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December 15, 2004

National Energy Board
444 Seventh Avenue S.W.
Calgary, AB T2P 0X8

**Attention: Mr. Michel Mantha
Secretary**

Via Electronic Filing and Courier

Dear Mr. Mantha:

Re: Mackenzie Valley Pipeline Application Pursuant to the NEB Act (the Application)
Materials Quality Assurance Program
Hearing Order GH-1-2004

Enclosed is one copy of the *Materials Quality Assurance Program for the Mackenzie Valley Pipeline*.

This document is referenced in Section 3.2.1 of Volume 3, Engineering Design, of the Application and addresses the requirements of the National Energy Board's Filing Manual, Guide A.1.3.

Imperial Oil Resources Ventures Limited (Imperial) is filing this document on behalf of the Mackenzie Valley pipeline proponents. The document outlines the actions that Imperial as the operator will take to ensure that material purchased for use in the proposed Mackenzie Valley pipeline facilities are appropriate for their intended use.

Yours truly,

A.D. (Sandy) Martin
Manager, Regulatory Affairs
Mackenzie Gas Project

Enclosure

cc: D. Davies – Macleod Dixon



Mackenzie Valley Pipeline Supplemental Information

Materials Quality Assurance Program

**Submitted to:
the National Energy Board**

**Submitted by:
Imperial Oil Resources Ventures Limited**

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MACKENZIE VALLEY PIPELINE SUPPLEMENTAL INFORMATION MATERIALS QUALITY ASSURANCE PROGRAM

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INTRODUCTION

**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM****PROGRAM OBJECTIVES**

PURPOSE OF PROGRAM

The purpose of this Materials Quality Assurance Program and the associated processes is to confirm that the pipe and components to be used in the Mackenzie Valley pipeline meet the approved project materials specifications. These materials specifications typically define the required testing, inspection, level of verification, such as sampling or 100% inspection, their frequency and acceptance criteria for pipe and components, such as valves and flanges, for the pipeline and associated facilities.

SCOPE OF PROGRAM

The Materials Quality Assurance Program applies to the permanent materials and consumables associated with the pipe and components for the Mackenzie Valley pipeline and associated pipeline facilities.

Specifications will be based on CSA standards with additional project-specific requirements. In some cases, the specifications will be developed specifically for materials to be used in a northern environment.

QUALITY OBJECTIVE

Imperial Oil Resources Ventures Limited (Imperial) has established project objectives for the Mackenzie Valley pipeline (the project). The project's primary quality objective is to ensure that project design and execution activities are conducted according to regulatory and project requirements, thereby providing for safe, environmentally sound and cost-effective project execution and facility operations. Quality processes and requirements have been, and continue to be, established to confirm that engineering, procurement, transportation, fabrication, construction, commissioning and start-up activities meet this objective.

As stated in Section 1.6.2 of the *Application for Approval of the Mackenzie Valley Pipeline*, one of the goals for the pipeline is to demonstrate industry-leading performance in key project areas, including:

- safety, health and environment
- quality
- cost
- schedule for project execution

QUALITY OBJECTIVE (cont'd)

As operator of the Mackenzie Valley pipeline, Imperial will oversee and manage the development and execution of the project, including quality assurance. The project will be executed in three phases:

- conceptual and preliminary engineering
- detailed engineering, procurement and construction
- commissioning and start-up

Engineering contractors, construction contractors, fabricators and suppliers of materials and services involved in each phase will implement their own quality management systems. The quality assurance programs and quality assurance plans implemented under these systems will be required to meet the intent of the ISO 9000 series requirements. If determined necessary by the operator, these programs will be modified to be consistent with this Materials Quality Assurance Program. These modifications will normally be accomplished through the development of a project-specific quality plan, which will typically require operator approval.

Subcontractors and suppliers working for contractors that are working directly for the operator, or one of the operator's contractors or subcontractors, will be required to meet the requirements of this Materials Quality Assurance Program. In these cases, where individual quality plans are considered to be necessary, they will be submitted for approval by the contractor that the subcontractor or supplier is working for. In some of these cases, the operator may also stipulate additional approval requirements.

PROGRAM CONTROL AND REVISION

This Materials Quality Assurance Program will be revised, as necessary, by the project manager, the project engineering manager and project quality management, to address changes in project scope, quality assurance organization, roles and responsibilities, or to improve its effectiveness.

INTRODUCTION

**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM****QUALITY ASSURANCE ORGANIZATION**

ORGANIZATIONAL APPROACH

Quality assurance personnel will be included in the operator's project management team, as necessary, to implement the Materials Quality Assurance Program. Quality management personnel will report to senior management responsible for the project.

