TRANSMOUNTAIN

Trans Mountain Expansion Project

Quality Management Plan

Document # 01-13283-GG-0000-RPT-CM-0002

KINDER MORGAN CANADA INC.

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Table of Contents

TABLE OF CONCORDANCE

Condition 9 is applicable to the following legal instruments: OC-064 (CPCN), XO-T260-008-2016 (Pump 1), XO-T260-009-2016 (Pump 2), and XO-T260-010-2016 (Tanks). Table 1 describes how this plan addresses the Condition requirements applicable to the Quality Management Plan.

TABLE 1
LEGAL INSTRUMENT CONCORDANCE WITH NEB CONDITION 9:
Quality Management Plan:

NEB Condition 64a) and 64b)	OC-064 CPCN	XO-T260-008-2016 PUMP1	XO-T260-009-2016 PUMP2	XO-T260-010-2016 TANKS
Trans Mountain must file with the NEB, at least 4 months prior to manufacturing any pipe and major components for the Project, a Project-specific Quality Management Plan that includes:				
a) Material/vendor qualification requirements;	Section 6.1 – Vendor Pre-Qualification			
b) Quality control and assurance of pipe, fittings, and component that ensure all materials meet Trans Mountain's specifications (i.e. processes, procedures, specifications, random testing, inspection, and test reports);	Section 6.2 – Criticality Assessment Section 6.3 – Vendor Quality Inspection Activities			
c) Mandatory documentation of process conditions during manufacture and verification of the conformance of manufacturer material test reports with Trans Mountain's requirements;	Section 4.5 – Quality Records Section 6.3 – Vendor Quality Inspection Activities Section 6.4 – Identification and Traceability			
d) Mandatory inspection requirements, inspector competency training, and qualifications;	Section 3.2 – TMEP Responsibility and Competency Evaluations Section 3.3 – Contractor Quality Management Organization and Responsibilities Section 6.3 – Vendor Quality Inspection Activities and Oversight Section 7.0 – Construction Quality Management			
e) Non-conformance reporting and correction procedures;	Section 4.2 – Non-Conformance Detection and Reporting			
f) Change management process;	Section 4.4 – Management of Change			
g) Commissioning requirements; and	Section 8.0 – Commissioning Quality Management			
h) Material handling requirements during transportation.	Section 6.0 – Supply Chain Quality Management			

1.0 INTRODUCTION

Trans Mountain Pipeline ULC (Trans Mountain) submitted a Facilities Application to the National Energy Board (NEB) in December 2013 for the proposed Trans Mountain Expansion Project (the Project or TMEP). On November 29, 2016, the Governor in Council concluded that the Project was in the public interest of Canada. A Certificate of Public Convenience and Necessity (CPCN) allowing the Project to proceed, subject to 157 conditions, was issued on December 1, 2016.

Trans Mountain submits the attached document (Document # 01-13283-GG-0000-RPT-CM-0002, Rev. 2), pursuant to Condition 9, Quality Management Plan (QMP).

1.1 Purpose and Scope

This document is the Project-specific Quality Management Plan produced for TMEP, in order to:

- define the overall approach to be used by the Project team for quality management for the engineering, procurement, construction, pre-commissioning and turnover to operations;
- define the TMEP quality management organization and the associated accountabilities;
- define the review, surveillance and auditing requirements;
- identify related plans, governing procedures, and associated documents;
- define project reporting requirements, as related to quality management;
- satisfy the requirements pursuant to the Condition 9, Quality Management Plan.

To understand the proper context, it is important to recognize the fact that:

- This QMP is a subset of the TMEP Overall Project Execution Plan (01-13283-RPT-PM-0017), and needs to be considered as such; and
- Scope-specific QMPs will be produced by contractors and vendors engaged on the Project, and will be reviewed and approved by Trans Mountain, prior to the commencement of any project activities.

This document establishes the governing procedures and processes related to:

- The development and finalization of project deliverables produced by the Trans Mountain team.
- The TMEP Quality Management oversight of all activities and deliverables associated with engineering, procurement, construction, commissioning, and turnover to operations, as undertaken by the Contractors.

