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1. **Introduction**

This Project Quality Management Plan (QMP) provides an overview of the Quality Management activities for the Project as required for Stage Gate X. The purpose of the QMP is to ensure that required procedures, specifications and standards are in place and effectively implemented by conducting Quality Assurance and Quality Control activities. In addition, the QMP facilitates communication between the *Project Execution Team (PET)* and Functional Groups, enhancing on-boarding by building links between the project personnel and the functional process owners. The overall effect of the Project QMP supports the Enbridge Continual Improvement efforts.

The Project QMP forms part of the Project Execution Plan (PEP) and will apply to all project quality activities. For information about the roles and responsibilities of various groups involved in quality activities refer to the RACI matrix in the PEP.

1.1 **Project Summary**
2. Quality Management Overview

The following section introduces the approach to Quality Management employed by Enbridge Major Projects.

2.1 Quality Management System

In the context of Enbridge Major Projects, Quality is defined as achieving conformance to all procedures, specifications, and standards applicable to the project. Quality is further defined as meeting project specific score card metrics and key performance indicators. To manage Quality is to proactively ensure that these objectives are met.

At Enbridge, well defined management systems are in-place for core business functions (i.e. engineering, construction, procurement, environment, safety, administration, etc.). Specific Functional Departments are responsible for developing and continually improving procedures and processes within those management systems. The aspects of quality assurance and quality control (QA/QC) are defined within those processes and procedures.

It is the role of the Enbridge Quality Management System (QMS), led by the MP Engineering Services, to centralize the Quality aspects from the various independent management systems. By centralizing, the intent of the QMS is to drive consistent Quality principles, formats & objectives and enable quality management to be viewed as a focused business function in and of itself. In other words, the QMS is the framework management system for quality programming.

2.1.1 Quality Management Plan Preparation

A key tool for the QMS is the preparation of a Quality Management Plan (QMP) which describes the specific requirements of quality programming for a Major Project and how those requirements will be conducted. The QMP is part of the Project Lifecycle Gating Control (PLGC) 14.1 requirements of the PEP. The QMP draws its context from those Functional Departments which contribute to the Project design and installation execution phase. For the Project, specifically, this QMP centralizes the quality management components from the following Functional Process owners:

- Business Development Engineering (BDE)
- Engineering
- Procurement
- Construction
- Safety Services
- Operational Readiness
- Environment, Lands, & Right Of Way(ROW)
- Project Management Office (PMO)
- Public, Government, and Aboriginal Affairs
- Compliance
- Project Execution Team

A structured and purposeful workshop will be planned to develop a comprehensive Quality Management Plan. MP Engineering will lead the review of the Quality Management processes from all functional departments affecting Project execution. The workshop will also provide an opportunity for participants to identify quality risks. In keeping with the Major Projects’ project centric authority, the facilitated session will serve to gather direction and advice from the Project Execution Team leadership, who is the final approvers of this plan. Post workshop follow-up activities will be facilitated by MP Engineering Services, leading to a final QMP which represents each Functional Department’s intentions and the Project Execution Team’s direction.
2.2 Processes and Procedures
As per the above definition of Quality, key project execution work activities will be governed by established processes and procedures. A list of key procedures will be developed for the QMP.

If the procedures are not available at the appropriate time in the project life cycle (as noted in Appendix A), the associated risk will be tracked within the project risk register.

If any deviations to the core procedures is sought by the Project Execution Team, the rationale to be documented and informed to the procedure owner.

2.3 Key Performance Indicators
Key Performance Indicators (KPI’s) will be established within the project. Inputs to the KPI’s may be a combination of deliverables, functional process objectives, milestones based on schedule and or cost. The inputs will result from consultation with functional process owners and final approval will remain with the Project Execution Team. A summary of the KPI’s will form Appendix B of this QMP. The KPI’s will be monitored as applicable during the execution of the project and reported in the Monthly Quality Summary Reports.

2.4 Project Quality Assurance Process Reviews Plan (Assessments)
As required by the PLGC 37.2 the Project QA Process Review Plan is an integral component of the QMP. This plan will be developed for regular reviews of the implementation of the key project procedures and processes. The assessment results will document findings and the measures to be implemented. Findings may be recorded as Non Conformances (NCR’s) or Opportunities for Improvement (OFI’s). Results will be tracked and reported as a part of the Quality Summary Report.

2.5 Project Personnel Quality Training
The Project Quality Coordinator shall evaluate project personnel training needs in conjunction with the Project Execution Team. Training sessions, including sessions on Quality (Basic), Project Orientation, Project QMP implementation, Quality – As Process Approach and Introduction to KPI selection and tracking or parts thereof may be provided to project personnel.

Field personnel shall also be trained to enhance their competency, The Project Quality Coordinator in conjunction with the Project Construction Manager shall plan and manage to conduct such training where applicable, including trade specific e.g. Welding Inspector in accordance with Z-662 requirements.

2.6 Quality Management System (QMS) Tools
In addition to this QMP, there are several QMS procedures available for implementation on any Major Project. These procedures are available on the MP Engineering Services SharePoint. The Project Execution Team has elected to implement the following QMS procedures:

2.6.1 Non-Conformance Reporting (NCR) Procedure
This procedure (MP-QMS-PROC-001 NCR Procedure) governs the correction of non-conforming conditions in either product (e.g. a purchased valve) or process (e.g. maintenance of training records). It requires actions to be taken to address the immediate problem, identify the root cause, and recommend long-term corrective actions as necessary. All NCRs will be tracked and reported as a part of the Quality Summary Report.
Important Clarification: A Non-Conformance is any situation in a product, process or service which does not meet documented specifications, whereas a Non-Compliance is any situation in product, process or service which does not meet regulatory or legal requirements. The Project Compliance Analyst shall review all NCR’s to determine if any constitute Non-Compliance. The Project Quality Coordinator will correspond with the Project Compliance Coordinator to establish status.