RESPONSIBILITIES

Quality is an integral part of performing work and is the responsibility of the line management directly accountable for the work. All organizations and parties providing products or services:

- are responsible for the quality of their work
- are to have their work performed by trained and qualified personnel
- are to assign the work to individuals with a sufficient level of responsibility and authority to direct action and allocate resources needed for implementation

Authority may be delegated. However, responsibility remains with the assigned individual.

Project Manager's Responsibility

The project manager has overall responsibility for project quality and is the owner and approver of this Materials Quality Assurance Program.

Project Engineering Manager's Responsibility

The project engineering manager has endorsed this Materials Quality Assurance Program and is responsible for project team compliance with it during the engineering phases of the project. Most of the materials will be purchased during the engineering phases.

The project engineering team, under the direction of the project engineering manager, confirms that the design of project facilities complies with applicable federal, territorial, provincial and municipal regulations, industry codes and standards, and with corporate standards and specifications.

Other Project Management Responsibilities

Responsibilities for construction activities and the related responsibilities for implementing this Materials Quality Assurance Program will be defined before the construction phase and will be included in the quality assurance organization plan at that time.

Project Quality Management Responsibility

Project quality management are responsible for:

- overseeing the development and implementation of project quality assurance plans, programs, processes and procedures in the engineering office and in the field
- planning and scheduling quality assurance activities
- promoting a consistent approach to quality management across the project
- actively promoting quality awareness and commitment on the project
- maintaining quality interfaces within the project
- maintaining the Materials Quality Assurance Program and the procedures required to implement it
- providing input to contracts and purchase orders regarding quality assurance requirements
- monitoring compliance with, and effectiveness of, quality requirements by:
 - performing audits and conducting surveillance
 - verifying that identified deficiencies are stewarded to resolution and are closed out
- participating in selected audits conducted by contractors
- helping the operator's project management team to select quality assurance personnel
- establishing project quality reporting requirements and performance measurement criteria
- collecting, consolidating and evaluating resulting data
- providing project management with reports on quality status and performance

Third Parties' Responsibilities

Manufacturers, fabricators, constructors and suppliers of materials and services are responsible for the quality of their work.

Third party agencies might be assigned responsibility for implementing portions of this Materials Quality Assurance Program, as quality assurance coordination, surveillance or inspection representatives for Imperial. When these representatives perform these quality assurance activities for Imperial, Imperial will:

- verify that the representatives are appropriately qualified
- oversee and assess the adequacy and effectiveness of the quality assurance activities that the representatives perform

QUALITY ASSURANCE AND CONTROLS**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM****DESIGN CONTROL**

PURPOSE

Design activities performed in support of the Materials Quality Assurance Program will be conducted in a planned and controlled manner, so that all applicable requirements, such as regulations, codes, project standards and specifications, are met and correctly implemented.

These design activities will be planned and controlled so that:

- design inputs relating to product requirements are determined and records are maintained
- design outputs are provided in a form that enables them to be verified against the inputs and approved before they are released for use as a final product, or as an input for another product
- the design is systematically reviewed at planned stages
- the design is verified and records of results and any necessary actions are maintained
- design changes are identified and reviewed and records of reviews and actions are maintained

The operator will require that the interfaces between groups involved in design development are managed to promote effective communication and clear assignment of responsibility.

INDEPENDENT REVIEWS

Independent reviews will be conducted to confirm that:

- the design meets technical and functional requirements, including:
 - materials selection
 - processes adopted
 - technical solutions for manufacturing, construction, operations and maintenance conditions

INDEPENDENT REVIEWS (cont'd)

- the design and associated documents comply with the applicable regulations, codes, standards and contractual requirements

Independent reviews will be performed in accordance with project management and engineering surveillance processes and schedules and as required by regulatory agencies. Operator-initiated independent reviews will be conducted by qualified Imperial personnel not associated with the project, or by industry experts or other qualified personnel.

**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM**

**CONTROL OF PURCHASED MATERIALS AND
SERVICES**

PURPOSE

The procurement of materials and services will be controlled to maintain conformance with specified requirements. Procurement activities will be performed according to project approved procedures that provide controls for both pre-contract award and post-contract award activities.

Materials purchased by the operator, as well as those purchased by the manufacturers, fabricators, constructors, contractors and subcontractors, will be in accordance with this Materials Quality Assurance Program. The manufacturers, fabricators, constructors, contractors and subcontractors will be required to have project-approved quality plans and procedures that address procurement of project materials, unless an exception is granted by the operator.

