

OWNER

Hydrostatic Testing, Dewatering and Drying

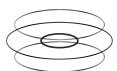


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ISSUE SUMMARY AND APPROVAL

This page records each issue of SPC-SPC-011. The preparer, reviewer and approver sign for each revision.

Rev.	Date	Issue purpose	Description
A	2026-09-29	Issued for Review	First issue

Contributors

Rev.	Discipline	Prepared by	Reviewed by	Approved by
A	Specifications			

SECTION PC - SPC - 011

HYDROSTATIC TESTING, DEWATERING AND DRYING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes the strength and leak testing of all new station piping and of the outlet lateral, followed by dewatering, drying and nitrogen blanketing, with the records required by 49 CFR 192.517:

1. Test procedure, test section definition, test heads, temporary piping, and fill and dewatering equipment.
2. Test water acquisition, filtration, sampling, storage, freeze protection and lawful disposal.
3. Hydrostatic strength test and leak test of each test section.
4. Testing of the Class 150 fuel gas, stainless vent and liquid drain systems at their own test pressures.
5. Dewatering, swabbing, drying to the target dewpoint, and nitrogen blanketing until gas-in.
6. Nondestructive examination and documentation of any closure weld that cannot be pressure tested.
7. Test records and test package turnover.

B. Related sections:

1. SPC-SPC-001, General Requirements and Definitions.
2. SPC-SPC-006, Piping Fabrication and Installation; SPC-SPC-007, Welding; SPC-SPC-008, Nondestructive Examination.
3. SPC-SPC-012, Tie-in, Hot Tap Coordination and Purging.
4. SPC-SPC-014, Instrumentation Installation, Tubing and Calibration (instrument tubing tests).
5. SPC-SPC-019, Inspection and Test Plan; SPC-SPC-020, Construction Records and Turnover.

C. Work by others:

1. Pressure testing of the hot tap fitting and tap valve on the trunkline is performed by (the receiving pipeline operator).
2. Shop tests of pre-tested units are performed by the equipment vendors under their purchase orders. This section defines what the field shall accept.

D. Test sections, elevations and test pressures are calculated in MEC-CAL-003, Hydrostatic Test Calculation. This section governs how the tests are run. Where the two differ, the Contractor shall raise a request for information before testing.

1.02 REFERENCES

A. Codes and regulations, latest edition in force on the date of the contract unless an edition is stated:

1. 49 CFR 192 Subpart J, Test Requirements: 192.503, 192.505, 192.507, 192.515 and 192.517.
2. ASME B31.8-2022, Gas Transmission and Distribution Piping Systems, paragraph 841.3, Testing After Construction.
3. ASME B16.5-2020, Pipe Flanges and Flanged Fittings (flange shell test pressure).
4. ASME B16.34-2020, Valves, Flanged, Threaded and Welding End (valve shell test pressure).
5. ASME PCC-2-2022, Repair of Pressure Equipment and Piping, Article 5.1, Pressure and Tightness Testing (stored energy and safe distance).
6. API RP 1110, Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide.
7. 165:20, Gas and Hazardous Liquid Pipeline Safety.
8. Water Resources Board rules, 785:20 and 785:30, for water use from a stream or well.

B. Project documents:

1. GEN-DB-001, Basis of Design (maximum allowable operating pressure 1,440 psig; test pressure 2,160 psig minimum).
2. MEC-CAL-003, Hydrostatic Test Calculation.
3. MEC-CAL-001, Pipe Wall Thickness, Hoop Stress and Buried Lateral External Loads.
4. MEC-LST-001, Line List; PIP-SPC-001, Piping Material Specification.
5. MEC-DS-001, V-101 Filter Separator; MEC-DS-002, PR-101 Pig Receiver; MEC-DS-003, H-101 Line Heater; MEC-DS-008, Insulating Joints.
6. PRO-DWG-101 to PRO-DWG-111, Piping and Instrumentation Diagrams.
7. REG-RPT-002, Permit and Approvals Matrix (test water source and discharge).
8. CON-RPT-003, Construction HSE Plan (hydrotest exclusion zones).

1.03 DEFINITIONS

A. Test section: a contiguous piping system tested as one unit and bounded by test heads or blind flanges. Closed valves shall not be used as test boundaries, because a Class 600 valve seat is rated for only 1.1 times its 100 °F rating (1,628 psig).

