7/31/2014

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540 UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION

PARAMETER	RANGE .	STANDARD VALUE	OBSERVED INDICATION	CORRECTED INDICATION	TOLERANCE	PASS	FAIL
PRESSURE :	0	0	0		1%		
PSIG ___		32	34	—		✓	
PSID ___		70	70	—		✓	
PSIA ___	0-150	150	152	—		✓	
IN Hg ___							
IN H2O ___							
OTHER ___							
VACUUM :							
IN Hg ___							
OTHER ___							
TEMPERATURE :							
DEG F ✓							
DEG C ✓							
OTHER ___							

DETERMINATION OF IMPACT / NOTES :

TSG CALIBRATION SUP. / QUALITY ASSURANCE SUP.

RESTRAINED

TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

Certificate of Calibration

ARB, INC. PITTSBURG
1875 LOVRIDGE ROAD
PITTSBURG
CALIFORNIA 94565

Customer ID #	3773
File #	1329
Instrument Type	RECORDER, TEMPERATURE
Range	0-150
Units	DEG F
Resolution	2
Mfg.	TECH CAL
Model	1B100
Cal By	MIKE MCCONNELL 90765
Curent Cal Cycle (Months	6
Previous Cal Cycle	12
Standards Used	EUTECHNICS 139200-1.2 S/N 100049 DUE 8/7/2015 NIST TE188, TE192, TE195

Certificate Number:	2402318
Rated Accuracy	1%
Pass/Fail as Found	PASS
Pass/Fail as Left	PASS
1st (Mfg) S/N	02100
2nd S/N	TC-03
Cal Date	10/1/2014
Cal Due	4/1/2015
Notes	

ISO 9000 COMPLIANT

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASURMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.

CALIBRATION DATA SHEET
PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER	TSG JOB & ITEM #	CERTIFICATE NO.	CAL DATE	CAL DUE
ARB	3773	2402318	10/1/2014	4/1/2015

MFG.	MODEL	CAL BY	MFG S/N
TECH CAL	1B100	Mike McConnell	02100

RANGE MIN	MAX	UNITS	RESOLUTION	RATED ACCURACY, % FULL SCALE	2ND S/N
0	150	DEG F	2	1.00 %	TC-03

INSTRUMENT DISCRIPTION

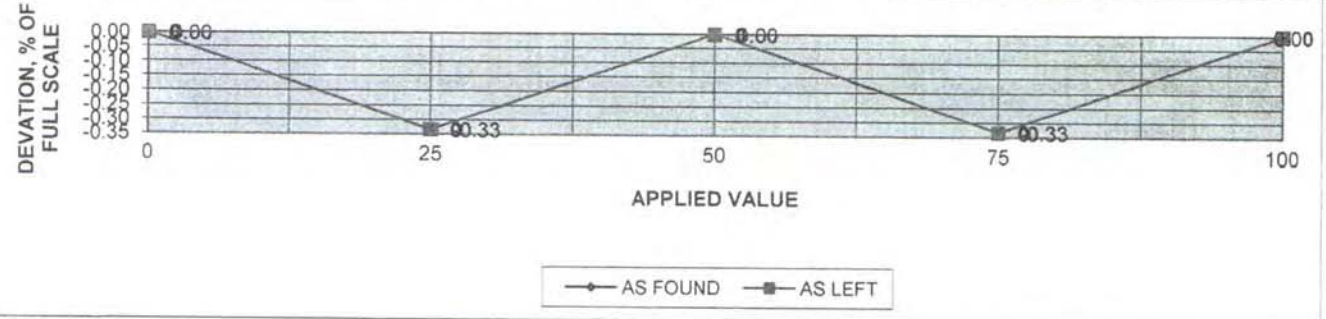
PRESS.	TEMP.	VACUUM	CASE SIZE	CONN. SIZE	CONN. LOCATION	THREAD TYPE
	X		N/A	N/A	N/A	N/A

STANDARDS USED

	MFG.	MODEL	S/N	RECAL	N.I.S.T #
X	AMATEK	DM-T-150	8681	3/29/2016	4520.001
X	EUTECNICS	139200-1.2	10049	8/7/2015	TE188, TE192, TE195

CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVATION		PASS / FAIL	
	DEG F	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	37.50	37.00	37.00	-0.50	-0.50	-0.33	-0.33	PASS	PASS
50	75.00	75.00	75.00	0.00	0.00	0.00	0.00	PASS	PASS
75	112.50	112.00	112.00	-0.50	-0.50	-0.33	-0.33	PASS	PASS
100	150.00	150.00	150.00	0.00	0.00	0.00	0.00	PASS	PASS



IMPACT / NOTES :

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASUREMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION

TSG CALIBRATION / Q.A. SUPERVISOR

REMOTE RESTRAINED

TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

Certificate of Calibration

ARB, INC. PITTSBURG
1875 LOVRIDGE ROAD
PITTSBURG
CALIFORNIA 94565

Customer ID #	3773
File #	1329
Instrument Type	RECORDER, TEMPERATURE
Range	0-150
Units	DEG F
Resolution	2
Mfg.	CLIF-MOCK
Model	N/A
Cal By	MIKE MCCONNELL 90765
Current Cal Cycle (Months)	6
Previous Cal Cycle	6
Standards Used	FLUKE 515A SN 10520 5/29/2016 NIST F27829

Certificate Number	2402200
Rated Accuracy	1%
Pass Calibration Found	PASS
Pass Fail as Left	PASS
1st Mfg's S/N	MFG-3011
2nd S/N	AC-08
Cal Date	8/28/2014
Cal Due	2/28/2015
Notes	

TECHNICAL SERVICES GROUP CERTIFIES THAT THIS INSTRUMENT HAS BEEN CALIBRATED TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY AND CONFORMS TO ISO 10012 AND ANSI / NCSL Z-540. UNLESS OTHERWISE SPECIFIED MEASURMENT UNCERTAINTIES ARE LESS THAN 1/4 OF TOLERANCE OR 1 MINOR DIVISION.

CALIBRATION DATA SHEET
PRESSURE / TEMPERATURE

2900 MAIN ST ALAMEDA, CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER	TSG JOB & ITEM #	CERTIFICATE NO.	CAL DATE	CAL DUE
ARB	3773	2402200	8/28/2014	2/28/2015

MFG	MODEL	CAL BY	MFG S/N
CLIF MOCK	N/A	Mike McConnell	MFG-3011

RANGE MIN	RANGE MAX	UNITS	RESOLUTION	RATED ACCURACY % FULL SCALE	2ND S/N
0	150	DEG F	2	1.00 %	AC-08

INSTRUMENT DISCRIPTION

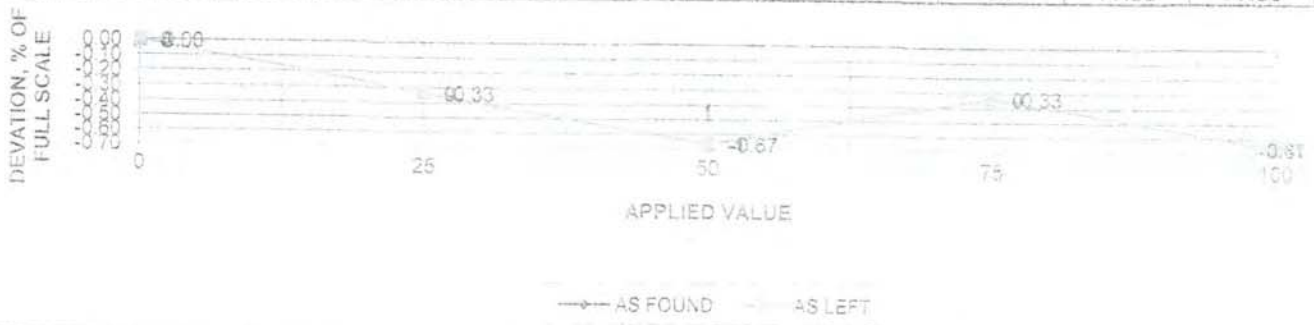
PRESS	TEMP	VACUUM	CASE SIZE	CONN SIZE	CONN. LOCATION	THREAD TYPE
X			RECORDER	1/4"	BACK	N/A