CONTROL OF PURCHASED MATERIALS

Supplier Evaluations

Potential suppliers of materials will be evaluated based on their capability to provide materials that meet or exceed the approved specifications. Part of the evaluation will include an assessment of the potential material supplier's quality capability. The scope and depth of evaluation will be based on the criticality of the purchased materials and might include:

- evaluating the supplier's quality management system
- reviewing the supplier's quality records
- directly evaluating the supplier's facilities, personnel and quality program implementation
- reviewing records of the supplier's past performance in providing similar products

Competitive Bid Participation

When materials are purchased via competitive bid, quality assurance personnel will typically review and provide input to the invitation to bid package, the evaluation of bids, the bid clarifications and selection of suppliers. Quality assurance personnel will also review and provide input to requests for quotes and

Competitive Bid Participation (cont'd)

individual purchase orders based on the criticality of the materials being purchased.

Purchase Order Quality Provisions

Quality requirements included in procurement documents will be based on the type of materials being purchased and their criticality. Quality requirements to be considered for individual purchases include:

- test and inspection requirements
- procedure qualification
- personnel qualification
- materials traceability
- packaging, shipping and handling requirements

Purchasing documents will also contain appropriate provisions for:

- Imperial's, or its representative's, right of access to the site and product
- Imperial's, or its representative's, verification of the product, including hold and witness points and records
- reporting nonconformances and approval or rejection of their dispositions
- documentation requirements

Monitoring Suppliers

Material suppliers will be monitored based on the nature of the materials being purchased and their criticality. Monitoring activities will include, as appropriate:

- reviewing and approving documents and procedures
- conducting source inspections
- conducting audits
- surveillance
- receipt inspection
- post-installation testing

CONTROL OF PURCHASED SERVICES**Supplier Evaluations**

Potential service suppliers, such as fabricators, manufacturers, constructors and inspectors, will be evaluated based on their capability to provide the services to be awarded. Part of the evaluation will be an assessment of the potential supplier's quality capability. Typically, the assessment will include:

- evaluating the supplier's quality management system
- reviewing the supplier's quality records
- evaluating the supplier's personnel and quality program implementation

Contracting Participation

Quality assurance personnel will participate in the contracting process to provide input to the selection of qualified suppliers and to confirm that appropriate quality requirements have been included in the contract documents. Quality assurance personnel will normally participate in the following:

- providing input to invitations to bid
- evaluating bids
- clarifying bids
- selecting suppliers

Before awarding a contract, the supplier will be required to provide a satisfactory response to each quality-related clarification resulting from the bid evaluation.

Contractors and subcontractors will be required to implement their own quality assurance programs and provide a project-specific quality plan, as necessary, to satisfy this Materials Quality Assurance Program. In addition, contracting documents will stipulate the requirements for:

- approving the supplier's quality programs, quality plans, supporting procedures and quality assurance personnel
- reporting quality performance

Monitoring Suppliers

Service suppliers' performance will be monitored through audits and surveillance. The level of monitoring will be based on the criticality of the service provided.

QUALITY ASSURANCE AND CONTROLS**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM****MANUFACTURING, FABRICATION AND
CONSTRUCTION CONTROL**

RESPONSIBILITY

Manufacturers, fabricators, constructors, contractors and subcontractors will be responsible for ensuring that:

- materials, products, components, units and assemblies comply with applicable regulations, codes, standards, specifications, contracts and subcontracts
- quality assurance and quality control activities are performed according to approved quality plans and procedures, as required by the contracting or procurement documents

SCOPE OF QUALITY CONTROL

Quality control activities apply to materials and services that manufacturers, fabricators, constructors, contractors and subcontractors purchase. This will require development of:

- manufacturing, fabrication and construction procedures
- inspection and test plans
- control of documents and data

Inspection and Test Plan

The manufacturer, fabricator or constructor's inspection and test plans (ITPs) will be used to manage the quality control of products. ITPs include the supplier, manufacturer, fabricator or constructor's planned quality activities to be performed and documented on an item or activity. In the ITPs, the witness and hold points for selected inspections and tests will be specified by quality assurance personnel of the responsible organization, the contractor who contracted the work and, in some cases, Imperial. Acceptance of these inspections and tests will be documented by the designated quality representatives from each participating organization.