2.6.2 Quality Assessment Procedure
This procedure governs the processes used in performing assessments of suppliers of equipment or services as defined in paragraph 2.4.

2.6.3 Lessons Learned
Tracking and reporting of all Project Lessons Learned at each stage gate is part of the PLGC requirements. The lessons learned reported to the Project Management Office (PMO) are included in a central database which ultimately enables continual improvement guidance for the functional area processes. This process is managed by the Lessons Learned Coordinator on the project. The Quality Coordinator will assist in the identification of lessons learned and will be responsible to validate the actions taken by the various affected process owners. Identification of the lessons learned coordinator required.

2.6.4 Change Management
The Project Team will ensure a documented Management of Change process is established for use across all aspects of the project.

2.6.5 Document Control Procedure
This procedure governs file storage structure and internal procedures used during the project life cycle.

2.6.6 Records Management Procedure
This procedure governs the collection and hand-off of project records to the LP Technical Records team during the project and at project completion.

2.6.7 Root Cause Analysis
Root Cause Analyses are carried out ad hoc by project team members for all significant project issues. The Quality Coordinator will lead or assist project team members throughout this process. This practice is a key quality management activity, however, at this time a formal Company Root Cause Analysis procedure is unavailable.
3. **Project Quality Coordinator**

The *Project Quality Coordinator*, reporting through to the *Project Execution Team*, has the accountability to monitor and report on the quality management activities that are carried out on the Project. The following points describe the key aspects of the Quality Coordinator’s role.

3.1 **Project Quality Assurance Process Review Plan**

As noted in section 2.4 above, a Project Quality Assurance Process Review Plan (Assessment Plan) will be developed for the Project. The *Project Quality Coordinator* will be responsible for maintaining this plan, reporting on results, and following each identified finding through to completion. The procedure for planning and executing these reviews is defined in QMS Assessment Procedure MP-QMS-PROC-002.

3.2 **Findings Management**

Regarding NCR's, the Project Quality Coordinator will:
- Ensure NCR Training is imparted to all identified individuals on the project MP-QMS-PROC-001
- Provide guidance to the Project Team for the Findings and NCR process
- Maintain NCR log and follow up for closure
- Provide monthly status of NCR for the project
- Escalate NCR’s not closed within appropriate time frame

3.3 **Quality Summary Report**

A monthly Quality Summary Report will be prepared by the *Project Quality Coordinator* showing the status of the key quality-related activities. The Quality Report is intended to provide the project leadership with status updates regarding Assessments, NCR closures, KPI results, as well as Field Request for Information (RFI).
4. **Project Execution Quality Aspects**

The following section describes the quality considerations within each of the main execution areas of the project.

4.1 **Business Development Engineering (BDE)**

*Process Owner: MP Development Engineering*

Business Development Engineering (BDE) group contributes to the ongoing project execution by developing, reviewing, and ensuring consistent application of the following:

- Comparator Analysis
- Cost and schedule contingency assessment
- BDE Classified Project Proposal
- Sr. Mgmt Review and Sign-off of BDE Project Proposal
- BDE Cold Eyes Review

As part of these reviews, BDE validates the developed detail design, procurement, approved changes, and other execution details against the business scope defined in the FEED package.

4.2 **Detailed Engineering**

*Process Owner: MP Engineering Services*

Project will engage approved Engineering Consulting firms for engineering design that will provide services as per the Engineering Services Agreement (ESA).

4.2.1 **Engineering Consultant Coordination Program**

All Engineering Consultants are bound by the terms of their ESA to meet required Enbridge standards, specifications, and all applicable codes and regulations for the Project. Project Execution Team will be responsible for ensuring that front-end preparatory on-boarding activities of the engineering consultant are conducted sufficiently in advance of the consultant’s work scope to enable them to meet these requirements. Moreover, as the Engineering Consultant assigns new employees during the course of the project, on-boarding activities should also take place with these individuals. MP Engineering Services has developed an Engineering Consultant On boarding Handbook to guide this process.

In order to ensure ongoing coordination and communication between the Project Execution Team and the Engineering Consultant, regular coordination meetings should be conducted. For the duration of this project a designated Project Manager representing the Engineering Consultant will be the key interface with the Project Execution Team. The designated Project Manager will be responsible to monitor and report on the progress to Project Execution Team.

This monitoring will include:

- Real-time monitoring of engineering costs
- Identifying and recording cases of engineering and drafting rework
- Collecting data related to other established quality metrics

MP Engineering Services will plan, schedule and conduct assessments of the Engineering Consultant as per the requirements of the Project QA Process Review Plan (Assessment Plan) in order to verify
effectiveness of their implemented quality management system. Performance data related to the cost, quality and schedule of engineering consultant activities on the project compared to similar data from other projects and will be analyzed for trends by MP Engineering Services. In association with the consultants’ services, the consultant will provide a Project Specific Quality Plan pertaining to their execution of project contract with their Engineering Execution Plan. The Project Quality Coordinator will review and provide feedback to the contractors’ counterpart ensuring the contractor’s quality plan is aligned with the project’s QMP.