B. Strength test: a test at or above the minimum test pressure for the full hold duration.

C. Leak test: inspection of all accessible joints at a reduced pressure after the strength test.

D. Pre-tested unit: a fabricated unit, skid or vessel tested before installation, for at least 4 hours where 49 CFR 192.505(d) permits.

E. Closure weld: a weld that joins two separately tested sections and is not itself pressure tested.

F. Deadweight tester (DWT): the primary pressure standard during the test.

G. Stabilization: the period after test pressure is reached during which water and pipe temperatures equalize and the pressure trend becomes predictable.

1.04 SUBMITTALS

A. The Contractor shall submit the items in Table 1-1 for the action shown. Work covered by a submittal shall not start until the submittal is returned accepted.

Table 1-1: Submittal Schedule

No.	Submittal	Timing	Action
11-S1	Hydrostatic test procedure: test sections on marked-up P&IDs, boundaries, test heads, fill and vent points, instrument locations, pressure schedule with elevation-corrected pressures, stabilization and hold, acceptance, leak investigation, depressurization, dewatering, drying, blanketing and exclusion zones	30 days before the first test	EOR approval
11-S2	Test head and temporary piping design: drawings, rating, material certificates and the record of each head's pre-test	With 11-S1	EOR approval
11-S3	Water management plan: source, volume, permit or purchase agreement, sampling, storage, freeze protection, additives, discharge location, method and authorization	30 days before the first fill	Owner approval
11-S4	Instrument list with calibration certificates	7 days before each test	Owner review
11-S5	Pre-test checklist QF-11-01 with the test package: weld map, NDE acceptance of every weld, isometrics, list of removed and blinded components	7 days before each test	Owner and EOR review
11-S6	Test record QF-11-02, charts, DWT log QF-11-03, temperature log, pressure-temperature correction QF-11-04	Within 24 hours of test completion	EOR approval
11-S7	Water sampling results and disposal records QF-11-05	Before discharge and at completion	Owner review
11-S8	Dewatering and drying record QF-11-06; nitrogen blanket record QF-11-07	At completion	Owner approval
11-S9	Closure weld package QF-11-08, where a closure weld is approved under 3.11	Before gas-in	EOR approval

1.05 QUALITY ASSURANCE

A. The test supervisor shall have directed at least five hydrostatic tests of steel gas piping at 1,000 psig or more and shall be on site for every test.

B. The Contractor's personnel who operate valves or pressurize piping after the station is connected to a gas source shall be qualified under the Owner's operator qualification program (49 CFR 192 Subpart N).

- C. Hold and witness points shall be as listed in 3.13 and in SPC-SPC-019. The Contractor shall give 7 days' notice of each test to the Owner and the EOR, and 7 days' notice to the receiving pipeline operator for the outlet lateral test.

1.06 MEASUREMENT AND PAYMENT

- A. Pay item 11.01, Hydrostatic testing, dewatering and drying: lump sum per test section (TS-01A, TS-01B, TS-02, TS-03, TS-04 and TS-05). The price shall include the procedure, test heads, temporary piping, fill, pressurization, instruments and calibration, stabilization and hold, leak test, pressure-temperature calculations, depressurization, dewatering, swabbing, drying, soak test, the nitrogen blanket and its maintenance until gas-in, records, and any additional NDE of closure welds. Vendor shop tests are excluded.
- B. Pay item 11.02, Test water acquisition, treatment and disposal: lump sum. The price shall include the source permit or purchase, hauling, storage, filtration, sampling and laboratory analysis, compliance with the discharge authorization, and hauling to disposal. Permits held in the Owner's name are filed by the Owner with data prepared by the Contractor.
- C. Re-tests caused by Contractor leaks, failures, instrument errors or procedure deviations shall be at the Contractor's cost. Re-tests caused by a defect in Owner-furnished material that the Contractor's receiving inspection could not reasonably have found shall be paid as force-account work under pay item 01.06.

