



File OF-Surv-OpAud-P749-2016-2017 01
14 March 2017

Mr. Mick Dilger
President & Chief Executive Officer
Pembina Energy Services Inc. and Pouce Coupé Pipe Line Ltd.
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Email [REDACTED]

Dear Mr. Dilger:

Final Audit Report for Pembina Pipeline Corporation (Pembina)

The National Energy Board (NEB or the Board) has completed its Final Audit Report of Pembina. The intent of the audit focused on Pembina's NEB regulated assets that Pembina owns and operates under Pembina Energy Services Inc. and Pouce Coupé Pipe Line Ltd. Pembina Prairie Facilities Ltd. was not included in the scope of this audit. The audit focused on sub-element 4.2 *Investigation and Reporting Incidents and Near Misses* of the NEB Management System and Protection Program Audit Protocol.

A Draft Audit Report documenting the Board's evaluation of Pembina was provided to Pembina on 1 February 2017 for review and comment. Pembina provided some comments and feedback which was reviewed and considered in the development of the Final Audit Report. The Board has made several changes to the Draft Audit Report and its Appendices.

The findings of the audit are based upon an assessment of whether Pembina was compliant with the regulatory requirements contained within:

- The *National Energy Board Act*;
- The *National Energy Board Onshore Pipeline Regulations*;
- The *Canada Labour Code, Part II*, and the *Canada Occupational Health and Safety Regulations*;

Pembina was required to demonstrate the adequacy and effectiveness of the methods selected and employed within its management system and programs to meet the regulatory requirements listed above.

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The Board has enclosed its Final Audit Report and associated Appendices with this letter. The Board will make the Final Audit Report public and it will be posted on the Board's website.

Within 30 days of the issuance of the Final Audit Report by the Board, Pembina is required to file a Corrective Action Plan (CAP), which describes the methods and timing for addressing the Non-Compliant findings identified through this audit, for approval.

The Board will make the CAP public and will continue to monitor and assess all of Pembina's corrective actions with respect to this audit until they are fully implemented. The Board will also continue to monitor the implementation and effectiveness of Pembina's management system and programs through targeted compliance verification activities as a part of its on-going regulatory mandate.

If you require any further information or clarification, please contact Darryl Pederson, Lead Auditor, at 403-461-9953.

Yours truly,

Original signed by L. George for

Sheri Young
Secretary of the Board

c.c. 

National Energy
Board



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National Energy Board
Audit Report of Pembina Energy Services Inc.
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Canada

Executive Summary

Companies regulated by the National Energy Board (NEB or the Board) must demonstrate a proactive commitment to continual improvement in safety, security and environmental protection. Pipeline companies under the Board's jurisdiction are required to incorporate adequate, effective and implemented management systems into their day-to-day operations.

This report documents the Board's audit of Pembina Energy Services Inc. and Pouce Coupé Pipe Line Ltd. (Pembina). The audit was focused on sub-element 4.2 ***Investigation and Reporting Incidents and Near-misses*** of the National Energy Board Management System and Protection Program Audit Protocol published in July 2013. The audit also evaluated some of the other management system elements which were relevant to the scope of this audit. The audit was conducted using the *National Energy Board Onshore Pipeline Regulations* (OPR) as amended on 19 June 2016 and the relevant sections of CSA Z662-15 as well as the requirements of the *Canada Labour Code* (CLC), *Part II*, and the *Canada Occupational Health and Safety Regulations* (COHSR).

The Board conducted the audit using the audit protocols detailed in Appendices I and II. Appendix I covers these five components of sub-element 4.2: Reporting of Incidents and Near-Misses; Investigation; Developing and Implementing Corrective and Preventive Actions; Communication of Findings, Follow Up and Shared Learnings; and Analysis and Trending of Data Related to Incidents and Near-Misses. Appendix II covers other management system elements that were relevant to the scope of this audit. These two Appendices comprise the body of the audit assessment of Pembina.

At the time of the Board's audit of Pembina's regulated facilities, Pembina was in transition from an old incident investigation and reporting system to a completely new and different system. Many of the process documents and procedures were found to be in transition from the former system to the new system and as result many of the OPR required processes were found to be non-compliant. However, during this transition period, the Board found that Pembina was using ongoing established activities still based on their old system for the reporting of incidents and near-misses, conducting investigations, developing corrective and preventive actions and learning from incidents.

The Board found all of Appendix I to be non-compliant; and 4 findings of non-compliance were identified in Appendix II. These non-compliances are described below.

Appendix I

Finding 1: Pembina did not have a process reflective of its current system for reporting of incidents and near-misses, and it did not have definitions for an incident that was reflective of all programs. This is non-compliant with OPR s.6.5(1) (r) and 6.5 (2).

Finding 2: Pembina did not have a process in place to ensure incidents were reported to the Board where applicable. This is non-compliant with OPR s.52(1).

Finding 3: Pembina did not have a process reflective of its current investigation procedure including the proper selection of immediate and root causes. This is non-compliant with OPR s.6.5(1) (r).

Finding 4: Pembina did not have a process and or procedure in place for the development of corrective and preventative actions. This is non-compliant with OPR s.6.5(1) (r).

Finding 5: Pembina did not have processes and procedures in place for communication of findings and learnings related to incidents and near-misses. This is non-compliant with OPR s.6.5(1) (m).

Finding 6: Pembina did not have processes and procedures in place for evaluating, monitoring and trending incident and near-miss data. This is non-compliant with OPR s.6.5(1) (s).

More details on the above non-compliant findings to the OPR can be found in Appendix I.

Appendix II

Finding 7: Pembina did not have a hazard inventory. This is non-compliant with OPR s.6.5(1) (d)

Finding 8: Pembina did not have a list of all legal requirements that are applicable to the company in matters of safety, security and protection of the environment; that contained the regulations and/ or industry standards related to sub-element 4.2. This is non-compliant with OPR s.6.5(1)(h).

Finding 9: Pembina has not conducted an internal audit that includes the management system and all protection programs. This is non-compliant with OPR s.6.5(1)(w).

Finding 10: Pembina does not have an effective process for the retaining and maintaining of records related to incident investigations. This is non-compliant with OPR s.6.5(1) (p).

More details on the above non-compliant findings to the OPR can be found in Appendix II.

Although Pembina has been found non-compliant in the above noted instances, the Board is satisfied that Pembina has adequate activities in place while they update their existing standards, procedures and processes to reflect their newly established system.



Within 30 days of the Final Audit Report being issued, Pembina must develop and submit a Corrective Action Plan for Board approval. The Corrective Action Plan must detail how Pembina intends to resolve the non-compliances identified by this audit. The Board will verify that the corrective actions are completed in a timely manner and applied consistently across the NEB-regulated portion of Pembina's system. However, the Pembina Prairie Facilities system, which is NEB-regulated and is operated under contract by NOVA Chemicals Corporation, was not included in the scope of this audit. The Board will also continue to monitor the overall implementation and effectiveness of Pembina's management system and programs through targeted compliance verification activities as part of its ongoing regulatory mandate.

The Board will make its Final Audit Report and Pembina's approved Corrective Action Plan public on the Board's website.

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1.0 Audit Terminology and Definitions

(The Board has applied the following definitions and explanations in measuring the various requirements included in this audit. They follow or incorporate legislated definitions or guidance and practices established by the Board, where available.)

Adequate: The management system, programs or processes comply with the scope, documentation requirements and, where applicable, the stated goals and outcomes of the NEB Act, its associated regulations and referenced standards. Within the Board's regulatory requirements, this is demonstrated through documentation.