4.2.2 Leak Management
A Leak Prevention Guideline has been developed by MP Engineering Services to focus the Project Execution Team on front-end execution activities that will reduce leaks (i.e. adherence to Enbridge Engineering Standards, Construction Specifications, project procedures, appropriate material and equipment selection, and good engineering practices).

Leaks that do occur will be entered into the Enbridge Leak Database by regional operations personnel. LP Facility Integrity and MP Engineering Services will perform a root cause analysis to determine responsibility of the leak and report their findings. Leaks deemed to be project related will be reported quarterly in the MP Safety Statistics Report. MP Engineering. Facility Integrity will further perform a “Lessons Learned” and will submit appropriate corrective actions such as specification, procedure, material or equipment changes. The results will be communicated across Major Projects to ensure a reduction in leak statistics.

4.2.3 Deviations from Enbridge Standards
During execution of the project there may be instances when the Project Execution Team identifies a need to deviate from Enbridge standards. All deviations must be formally requested through the LP Engineering Standards Group with a clear description and justification. The Technical Standard Deviation Request (TSDR) procedure is available on the Enbridge Standards and Specifications SharePoint.

4.2.4 System Operability Review
A formal System Operability Review (SORT) will be conducted to ensure that the proposed project is fit for service. The review will provide an assessment of operability with respect to customer requirements and overall system integration. The review will include capacity, connectivity, pipeline and facilities integrity, measurement, petroleum quality, control center operations, regional and field operations, energy management and power, forecasting, scheduling, terminals and any other relevant requirements associated with the project. In addition, the System Operability Review will also consider future implications of the project and will identify potential issues as the project passes through various stage gates.

SORT Review will be conducted by the LP System Optimization group prior to Stage Gates 1, 2 and 3. All issues and related comments will be captured within the issues tracking tool JIRA. The SORT Review Team will resolve the issues identified and have these approved by the designated authority prior to moving on to the next stage gate.

4.2.5 System Technical Assessment Review
System Technical Assessment Review (START) will be the mechanism whereby the project team engages the core LP technical groups listed below:
- Engineering Services (Standards and Technical Deviations, Drawings, Technical Records)
- Operations Engineering (Subject Matter Experts, Technical Reviewers)
- Systems Integrity (Reliability, Maintainability, Welding, Inspection)
A System Technical Assessment Review (START) will be conducted by the Project Execution Team prior to Stage Gates 1, 2 and 3. For Stage Gate 3 (Design and Procurement), the focus will be on the deliverables as applicable and defined on the Project START RACI Matrix:

- Critical Process Reviews which will include Final Ramp Rate Flow Profile, Operating and Control Philosophy, Operating Procedures, Safety Procedures, Tie-in Plan, Fill and Flood Plans, Hydro Testing Plan and Final Shipping Strategy Review
- Critical Design Reviews at 30/60/90% completion which will include Process Flow Diagrams (PFDs), Preliminary P&ID’s, Approved Single Line Diagrams (SLDs), Data Sheets for Major Equipment, Mechanical, Electrical, Instrumentation, Review of all Drawing Packages from all Disciplines, Alignment Drawings and Review of all Regulatory Application Preliminary Drawings.
- EPC Schedule Review which will include Long Delivery Items and applications such as power supply, transformers and other major components, Contracting Strategy and Procurement Strategy.
- Verification that Enbridge Standards will be followed and Identification of new or modified standards that may be required
- Identification of potential issues related to Risks, Integrity, Corrosion, Fire and Safety Plans

4.2.6 Value Improving Processes
The Project Execution Team and the Engineering Consultant will be responsible for ensuring that value improving exercises such as Value Engineering and Constructability Reviews have been addressed for the project. The purpose here will be to identify and document opportunities to optimize expenditures, save time, improve quality, minimize rework and utilize resources more effectively. The Value Improving Processes will be defined by Enbridge and the Engineering Consultant, and will take the form of a joint consultant / Project Execution Team facilitated sessions. These sessions should also include input from the Subject Matter Experts (SME’s) within LP Ops Engineering. A report will be submitted by the Engineering Consultant to the Project Execution Team which will include innovations related to cost, schedule and quality. Refer to the Project Value Management Plan for details.

4.3 Procurement
(Process Owner: MP Procurement)

Procurement for Major Projects will be conducted in compliance with Enbridge Inc. Major Project Procurement Policy (“the Policy”) which provide Projects the standards for establishing effective procurement controls. The Policy has been developed to afford maximum flexibility in the design of the procurement control processes and procedures intended to achieve these standards.

Project management will be responsible to establish Project specific processes and procedures consistent with the standards contained within the Policy, where the control processes and procedures:

- do not exist within the Business Unit;
- exist within the Business Unit but do not meet the standards of this Policy; or
- have not yet been developed by MP Procurement and implemented for use by Major Projects.

Project specific processes and procedures must be Approved by Major Project Procurement prior to implementation and be reflective of the Policy standards.
4.3.1 Procurement Planning

The Project Procurement Manager will develop a Project Procurement Strategy (19.1) with the objective of presenting the overall strategic concepts for Project procurement setup, planning, management and execution in subsequent Project stages. Key elements of the Project Procurement Strategy will include, but not be limited to demonstrated understanding of:

- The Project scope, commercial drivers and critical success factors,
- Market conditions and environment in which the Project will be executed,
- Known critical services and/or long lead items, how they may/may not be impacted by the above market conditions and environment and how that will be reflected in subsequent Project procurement planning,
- Obligations, if any, contained within any applicable client agreements which may impact Project procurement.
- Accountabilities and key deliverables associated with successfully Project Procurement setup.