PART 2 PRODUCTS

2.01 TEST WATER

- A. Test water shall be fresh water filtered to 100 micron (absolute) at the fill point, with pH 6.0 to 9.0, chlorides 250 mg/L maximum and total suspended solids 50 mg/L maximum.
- B. Water for the stainless vent system (test section TS-04) shall contain no more than 50 mg/L chlorides, verified by a laboratory certificate before fill, because austenitic stainless steel is susceptible to chloride stress corrosion cracking where water evaporates.
- C. No additive shall be used without the written approval of the Owner and the EOR, and then only with a disposal method that covers the additive.

2.02 TEST HEADS, BLINDS AND TEMPORARY PIPING

- A. Temporary test heads shall be welded assemblies of pipe and fittings with a wall thickness greater than that of the pipe under test, designed to ASME B31.8 for the maximum test pressure at their location. Each head shall be hydrostatically pre-tested at 1.25 times the maximum test pressure at its location (2,775 psig for a head on an A6 section at the 2,220 psig low-point limit) before first use, and shall be permanently marked with its rating and pre-test pressure.
- B. Class 600 blind flanges may bound a test section only where the test pressure at the blind does not exceed the ASME B16.5 shell test pressure for the flange (2,220 psig for Class 600, Group

1.1, taken as 1.5 times the 1,480 psig rating at 100 °F). Blinds at A6 boundaries are acceptable because the highest calculated pressure at any A6 low point is 2,195 psig. Blinds on Class 150 and Class 900 connections shall follow the same rule for their class.

- C. Temporary hoses and piping shall be rated for at least the maximum test pressure at their location and restrained with whip checks.

2.03 PUMPS AND DRYING EQUIPMENT

- A. The fill pump shall be able to fill each section in one continuous operation and shall have a 100 micron inlet filter and a flow meter.
- B. The pressurizing pump shall be positive displacement, with a relief valve set at the maximum allowable test pressure at the pump location, and a bleed valve.
- C. Pigs for the outlet lateral shall be bi-directional foam or poly pigs.
- D. The dry air unit shall deliver oil-free air at a dewpoint of -60 °F (atmospheric) or drier.
- E. Nitrogen shall be 99.5 % pure or better, with a certificate.

2.04 INSTRUMENTS

- A. Test instruments shall meet Table 2-1. Every instrument shall carry a calibration traceable to the National Institute of Standards and Technology (NIST).

Table 2-1: Test Instruments

Instrument	Range or type	Accuracy	Calibration
Deadweight tester	Covering 2,160 to 2,220 psig	0.025 % of reading	Within 12 months
Pressure recorder	Test pressure between 50 % and 90 % of span (0 to 3,000 psi for A6)	0.25 % of span	Within 30 days against a DWT; checked against the DWT at the start and end of each test
Pressure gauges	4.5 in dial minimum, 0 to 3,000 psi; one at the pump, one at the high point	0.5 % of span	Within 30 days
Temperature recorders	Two per section minimum: water or pipe wall, and ambient; buried sections measured at pipe depth	0.5 °F	Within 30 days
Dewpoint meter	Chilled mirror or ceramic sensor to -80 °F	2 °F	Within 6 months

PART 3 EXECUTION

3.01 PREREQUISITES

- A. Before a section is filled, the Contractor shall complete pre-test checklist QF-11-01 and obtain its release under hold point HP-11-02. The checklist shall confirm the following:
1. All welds in the section are complete and accepted by NDE under SPC-SPC-008, and the weld map and NDE log are reconciled.
 2. Buried field joints are coated and accepted under SPC-SPC-009. Closure and tie-in welds are left exposed.
 3. Permanent supports are installed, and temporary supports are added where the water weight exceeds the permanent support design in MEC-CAL-004, Piping Flexibility and Stress Screening.
 4. Instruments, relief valves, thermal relief valve TSV-136, analyzer probe SP-141 and every other pressure-limited item are removed or isolated and blinded. Open instrument connections are plugged with Class 6000 plugs.
 5. Control valves FCV-131 and FCV-132 are replaced by test spools, unless the vendor confirms in writing that body, trim and actuator are suitable for 2,195 psig.
 6. In-line ball valves are half open so that the body cavity fills and the seats carry no differential pressure. Check valve CKV-171 is set open or its internals removed per the vendor.
 7. Exclusion zones are barricaded and signed, and the notifications in 1.05 C have been made.
 8. Test water has been sampled and meets 2.01.