This document does not constitute the entire define the entire quality management scope for the Trans Mountain Project, as a stand-alone Project Quality Plan is to be developed by each of the Contractors (and their sub-contractors) to address their individual scopes of work.

Contractor Project Quality Plans shall be developed to comply with the Quality Requirements List (01-13283-GG-0000-QA-LST- 0003) document included in each of the contracts or purchase order agreements.

Contractor Project Quality Plans shall be submitted to TMEP for review and approval, in accordance with contractual requirements. Project Quality Plans developed by sub-contractors shall be submitted to the responsible Contractor for review and approval.

In addition, this QMP supports the requirements of Major Projects Management Plan referred to in Section 3.2.1 of the Integrated Safety and Loss Management System (ISLMS) Document 0100, and the program objectives established in the Project Charter.

The TMEP Chief Quality Assurance Lead is responsible for the development, maintenance, control and distribution of the QMP.

1.2 Project Quality Objectives

The quality objectives established for the project are:

- Engineering designs will be clearly documented, consistent with specified design standards and in accordance with operating performance requirements;
- Work will comply with applicable acts, regulations, statutes, permitting requirements and generally accepted engineering best practices;
- Equipment and materials procured and installed will be consistent with the engineering design; and
- Documentation providing objective evidence of conformance to the requirements will be maintained and records will be preserved.

2.0 DEFINITIONS AND ACRONYMS

Contractor	The party which carries out all or part of the design, engineering, procurement, construction, pre-commissioning and turn over, in accordance with the requirements of a Contract document.
Corrective Action	An action taken to eliminate the cause of a detected non-conformity or other undesirable condition.
EOR	Engineer of Record
Inspection	Conformity evaluation by observation and judgement accompanied as appropriate by measurement, testing or gauging.
IFC	Issued for Construction
ISLMS	Integrated Safety and Loss Management System
KMC	Kinder Morgan Canada, Inc.
KPI	Key Performance Indicator
Manufacturer/Supplier/Vendor	The party which manufactures fabricates or supplies equipment or materials in accordance with the requirements of a Purchase Order, Work Order, or Agreement.

NCR	Non-Conformance Report
NDE	Non Destructive Examination
Nonconformity	Non-fulfilment of a requirement.
Preventive Action	An action taken to eliminate the cause of a potential non-conformity or other potentially undesirable condition.
Process	A set of inter-related or interacting activities that transform inputs into outputs.
QMP	Quality Management Plan
Quality	Degree to which a set of inherent characteristics fulfils requirements.
Quality Assurance (QA)	The planned review of work and documentation focused on providing confidence that quality requirements will be fulfilled.
Quality Control (QC)	The process of checking records and/or activities focused on fulfilling quality requirements.
Quality Improvement	Actions taken throughout the organization to increase the effectiveness and efficiency of activities and processes to provide added benefits to both the organization and its customers.
Quality Management	All activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system.
Quality Planning	Determining and defining the customer's needs, and framing the objectives, standards and controls to meet them.
Quality Plan	A document setting out the specific quality practices, resources and sequence of activities relevant to a particular product, service, contract or project. The plan for the project as a whole is termed the Project Quality Plan; plans prepared by Contractors or Suppliers may then be termed Contractor or Supplier Quality Plans.
RFI	Request for Information
SME	Subject Matter Expert
TDN	Technical Deviation Notice
TMEP	Trans Mountain Expansion Project
Verification	Confirmation, by the provision of objective evidence, that specified requirements have been fulfilled.

3.0 ORGANIZATION AND RESPONSIBILITIES

3.1 Quality Organizational Structure

Refer to the NEB Condition 88 filing, for the TMEP organization charts. The TMEP Quality Assurance and Compliance Management Team is included as QAS.1 within the referenced document.

3.2 TMEP Responsibilities and Competency Evaluations

Responsibility for quality rests with all project personnel in the execution of their duties.

Specifics for each role identified within the organization charts have been documented in the associated Job Descriptions or Contractor Qualification Specifications (CQSs). Job Descriptions and CQSs identify the following for each position:

- Job description
- Responsibilities (including key deliverables)
- Educational requirements
- Experience requirements
- Competencies and skills requirements

Trans Mountain leadership is committed to ensuring that qualified and competent quality resources are available to the project as per schedule requirements.