The Project Procurement Manager will develop an Initial Project Procurement Plan 19.2 and mature that plan into complete Project Procurement Plan 19.3 with the objective of presenting the detailed plan for Project procurement management through completion and turnover of the Project to operations. Key elements of the completed Project Procurement Plan 19.3 will include but not be limited to:

- An overview of the organizational plan for Project procurement and it’s state of setup and readiness,
- Well defined plans supporting the management and execution of contracts and materials, and demonstration that such plans are supported by processes which are understood and executable,
- The development of master procurement schedules and the stewardship plan to those schedules.

Engagement of Project stakeholders is required in the development of the Procurement Strategy and Plan and consensus is important. Therefore, the Procurement Strategy and Plans must be approved by applicable Project stakeholders prior to moving forward for stage gate approval.

The Project Procurement Manager and Project Vice President have responsibility and accountability to ensure the Strategy and Plan provide the vest value solution to the Project, and offers the best methods to satisfy the Project objectives without compromise to corporate and Major Project policies and standards.

4.3.2 Contracting

Contracting processes employed by the Project will ensure effective management and accountability relating to contract development and administration of all contracts as defined by the Policy, and in compliance with Policy standards.

4.3.3 Materials Management

4.3.3.1 Materials Control

Material Control processes employed by the Project will ensure accountability and Project direction relating to material quantification, change management, overall material traceability and control from the material take off through surplus disposition phases. Material Controls key deliverables to the Project will be the material status, material reconciliation, and build analysis reporting.
4.3.3.2 Expediting
Expediting processes employed by the Project will ensure that Project material arrives on time, to the correct location and that the vendor meets all of the terms and conditions of supply within the purchase order. Expediting failure ultimately leads to loss of schedule and contractor claims due to the resulting inability to execute their work.

4.3.3.3 Inspection
Inspection processes employed by the Project will utilize examination and testing to ensure that vendor supplied material conforms to the applicable requirements as set out by engineering and the approved inspection and test plan. If non-conformities are found, inspection will work with the vendor and Project team to ensure corrective action is taken.

4.3.3.4 Logistics
Logistics processes employed by the Project will ensure that Project material is transported damage free and delivered to the destination utilizing competitive pricing, the most appropriate mode of transportation, and within the Project schedule.

4.3.3.5 Warehouse Management
Warehouse Management processes employed by the Project will ensure the control of movement, storage & inventory, security, maintenance & preservation of materials within the Project warehouse or lay down area.

4.3.3.6 Material Coordination
Material Coordination processes employed by the Project will ensure interfaces between purchasing and the construction contractor to ensure that all free issue material shortages are addressed.

4.3.3.7 Surplus Management
Surplus Management processes employed by the Project will ensure that surplus material can be identified and is addressed throughout the lifetime of the Project. The processes will also ensure that the Project is accountable for the method and completion of the liquidation of all Project assets prior to Project close out.

4.3.3.8 Vendor Management
Vendor Management processes employed by the Project will ensure the Project and the Company to collect, store and manage vendor information including Project vendor performance reports, inspection findings & quality trends, and vendor red flag alerts.

4.4 Construction
(Process Owner: MP Construction & Safety Services)

The MP Construction Services Group will provide the following support services to the project:
- Welding preparedness plan and Joining Program and monitoring as required
- Field construction assessments and verification activities
- Minimum inspection practices and training
- Document turnover package assessment and verification

4.4.1 Construction: Facilities
MP Construction Services has established the ‘Canadian Facilities Construction Quality Assurance Program’, construction specifications, and standards as part of the project’s facilities construction documents.
In order to define the inspection requirements, MP Construction Services has established a “Field Inspection Procedures Guide” for implementation on the projects. It includes inspection requirements, inspectors’ training and qualifications, their performance, records and reporting requirements, daily, weekly and monthly inspection procedures, the Request for Information (RFI) process, material handling guidelines, roles and responsibilities to ensure conformance to requirements. For more and current information, refer to The Major Projects Canadian Facilities Construction Services “Field Inspection Procedures Guide for Facilities Construction”.

4.4.2 Construction: Pipeline

MP Construction Services has established the ‘Canadian Pipeline Construction Quality Assurance Program’, construction specifications and standards as part of the project’s construction documents.

In order to define the inspection requirements, MP Construction Services has established a “Field Inspection Procedures Guide” for implementation on the projects. It includes inspection requirements, inspectors’ training and qualifications, their performance, records and reporting requirements, daily, weekly and monthly inspection procedures, the Request for Information (RFI) process, material handling guidelines, roles and responsibilities to ensure conformance to requirements. For more and current information, refer to The Major Projects Canadian Mainline Construction Services “Field Inspection Procedures Guide for Pipeline Construction”.

4.4.3 Contractors Quality Plan

Major Projects Construction Services has established the “Contractor Quality Plan Expectation document”. Every contractor for the Project shall be required to implement a Quality Plan providing assurance that all material and services provided by the contractor are completed in accordance with the contract, including Enbridge drawings, specifications and standards, environmental, permitting and landowner requirements, as applicable to scope of work.