Audit: A systematic, documented verification process of objectively obtaining and evaluating evidence to determine whether specified activities, events, conditions management systems or information about these matters conform to audit criteria and legal requirements and communicating the results of the process to the company.

Compliant: The company has demonstrated that it has developed and implemented programs, processes and procedures that meet legal requirements.

Corrective Action Plan: A plan that addresses the non-compliances identified in the audit report and explains the methods and actions that will be used to correct them.

Developed: A process or other requirement has been created in the format required and meets the described regulatory requirements.

Effective: A process or other requirement meets its stated goals, objectives, targets and regulated outcomes. Continual improvement is being demonstrated. Within the Board's regulatory requirements, this is primarily demonstrated by records of inspection, measurement, monitoring, investigation, quality assurance, audit and management review processes as outlined in the OPR.

Established: A process or other requirement has been developed in the format required. It has been approved and endorsed for use by the appropriate management authority and communicated throughout the organization. All staff and persons working on behalf of the company or others that may require knowledge of the requirement are aware of the process requirements and its application. Staff has been trained on how to use the process or other requirement. The company has demonstrated that the process or other requirement has been implemented on a permanent basis. As a measure of "permanent basis", the Board requires the requirement to be implemented, meeting all of the prescribed requirements, for three months.

Finding: The evaluation or determination of the compliance of programs or elements in meeting the requirements of the *National Energy Board Act* and its associated regulations.



Implemented: A process or other requirement has been approved and endorsed for use by the appropriate management authority. It has been communicated throughout the organization. All staff and persons working on behalf of the company or others that may require knowledge of the requirement are aware of the process requirements and its application. Staff has been trained on how to use the process or other requirement. Staff and others working on behalf of the company have demonstrated use of the process or other requirement. Records and interviews have provided evidence of full implementation of the requirement, as prescribed (i. e. the process or procedures are not partially utilized).

Inventory: A documented compilation of required items. It must be kept in a manner that allows it to be integrated into the management system and management system processes without further definition or analysis.

List: A documented compilation of required items. It must be kept in a manner that allows it to be integrated into the management system and management system processes without further definition or analysis.

Maintained: A process or other requirement has been kept current in the format required and continues to meet regulatory requirements. With documents, the company must demonstrate that it meets the document management requirements in OPR, section 6.5(1)(o). With records, the company must demonstrate that it meets the records management requirements in OPR, section 6.5 (1)(p).

Management System: The system is set out in OPR sections 6.1 to 6.6. It is a systematic approach designed to effectively manage and reduce risk, and promote continual improvement. The system includes the organizational structures, resources, accountabilities, policies, processes and procedures required for the organization to meet its obligations related to safety, security and environmental protection.

(The Board has applied the following interpretation of the OPR for evaluating compliance of management systems applicable to its regulated facilities.)

As noted above, the NEB management system requirements are set out in OPR sections 6.1 to 6.6. Therefore, in evaluating a company's management system, the Board considers more than the specific requirements of section 6.1. It considers how well the company has developed, incorporated and implemented the policies and goals on which it must base its management system as described in section 6.3; its organizational structure as described in section 6. 4; and considers the establishment, implementation, development and/or maintenance of the processes, inventory and list described in section 6.5(1). As stated in sections 6.1(c) and (d), the company's management system and processes must apply and be applied to the programs described in section 55.

Non-Compliant: The company has not demonstrated that it has developed and implemented programs, processes and procedures that meet the legal requirements. A Corrective Action Plan must be developed and implemented.

Practice: A repeated or customary action that is well understood by the persons authorized to carry it out.

Procedure: A documented series of steps followed in a regular and defined order thereby allowing individual activities to be completed in an effective and safe manner. A procedure also outlines the roles, responsibilities and authorities required for completing each step.

Process: A documented series of actions that take place in an established order and are directed toward a specific result. A process also outlines the roles, responsibilities and authorities involved in the actions. A process may contain a set of procedures, if required.

(The Board has applied the following interpretation of the OPR for evaluating compliance of management system processes applicable to its regulated facilities.)

OPR section 6.5(1) describes the Board's required management system processes. In evaluating a company's management system processes, the Board considers whether each process or requirement: has been established, implemented, developed or maintained as described within each section; whether the process is documented; and whether the process is designed to address the requirements of the process, for example a process for identifying and analyzing all hazards and potential hazards. Processes must contain explicit required actions including roles, responsibilities and authorities for staff establishing, managing and implementing the processes. The Board considers this to constitute a common 5 w's and h approach (who, what, where, when, why and how). The Board recognizes that the OPR processes have multiple requirements; companies may therefore establish and implement multiple processes, as long as they are designed to meet the legal requirements and integrate any processes linkages contemplated by the OPR section. Processes must incorporate or contain linkage to procedures, where required to meet the process requirements.

As the processes constitute part of the management system, the required processes must be developed in a manner that allows them to function as part of the system. The required management system is described in OPR section 6.1. The processes must be designed in a manner that contributes to the company following its policies and goals established and required by section 6.3.



Further, OPR section 6.5(1) indicates that each process must be part of the management system and the programs referred to in OPR section 55. Therefore, to be compliant, the process must also be designed in a manner which considers the specific technical requirements associated with each program and is applied to and meets the process requirements within each program. The Board recognizes that single process may not meet all of the programs; in these cases it is acceptable to establish governance processes as long as they meet the process requirements (as described above) and direct the program processes to be established and implemented in a consistent manner that allows for the management system to function as described in 6.1.

Program: A documented set of processes and procedures designed to regularly accomplish a result. A program outlines how plans, processes and procedures are linked; in other words, how each one contributes to the result. A company regularly plans and evaluates its program to check that the program is achieving the intended results.

(The Board has applied the following interpretation of the OPR for evaluating compliance of programs required by the NEB regulations.)

The program must include details on the activities to be completed including what, by whom, when, and how. The program must also include the resources required to complete the activities.

2.0 Abbreviations

AO: Accountable officer

AOC: Abnormal operating condition

CCO: Control center operator

CLC: *Canada Labour Code, Part II*

COHSR: *Canada Occupational Health and Safety Regulations*

CSA Z662-15: CSA Standard Z662 entitled *Oil and Gas Pipeline Systems*, 2015 version

DNV: Det Norske Veritas

EHS: Environment, health and safety

ERL: Emergency response line

IRT: Incident Review Team

MOC: Management of change

NEB: National Energy Board

OERS: Online Event Reporting System

OMS: Operations Management System

OPR: *National Energy Board Onshore Pipeline Regulations*

Pembina: Pembina Energy Services Inc.

SCADA: Supervisory control and data acquisition

SMART: Safety Management and Recognition Tool

SMS 10.1.01: Incident Reporting, Investigation, and Analysis Standard

3.0 Introduction: NEB Purpose and Audit Framework

The NEB's purpose is to promote safety and security, environmental protection, and efficient energy infrastructure and markets in the Canadian public interest within the mandate set by Parliament in the regulation of pipelines, energy development and trade. In order to assure that pipelines are designed, constructed, operated and abandoned in a manner that ensures: the safety and security of the public and the company's employees; safety of the pipeline and property; and protection of the environment, the Board has developed regulations requiring companies to establish and implement documented management systems applicable to specified technical management and protection programs. These management systems and programs must take into consideration all applicable requirements of the NEB Act and its associated regulations, as well as the *Canada Labour Code, Part II*. The Board's management system requirements are described within the OPR, sections 6.1 through 6.6.

To evaluate compliance with its regulations, the Board audits the management system and programs of regulated companies. The Board requires each regulated company to demonstrate that they have established and implemented, adequate and effective methods for proactively identifying and managing hazards and risks.