Competency Evaluations – TMEP Employees

Any and all Trans Mountain employees will be subject to the requirements of KMC's Human Resources policies and procedures, which outline hiring guidelines and competency evaluations through performance reviews.

Completency Evaluations – TMEP Contractors

The qualification requirements for all contract employees are specified in accordance with the requirements of the Contractor Qualification Specifications and Records standard (KMC 10100 – 4.2), and verification of those competencies has been developed for TMEP using the Contractor Competency Assurance Plan (KMC 10100 - 4.1) as a guideline, and are detailed in the TMEP Resourcing and On-Boarding Plan (01-13283-GG-0000-PM-PRO-0002).

The hiring manager for TMEP is the VP TMEP Execution. The Project CQS records will be maintained with the Project records and may be included in the KMC database.

In the case where Trans Mountain hires external contractors with qualifications that are not available in-house, TMEP will qualify candidates against defined requirements documented in the CQS.

3.3 Contractor Quality Management Organization and Responsibilities

Contractors shall be responsible for the quality of their own deliverables, and for adherence to the requirements of the contractual agreement. Contractors shall ensure that resources required for the development and monitoring of deliverable quality are competent and effective, and are deployed in a timely fashion.

Contractors shall meet all Quality Requirements (01-13283-GG-0000-QA-LST- 0003), as included in the contractual agreements. For their scope, all major contractors and critical materials suppliers shall meet requirements that include:

- Development of project-specific quality plans describing the implementation of their quality management system to fulfill the project requirements
- Provision of evidence of key personnel competencies
- Issuance of project-specific procedures and Inspection and Test Plans (ITPs), as required
- Ensuring TMEP's contractual Quality Requirements (01-13283-GG-0000-QA-LST- 0003) are transferred to sub-contractors and that compliance is continually monitored through the review of contract deliverables
- Development and maintenance of an audit schedule for the scope of work and ensuring that findings are documented and closed out in a timely manner
- Reporting regularly on the effectiveness of their quality management system
- Supporting TMEP project audits, reviews and inspections, and allowing TMEP to participate in their own audits, reviews and inspections as deemed necessary.

4.0 OVERALL QUALITY MANAGEMENT

4.1 Auditing and Internal Assessments

Project quality auditing and internal assessments shall be conducted in accordance with the requirements of the TMEP Audit Procedure (01-13283-GG-QA-PRO-0104), which is based on the requirements of ISO 9001: 2015 – Quality Management Systems Requirements and ISO 19011: 2011 – Guidelines for Auditing Management Systems.

The TMEP Quality Assurance Compliance Lead will maintain an audit and internal assessments schedule specific to the TMEP. The schedule will clearly identify planned and completed audits.

The schedule will be risk-based, and will seek to make effective use of internal audit resources, and will 'piggy-back' on planned Contractor and Vendor audits, where possible.

4.2 Non-Conformance Detection and Reporting

Trans Mountain's non-conformance detection and reporting process has been developed in accordance with the requirements of the ISO 9001: 2015 – Quality Management Systems Requirements standard, and is detailed in the Non-Conformance, Non-Compliance & Improvement Management Procedure (01-13283-GG-0000-QA-PRO-0086).

4.2.1 Contractor / Vendor Non-Conformance

Contractor and Vendors shall establish and maintain internal processes to track and manage Non-Conformances (NCs), Corrective Actions and Preventive Actions (CAPAs), and Opportunities For Improvement (OFIs).

Trans Mountain shall review these processes for adequacy as part of the Contractor/Vendor pre-qualification evaluation. If these processes are determined to be inadequate, the Contractor / Vendor shall update same to meet TMEP requirements.

These processes shall require that NCs are logged and reported to the TMEP Chief Quality Assurance Lead, the Quality Assurance Lead and Quality Assurance Coordinators, as applicable and as agreed.

Critical NCs that may impact TMEP metrics (for example, those with significant impact on safety, quality, cost, and schedule) shall be reported immediately to TMEP Chief Quality Assurance Lead. All NCs are to be reported within 48-hours.