The Contractor’s Quality Plan will describe how the contractor plans to staff qualified personnel, use resources, control and document evidence of compliance to the contract requirements. This document will be reviewed by the Project Quality Coordinator with inputs from the Project Execution team for applicability and execution.

4.4.4 Field Inspections

During construction there will be numerous inspectors on site that will observe and monitor Contractor work in the field and ensure continuous compliance with specific requirements of the construction contract documents. Project Field Inspectors will execute Quality, Safety and Environmental Plans in accordance with Field Inspection Procedures Guides for both Pipeline and Facilities construction. The Field Inspectors are directly responsible to the Field Construction Manager, however they shall liaise with the Project Quality Coordinator where deemed necessary for data gathering and reporting.

The quality control function of assuring compliance with the requirements will take precedence over the production function from the point of view of activity inspection. Technical performance and specified requirements will not be sacrificed to accommodate production expediency.

4.5 Environmental Protection

(Process Owner: LP Environment, Land, & ROW)
The *Project Execution Team* will develop an Environmental Protection Plan (EPP) that includes the Environmental Policy and addresses environmental management planning, key environmental concerns and mitigation strategies, preconstruction activities, roles and responsibilities, and the waste management plan including treatment and disposal plan and records retention.

The *Project Environmental Analyst* will coordinate environmental inspections during the construction phase of the project. The *Environmental Inspector* and other key on-site construction personnel will maintain copies of all environmental requirements as outlined in the Environmental Protection Plan.

The *Project Environmental Analyst* will confirm that necessary permits have been received and all required notifications have been submitted. The *Environmental Inspector* will ensure that these permits are stored on site with other relevant construction files.

The *Project Environmental Analyst* will develop an environmental training program that sets out environmental training for the project team, mainline contractor and for all individuals working or visiting the construction right-of-way. Records will be maintained of all individuals who have received training.

The *Project Environmental Analyst* in conjunction with the Environmental Inspector will ensure that an environmental incident reporting form has been completed for all Level 1, 2 & 3 environmental incidents as well as those classed as a reportable spill or other environmental incident. The completed environmental incident reporting form will be maintained within the project files in addition to being provided to the LP Environment (Projects) group.

### 4.6 Land and ROW Acquisition

**(Process Owner: LP Environment, Land and ROW)**

The LP Land & ROW Group is responsible for developing a *Land/ROW Acquisition Plan* that outlines the initial strategy and execution plan for the acquisition of the required land rights for the project. The primary objective of Land & ROW, as it relates to the Project, is to successfully acquire the land rights, including but not limited to PLA’s, MLL’s, PIL’s TFA’s, third party consents, third party crossing/proximity agreements, and road use agreements. These rights are to be acquired in accordance with the approved scope, schedule and budgets. Land & ROW will provide critical support to other functions within the Project Execution Team and will be committed to successfully meet those obligations by providing quality deliverables on a timely basis. All work completed by contractors will be monitored and reviewed so as to ensure that the work completed is within acceptable Enbridge and industry standards.

### 4.7 Health and Safety

**(Process Owner: MP Construction & Safety Services)**

The *Project Execution Team* will develop a comprehensive Health and Safety Management Plan that includes reference to Enbridge Health and Safety policy and is aligned with the MP Health and Safety Management system. This plan will address health and safety management planning and execution procedures on construction as well as commissioning activities of the project. An Emergency Response Plan will be an integral part of the Health and Safety Management Plan.
Safety assessments will be conducted by Project Health and Safety Coordinator during the construction phase of the project. Informal inspections will be conducted on a daily basis and observations will be documented with necessary corrective actions, due date and person responsible. Formal inspections will be conducted on a weekly basis. The Contractor will ensure the results of the Inspection are discussed during the next safety or tailgate meeting.

4.8 Law and Regulatory Affairs
(Process Owner: Enbridge Compliance)

Law and Regulatory Affairs will provide legal and regulatory expertise and coordinate the regulatory approval process for the HSP. Moreover, Law and Regulatory Affairs will provide overall support for all regulatory and legal issues throughout the project lifecycle. After regulatory approvals are obtained Law and Regulatory Affairs will support the project and in particular the Project Compliance Analyst to help ensure compliance with regulatory legislation as well as with commitments and conditions associated with the regulatory approval processes.

4.9 Compliance Management
(Process Owner: Enbridge Compliance)

All Project team members are expected to meet the requirements of all Enbridge policies, including: Enbridge Inc. Compliance Policy; Documents Policy; and Internal Audit, Investigation & Review Policy. It will be the responsibility of the Project Execution Team to manage compliance with all applicable regulatory requirements and project commitments, with the ability to produce expected compliance deliverables for project reporting. All actual and potential material non-compliances, as defined in the Internal Audit, Investigation & Review Policy must be reported to the Compliance Officer.

To assist with meeting these policies, the Project Compliance Analyst will develop a Compliance Management Plan (CMP) which will define the compliance management processes and the best practices and prepare the Project Team to effectively plan for, identify, report on and track to completion all applicable regulatory requirements. In addition to applicable legislation, these requirements include commitments made during the regulatory application process, conditions arising from approvals, as well as any additional compliance requirements that may arise during the lifecycle of the project including those resulting from notice actions or guidelines from regulators. Support for development and execution of the CMP will be provided by LP Compliance, who will also conduct periodic compliance health checks of the project.