During the audit, the Board reviews documentation and samples records provided by the company in its demonstration of compliance and interviews corporate and regionally-based staff. This enables the Board to evaluate the adequacy, effectiveness and implementation of the management system and programs.

After completing its field activities, the Board develops and issues a Final Audit Report (this document). The Draft Audit Report is submitted to the company for its review and to provide the company the opportunity to submit its comments to the Board. The Board will take the company's comments into consideration before issuing the Final Audit Report. The Final Audit Report outlines the Board's audit activities and provides evaluations of the company's compliance with the applicable regulatory requirements. Once the Board issues the Final Audit Report, the company must submit and implement a Corrective Action Plan to address all non-compliances identified. Final Audit Reports are published on the Board's website. The audit results are integrated into the NEB's risk-informed lifecycle approach to compliance assurance.

4.0 Background

The NEB expects pipeline companies to operate in a systematic, comprehensive and proactive manner that manages risks. The Board expects companies to have effective, fully developed and implemented management systems and protection programs that provide for continual improvement.

As required by the OPR, companies must establish, implement and maintain effective management systems and protection programs in order to anticipate, prevent, mitigate and manage conditions that may adversely affect the safety and security of the company's pipelines, employees, the general public, as well as the protection of property and the environment.

This audit is focused on sub-element 4.2 ***Investigation and Reporting Incidents and Near-misses*** of the National Energy Board Management System and Protection Program Audit Protocol, which was published in July 2013.

The Board's Management System and Protection Program Audit Protocol has the following expectations for sub-element 4.2:

“The company shall have an established, implemented and effective process for reporting on hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions. This should include conducting investigations where required or where hazards, potential hazards, incidents and near-misses have or could have resulted in the safety and security of the public, company employees and the pipeline, and protection of property and the environment, being significantly compromised.

The company shall have an established, maintained and effective data management system for monitoring and analyzing the trends in hazards, incidents and near-misses.

The company should integrate the results of its reporting on hazards, potential hazards, incidents and near-misses with other data in hazard identification and analysis, risk assessments, performance measures and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.”

5.0 Audit Objectives and Scope

This audit objective was to evaluate the company against the applicable requirements specifically as they relate to incident and near-miss reporting and investigation, incident and near-miss data analysis and integration, and taking corrective and preventive actions. The audit verified that the company has developed and implemented the systems, programs and processes to meet the applicable legal requirements in order to ensure the protection of property and the environment and the safety and security of the public and of the company's employees.

The applicable regulatory requirements for this audit are contained within:

- the NEB Act and its associated regulations, including;
- the *National Energy Board Onshore Pipeline Regulations*;
- the *Canada Labour Code, Part II*, and the *Canada Occupational Health and Safety Regulations*; and

The audit scope was focused on sub-element 4.2 of the Board's audit protocol, and not all management system elements, per se, were in scope for a complete assessment in this audit. The following elements of the Board's audit protocol were included in the scope but only to assess the requirements directly relevant to incident and near-miss reporting, investigation, and taking corrective and preventive actions:

1.1 Leadership Accountability

1.2 Policy and Commitment Statements

2.1 Hazard Identification, Risk Assessment and Control

2.2 Legal Requirements

2.3 Goals, Objectives and Targets

2.4 Organizational Structure, Roles and Responsibilities

3.3 Management of Change

3.4 Training, Competence and Evaluation

4.2 Investigations of Incidents, Near-misses and Non-compliances

4.3 Internal Audit

4.4 Records Management

5.0 Management Review

The scope was inclusive of all programs (safety, environment, integrity, emergency, security, damage prevention).

Included in Appendices I and II are the audit questions and NEB assessments pursuant to the audit. Appendix I is the first part of the audit assessment, which is solely focused on sub-element 4.2; that is, the incident and near-miss reporting and investigation, incident and near-miss data analysis and integration, and taking corrective and preventive actions.

Appendix II is the second part of the audit assessment, which evaluates some of the other elements of the Board's management system audit protocol. Only those management system elements considered to be the most relevant to the scope of the audit have been assessed, and the assessment of those elements was focused on incidents and near-misses.

6.0 Audit Process, Methodology and Activities

On 22 September 2016, the Board informed Pembina of its intent to audit Pembina's NEB-regulated facilities with the exclusion of the Pembina Prairie Facilities system. Board staff then submitted the audit protocols (Appendices I and II) to Pembina, requesting it to answer specific questions relevant to the scope of the audit and initial documentation requests. Appendix I is divided in five sections, with each section covering a partial component of the Board's expectations for sub-element 4.2. Each section lists the questions that have been asked to the company in order to demonstrate compliance. The NEB conducted its assessment based on the responses provided by the company and the evidence gathered during the audit. The same approach was used for the audit assessment summarized in Appendix II.

Board staff was in contact with Pembina staff on a regular basis to arrange and coordinate this audit. Pembina established a digital access portal for Board staff to review documentation and records.

On 14 October 2016, Board staff conducted an opening meeting with representatives from Pembina in Calgary, Alberta to confirm the Board's audit objectives, scope and process. Subsequent to the opening meeting, interviews were held in Sherwood Park, AB; Fort St. John, BC; and at Pembina's head office in Calgary between 21 November and 1 December 2016. The table below provides more details about the audit activities. Throughout the audit, Board audit staff gave Pembina daily summaries with action items, where required.

Summary of Audit Activities

- Audit opening meeting (Calgary, AB) – 22 September 2016
- Calgary office interviews (Calgary, AB) – 21-22 November 2016
- Field verification activities:
 - Interviews – (Sherwood Park, AB) – 24 November 2016
 - Interviews – (Fort St. John, BC) – 30 November – 1 December 2016
- Audit close-out meeting (teleconference) – 13 December 2016

7.0 Audit Summary and Conclusions

During this audit, Pembina was required to demonstrate the adequacy and effectiveness of its management system, programs and its processes as they relate to incident and near-miss reporting and investigation, incident and near-miss data analysis and integration, and taking corrective and preventive actions. The Board reviewed documentation and records provided by Pembina and interviewed Pembina's staff.

The Board's audit of Pembina's NEB-regulated facilities found that Pembina was in transition from one incident, investigation, and data analysis system to a new, completely different system. As a result a significant number of processes and procedures were in the process of being updated to reflect the operation of the new system. During the transition, Pembina was completing the majority of these management system elements by activity and not by effectively implemented and established processes, which is required by the OPR, for reporting incidents and near-misses, conducting investigations, developing corrective and preventive actions and learning from incidents. For the majority of the required processes, Pembina was still using the processes and related documentation from their recently retired Lotus Notes based system as revisions were being put in place to accommodate their new system. Staff was aware of the processes and procedures that they were supposed to be using and demonstrated this during interviews and through a review of records.

The OPR s.6.5(3) requires that companies document the processes and procedures required by the OPR s.6.5(1). Pembina was found non-compliant for all areas in Appendix I as they do not have fully documented process for investigations, taking corrective and preventive actions, trending and analysis and communicating lessons learned. Pembina was found to be non-compliant with several sub-elements in Appendix II, generally for areas that are not related to their incident investigation, reporting, corrective and preventative actions, and analysis. Findings listed below are grouped according to Appendix I and II.

Appendix I

Finding 1: *Pembina did not have a process reflective of its current system for reporting of incidents and near-misses, and it did not have definitions for an incident that was reflective of all programs.*

The audit verified that Pembina does not have definitions of incidents that are applicable to all program areas required by the OPR. By activity, Pembina is conducting internal reporting of incidents and near-misses, however this is not compliant with OPR s.6.5(1)(r) and 6.5(2) which requires documented processes. The Board found that Pembina had recognized the gap and has undertaken steps to address this issue.