Trans Mountain reserves the right to request that Contractors and Vendors follow the TMEP Non-Conformance, Non-Compliance & Improvement Management Procedure (01-13283-GG-0000-QA-PRO-0086), if deemed necessary.

The distribution of NCRs and NCR status reporting shall include but may not be limited to:

- TMEP Vice President
- Applicable directors and project managers
- TMEP Chief Quality Assurance Lead
- TMEP Document Control

4.2.2 Control of Non-Conforming Product

Trans Mountain and its Contractors / Vendors will ensure all non-conforming product is identified, segregated, and prevented from further use or processing.

Non-conforming products shall be quarantined, pending disposition by:

- Using the product as-is, through concession;
- Repairing the product to meet requirements;
- Re-classifying the product for an alternative use; or
- Scrapping the product altogether.

Decisions on the disposition of all non-conformances shall be approved by Trans Mountain.

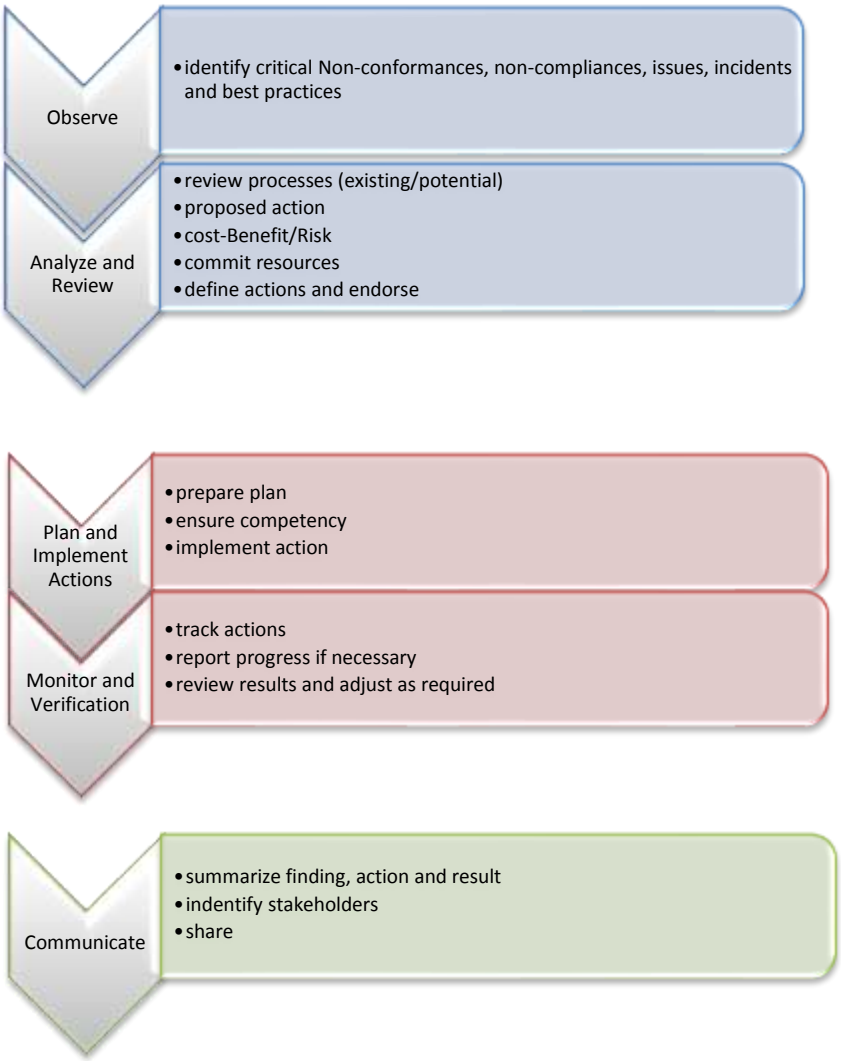
4.3 Lessons Learned

By definition, lessons learned are root cause observations made on past actions that influence future similar actions. They can be either negative or positive, and their identification and incorporation help curtail the negative, and encourage the positive. An effective lessons learned process ensures implementation of findings before the occurrence of the next action.