The list of applicable regulatory requirements, referred to as the project Compliance Tracking Record (CTR), will be managed within Methodware software. In managing the CTR, the Project Compliance Analyst will ensure that all regulatory compliance issues are addressed and/or escalated, as required. Management of the CTR will require communication with both key functional project staff (e.g., environment, construction, engineering, etc.) as well as with staff responsible for other control-type processes (e.g., risk, quality, scheduling, etc.).

4.10 Public, Government and Aboriginal Affairs
(Process Owner: MP Public, Government, & Aboriginal Affairs)
The Public, Government and Aboriginal Affairs group will execute the Participant Involvement Program throughout the life of the project, from project initiation through the application filing and review process, and following regulatory approval through pipeline and facilities construction being put into operations. Upon approval, the group will continue to engage and communicate with stakeholders regarding construction and other issues of stakeholder concern through to the project being put into service.

4.11 Gating Control
(Process Owner: MP PMO)

The Project Stage Gate Coordinator will be responsible for ensuring that all PLGC processes are understood by the members of the Project Execution Team and that PLGC deliverables are completed as per PMO requirements. If a deliverable cannot be completed, is completed late or does not meet the scope of the deliverable the Project Stage Gate Coordinator will use PMO’s Deviation Form PMO-03-0038 to record the decision and any corresponding risk. The project Leader and the MP VP can support either not completing the deliverable or can put it on a recovery plan for completion in the next project stage. These recovery plans are recorded on the Gate Decision Record.

4.12 Risk Management
(Process Owner: MP PMO)

The Project Risk Specialist will develop a Risk Management Plan defining the project’s risk management objectives, strategic principles, risk management process and tools, risk management activities and deliverables, roles and responsibilities, communication protocols, and training requirements as applicable during the planning, design, procurement and construction stages of the project.

The Project Risk Specialist will support the Project Execution Team by identifying foreseeable risks; prioritizing, monitoring and updating the risk register on timely basis; and developing mitigation strategies throughout the life of the project. Risk-based information will be communicated to project stakeholders in a timely manner at an appropriate level of detail to enable project strategy to be modified in the light of current risk exposure.

4.13 Insurance Risk Management

The Insurance Risk Management team will manage Enbridge’s risk on the project by financial transfer. This is mainly achieved through the development and purchase of a construction specific insurance program.

4.13.1 Project Specific Insurance

Course of Construction insurance is a specific form of property insurance that covers damage caused by an insured peril or during transit, to permanent and temporary works, structures, buildings and material attached to or connected with the project.

Wrap-up Liability insurance covers costs Enbridge or our contractors could become legally obligated to pay as a result of damages caused to a third party during execution of the project.

Both of the above insurance coverages are subject to a deductible and to the limits of the policy purchased for the project, to be announced upon inception.
4.13.2 Contractual Transfer
Reducing or eliminating project risk is also achieved by contractual transfer. Insurance Risk Management ensures the adequacy and completeness of insurance provisions within construction contracts, consulting services agreements and engineering services agreements to protect Enbridge’s interests.

4.13.3 Insurance Application
The following information is required from the Project Execution Team six (6) to eight (8) weeks prior to the construction start date for purposes of assembling an insurance application for the project.

- Detailed scope of work
- Breakdown of construction costs (ie: materials, equipment, electrical, piping, instrumentation – as well as a breakout of the estimated labor costs)
- Construction Schedule
- Plot plans/construction drawings
- Geotechnical reports
- Environmental Reports
- Transport and storage details on major equipment

4.13.4 Insurance Premiums, Ongoing Monitoring and Final Adjustment
The project’s insurance premiums will be based on the scope of work, schedule and estimated construction value (dollars at risk). If any of these three components materially change during execution of the project, the Project Execution Team must notify Insurance Risk Management to ensure compliance with reporting obligations of the project specific insurance policies.

- Examples of a material scope change are addition of station piping, a pump, tank, building, or meter and/or changing the location of such and deviating from the original design.
- A guideline to assess what constitutes a material change in project construction values is +/- 15%.
- Any changes in the in-service date declared within the project insurance application must be reported to ensure coverage is purchased for the additional time on risk.

Three (3) to six (6) months past the project in-service or substantial completion date, Insurance Risk Management will work with the Project Controls Engineer to analyze final construction values for insurability. The final insurable construction values will be reported to insurers, and additional premiums may be assessed if the project spend exceeds budget.

4.13.5 Claims
Should damage occur during execution of the project, the Project Execution Team must notify Insurance Risk Management to ensure compliance with reporting obligations of the project specific insurance policies. Should either of the Course of Construction or Wrap-up Liability insurance policies be exercised, Insurance Risk will manage, advise, and assist in claims handling and resolution as required.

Aligns itself with commercial / business processes that are subject to corporate reviews and administration.
4.14 Document and Records Management  
(Process Owner: MP Engineering Services, LP Technical Records)

4.14.1 Document Control
A Document Control and Retention Plan, prepared by the Project Execution Team, is a Gate 1 deliverable that sets out a strategy for managing and controlling all documents and technical records related to the Project.

It is the responsibility of the Project Document Control Analyst to ensure that all required project documents and records being created are filed and retained in compliance with established procedures.

4.14.2 Records Management
The Project Document Control Analyst is to ensure all records required by Major Projects' internal and regulatory stakeholders are identified, filed and prepared for delivery, in accordance with established procedures.

Assessments of field documents will be performed at 25% and 75% completion of construction activities and any documentation deficiencies will be corrected. At 100% construction completion, the field documents will be sent to the Project Document Control Analyst and a final assessment will be performed.