3.02 TEST SECTIONS

- A. The Contractor's test packages shall follow the section boundaries of MEC-CAL-003, summarized in Table 3-1. The station piping upstream and downstream of meter skid SK-110 is tested in two sections because the skid, a pre-tested unit, is the only connection between them and is blinded during the station tests.

Table 3-1: Test Sections

Section	Extent (MEC-CAL-003 governs)	Class	Target at high point, psig	Worst low point, psig	Low-point limit, psig	Hold, h
TS-01A	IJ-101 to SK-110 inlet flange; PR-101 included; V-101 isolated	A6	2,175	2,195	2,220	8
TS-01B	SK-110 outlet flange to the downstream face of SDV-103; H-101 coil isolated	A6	2,175	2,192	2,220	8

Section	Extent (MEC-CAL-003 governs)	Class	Target at high point, psig	Worst low point, psig	Low-point limit, psig	Hold, h
TS-02	Outlet lateral, SDV-103 downstream flange through IJ-102 to a test head at the tap end	A6	2,175	2,194	2,220	8
TS-03	Fuel gas downstream of FG-101 to H-101 and G-101	A1	435	443	450	4
TS-04	Stainless vent header and branches to the VS-101 inlet flange	S1	418	424	425	4
TS-05	Liquid drains downstream of the specification breaks to T-101	D1	435	444	450	4
PT-01 to PT-05	SK-110 skid, FG-101 skid, V-101 liquid outlet spools, V-101, H-101 coil (vendor shop tests)	A6, A1	Per vendor	Per vendor	Per class	4 minimum

Note 1: The outlet lateral is about 96 ft of NPS 12, 0.500 in wall pipe from IJ-102 to the tap valve (HOLD H-04, final length by survey). It is tested against a temporary test head before it is connected, so no test pressure acts on the tap valve.

B. Vessels. V-101 shall be excluded from the field test and blinded at its nozzles, because its shop hydrotest (2,225 psig) is the vessel's own test and a second field test would add no assurance while exposing the coalescer internals to water. PR-101, shop tested at 2,225 psig, shall be included in TS-01A. The H-101 coil shall be excluded, with Class 900 blinds on its Class 900 companion flanges. Insulating joints IJ-101 and IJ-102 shall be included; their factory test shall be 2,225 psig because the field test reaches 2,195 psig at the joint.

C. Meter skid SK-110 shall be tested at the vendor with the ultrasonic meters and flow conditioners replaced by spools, and shall not be retested in the field.

3.03 TEST PRESSURE WINDOW

A. The minimum test pressure is 2,160 psig (1.5 times the 1,440 psig maximum allowable operating pressure) at the high point of every A6 section. The maximum at the low point is the lowest of the 100 % SMYS pressure of the thinnest pipe or fitting (MEC-CAL-001), the valve shell test pressure, the flange shell test pressure and any vendor limit. For Class 600 piping the flange shell test pressure governs:

$$P_{fl} = 1.5 \times 1,480 = 2,220 \text{ psig}$$

B. Water at 60 °F and test pressure adds 0.4361 psi per foot of elevation difference, so the pressure at the low point is:

$$P_{low} = P_{high} + 0.4361 (z_{high} - z_{low})$$

- C. The target band at the high point shall be 2,160 to 2,190 psig, with a target of 2,175 psig. The largest elevation difference in any A6 section is 11.2 ft in TS-01A, which gives 2,195 psig at the low point at the top of the band, 25 psi inside the limit.
- D. Test pressure shall be measured with the DWT connected at the high point. Where it is connected elsewhere, the reading shall be corrected by 0.4361 times the elevation difference. The procedure shall show the surveyed high and low elevations of each section. If the as-built elevations differ from those in MEC-CAL-003 by more than 1 ft, the Contractor shall submit revised pressures before the test.

3.04 FILL

- A. Sections shall be filled from the low point, venting air at every high point until solid water flows. A fill pig shall run ahead of the water in the outlet lateral.
- B. The fill rate shall be low enough to avoid air entrainment. The volume shall be recorded by flow meter, and a difference of more than 5 % from the calculated section volume shall trigger an air check.
- C. At about 50 % of test pressure the Contractor shall record the volume added per psi. A value more than 1.06 times the theoretical value in MEC-CAL-003 indicates entrained air, and the section shall be re-vented.
- D. Pressurization to test pressure shall not start until the water-to-pipe (or water-to-ground for buried pipe) temperature difference is 2 °F or less.