Trans Mountain expects that Contractors and Vendors will develop and utilize their own internal lessons learned to the benefit of the TMEP. Lessons learned that impact project

metrics shall be documented and communicated to Trans Mountain for awareness and distribution.

Trans Mountain promotes a lessons learned culture internally and with Contractors and Vendors, and follows an industry best practices process, as outlined below:



A workshop, held early in the Detailed Design phase, identified lessons learned relevant to the TMEP from detailed design through to commissioning and start-up, with a focus on engineering, manufacturing and construction quality.

Identified lessons learned from this session have been reviewed, and specific actions have been assigned to relevant parties for incorporation.

Trans Mountain's Supply Chain routinely facilitates lessons learned sessions with Contractors and Vendors to take advantage of learnings from past projects, for benefit of the TMEP.

KMC maintains lessons learned records via KMOnline for internal reference and use.

Lessons learned sessions are to be held as necessary but at minimum as part of the scope initiation and close-out activities. Results shall be shared with stakeholders, and records maintained.

4.4 Management of Change

Project changes are reviewed by SMEs, and approved or rejected in accordance with the requirements of the TMEP Overall Project Execution Plan (01-1328-RPT-PM-0017), and the TMEP Management of Change Process (01-13283-RPT-PM-0021).

4.5 Quality Records

Records that provide evidence of compliance with specified requirements will be identified and captured in accordance with a documented process. Trans Mountain will maintain all documents and records related to the TMEP as per ISLMS 5.3 Records Management Standard. Contractors and Vendors will ensure formal turn-over of required records as per contractual agreements, and in accordance with the TMEP Construction Turn Over Requirements (01-13283-GG-0000-QA-QMR-0001). Trans Mountain SMEs, quality leads and inspectors will review any and all such records to ensure that they are complete, and that they meet TMEP requirements.

4.6 Quality Performance and Reporting

4.6.1 Quality Dashboard

The Quality Dashboard creates high visibility for the leading and lagging indicators related to quality on the TMEP. These indicators measure the effectiveness of the Quality Management System in use.

Each sub-program defines indicators to assist the leadership in defining areas of project execution where greater focus may be required.

The key features of the quality management dashboard are:

- visual indication of success of the QMP via color coding, creating a clear understanding without extensive data manipulation;
- emphasis on leading indicators rather than lagging indicators, ensuring proactive management of the QMP rather than reactive management; and
- reliably measureable KPIs.

The current quality-related KPIs include, but are not limited to:

KPI Description	Driving Behaviour	Calculation	Scope	Target
% Corrective Actions addressed on time	Promote a culture of effective responses to prevent recurrence	(Total open-#open&pastdue)/(total open)	total cumulative	Green: 100%-90% Yellow: %90-75% Red: <75%
Total Deficiency Rate	Promote proactive quality culture to reduce deficiencies	# of deficiencies (that week)*200,000/(MnHr Worked)	Weekly and cumulative	Upper and lower limit based on project statistics

Audit Score	Driving a culture of compliance and success	# of applicable check points - #non-conforming/# applicable check points	Average of total audit score	Green: 100%-90% Yellow: %90-75% Red: <75%

Additional quality-related KPIs may be identified, depending on stage of project execution. These KPIs will be rolled out to all vendors and contractors, as needed, and the need for their input shall be defined contractually.

Planned versus completed audits shall be documented and reported via the monthly quality reports and shall include a summary of the findings of all completed audits.

5.0 ENGINEERING QUALITY MANAGEMENT

Qualified engineering firms have been engaged for the design scope of the TMEP, and Trans Mountain shall rely on these engineering firms' quality management systems and Professional Practice Management Plans (PPMPs) to ensure quality.

5.1 Introduction, Scope and Objectives

The primary objective of Engineering QA is to ensure that engineering activities are performed adequately to specified requirements resulting in a safe and reliable operating asset conforming to TMEP, regulatory, and jurisdictional authority requirements, and governing codes and standards.

To achieve this objective, the Engineering Contractors must fully understand TMEP's quality requirements and shall work to proven and approved procedures and methods. In addition, engineering work must be adequately verified and requirements clearly and completely communicated between TMEP, each Engineering Contractor, and the equipment vendors and Construction Contractors.