Finding 2: *Pembina did not have a process in place to ensure incidents were reported to the Board where applicable.*

The audit verified that Pembina does not have a process in place to reflect the current requirements to report applicable incidents to the Board. Pembina's current process does not reflect the requirements of the Online Event Reporting System (OERS) that has been in place since 1st January 2015, and as a result they are non-compliant with OPR s.52(1). The Board found through interviews that Pembina management is aware of the issue and provided draft documentation to show they are working on updating this process.

Finding 3: *Pembina did not have a process reflective of its current investigation procedure including the proper selection of immediate and root causes.*

That audit verified that Pembina demonstrated that it has conducted investigations of incidents and near-misses. However, the documented process used is not reflective of the new system that was put in place in 2016 and is non-compliant with OPR s.6.5(1)(r). Additionally, a sampling of investigations by Board staff indicated the root cause did not always appear to line up with the incident investigation. The Board identified through interviews that Pembina is aware and had previously identified this gap and is working on revising the processes and documentation to correct this finding.

Finding 4: *Pembina did not have a process and or procedure in place for the development of corrective and preventative actions.*

The audit verified that Pembina, by activity, demonstrated it has developed and implemented corrective and preventative actions for some of their incidents and near-misses. However, the Board reviewed the documented process and found that it does not contain an adequate level of detail on the steps and actions and for when it should be applied. This is non-compliant with OPR s.6.5(1)(r).

Finding 5: *Pembina did not have processes and procedures in place for communication of findings and learnings related to incidents and near-misses.*

The audit verified that Pembina, by activity, has communicated learnings related to incidents and near-misses across the organization through several methods such as Safety Bulletins and safety meetings. However, the currently documented process is not adequately detailed for the Board to consider it an adequate and effective process. This is non-compliant to OPR s.6.5(1)(m).

Finding 6: *Pembina did not have processes and procedures in place for evaluating, monitoring and trending incident and near-miss data.*

The audit verified that Pembina performs some limited trending and analysis of data through their newly implemented SMART system. Senior management is provided with various statistics and analysis on a monthly and quarterly basis. However, Pembina does not currently trend and analyze data for all program areas and the Board identified concerns about how some incidents are categorized and assessed during the investigation phase. As a result the trending and analysis of data may not provide accurate information. This is non-compliant with OPR s.6.5(1)(s).

The audit verified that Pembina has in practice an investigation process that allows the company to investigate its incidents and near-misses, and identify the necessary corrective and preventive actions. However, the current practice is not fully reflected in a documented process, which is non-compliant with the OPR s.6.5(3). Pembina had already identified this gap and has initiated steps to address this issue.

More details on the above non-compliant findings to OPR are available throughout Appendix I.

Appendix II

Finding 7: *Pembina did not have a hazard inventory.*

The audit verified that Pembina does capture new hazards and potential hazards from incidents and near-misses through an ad hoc process. However Pembina has not established an inventory of all hazards and identified hazards as required under OPR s.6.5(1)(d). As this audit was narrow in its scope, it did not review in detail all of the other clauses that make up the sub-element for Hazard Identification, Risk Assessment and Control.

Finding 8: *Pembina did not have a list of all legal requirements that contained the regulations and/ or industry standards related to sub-element 4.2.*

The audit verified that Pembina did not have a legal list that was relevant to sub-element 4.2. This is in non-compliance to OPR s.6.5(1)(h). As this audit was narrow in its scope, it did not review in detail all of the other clauses that make up the sub-element for Legal Requirements.

Finding 9: *Pembina has not conducted an internal audit that includes the management system and all protection programs.*

Pembina did provide portions of two recently conducted internal audits, one for their Emergency Management Program and one that covered parts of the health and safety section of the NEB Integrity Management Program. However, Pembina does not have all required programs in place, and the audit protocols for the Damage Prevention Program are dated 16 December 2016, which does not meet the test of being *effectively* implemented as described in section 1 above. The Board also identified concerns with Pembina's quality assurance program related to categorization of incidents and the determination of potential severity of incidents. This is in non-compliance to OPR s.6.5(1)(w). As this audit was narrow in its scope, it did not review in detail all of the other clauses that make up the sub-element for Internal Audit.

Finding 10: *Pembina does not have an effective process for the retaining and maintaining of records related to incident investigations.*

The audit verified that Pembina does generate, maintain and retain records. However, in relation to the incident and near-miss investigations, Pembina did not demonstrate that they had a process to ensure all applicable records were traceable and trackable. This is in non-compliance to OPR s.6.5(1)(p).

More details on the above non-compliant findings to OPR are available in Appendix II.

Although Pembina has been found non-compliant in the above noted instances, the Board is of the opinion that Pembina has adequate activities in place while they update their existing standards, procedures and processes to reflect their newly established system.

As per the Board's standard audit practice, Pembina must develop and submit a Corrective Action Plan describing its proposed methods to resolve the non-compliances identified and the timeline in which corrective actions will be completed. Pembina will be required to submit to the Board for approval its Corrective Action Plan within 30 days of the Final Audit Report being issued by the Board.

The Board will assess the implementation of all of Pembina corrective actions to confirm they are completed in a timely manner and on a system-wide basis until they are fully implemented. The Board will also continue to monitor the overall implementation and effectiveness of Pembina's management system and programs through targeted compliance verification activities as a part of its ongoing regulatory mandate.

The Board will make its Final Audit Report and Pembina's approved Corrective Action Plan public on the Board's website.



National Energy Board Incident Management Audit Protocol

Appendix I – Evaluation of Sub-element 4.2

1.0 Reporting of Incidents and Near-Misses

Expectations: The company shall have an established, implemented and effective process for reporting on hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions. This should include conducting investigations where required or where hazards, potential hazards, incidents and near-misses have or could have resulted in the safety and security of the public, company employees and the pipeline, and protection of property and the environment, being significantly compromised.

The company shall have an established, maintained and effective data management system for monitoring and analyzing the trends in hazards, incidents and near-misses.

The company should integrate the results of its reporting on hazards, potential hazards, incidents and near-misses with other data in hazard identification and analysis, risk assessments, performance measures and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.

Regulatory References: OPR s. 6.5(1)(r), s.6.5 (2) and s.52(1) and CSA Z662-15 Clause 3.1.2 (h)(ii)

1.1 Internal Reporting

Question 1.1:

Describe the company's process for internal reporting of incidents and near-misses. The response should discuss the company's definition(s) and criteria for internally reportable incidents and near-misses.

NEB Assessment:

The document **Incident Reporting, Investigation, and Analysis Standard 10.1.01 (SMS 10.1.01)** contains Pembina's processes for the internal reporting of incidents and near-misses. Document review indicated the standard contained roles, responsibilities and some procedural steps for reporting, documenting, investigation and corrective actions. Additionally, the standard outlined that it was applicable to the following Programs: Safety, Security, Environmental, and Regulatory Compliance. A review of the Pembina Integrity Management Program and the Damage Prevention Program indicated the documents referred to the **SMS 10.01** as the incident investigation process.

Through an information request response and through interviews, Pembina indicated that all programs follow the following definitions for an Incident, Near-miss and Hazard ID:

- Incident: An unplanned, undesired event that hinders completion of a task and may cause injury, illness, or property damage;
- Near-miss: An incident where there was no damage or personal injury sustained, but given a slight shift in position or time, damage and/or injury could have easily occurred; and



- Hazard ID: A hazard is the potential associated with a condition or activity that, if left uncontrolled, can result in an incident.