3.05 PRESSURIZATION AND STRENGTH TEST

- A. Pressure shall be raised at no more than 50 psi/min, with 15 min holds at 50 % and 80 % of test pressure to check for leaks from outside the exclusion zone and to confirm that the instruments agree. Above 80 %, the rate shall not exceed 20 psi/min.
- B. After the pump is isolated, the section is stable when two consecutive 30 min DWT readings differ by no more than the thermal change predicted in 3.07 plus 2 psi.
- C. The strength test hold shall be 8 hours continuous from the end of stabilization for A6 sections, and 4 hours for the A1, S1 and D1 sections and the pre-tested units. DWT readings shall be recorded every 15 min for the first hour and every 30 min thereafter, with water or pipe temperature and ambient temperature every 30 min and the chart running continuously.
- D. Pressure may be topped up only during stabilization. If the high-point pressure falls below 2,160 psig during the hold, the hold shall restart after the section is re-pressurized and re-stabilized.
- E. Pressure at the low point shall never exceed the limit in Table 3-1. The pump relief valve shall be set to ensure this.

3.06 LEAK TEST

- A. After the strength test, pressure shall be reduced to no more than 1,440 psig at no more than 100 psi/min and held for at least 30 min, and every accessible flange, weld, threaded joint and valve shall be inspected. Personnel shall approach joints only at this reduced pressure and never during the strength test, because of the stored energy in the section.

3.07 PRESSURE-TEMPERATURE CORRECTION

- A. The pressure change during the hold shall be reconciled with the water temperature change using the relation for restrained, water-filled pipe:

API RP 1110, pressure-temperature relationship for restrained pipe

$$\frac{dP}{dT} = \frac{\beta - 2\alpha}{\frac{D(1 - \nu^2)}{Et} + C}$$

where β is the volumetric thermal expansion of water at test conditions, $\alpha = 6.5 \times 10^{-6} / ^\circ\text{F}$ is the linear expansion of steel, D and t are the pipe outside diameter and wall, $E = 29.5 \times 10^6$ psi, $\nu = 0.3$, and C is the isothermal compressibility of water at test conditions.

- B. For NPS 12 pipe with a 0.375 in wall at 60 °F and 2,175 psig, $\beta - 2\alpha = 8.93 \times 10^{-5} / ^\circ\text{F}$, $D(1 - \nu^2)/(Et) = 1.05 \times 10^{-6} / \text{psi}$ and $C = 3.09 \times 10^{-6} / \text{psi}$, so $dP/dT = 21.6 \text{ psi}/^\circ\text{F}$. Table 3-2 shows how strongly the value depends on water temperature; the Contractor shall therefore use the measured mean water temperature for each period evaluated, and weight buried and above-grade temperatures by volume in mixed sections.

Table 3-2: Pressure Change per Degree for NPS 12 x 0.375 in Pipe

Water temperature, °F	40	60	70	90
dP/dT, psi/°F	3.7	21.6	29.3	42.9

- C. Example: a hold that starts at 2,180 psig and ends at 2,162 psig (a change of -18 psi) while the water cools 0.9 °F at 60 °F has an expected thermal change of $21.6 \times (-0.9) = -19.4$ psi. The unexplained change is +1.4 psi, within the ±10 psi limit, and the end pressure is above 2,160 psig, so the test is acceptable.

3.08 LEAK INVESTIGATION AND FAILURES

- A. If the unexplained pressure change exceeds the acceptance limit, or a leak is seen, the Contractor shall stop the test, reduce pressure to 50 % of test pressure or less, and investigate: walk down all joints, re-check the instruments, check for entrained air, and bleed-check the boundaries.
- B. A leak at a weld shall be repaired by depressurizing fully, cutting out or repairing under SPC-SPC-007, re-examining under SPC-SPC-008, and re-testing the whole section for the full duration.