Engineering verification is the review of engineering deliverables to ensure adherence to:

- Project Specifications (refer to TMEP Engineering Standards, Specifications and Procedures List (01-13283-GG-0000-TEC-EP-0005);
- Project Design Basis;
- Regulations and codes; and
- Sound engineering practices

Additional TMEP engineering responsibilities include:

- Provision of design inputs (specifications, parameters, etc.)
- Participation in design reviews
- Acceptance of IFC documents
- Review of Technical Deviation Notices (TDN) and Request For Information (RFI) responses from the Engineer of Record (EOR)

5.2 Contractor's Responsibilities

The Contractor shall develop project and engineering discipline-specific QA and QC procedures based upon their Quality Management System (QMS) and customized to the requirements of their own project-specific Quality Plan.

Designated engineering discipline personnel shall be assigned quality checking and design verification responsibilities, and shall be provided with adequate time in their work schedule for effective QC activities. QC checking shall be performed in accordance with pertinent checklists to ensure consistency. Checking and verification feedback shall be discussed and resolved with the document originator, typically through a squad checking process. Unresolved or disputed comments shall be reported to Project Engineering and/or Project Management.

QA personnel shall be assigned to perform quality audits to verify that quality checking and verification activities are being performed and documented, as specified in the Project-specific Quality Plan.

For further details, refer to the Overall Project Execution Plan, Section 8.3.3 – EPC Contractor Accountabilities (Facilities), and Section 8.4.3 – EPC Contractor Accountabilities (BC Lower Mainland).

6.0 SUPPLY CHAIN QUALITY MANAGEMENT

Trans Mountain will directly and indirectly purchase materials and equipment required to construct the TMEP. The Procurement Execution Plan (01-13283-GG-0000-RPT-PR-0002) and Expediting and Logistics Management Procedure (01-13283-GG-0000-SC-PRO-0001) outline the processes in place to ensure that materials and equipment meet TMEP design, handling, transportation, receiving, storage, and preservation requirements.

The Quality Requirements List (01-13283-GG-0000-QA-LST- 0003) document, customized to the scope of work, is to be included in Material Requisitions, Requests for Quote/Proposal, and subsequently in Purchase Orders, and contractual agreements.

Supplementary quality requirements are outlined in the TMEP Materials and Equipment Quality Assurance Standard (TMEP-PM3501).

6.1 Vendor Pre-Qualification

All critical service purchase materials and equipment, and contracted services will be obtained from vendors and contractors on the Approved Manufacturers List or those qualified on the basis of technical, quality, safety, and commercial factors, in accordance with the requirements of the TMEP Vendor Pre-Qualification procedure (01-13283-GG-0000-SC-PRO-0002).

Sub-vendor quality shall be subject to the requirements of the Contractor's or Vendor's QMPs. For Trans Mountain, "sub-vendors" means any supplier or contractor that does not have a contractual agreement directly with Trans Mountain.

6.2 Criticality Assessment

Criticality assessments, for key categories of equipment and materials is required to ensure that the level and scope of inspection for the material or equipment is appropriate. Requirements associated with this risk-based assessment are defined in the TMEP Criticality Rating Specifcation (01-13283-GG-PM-0001), and shall be conducted by the relevant discipline engineer, with input from project management.

The criticality level shall be reviewed and verified by a Trans Mountain SME.

The Criticality Rating scale of 0 to 4 matches the scale defined for inspection levels in the Materials and Equipment Quality Assurance Standard (TMEP-PM3501). On this scale, “4” identifies the highest criticality level and thus requires the most comprehensive inspection level, while “0” identifies the lowest criticality level and requires no inspection.

The line pipe criticality assessment and subsequent tasks follow the requirements of the Line Pipe Criticality Assessment (01-13283-SG-M000-PL-ASS-0001) document.

6.3 Vendor Quality Inspection Activities and Oversight

Trans Mountain will complete quality activities internally and on Contractors and Vendors via audits and assessments, inspections and surveillance for specific tasks, products or scopes at a frequency deemed necessary by regulatory requirements, project requirements, and best practice.