In addition to the above definitions, and specific to pipeline incidents, Pembina would further classify using CSA Z662 Annex H into a damage incident or a failure incident. A damage incident includes an event that damages the pipe or component without a release, and a failure incident as an unplanned release of fluid.

Interviews with Pembina personnel indicated the definition of incident as it applies to several programs, such as Damage Prevention and Environment, and the overall management system is currently being updated. It is the Board's understanding that revisions will include further clarity and criteria for definition of an incident and near-miss.

It is the Board's understanding that in May 2016, Pembina moved from a Lotus Notes based software system for reporting incidents and near-misses to a new software system called **Safety Management and Recognition Tool (SMART)**. This system is now responsible for the workflow and processes from initial reporting through investigation to the completion of action items associated with the incident. The SMART system was designed to be used for the reporting of incidents, near-misses, hazard identification, and positive safety recognitions which are used by staff to give positive recognition to other staff members in relation to being safe at work.

Through the SMART system Pembina categorizes and breaks down Incidents and Near-misses into the following broad categories: environment (spills and releases), property damage, illness injury, and fatality (safety), security, public concern noncompliance, quality measurement production loss, and vehicle incident. Additional categories of hazard identification and refusal of unsafe work also exist in the SMART system for additional trending and analysis options for Pembina.

Pembina provided a draft environmental standard that further defines and expands upon environmental incident types, along with a clarification on roles and responsibilities, regulatory thresholds, and reporting requirements.

Through document review and interviews, the Board found that **SMS 10.01** incident reporting and investigation procedure has not been revised to reflect the changes from the previous Lotus Notes system to the new SMART incident investigation data system. Examples include incident classification, workflow with review and approval by an SSER Analyst, and entering more than one incident type for a single incident.

The Board has found that Pembina has a documented standard **SMS 10.1.01** for performing incident investigations, however, the standard has the following key deficiencies:

- Standard only applies to Safety, Environment and Emergency and does not adequately describe the applicability of Integrity, Damage Prevention and the management system including program specific definitions of incidents. For example the Environment program definition is limited to spills and releases.
- **Appendix 2 Incident Notification Guideline** is not outlined. **SMS 10.1.01** does not adequately address the Integrity Management Program, Damage Prevention and Crossings programs related to incident investigation and near-misses in its current form. Through interviews and information requests (IRs) to Pembina, the Board was made aware that these deficiencies have been recognized in the Damage Prevention and Crossings programs and updates to **SMS 10.1.01** that are currently underway.

Conclusion:

Pembina has demonstrated that some parts of a process for reporting of hazards, potential hazards, incidents and near-misses have been established and implemented in **SMS 10.1.01**. Some processes and some roles and responsibilities have been outlined.

The audit verified Pembina does not have an established, implemented and effective process for the internal reporting of incidents and near-misses. Based on the review conducted and considering the scope of this audit, the Board has identified a non-compliance with OPR s.6.5(1)(r) and s.6.5(2) in relation to Question 1.1 – Internal Reporting.

1.2 Reporting to the BoardQuestion 1.2:

Describe the company's process for the reporting of incidents to the Board. The response should discuss the company's definition(s) and criteria for externally reportable incidents.

NEB Assessment:

Pembina's document **SMS 10.1.01, section 4.4 External Notifications for the Federal Government** describes the regulatory requirement for reporting to the Board. This includes contact information and lists the reporting requirements of the *NEB Onshore Pipeline Regulations* such as explosion, spills, and interruptions. Section 4.4 also describes the information to be provided in the preliminary incident report, but does not provide a process for reporting to the NEB. During interviews Pembina did indicate all reporting to the NEB would go through their Regulatory Affairs group. A review of additional documentation submitted by Pembina did not reveal a process for reporting incidents to the Board.

The **Integrity Management Program document Section 8.3, Failure and Incident Investigation Program**, refers to CSA Z662 Annex H as the guiding document on how to prepare a submission. The Integrity Management Program document also references the SMART system, but **SMS 10.1.01** does not reference or link to this document.

Pembina has a Regulatory Reporting Process Manual, but there is no mention of the process of reporting incidents to the Board in the document.

Through an all company letter, the Board informed all NEB-regulated companies that as of January 1st 2015, regulated entities were to use the new online event reporting system (OERS) to inform the Board of all reportable incidents. However Pembina's document **SMS 10.1.01** does not outline the OERS requirements. Through an IR, Pembina provided a portion of the draft revised **SMS 10.1.01**. In this document they now reference the OERS for NEB-reportable incidents.

In the documentation reviewed and in discussion during interviews, Pembina does not include all of the Board's reporting guidelines in their current definition of a Board-reportable incident. Pembina did not include reporting a significant adverse effect on the environment, an unintended or uncontrolled release of gas, and operating a pipeline beyond its design limits or any operating limit imposed by the Board. According to section 3.1 within the OERS guidance document the following scenarios apply:

- the death of or serious injury to a person;
- a significant adverse effect on the environment;
- an unintended fire or explosion;
- an unintended or uncontained release of low-vapour pressure (LVP) hydrocarbons in excess of 1.5 m³;



- an unintended or uncontrolled release of gas or high-vapour pressure (HVP) hydrocarbons;
- the operation of a pipeline beyond its design limits as determined under CSA Z662 or CSA Z276 or any operating limits imposed by the Board.

The Board's review of Pembina's incident investigations indicated an incident on the NEB portion of the Pembina system which should have been reported to the NEB. A review of the NEB incident database did not indicate such a report had been made.

Conclusion:

Pembina has demonstrated that some activities for reporting incidents to the Board are in place. Some roles and responsibilities have been outlined for use when required. The document is currently being updated to reflect changes to how Pembina currently operates with its new SMART system.

The audit verified Pembina does not have an established, implemented and effective process for the reporting of incidents to the Board. Based on the review conducted and considering the scope of this audit, the Board has identified a non-compliance with OPR s.52(1) in relation to Question 1.2 – Reporting to the Board.

2.0 Investigation

Expectations: The company shall have an established, implemented and effective process for reporting on hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions. This should include conducting investigations where required or where hazards, potential hazards, incidents and near-misses have or could have resulted in the safety and security of the public, company employees and the pipeline, and protection of property and the environment, being significantly compromised.

The company shall have an established, maintained and effective data management system for monitoring and analyzing the trends in hazards, incidents and near-misses.

The company should integrate the results of its reporting on hazards, potential hazards, incidents and near-misses with other data in hazard identification and analysis, risk assessments, performance measures and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.

Regulatory References: OPR s.6.5(1)(r), s.52(1) and CSA Z662-15 Clause 3.1.2 (h)(ii), 10.3.6, 10.4.4.1 and Annex H.

Question 2.0:

Describe the company's process for incident and near-miss investigations. Include in your response how the company identifies causes and contributing factors, including immediate and root causes.

NEB Assessment:

Pembina has a documented standard **Incident Reporting, Investigation, and Analysis Standard 10.1.01 document (SMS 10.1.01)** that outlines responsibilities for incident reporting and requirements for performing investigations. Pembina has a database system, called the SMART system, for reporting, approvals, tracking, analyzing and corrective action tracking to closure.



The Board has found through interviews and documentation that all incidents are investigated and analyzed using the “5 Whys” method to identify immediate, basic and root cause(s) of the incident. For more severe or complex incidents, Pembina indicated they may also use externally-based causation analysis tools.

The Board found that the **Integrity Management Plan** indicates a specific analysis technique is to be used for investigations of integrity incidents, however, **SMS 10.1.01** and the **Integrity Management Program** are not integrated and do not provide additional information on how or where to use the analysis technique.