STANDARDS USED

	MFG	MODEL	S/N	RECAL	N.I.S.T #
X	AMATEK	DM-T-150	8661	3/29/2016	4520.001
X	FLUKE	515A	10520	5/29/2016	F27829

CALIBRATION DETAIL

% SPAN	APPLIED VALUE	OBSERVED INDICATION		ERROR		% DEVATION		PASS / FAIL	
	DEG F	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT	AS FOUND	AS LEFT
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PASS	PASS
25	37.50	37.00	37.00	-0.50	-0.50	-0.33	-0.33	PASS	PASS
50	75.00	74.00	74.00	-1.00	-1.00	-0.67	-0.67	PASS	PASS
75	112.50	112.00	112.00	-0.50	-0.50	-0.33	-0.33	PASS	PASS
100	150.00	149.00	149.00	-1.00	-1.00	-0.67	-0.67	PASS	PASS



IMPACT / NOTES :

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TSG CALIBRATION / QA SUPERVISOR

TECHNICAL SERVICES GROUP

2900 Main St Alameda CA 94501 Phone (510)522-8326 Fax (510)522-3136

Certificate of Calibration

ARB, INC. PITTSBURG
1875 LOVRIDGE ROAD
PITTSBURG
CALIFORNIA 94565

Customer ID #	3773
File #	1329
Instrument Type	DEAD WEIGHT TESTER
Range	25-3000
Units	PSIG
Resolution	AS RATED
Mfg.	AMETEK
Model	HL36
Cal By	R.K. STRAHL
Curent Cal Cycle (Months)	12
Previous Cal Cycle	12
Standards Used	AMETEK DM-T-150 S/N 8681 DUE 3/3/2015 NIST 40568.001

Certificate Number:	2802599
Rated Accuracy	.1%
Pass/Fail as Found	PASS
Pass/Fail as Left	PASS
1st (Mfg) S N	HL6413
2nd S N	N/A
Cal Date	3/18/2014
Cal Due	3/18/2015
Notes	

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CALIBRATION DATA SHEET
PRESSURE / TEMPERATURE

LAST REVISION: 9/24/2013

TECHNICAL SERVICES GROUP
2900 MAIN ST ALAMEDA CA 94501 PHONE (510) 522-8326 FAX (510) 522-3136

CUSTOMER	TSG JOB	TSG ITEM	CUST. P. O. #	SHIPPING #	DESCRIPTION: PRESS. / TEMP. / TEST GAGE / RECORDER / OTHER	ASSIGNED G-T #
ARB	3773			41725	DPHD WT TDR	

1ST SERIAL #	2ND SERIAL #	MANUFACTURER	MODEL	RANGE	RESOLUTION	DIGITAL	ANALOG
HL 6413		AMETEK	HL 36	25-3000	✓	—	—

CASE SIZE	CONNECTION TYPE	CONNECTION SIZE	THREAD TYPE	RATED ACCURACY %	NIST TRACEABLE #
—	BOTTOM / BACK	1/8" 1/4" ✓1/2" OTHER	NPT ✓TUBE UN ISO	0.1	PRESSURE: 40568301 TEMPERATURE: TE188, TE192, TE195

EXISTING CAL CYCLE	CAL CYCLE UPDATE	LAST CAL DATE	CAL DATE	RECALIBRATE
4Y		5/13	3/18/14	3/18/15

TECHNICIAN	BADGE #	TEMPERATURE DEG. F	RELATIVE HUMIDITY %	CALIBRATION PROCEDURE
R.K. STRAHL	1502	68 - 72	< 60 %	G-A1, SCP-01, SCP-02, SCP-03

CONDITION

AS RECEIVED		AS RETURNED	
GOOD ✓	DAMAGED	IN TOL. ✓	OUT OF TOL.
IN TOL. ✓	OUT OF TOL.	LIMITED	B.E.R.
		REPAIRED BEFORE TEST	PCS. CALIB.