Contractors and Vendors are responsible to implement the necessary quality controls as outlined in the contractual requirements, their approved QMPs, and Inspection and Test Plans (ITPs). Trans Mountain shall review Contractor and Vendor plans to ensure that processes for mechanisms are in place to comply with project and specification requirements, and that TMEP will be engaged at the appropriate and agreed points to complete quality assurance and inspection activities.

ITPs specific to each purchased equipment, material or activitity shall be governed by:

- Applicable statutory requirements;
- Applicable Industry standards;
- TMEP specifications and standards;
- Criticality Rating Specification (01-13283-GG-PM-0001); and
- Material and Equipment Quality Assurance Specification (TMEP-3501).

Vendor inspection requirements shall initially be identified on the purchase order or contract agreement. Contractors shall identify the inspection requirements for their activities as required to meet regulatory and project requirements. Each Contractor or Vendor shall submit an ITP which reflects the requirements of the purchase order or contract agreement, and aligns with the Contractor or Vendor’s own standard inspection protocols. ITPs shall be reviewed and commented on by Trans Mountain.

An ITP template, defining minimum standards, has been provided in the TMEP Material and Equipment Quality Assurance Standard (TMEP-3501).

All records resulting from quality control or testing activities must be maintained and formally turned over to Trans Mountain. Records will be reviewed by TMEP Quality Assurance personnel for completeness and to ensure testing equipment, calibration, personnel qualifications, material test reports compliance, adequacy of material traceability, etc.

The inspection of materials and equipment, including assessments of manufacturing processes will take place at the vendor’s facilities, in accordance with the requirements of approved Inspection and Test Plans (ITPs).

Equipment vendors are responsible for complying with the requirements of the procurement documents, technical specifications, and applicable material specifications (including material identification marking and traceability) and providing certification to that effect.

6.4 Identification and Traceability

Contractors and Vendors shall ensure adequate identification and traceability on all material and testing equipment. Records and certification shall be maintained and turned over to Trans Mountain, as required. As part of the inspection and audit process, Trans Mountain SMEs, Quality Assurance Coordinators and/or Inspectors, shall ensure traceability requirements, per TMEP specifications, are being met.

7.0 CONSTRUCTION QUALITY MANAGEMENT

TMEP QA Management will provide a Quality Assurance Coordinator, and Project Management will supply a complete team of inspectors for each construction area. Contractor Qualification Specifications (CQSs) have been developed for each of those roles.

Per the requirements of the Quality Requirements List document (01-13283-GG-0000-QA-LST-0003), each construction contractor and each critical sub-contractor shall develop a project quality plan specific to their scope. Each Project Quality Plan shall be reviewed by TMEP, and approved by the Chief Quality Assurance Lead, prior to construction start.

During field construction, Inspection and Testing Plans (ITPs) will be developed, in a joint effort with TMEP construction and quality groups, and the contractors.

Results of inspections will be documented so that any deficiencies or quality issues are identified, and addressed in accordance with the requirements of Section 4.2 of this plan.

The work shall be continually assessed to confirm conformance with requirements by both the inspection and QA personnel.

7.1 Supplemental Construction Quality Activities

Supplemental quality activities may be undertaken to ensure overall project quality. These activities are not typically part of the Inspection or Field Audit programs; however, field quality process auditors can participate as requested. Supplemental quality activities ensure that:

- Quality requirements are adequately considered in construction planning;
- Before individual construction activities begin, ensuring availability of:
    - Issued for construction (IFC) documents (drawings, ITPs, procedures, specifications and Project and industry reference documents);
    - Proper materials, as required by design, including applicable records; and
    - Construction equipment and necessary measuring and test equipment (with valid calibration).

8.0 COMMISSIONING QUALITY MANAGEMENT

Commissioning and start-up work transitions a constructed pipeline or facility from a non-energized state to an energized, safe to operate fixed asset. There are various activities associated with this phase of the project, including Quality Assurance and Quality Control to ensure the installed equipment is functioning correctly.

Commissioning is a critical final acceptance activitity of the Project to ensure the project is complete and ready to operate as intended.

Detailed commissioning and start-up plans will be developed and executed for individual pipeline segments, main line block valves (MLBV), tanks, manifolds, pump stations, electrical and control systems.