SMS 10.1.01 contains an **Incident Investigation Process** chart for investigators to follow. The chart is to provide basic information to an investigator when completing their work. However after review of the process, the Board found it to be lacking detail and instruction on how to fully complete an investigation including steps such as looking at how the hazards identified in original existing hazard analysis failed to prevent the incident or near-miss. Additional steps on verifying the proper selection of incident type, record keeping, and assurance that corrective actions were implemented are lacking in detail or missing.

Through interviews, the Board identified that it is possible for Pembina to enter a sub-incident as part of a larger more complex incident. However, near-misses and hazard IDs are stand alone and cannot be automatically linked as part of an incident in SMART. Additionally this was not written into the existing process document.

Depending on the severity and type of incident, an investigation team may be created and become part of the investigation. The investigation team would generally include the lead investigator, subject matter experts as required, and the person who was involved in the incident. During interviews, Pembina indicated that the lead investigator has to have completed the 5 Why training and can either be recommended by someone in a supervisory capacity or they can be someone who is recommended by the person who entered the incident into the SMART.

During a review of incident and near-miss data, the Board identified several incidents where the incident type, incident description, severity and likelihood did not fully align. In more than one incident the incident type was selected for environment (spill/ release) but the incident description would have suggested that the incident was safety (illness/injury/fatality) or vehicle incident related. This also applied to severity rating where either a health and safety descriptor was applied to an environment incident.

Additionally, the Board frequently identified incidents where the likelihood was entered as rare (remote occurrence in industry) or unlikely (remote occurrence in company/ occasional occurrence in industry) but there were repeat incidents occurring in less than a year that were almost identical in nature. With a low severity descriptor and a rare or unlikely likelihood the SMART system would generate a low potential severity rating.

Through interviews and document review the auditors found that Safety Advisors do have the ability to enter the SMART system and update or change entries where required, however in none of the incidents looked at by the Board had this occurred. Approvers of the incident report also have the ability to reject the report, and have the lead investigator make changes where there has been identified concerns. The Board did not observe a quality assurance check in place to ensure the quality of the investigation details.

The Board reviewed information for numerous incidents in the SMART database and specifically reviewed the root causes for several incidents. The Board found it difficult to determine how the root cause was linked to the actual incident without additional description added to the incident to explain the linkage. Pembina did not demonstrate any additional information to clarify the discussed root causes. Discussion with several interviewees indicated they had concerns regarding the quality with some of the investigations.

Conclusion:

Pembina has demonstrated that some parts of a process for incident and near-miss investigation are in place. Some roles and responsibilities have been outlined for use.

The audit verified that Pembina does not have an established, implemented and effective process for incidents and near-miss investigations. Based on the review conducted and considering the scope of this audit, the Board has identified a non-compliance with OPR s.6.5(1)(r) in relation to Question 2.0 – Investigation.

3.0 Developing and Implementing Corrective and Preventive Action(s)

Expectations: The company shall have an established, implemented and effective process for reporting on hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions. This should include conducting investigations where required or where hazards, potential hazards, incidents and near-misses have or could have resulted in the safety and security of the public, company employees and the pipeline, and protection of property and the environment, being significantly compromised.

The company shall have an established, maintained and effective data management system for monitoring and analyzing the trends in hazards, incidents and near-misses.

The company should integrate the results of its reporting on hazards, potential hazards, incidents and near-misses with other data in hazard identification and analysis, risk assessments, performance measures and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.

Regulatory References: OPR s. 6.5(1)(r) and CSA Z662-15 Clause 3.1.2 (h)(ii), 10.3.1, and 10.3.6

Question 3.0:

Describe the company's processes and procedures for developing and implementing all necessary corrective and preventive actions to address all of the incident causes and contributing factors.

NEB Assessment:

The Board has found that **SMS 10.01.1** standard provides the steps for performing an incident investigation; however, it does not adequately provide a process to guide Pembina employees on how to create corrective and preventative actions.

Pembina's SMART system contains fields where proposed corrective and preventative actions for incidents and near-misses can be entered, along with assigning a person responsible, target deadline, actual completion date, status, and action validated. Through interviews, Pembina indicated that it is not mandatory to have preventative or corrective actions entered in the system prior to closing an incident in SMART.

SMS document 10.1.01 was originally developed for the old Lotus Notes system, but it has not yet been revised to reflect the procedural steps as required in the new SMART system for corrective and preventative actions. The Board has found the steps in SMART system are not adequately described in the **SMS 10.01.1** standard.



Proposed corrective and preventative actions are entered into SMART and tracked through to sign-off. The Board found there is no documented process that outlines the activities that a Lead Investigator is to perform to close-out the action items including verification of evidence (assurance the corrective actions were implemented according to plans).

Through a review of incidents and near-misses over the past year, the Board identified incidents where both corrective and preventative actions had been entered for the same incident. However, this was not consistent, as other incidents had these fields blank and appeared to have the same level of potential severity. Additionally, even though these fields were not completed, they were approved by the Lead Investigator and the Safety Advisor.

Through the Board's sampling of the incident investigations, it was not always clear that management system causation was considered to ensure the company's management system was revised to prevent the incident from re-occurring. Corrective actions were typically limited in their depth and scope and in many instances it was difficult to observe how the corrective actions would prevent a similar incident from re-occurring. Interviews with Pembina personnel confirmed the concern about the quality of the investigations and the comprehensiveness of incident investigations corrective actions.

Pembina has established an **Incident Review Panel (IRP)**, which meets six times per year and includes senior level management including the Accountable Officer, to review selected incidents and perform, by activity, a quality assurance role. From the documents reviewed, the IRP does not have a formal process for verifying the completion of corrective actions they recommend. The Board has found the **SMS 10.1.01 standard** does not adequately describe the role and function of the IRP in the overall incident investigation Process.

Conclusion:

Pembina has demonstrated that some parts of a process for developing and implementing corrective and preventative actions are in place.

The audit verified that Pembina does not have an established, implemented and effective process for developing and implementing corrective and preventative actions. Based on the review conducted and considering the scope of this audit, the Board has identified a non-compliance with OPR s.6.5(1)(r) in relation to Question 3.0 – Developing and Implementing Corrective and Preventative Actions.

4.0 Communication of Findings, Follow Up & Shared Learnings

Expectations: The company shall have an established, implemented and effective process for reporting on hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions. This should include conducting investigations where required or where hazards, potential hazards, incidents and near-misses have or could have resulted in the safety and security of the public, company employees and the pipeline, and protection of property and the environment, being significantly compromised.

The company shall have an established, maintained and effective data management system for monitoring and analyzing the trends in hazards, incidents and near-misses.

The company should integrate the results of its reporting on hazards, potential hazards, incidents and near-misses with other data in hazard identification and analysis, risk assessments, performance measures and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.



The company shall have an established, implemented and effective process for the internal and external communication of information relating to safety, security and environmental protection. The process should include procedures for communication with the public; workers; contractors; regulatory agencies; and emergency responders - (from sub-element 3.5 Communication).

Regulatory References: OPR s. 6.5(1)(m) and CSA Z662-15 Clause 3.1.2 (h)(ii), (iii) and (vi), 10.3.6

Question 4.0:

Describe the company's processes and procedures to communicate the findings (cause and contributing factors) and corrective and preventive actions related to incidents and near-misses throughout the organization to ensure the company can prevent the occurrence of incidents due to similar causes. Also, describe the company's process for learning from such events.