STANDARDS USED

MFG.	MODEL	SERIAL #	RECALIBRATE
AMETEK	DM-T-50	8681	3/3/2015
EUTECHNICS	4600	100049	7/31/2014

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PARAMETER	RANGE	STANDARD VALUE	OBSERVED INDICATION	CORRECTED INDICATION	TOLERANCE	PASS	FAIL
PRESSURE :							
PSIG ✓		500.0 PSI	500.1 PSI			✓	
PSID							
PSIA		1000.0 PSI	999.9 PSI			✓	
IN Hg							
IN H2O		2000.0 PSI	1999.8 PSI			✓	
OTHER		2500.0 PSI	2499.8 PSI			✓	
VACUUM :		3000.0 PSI	2999.7 PSI			✓	
IN Hg							
OTHER							
TEMPERATURE :							
DEG F							
DEG C							
OTHER							

25 - 3000 PSI

.1%

DETERMINATION OF IMPACT / NOTES :

R.K. Strahl

TSG CALIBRATION SUP. / QUALITY ASSURANCE SUP.

STPR #31018614 TEST 2 OF 4 HYDROTEST TOTALS			
101	8" x 0.322", GR-B, SMLS, BARE	11.07	ft.
111	ELL 90°, 8" x 0.322", GR-B	2.00	ft.
112	ELL 45°, 8" x 0.322", GR-B	0.40	ft.
121	RED, 8" x 6", STD WT, GR-B	0.50	ft.
126	TEE, 8" x 3", STD WT, GR-B	2.34	ft.
201	8" BALL VALVE, ANSI 300	1.67	ft.
TOTAL 8" x 0.322", GR-B, SMLS		**17.98**	**ft.**

102	8" x 0.250", X-42, HFW, BARE	2.97	ft.
TOTAL 8" x 0.250", X-42, HFW		**2.97**	**ft.**

104	6" x 0.280", GR-B, SMLS, BARE	24.23	ft.
115	ELL 90°, 6" x 0.280", GR-B	8.04	ft.
116	ELL 45°, 6" x 0.280", GR-B	3.68	ft.
D	6" x 0.280", GR-B, SMLS, FBE	105.84	ft.
TOTAL 6" x 0.280", GR-B, SMLS		**141.79**	**ft.**

105	3" x 0.216", GR-B, SMLS, BARE	1.16	ft.
122	RED, 3" x 2", STD WT, GR-B	0.56	ft.
126	TEE, 8" x 3" STD, BRANCH, GR-B	1.16	ft.
TOTAL 3" x 0.216", GR-B, SMLS		**2.88**	**ft.**

106	2" x 0.154", GR-B, SMLS, BARE	9.14	ft.
C	2" COUPLING, SOCKETWELD	0.34	ft.
162	CAP, 2", SOCKETWELD, 3000#	2	ea.
TOTAL 2" x 0.154", GR-B, SMLS		**9.48**	**ft.**

107	3/4" x 0.154", GR-B, SMLS, BARE	12.34	ft.
117	ELL 45°, 3/4" x 0.154", #3000	0.96	ft.
165	NIPPLE, 3/4" x 1/2" x 3", GR-B	0.50	ft.
169	1" VALVE TEE, MUELLER	2	ea.
167	1/2" BALL VALVE	2	ea.
168	1/2" PLUG, THREADED	2	ea.
TOTAL 3/4" x 0.154", GR-B, SMLS		**13.80**	**ft.**

STPR #41918944 TEST 2 OF 4 HYDROTEST TOTALS			
101	8" x 0.322", GR-B, SMLS, BARE	14.74	ft.
111	ELL 90°, 8" x 0.322", GR-B	8.00	ft.
112	ELL 45°, 8" x 0.322", GR-B	0.16	ft.
TOTAL 8" x 0.322", GR-B, SMLS		**22.90**	**ft.**

102	8" x 0.250", X-42, HFW, BARE	15.01	ft.
TOTAL 8" x 0.250", X-42, HFW		**15.01**	**ft.**

104	6" x 0.280", GR-B, SMLS, BARE	2.86	ft.
115	ELL 90°, 6" x 0.280", GR-B	1.24	ft.
116	ELL 45°, 6" x 0.280", GR-B	1.24	ft.
161	CAP, 6" x 0.280", GR-B	0.58	ft.
D	6" x 0.280", GR-B, SMLS, FBE	15.82	ft.
TOTAL 6" x 0.280", GR-B, SMLS		**21.74**	**ft.**