Deviations

The organization responsible for the specification requirements will evaluate and approve, or reject, proposed deviations from specified requirements, using a documented process. The objective of the evaluation is to verify that the resulting

Deviations (cont'd)

conditions are technically adequate and that they comply with the applicable regulations, codes and standards.

Audits and Surveillance

Compliance with quality-related requirements will be assured through quality surveillance and audits. Audits will be conducted by the operator and the manufacturers, fabricators, constructors, contractors and subcontractors according to their approved project quality plan and established project procedures.

**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM**

MATERIALS IDENTIFICATION AND CONTROL

PURPOSE

Manufacturers, fabricators, constructors, contractors and subcontractors will establish controls, so that only approved materials and consumables, such as pipe, valves, flanges and weld rod, paint and adhesives, are used and permanently installed. The controls will be applied, when required by codes, standards or specifications that include specific identification or traceability requirements, such as heat, batch, lot, part number or serial number.

ITEM AND MATERIAL IDENTIFICATION

Materials will be physically identified, unless the organization responsible for establishing the controls agrees that this would be impractical or insufficient. If physical identification is not practical or sufficient, physical separation, procedural control or other means will be used to provide assurance that the correct materials are used.

Physical markings must not be obliterated or hidden by processes like surface treating, coating, or assembly, until the material has been verified by the responsible quality organization and documented. Once markings are hidden or obliterated, procedural controls will be used to maintain material traceability during further processing, such as further assembly or coating, through to final assembly or installation. The procedural controls for maintaining traceability will be approved by the organization responsible for maintaining traceability and the quality organization responsible for accepting the final assembly or installation.

IDENTIFICATION MARKINGS

Identification markings, when used, will be applied using methods that provide legible identification and that do not impair the function or service life of the material or component. Markings will be transferred to each part of the material when subdivided.

**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM**

**TESTING CONTROLS AND SPECIAL
PROCESSES**

CONTROL OF SPECIAL PROCESSES

Manufacturers, fabricators, constructors, contractors and subcontractors will establish controls for processes that control or verify quality, such as those that are used in welding, heat treating and nondestructive examination (NDE). The controls will provide the necessary assurance that processes are performed by qualified personnel, using qualified equipment and procedures, in accordance with specified requirements.

Processes will be controlled by instructions, procedures, drawings, checklists, travelers or other means, so that process parameters are controlled and specified environmental conditions are maintained.

Records will be maintained for:

- personnel performing special processes, including their current qualifications and certifications
- special processes and procedures, including current approvals and revision records
- equipment used in special processes, including current approvals, calibrations and certifications

CONTROL OF MEASURING AND TEST EQUIPMENT

Manufacturers, fabricators, constructors, contractors and subcontractors will establish controls for tools, gauges, instruments and other measuring and test equipment used to verify conformance to specified requirements. The controls will provide the necessary assurance that measuring and test equipment is calibrated and adjusted to maintain accuracy within the original equipment manufacturer's specified limits, and that qualified personnel perform the calibrations and adjustments.

The selection of measuring and test equipment will be controlled, so that the equipment used is of the proper type, range, accuracy and tolerance for the intended verification that is to be performed.

Measuring and test equipment will be calibrated, adjusted and maintained at prescribed intervals or, before use, against certified measuring devices having

CONTROL OF MEASURING AND TEST EQUIPMENT (cont'd)

known relationships to recognized Canadian standards. If no recognized Canadian standards exist, the basis for calibration will be documented and submitted to the organization responsible for the quality of the affected product or products, for approval consideration.

Calibration intervals will be established for each device, based on type, stability characteristics, required accuracy, intended use and other conditions affecting accuracy. When a device is found to be out of tolerance, it will be removed from service until it is properly recalibrated. A written evaluation will be made of the impact on the validity of any inspections or test performed on items using the out-of-calibration device and the acceptability of those items. The evaluation will be reviewed and accepted or rejected by a qualified representative of the organization that established the original specification for the suspect items.

Calibration records will be maintained for each measuring and test device.

TEST CONTROL

Manufacturers, fabricators, constructors, contractors and subcontractors will establish controls for performing tests used to verify conformance to specified requirements. Characteristics to be tested and test methods to be used will be specified. Test results will be documented and their conformance with acceptance criteria will be evaluated.

The manufacturer, fabricator or constructor's inspection and test plan (ITP) will be used to manage quality control of products and services. The organization responsible for the quality of the product and the ITP will provide the organization responsible for accepting the product the opportunity to identify hold and witness points. The operator will also be provided this opportunity.