The Quality Coordinator, the Project Construction Team and the Project Document Control Analyst will work with contractors and inspectors to ensure that deficiencies, if any, are corrected before turnover to LP Technical Records.

4.15 Cost Management  
(Process Owner: MP PMO)

The Project Controls Manager will develop a project controls plan detailing the projects practices for WBS development and maintenance, performance management baseline, cost estimate management, cost control procedures, progress measurement, field controls, invoice management, reporting, project close out plan and the use of project management systems based on the PMO standard. In addition, a resourcing plan will be developed detailing the roles and responsibilities, communication protocols and possible training requirements during the planning, design and procurement and construct stages of the project.

The Project Controls Manager will support the project execution team by reporting incurred and expended costs while maintaining the Enbridge standard of performance metrics on a timely basis to facilitate project execution team decision process. Additionally, potential project areas of cost concern and undesirable trends will be identified by the project cost team and brought to the attention of the project execution team. The main communication tool of the team will be regularly scheduled reporting identified in the project controls plan reporting calendar, unless otherwise deemed a special case.

A Work Breakdown Structure (WBS) will be developed by the Project Execution Team in order to provide the foundation for cost management and reporting. The detailed scope and estimate based on the Project Execution Plan and Schedule will form the basis for Cost Control activities.
4.16 Schedule Management
(Process Owner: MP PMO)

A Project Master Schedule will be developed, the Project Execution Team in conjunction with the cost estimate so as to ensure that the project scope and assumptions used in both are well aligned. The Schedule will be developed based on the structure set out in the project WBS and will be resource loaded for each phase of execution to track resources usage as well as progress. A Basis of Schedule (BoS) will accompany the Schedule to summarize scope, execution strategy, issues & concerns, risks & opportunities, assumptions, exclusions and exceptions.

4.17 Operations Services
(Process Owner: LP, Operations Services)

Operations Services, as well as Regional and Area Operations staff are critical stakeholders during the design process. These Operations representatives must be included to ensure that the proposed design meets the operational requirements for maintainability, access, egress, safety, spare parts, equipment selection, etc.

Operations Services has prepared an acceptance checklist called the Operations Acceptance Criteria (OAC) that is to be used for Enbridge Operations acceptance at two critical milestones:
- acceptance at linefill, flooding and initial start up and
- final acceptance

These two milestones coincide with the PLGC’s Stage Gates 4 and 5 respectively. Signoff from various operations staff will be required to confirm that required items on the OAC are completed prior to proceeding past these milestones. Operations Services staff are available to assist Project staff during these milestones.

4.18 Change Management
(Process Owner: MP PMO)

The Project Execution Team will follow the Change Management processes to manage Change in:

- Control Budget, Current Budget and Forecast at Completion through Project Change Orders and Trends.
- Contracts through Change Orders, Change Directives, Purchase Order Revisions and Work Order Revisions.

4.19 Commissioning and Start-up
(Process Owner: MP Engineering Services)

The Commissioning and Start-up activities will transition a constructed facility from a non-energized state to an energized, safe-to-operate facility. Associated with this phase will be predominantly Quality Assurance/Quality Control activities to ensure equipment and systems performance in accordance with engineering design for the project. Key focus areas are as follows:
- High, medium and low voltage systems are tested and safely energized prior to placing into operations.
- All field devices are installed correctly and tested from the point of origin through the local control system.
- All devices are checked to the SCADA system to ensure that the Control Center Operator has correct status and control of the facility.
- All Safety and Emergency Shutdown (ESDs) perform as designed to protect equipment, employees, the public at large and the environment.
- All piping systems are protected from overpressure.
- All commissioning activities and testing are documented and signed by commissioning supervisor and the operations representative before turning over the system for placement into service.

Supporting the Project Execution Team, MP Engineering Services will jointly establish a Commissioning and Startup Plan, estimate and schedule along with required procedures that ensure conformance to the established commissioning standards.

The PEP will have a dedicated Project Commissioning Coordinator, as well as a Linefill / Station Flooding Coordinator (as a shared resource), both supported by MP Engineering Services.

4.19.1 Pre-commissioning
Pre-commissioning involves de-energized and energized functional testing of vendor equipment or prefabricated assemblies prior to their shipment to the site. Commissioning Guides will be developed by a third party consultant and will be specific to the piece of equipment or prefabricated assemblies to be tested per standard Enbridge practice. Formalized sign-off through affidavits between commissioning contractors and Enbridge will release the equipment for shipment. Systems will be rechecked onsite that may change due to the shipping process or due to safety related issues.

4.19.2 Dry Commissioning
Dry commissioning is the process of verifying if the facility is ready to be flooded. During dry commissioning all construction deficiencies related to the functional operation of the facility will be resolved. Moreover, prefabricated equipment deficiencies will be resolved per pre-commissioning documentation during this stage.

4.19.3 Linefill
The Linefill / Station Flooding Coordinator will plan and coordinate all materials and resources required to fill the mainline pipe. The role manages interdependencies between Operations (control centre and field), shipper services, PLM and the PEP Project Commissioning Coordinator.

A complete Linefill Plan will be developed by the Linefill / Station Flooding Coordinator outlining common schedule milestones with pipeline construction and facility commissioning.