NEB Assessment:

Pembina **SMS 10.1.01** outlines a high-level statement regarding requirement to share lessons learned from incidents. The Board has found that the statement does not provide a communications process or provide reference to further information to constitute a process.

Pembina document **1.1.03 Safety Communications Standard (Document 1.1.03) Section, 4.2 Learning from Incidents**, provides information on learnings that can be used in the prevention of incidents. However, the Board has found there is no process or direction given on what incidents are selected, or how broadly the information needs to be communicated.

Pembina document **1.1.03** is not linked to the existing version of **SMS 10.1.01**, which as described previously does contain a minimal amount of information on learnings from incidents.

Pembina's **Incident Review Panel (IRP)**, as described above, review selected incidents and near-misses. A review of the documentation provided by Pembina indicated that the IRP charter was established in 2010.

Learnings from incidents, including some discussed at the IRP, are formally communicated throughout the company, beyond just the business unit where the incident took place, in the form of Safety Bulletins; and are also posted on the Company's internal website. Interviews indicated that not all incidents have an associated Safety Bulletin and selected incident learnings are chosen for communication. Examples of Safety Bulletins were provided to the Board for review.

Pembina has monthly safety meetings at each of their locations in which incidents are reviewed by staff, and all staff are required to sign off on these learnings to demonstrate that they have reviewed them. Evidence of this was provided to the Board.

During interviews, Pembina indicated all regulatory reporting would go through their Regulatory Affairs group and there was some documentation made available that supported this statement, even though it was not detailed in the incident reporting process. The current version of **SMS 10.1.01** did not have all of the steps, role descriptions, and other requirements for communicating to the NEB as related to reportable incidents. A portion of the revised draft document **SMS 10.1.01** was shared with the auditors and it did appear to be correcting some of these deficiencies.

**Conclusion:**

Pembina has demonstrated that some parts of a process for communication of findings, follow-up and shared learnings are in place. Some roles and responsibilities have been outlined for use.

The audit verified that Pembina does not have an established, implemented and effective process for communication of findings, follow-up and shared learnings. Based on the review conducted and considering the scope of this audit, the Board has identified a non-compliance with OPR s.6.5(1)(m) in relation to Question 4.0 – Communication of Findings, Follow-up and Shared Learnings.

5.0 Analysis and Trending of Data Related to Incidents and Near-Misses

Expectations: The company shall have an established, implemented and effective process for reporting on hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions. This should include conducting investigations where required or where hazards, potential hazards, incidents and near-misses have or could have resulted in the safety and security of the public, company employees and the pipeline, and protection of property and the environment, being significantly compromised.

The company shall have an established, maintained and effective data management system for monitoring and analyzing the trends in hazards, incidents and near-misses.

The company should integrate the results of its reporting on hazards, potential hazards, incidents and near-misses with other data in hazard identification and analysis, risk assessments, performance measures and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.

Regulatory References: OPR s. 6.5(1)(s) and CSA Z662-15 Clause 3.1.2 (h)(ii).

Question 5.0:

Describe the company's processes and procedures to collect, evaluate, monitor and trend the incident and near-miss data. Explain how and for what purpose the company uses this information.

NEB Assessment:

The Board has found that Pembina, through the SMART system, was able to demonstrate that data is collected and retained on incidents and near-misses, and that users can sort and search various types of data that has been entered into the system.

During interviews, the Board was informed that one of the mandatory fields for entering data into the SMART system for all incidents is an investigation classification technique for incident causation codes. Interviews confirmed that all incidents entered into the SMART system have to be defined with causation code(s) and in many instances interviewees indicated the causation codes sometimes do not line up well with the actual incident. While management does receive the top 5 causation codes as part of their monthly report, the Board is concerned the causation codes may not always be informing management of what the true issue or concern is behind the codes.

As part of Pembina data trending and data analysis, Pembina management is provided with metrics showing the top 5 causation codes for incidents on a monthly basis. Key metrics are scored against



targets and circulated internally through a monthly Score Card completed for each business unit. Additional data, such as trending for business units, is included in a monthly Highlights Report which is provided to management and the Board of Directors. Additionally Pembina indicated the HSE Metrics Scorecard is used to evaluate each business unit against established targets, which impacts all employees' annual incentives. Additional trending and analysis is done for vehicle incidents, spill/ release data, and injuries which compare numbers with the previous year's data.

As discussed in section 1.0 Reporting of Incidents and Near-misses, Pembina does not have incident categories that cover all program areas and has limited reporting for environment which at the moment only includes spills / releases. The Board has found that a majority of the data available for trending and analysis is related to safety and vehicle incidents. As a result of this, the amount of data that is available for trending and analysis is limited in depth and breadth for an organization the size and scope of Pembina NEB-regulated operations.

As discussed in the above Section 2.0 Investigation, and through sampling of investigations, the Board had identified numerous incidents that had been mis-categorized and / or assigned only one incident type when inputted into the SMART system. As an example, Environment (spill/ release) incidents were categorized and no corresponding safety incident was inputted into the SMART system. As a result of incidents being mis-categorized or input as a single incident type, there is a risk that the data being trended and analyzed is skewed or misaligned, and it could result in missing critical trends in the data. Additionally the Board identified that some incidents had potential severity scores that were not aligned with the likelihood and the severity descriptors for the incident. As a result of this, the Board is concerned the trending and analysis of incident data can also be skewed or misaligned with what the true potential severity of the incidents could be, and critical trends are not being identified. With inaccurate data, there is a risk that the hazards and risks associated with the company's activities are not being accurately assessed and therefore, tracked and trended.

Conclusion:

Pembina has demonstrated they have an electronic database for the collection of data and that it can do some analysis and trending of information. The information is being shared within the company through to senior management, and is being used for decision making purposes. Some roles and responsibilities have been outlined for use.

The audit verified that Pembina does not have established, implemented and effective processes for analysis and trending of data related to incidents and near-misses. Based on the review conducted and considering the scope of this audit, the Board has identified a non-compliance with OPR s.6.5(1)(s) in relation to Question 5.0 – Analysis and Trending of Data Related to Incidents and Near-misses.



National Energy Board Incident Management Audit Protocol

Appendix II – Incident Management Interaction with other Management System Elements

1.0 POLICY AND COMMITMENT

1.1 Leadership Accountability

Expectations: The company shall have an accountable officer appointed who has the appropriate authority over the company's human and financial resources required to establish, implement and maintain its management system and protection programs, and to ensure that the company meets its obligations for safety, security and protection of the environment. The company shall have notified the Board of the identity of the accountable officer within 30 days of the appointment and ensure that the accountable officer submits a signed statement to the Board accepting the responsibilities of their position.

Regulatory References: OPR s. 6.2

Question 1.1:

Explain the role of the accountable officer and their responsibility and authority with respect to sub-element 4.2 ***Investigation and Reporting Incident and Near Misses***.

NEB Assessment:

As stated in Pembina's initial information response, the Accountable Officer (AO) is accountable for ensuring adequate human and financial resources are available to establish, implement and maintain Pembina's management system and all required programs.

Pembina's document titled **Operating Management System (OMS)** contains management commitment, planning and implementation components, and methods for checking corrective actions. Pembina has established a process that provides notification requirements for an incident or near miss, identifies reporting and investigation requirements, incorporates follow-up to prevent recurrence, and provides opportunity to learn lessons from failures in support of continuous improvement.

Conclusion:

Based on the review conducted and considering the scope of this audit, the Board did not identify compliance issues in relation to Leadership and Accountability as it applies to the investigation and reporting of incidents and near misses.