- C. A leak at a mechanical joint shall be repaired by depressurizing, replacing the gasket and re-tightening per ASME PCC-1 under SPC-SPC-006, then re-testing.
- D. A rupture shall be reported to the Owner and the EOR at once. The failed pipe shall be preserved for metallurgical examination, and the Owner shall decide on any regulatory notification.
- E. Every leak and failure and its disposition shall be recorded on QF-11-02, as 49 CFR 192.517(a) requires.

3.09 SAFETY

- A. Exclusion zones shall be at least 100 ft from test heads and open pipe ends on the pipe axis, and 50 ft around above-grade piping under test above 50 % of test pressure, or the larger distance from the stored-energy calculation in CON-RPT-003. Only the test crew, in a protected position, shall be inside the zone.
- B. No work other than inspection at the 3.06 reduced pressure shall be done on pressurized piping, and fittings shall not be adjusted under pressure.
- C. No test pressure shall act on the receiving pipeline operator's tap valve.

3.10 DEPRESSURIZATION, DEWATERING AND DISPOSAL

- A. Sections shall be depressurized at no more than 100 psi/min through a throttled valve to a controlled discharge.
- B. Discharge water shall be sampled before release for pH, total suspended solids, oil and grease, chlorides and any parameter the discharge authorization requires. Water shall be discharged only under the authorization confirmed in REG-RPT-002 (permitting authority HOLD H-17) or hauled to a permitted disposal facility.
- C. Land discharge shall pass through a filter bag or sediment trap and an energy dissipator onto vegetated upland, with landowner consent, at a rate that causes no erosion and no runoff to waters, streams, ponds, wetlands or road ditches. Volume, location and time shall be recorded.
- D. The outlet lateral shall be dewatered with bi-directional pigs driven by dry air or nitrogen until no free water is produced, then swabbed with foam pigs until the weight gain of a swab is less than 1 lb on two consecutive runs.
- E. Station piping shall be dewatered through low-point drains and by blowing dry air through each branch in turn, including instrument connections, dead legs, valve body cavities and meter body cavities. Ball valves shall be stroked fully with body drains open to release trapped water.
- F. The stainless vent system shall be drained and blown dry within 24 hours of the test, and no water shall be left standing in it or in VS-101, for the chloride reason given in 2.01 B.

3.11 CLOSURE WELDS

- A. The Contractor shall arrange its test sections so that no untested closure weld is needed. The final connections to the tap valve and to equipment are flanged joints for this reason.

- B. A closure weld that cannot be pressure tested shall be made only where the Owner and the EOR approve it in writing for that location, under a written procedure. 49 CFR 192 Subpart J does not provide an exemption from pressure testing for such a weld; the approval is an Owner and EOR decision based on the procedure and the following requirements, and the Owner shall confirm its regulatory position before approval.
1. Both joined pipes shall come from tested sections, or the pup shall have been pre-tested with the adjacent section.
 2. The weld shall be made to a qualified procedure by a qualified welder under SPC-SPC-007.
 3. The weld shall be examined by 100 % radiography, 100 % ultrasonic testing of the full weld volume, and magnetic particle testing of the root (where accessible) and of the completed cap, each accepted to API 1104.
 4. The weld shall be leak checked at operating pressure after gas-in under SPC-SPC-012.
- C. Any requirement of the receiving pipeline operator for testing, examination or witness of the tap valve connection is HOLD H-04 and shall be confirmed before the construction issue.

3.12 DRYING, NITROGEN BLANKETING AND FREEZE PROTECTION

- A. Sections shall be dried with dry air (-60 °F dewpoint or drier at the inlet) or by vacuum until the outlet dewpoint is -40 °F or drier at atmospheric pressure at every outlet point.
- B. A 12 hour soak test at atmospheric pressure shall follow. The section is accepted if the dewpoint has risen by no more than 5 °F and remains -40 °F or drier; otherwise drying shall continue.
- C. If gas-in is more than 7 days away, the section shall be purged with nitrogen and held at 10 to 15 psig of nitrogen with less than 2 % oxygen at the vent. Blanket pressure shall be checked and recorded weekly on QF-11-07.
- D. A test shall not start if the forecast minimum ambient temperature during fill, test or dewatering is below 35 °F, unless the procedure includes heating, insulation or burial of exposed piping and the EOR has approved it. Exposed small-bore and instrument connections shall be drained or heat traced.