Test Requirements

Test requirements and acceptance criteria will be provided by, or approved by, the organization responsible for the design of the item to be tested, unless otherwise specified by the operator. This will include provisions for random and progressive testing, where required.

Test Procedures

Test procedures will include or reference the test objectives and contain provisions for verifying that test prerequisites are met. As a minimum, test prerequisites will include:

- calibrated instrumentation
- appropriate equipment verified to be in proper operating condition
- trained and qualified personnel
- suitable environmental conditions
- provisions for data acquisition

- test acceptance criteria

Test Results

Test results will be documented and evaluated by qualified personnel of the responsible organization to verify that test requirements have been satisfied.

Test Records

Test records will, as a minimum, identify the:

- material or component tested
- date of test
- test data recorder
- results and acceptability
- action taken in connection with any deviations noted
- names and signatures of those performing the test and evaluating the test results

QUALITY ASSURANCE AND CONTROLS**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM****CONFORMANCE VERIFICATION AND
NONCONFORMANCE CONTROLS**

PURPOSE

Conformance with project technical and quality requirements will be confirmed through:

- inspections
- audits
- surveillance

INSPECTIONS

Inspections conducted to verify conformance with requirements will be planned and controlled. Characteristics to be inspected and inspection methods will be specified. Inspection results will be documented. Persons other than those who performed or directly supervised the work being inspected will perform inspections for acceptance.

Inspector Qualifications

Individuals who verify the conformance of work to requirements for the purpose of acceptance will, as a minimum, be qualified as required by applicable regulations, codes, standards and specifications.

Inspection for Acceptance

The organization responsible for performing inspections for acceptance will be given the opportunity to identify mandatory inspection hold points, as will the operator. The organization performing work will not proceed beyond inspection hold points without the specific consent of the designated organization or organizations that have identified the hold points.

Resolving Unsatisfactory Items or Nonconformances

The inspection organization will have procedures for documenting, verifying completing corrective actions and re-inspecting unsatisfactory items. Unsatisfactory items that have not been corrected at the time of final acceptance inspections will be documented and addressed in accordance with an approved nonconformance resolution process.

Inspection Records

As a minimum, inspection records will identify:

- the item inspected
- the inspection criteria
- the date of inspection
- the location of the inspection
- the inspector's name and signature
- the results and acceptability of the inspected item
- information on the action taken in connection with nonconformances

AUDITS

Planned and scheduled audits will be conducted to verify compliance with this Materials Quality Assurance Program and to determine its effectiveness. Audits will be performed according to written procedures or checklists by personnel that do not have direct responsibility for the activities being audited. Audit results will be reported to the responsible managers.

Managers who are responsible for deficiencies that have been identified during audits will develop and implement corrective and preventive action plans endorsed by the quality organization that performed the audit. The responsible quality organization will monitor the timeliness of corrective and preventive actions and verify their effectiveness.

SURVEILLANCE

Surveillance will be performed to monitor the effectiveness of the quality assurance processes. Surveillance consists of ongoing sampling of processes, work products and activities. The extent and frequency of surveillance will be based on the criticality of the activity or product. Repetitive deficiencies of a similar nature will be evaluated to determine if the associated processes and procedures require corrective action.

CONTROL OF NONCONFORMING ITEMS

Materials, components, or products that do not conform to specified requirements will be controlled to prevent them from being installed or used inadvertently. Controls will provide for identifying, documenting, evaluating, segregating and establishing the disposition of nonconforming items.

Nonconforming materials or components will be marked, tagged or otherwise identified as being nonconforming. The identification method will allow easy identification. If it is not practical to identify individual nonconforming items, such as a batch of bolts, the items will be segregated by using packaging or controlled storage.

CONTROL OF NONCONFORMING ITEMS (cont'd)

Documentation of nonconforming materials, components or products will clearly identify the:

- nonconforming item
- specific requirement that has not been met
- organization responsible for the item
- person who identified the nonconformance

Nonconforming materials, components or products will be reviewed and a disposition proposed and considered for approval by authorized personnel, as outlined in the nonconformance procedure of the organization producing the item. If the proposed disposition will result in the item deviating from originally specified requirements, the organizations that originally established and approved the requirement must evaluate and approve the deviation. The evaluation objective is to verify that the resulting conditions are technically adequate and in compliance with applicable regulations, codes and standards.

QUALITY ASSURANCE AND CONTROLS**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM****SHIPPING, HANDLING AND STORAGE
CONTROLS**

PURPOSE

The handling, storage, cleaning, packaging, shipping and preservation of materials and components will be controlled to prevent damage and to minimize deterioration.