4.19.4 Flooding Plan
The Linefill / Station Flooding Coordinator will plan and coordinate all materials and resources required to flood the facilities in a safe and effective manner. The Facility Flooding Plan will be developed by the Project Execution Team, supported by the Linefill / Station Flooding Coordinator and documented by a third party engineering consultant. The plan will be implemented by Operations and Pipeline Maintenance personnel (PLM) as support to the PEP.

4.19.5 Wet Commissioning
Wet commissioning is the process of verifying that the system and all of its associated equipment is calibrated and all required tuning of the devices is complete and the system is ready to be in place into operation. A Field Commissioning Team, working with Enbridge Operations personnel will be responsible for final check out of all devices once they are flooded.

4.19.6 Post Start-up

Upon facility being fully operational, the Field Commissioning Team will complete all site documentation and As-Built drawings for final submittal. Deficiency lists will be reviewed with the Director, Engineering and Construction for resolution and delegation.

4.20 Operational Readiness

(Process Owner: LP Operational Readiness)

Operational Readiness is the Enbridge Liquids Pipeline (LP) group that owns the Ready to Operate (RTO) process. Linked to the RTO process is the LP Ready to Transition (RTT) process that assigns LP VP Designates who are each accountable for implementing the RTT process within each of the VP areas.

Executing the RTO process will:

- Assure the efficient and smooth transition of newly constructed assets from project teams to operating entities,
- Assure assets delivered as expected and that each department is ready to receive, operate and support the new facilities consistent with their operating roles,
- Facilitate item resolution to assure a positive outcome on system operability,
- Support project teams to meet expectations and achieve Gate dates,
- Provide training sessions, individualized support and conduct project operational readiness reviews.

Through front end loading and planning the Project Execution Team will develop an Operational Acceptance Implementation Plan to define the project operational readiness schedule, objectives, implementation approach, roles and responsibilities, communication protocols, interface requirements and deliverables applicable during Stages 2 thru 6.

To support gating package approvals the RTO process has two primary deliverables both aligned with the Project Lifecycle Gating Control:

<table>
<thead>
<tr>
<th>Gate 4</th>
<th>Gate 5</th>
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<tbody>
<tr>
<td>Approval to Flood, Linefill, Wet Commission, Start-up and commence scheduled operations.</td>
<td>Asset Acceptance</td>
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<tr>
<td>PLGC Deliverable 50.4 Operational Turnover Plan (Initial)</td>
<td>PLGC Deliverable 50.5 Operational Turnover Plan (Completed).</td>
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<tr>
<td>---------------------------------------------------------</td>
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<tr>
<td>- Operational Turnover Matrix – with updated Gate 4 status.</td>
<td>- Operational Turnover Matrix – with updated Gate 5 status (open items transferred to PARTS list).</td>
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<tr>
<td>- Consolidated Punch Lists containing Type A items (B items will be tracked outside of the gate acceptance documentation).</td>
<td>- Project Acceptance Requirements Tracking Sheet (PARTS) list Consolidated and Ratified categorized as item type 1, 2 or 3.</td>
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<td>- Plans To Manage – any remaining work items which cannot be resolved prior to the anticipated acceptance date require a unique Plan To Manage to define scope, schedule and cost.</td>
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4.21 Geographic Information System (GIS)
(Process Owner: LP Engineering Services)

The LP Geomatics Services Group will validate and manage the digital data collected during the as-built pipeline surveys and right-of-way legal surveys. Standards will be developed by the Geomatics Services Group to define the format and content of the required geospatial data deliverables.

4.22 Transition Services
(Process Owner: MP Engineering Services)

After the facility is fully commissioned and in service, MP Engineering Services leads a process that assures the management of all outstanding work items through the development of a Transition Management Plan (developed in mutual agreement with the Project Execution Team). As documented in the Transition Management Plan, MP Engineering Services will generally take over the management of outstanding work items after Stage Gate 5 signoff – mainly those items that are common to multiple projects, require multiple stakeholder facilitation, or will require significant time to complete. MP Engineering Service’s role will be to serve as project managers on these items and engage tactical services from other departments (as matrix resources) as well as retaining project personnel where appropriate. The Transition Management Plan will be appended to the Operational Turnover Plan.
### 5. Process Owners Table

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List of Acronyms

AFE  Authorization For Expenditure
BOM  Bill of Material
CBS  Cost Breakdown Structure
CSA  Canadian Standards Associations
CSA Z662  CSA Standard Z662, Oil and Gas Pipeline Systems, 2007
CTR  Compliance Tracking Record
CWP  Construction Work Packages
DFO  Department of Fisheries and Oceans (Federal)
EMS  Environmental Management System
EPI  Enbridge Pipelines Inc. / Enbridge / The Company
EPP  Environmental Protection Plan
ERP  Emergency Response Plan
FEED  Front End Engineering and Design
HDD  Horizontal Directional Drill
MDR  Master Document Register
MR  Material Requisition
MRR  Material Receiving Report
NCR  Non Conformance Report
NDE  Non-Destructive Examination
NDT  Non-Destructive Testing
NEB  National Energy Board
NPS  Nominal Pipe Size
OHS  Occupational, Health and Safety Act
OPR  Onshore Pipeline Regulations
PCO  Project Change Order
PEP  Project Execution Plan
PLGC  Project LifeCycle Gating Control
QA/QC  Quality Assurance / Quality Control
QMP  Quality Management Plan
QMS  Quality Management System
RA(S)CI  Responsible, Accountable, (Supports), Consulted, Informed
RFI  Request for Information
RFQ  Request for Quotation
ROW  Right of Way
WBS  Work Breakdown Structure