3.13 FIELD QUALITY CONTROL

- A. The test record QF-11-02 for each section shall include at least the data required by 49 CFR 192.517(a): the operator's name, the name of the Owner's employee responsible for the test and of the testing company, the test medium, the test pressure, the test duration, the pressure recording charts or other records, the elevation variations where significant, and the leaks and failures with their disposition.
- B. Because the Owner requires traceable, verifiable and complete records for the maximum allowable operating pressure, the record shall also include the test section limits marked on P&IDs and isometrics, the welds and pipe heat numbers in the section, the temperature records,

the pressure-temperature correction, the instrument calibration certificates, the test water source, sampling and disposal records, and the signatures of the Contractor's test supervisor, the Owner's inspector and the EOR. Records shall be retained for the life of the pipeline under SPC-SPC-020.

C. The hold and witness points in Table 3-3 apply. Party codes: C Contractor, O Owner, E EOR, W receiving pipeline operator; H hold, W witness, R review, S surveillance, P perform.

Table 3-3: Hold and Witness Points

ID	Activity	C	O	E	W	Record
HP-11-01	Test procedure, test heads and water management plan approved	P	R	H	R	Approved procedure
HP-11-02	Pre-test checklist and test package complete, instruments calibrated, exclusion zones set (each section)	P	H	R	-	QF-11-01
HP-11-03	Test water sampling results acceptable before fill	P	H	-	-	QF-11-05
HP-11-04	Strength and leak tests of TS-01A and TS-01B, DWT at the high point, elevation-corrected pressures	P	H	W	W	QF-11-02, -03, -04
HP-11-05	Strength and leak test of TS-02, outlet lateral	P	H	W	W	QF-11-02, -03, -04
WP-11-01	Strength and leak tests of TS-03 to TS-05	P	W	-	-	QF-11-02
WP-11-02	Vendor shop tests of pre-tested units, including V-101 at 2,225 psig	S	W	R	W	Vendor certificate
HP-11-06	EOR acceptance of the test record before dewatering release (each section)	P	R	H	-	QF-11-02
WP-11-03	Test water discharge or haul-off	P	W	-	-	QF-11-05
HP-11-07	Drying acceptance, dewpoint and 12 hour soak	P	H	-	W	QF-11-06
HP-11-08	Closure weld NDE and documentation accepted, where a closure weld is approved	P	H	H	W	QF-11-08
WP-11-04	Nitrogen blanket checks until gas-in	P	S	-	-	QF-11-07

3.14 ACCEPTANCE

A. A test section is accepted when it meets every criterion in Table 3-4 and the EOR has signed the test record.

Table 3-4: Acceptance Criteria

Parameter	Criterion	Method
Minimum test pressure	2,160 psig or more at the high point of each A6 section for the full hold	DWT at the high point, or corrected for elevation
Maximum test pressure	Never above the low-point limit: 2,220 psig for A6, 450 psig for A1 and D1, 425 psig for S1	DWT and static head

Parameter	Criterion	Method
Hold duration	8 h for A6 sections; 4 h for A1, S1 and D1 sections and pre-tested units	Chart and DWT log
Pressure stability	Unexplained change after correction within ± 10 psi over the hold, with no downward trend over the last 2 h	QF-11-04
Leaks	None at any weld; none at mechanical joints at the leak test	Visual
Instruments	Calibrations current; recorder within 0.5 % of the DWT at start and end	Certificates, log
Test water	pH 6 to 9; suspended solids 50 mg/L; chlorides 250 mg/L (50 mg/L for S1)	Laboratory or field kit
Discharge	Within the authorization; no erosion or discharge to waters	Sample, visual
Lateral dewatering	Swab weight gain under 1 lb on two consecutive runs	Scale
Drying	Outlet dewpoint -40 °F or drier; rise of 5 °F or less after a 12 h soak	Dewpoint meter
Nitrogen blanket	10 to 15 psig; oxygen under 2 % at the vent	Gauge, oxygen meter
Closure weld	Radiography, ultrasonic and magnetic particle examination accepted to API 1104; Owner and EOR approval recorded	NDE reports
Records	All 49 CFR 192.517(a) items complete and signed	Review

END OF SECTION