SCOPE OF PROCEDURES

Procedures will be developed and approved according to procurement documents for handling, storing, packaging, shipping and preserving critical items and items susceptible to damage or deterioration.

The procedures will address the need for:

- special tools and equipment
- controlled environmental conditions, where required
- qualifying and training equipment operators
- frequency of any required inspection or maintenance

MARKING AND LABELLING INSTRUCTIONS

Instructions for marking and labelling for packaging, shipping, handling and storage will be established to adequately identify, maintain and preserve the item, including the need for a special environment or special controls. For example, these could include the need to control moisture content or the need to protect electronics from static electricity. Other special controls might include requirements to address safety, health and environmental hazards associated with various materials and consumables, as outlined in the material safety data sheet for the material or product.

**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM**

DOCUMENT, DATA AND RECORDS CONTROL

DOCUMENT CONTROL

The preparation, issue and change of project documents that specify requirements or prescribe activities affecting quality will be controlled, so that the correct documents are used to perform work. Such documents will be reviewed for adequacy and approved for release in accordance with document control procedures that meet the operator's document control requirements. Changes to these documents will be approved by the same organizations that originally issued and approved them.

ENGINEERING DESIGN DATA CONTROL

Engineering design data will be controlled to confirm that it is current and accurate. Specific standards for maintaining databases, including the accuracy and the frequency of updates, will be established based on the criticality of the information they contain. Responsibilities for maintenance will be assigned and compliance with established standards periodically measured.

CONTROL OF QUALITY RECORDS

Records that provide evidence of compliance with specified requirements and those that provide evidence of compliance with quality requirements will be identified and filed. Records will be:

- legible
- retrievable
- protected from damage, deterioration or loss
- retained for a period as specified in the regulations or in Imperial standards, whichever is greater

The required quality records will be specified in procurement documents specific to manufacturing, fabrication, construction, assembly, welding, NDE, inspection, testing, audit and surveillance activities. These records will be accepted, approved, filed and provided to the project on an agreed-upon schedule or on an activity or process-completion basis.

**MACKENZIE VALLEY PIPELINE
SUPPLEMENTAL INFORMATION
MATERIALS QUALITY ASSURANCE PROGRAM**

GLOSSARY

criticality	<p>A rating of high, medium, low or non-critical, for a system, activity or product that is determined through a process that assesses the risk to the project if the system, activity or product fails to perform as required. The evaluation considers:</p> <ul style="list-style-type: none">• safety, operability and financial consequences• probability factors, including design complexity and manufacturing, construction and installation complexities• professional judgement and experience
CSA	<p>The abbreviation for the Canadian Standards Association.</p>
design input	<p>The criteria, parameters, bases or other design requirements upon which detailed final design is based.</p>
design output	<p>Drawings, specifications and other documents defining the technical requirements of structures, systems or components.</p>
hold point	<p>A pre-established mandatory stopping point in an activity or work process to allow inspection and testing to verify conformance with requirements before proceeding to the next step or process.</p>
Imperial	<p>The abbreviation for Imperial Oil Resources Ventures Limited.</p>
inspection and test plan	<p>A plan used by the company and contract inspectors to identify the inspection and testing requirements in a project or task, as well as the acceptance criteria. The plan is usually a matrix or table and includes:</p> <ul style="list-style-type: none">• activity and the specification governing the activity• methods to be used, e.g., visual or nondestructive examination• responsibility for the activity• participation, e.g., hold and witness points• evidence of activity completion, e.g., verifying documentation
inspection, measuring and testing equipment	<p>Laboratory equipment, online analyzers, weigh scales used for product filling, and mass flow meters where no subsequent testing is done before product receipt by the customer.</p>
ITP	<p>The abbreviation for inspection and test plan.</p>

GLOSSARY

NDE	The abbreviation for nondestructive examination.
nonconformance	Non-fulfillment of a requirement.
nondestructive examination	An inspection process that might include visual, radiography, ultrasonic, magnetic-particle or liquid penetrant inspection methods.
operator	For the Mackenzie Valley pipeline, Imperial Oil Resources Ventures Limited.
quality assurance	The management plans, actions, functions and activities that give the customer reasonable assurance that materials, products or services have met the specified requirements.
surveillance	A program of assessments and verification.
verification	Confirmation that a product meets requirements.
witness point	A pre-established observation point in an activity or work process that requires that designated organizations be notified that a specific activity, test or inspection will take place, to provide the designated organizations with an opportunity to observe the activity, test or inspection.