1.2 Policy and Commitment Statements

Expectations: The company shall have documented policies and goals intended to ensure activities are conducted in a manner that ensures the safety and security of the public, workers, the pipeline, and protection of property and the environment. The company shall base its management system and protection programs on those policies and goals. The company shall include goals for the prevention of ruptures, liquids and gas releases, fatalities and injuries and for the response to incidents and emergency situations.

The company shall have a policy for the internal reporting of hazards, potential hazards, incidents and near-misses that include the conditions under which a person who makes a report will be granted immunity from disciplinary action.

The company's accountable officer shall prepare a policy statement that sets out the company's commitment to these policies and goals and shall communicate that statement to the company's employees.

Regulatory References: OPR s. 6.3 and CSA Z662-15 Clause 3.1.2(a)

Question 1.2:

Describe the policies that the company has to address the above expectations as they relate to incident prevention, reporting and investigation.

NEB Assessment:

The Board has found Pembina's OMS contains management commitment, planning and implementation components, and methods for checking and corrective actions. Pembina provided six (6) different policies (alcohol & drug policy, health, safety & environment (HSE) policy, information technology acceptable use policy, respectful workplace policy, security management policy, and whistleblower policy) as part of their evidence to demonstrate their activities are conducted in a manner that ensures the safety and security of the public, workers, and the protection of the environment. Three (3) key policies included:

- **HSE Policy** – identifying and managing risk to an acceptable level;
- **Security Management Policy** – identifying security risks and establishing programs, plans etc. to reduce risk to an acceptable level; and
- **Whistleblower Policy** – a process for reporting of serious issues and confidential follow-up.

The **Whistleblower Policy**, dated November 2015, advises employees in the **Prevention of Retaliation section** that they "will be protected from retaliation, harassment, discharge, demotion, suspension or other types of discrimination, or threats thereof, including compensation or terms and conditions of employment, that are directly related to the disclosure of such reports..." The policy states the conditions under which a person who makes a report will be granted immunity from disciplinary action and includes several options on how employees can file a complaint including internal options and an external hotline.

Conclusion:

Based on the review conducted and considering the scope of this audit, the Board did not identify compliance issues in relation to Question 1.2 - Policy and Commitment.



2.0 PLANNING

2.1 Hazard Identification, Risk Assessment and Control

Expectations: The company shall have an established, implemented and effective process for identifying and analyzing all hazards and potential hazards. The company shall establish and maintain an inventory of hazards and potential hazards. The company shall have an established, implemented and effective process for evaluating the risks associated with these hazards, including the risks related to normal and abnormal operating conditions. As part of its formal risk assessment, a company shall keep records to demonstrate the implementation of the hazard identification and risk assessment processes.

The company shall have an established, implemented and effective process for the internal reporting of hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions, including the steps to manage imminent hazards. The company shall have and maintain a data management system for monitoring and analyzing the trends in hazards, incidents, and near-misses.

The company shall have an established, implemented and effective process for developing and implementing controls to prevent, manage and mitigate the identified hazards and risks. The company shall communicate those controls to anyone exposed to the risks.

Regulatory References: OPR s. 6.5 (1)(c),(d),(e),(f),(r),(s) and CSA Z662-15 Clauses 3.1.2 (f)(i), (h)(ii)

Question 2.1:

Explain how hazards identified through incident and near miss reporting are used to input the hazard identification process and the hazard inventory.

NEB Assessment:

Pembina provided a document **3.1.01 Hazard Identification and Classification** as their standard for hazard identification and control. The document provides Pembina employees with information on hazard identification and classification, hazard categories, sources of hazards, assessment and control principles, and hierarchy of controls. The Board was provided with examples of hazards identified and reported in their database system for critical and non-routine tasks and demonstrated the system is being used.

Pembina utilizes a database system, called the SMART system, to collect and track hazard identifications and corrective actions. Pembina indicated that the SMART system tracks newly identified hazards, but does not maintain a consolidated list of hazards which incorporates newly identified hazards, as required by OPR s. 6.5(1)(d) that addresses the management system and all protection programs. Pembina could not demonstrate they have identified all potential hazards associated with their activities and processes. As such, there is no integration of newly identified hazards or review of existing hazards on the inventory as part of the incident investigation.

Conclusion:

Pembina demonstrated that potential hazards, hazards and controls are considered as part of routine and non-routine task analysis and a standard is available for staff to use when conducting hazard analysis.



The audit verified that Pembina does not have adequate processes and procedures to identify hazards through incident and near-miss reporting. Currently, newly identified hazards are not incorporated into an existing hazard and risk registry. Based on the review conducted and considering the scope of this audit, the Board identified a non-compliance with OPR s. 6.5(1)(d) in relation to Question 2.1 - Hazard Identification, Risk Assessment and Control.

2.2 Legal Requirements

Expectations: The company shall have an established, implemented and effective process for identifying, and monitoring compliance with, all legal requirements that are applicable to the company in matters of safety, security and protection of the environment. The company shall have and maintain a list of those legal requirements. The company shall have a documented process to identify and resolve non-compliances as they relate to legal requirements, which includes updating the management and protection programs as required.

Regulatory References: OPR s. 6.5 (1) (g),(h),(i)

Question 2.2:

Does your company have a legal list that contains the regulations and/or industry standards, any certificate or order conditions that the company has determined to be related to sub-element 4.2?

NEB Assessment:

Pembina provided a document titled **Regulatory Reporting Process For National Energy Board Regulated Assets** which provides direction and guidance for reporting on NEB-regulated assets. The document provided a process for tracking regulatory commitments and obligations for Pembina's NEB-regulated assets. The Board has found there is no mention of legal requirements or a legal list within the document.

A second document was provided by Pembina, titled **SMS Regulations and References Index**. Under standard **10.1.01 Incident Reporting, Investigation, and Analysis** which Pembina has been referencing for all incident reporting and investigation activities, only one regulation was listed.

The Board did not identify a complete list of regulatory requirements for sub-element 4.2.

Conclusion:

The Board has found Pembina did not demonstrate a list of legal requirements to the level of detail expected by the Board. Based on the review conducted and considering the scope of this audit, the Board identified a non-compliance with OPR s.6.5(1)(h) in relation to Question 2.2 – Legal Requirements.



2.3 Goals, Objectives and Targets

Expectations: The company shall have an established, implemented and effective process for developing and setting goals, objectives and specific targets relevant to the risks and hazards associated with the company's facilities and activities (i.e. construction, operations and maintenance). The company's process for setting objectives and specific targets shall ensure that the objectives and targets are those required to achieve their goals, and shall ensure that the objectives and targets are reviewed annually.

The company shall include goals for the prevention of ruptures, liquids and gas releases, fatalities and injuries and for the response to incidents and emergency situations. The company's goals shall be communicated to employees.

The company shall develop performance measures for assessing the company's success in achieving its goals, objectives, and targets. The company shall annually review its performance in achieving its goals, objectives and targets and performance of its management system. The company shall document its annual review of its performance, including the actions taken during the year to correct any deficiencies identified in its quality assurance program, in an annual report, and signed by the accountable officer.

Regulatory References: OPR s. 6.3, s.6.5(1)(a)(b), s.6.6 and CSA Z662-15 Clause 3.1.2 (h)(i)

Question 2.3:

- a) Does the company have goals, objectives and specific targets for the prevention of ruptures, liquid and gas releases, fatalities and injuries?
- b) Does the company have performance measures related to the goals, objectives and specific targets for the prevention of ruptures, liquid and gas release, fatalities and injuries?

NEB Assessment:

Pembina indicated that goals are set annually and reviewed on a quarterly basis and key metrics, which include targets, are approved by management and the HSE Committee of the Board of Directors. These metrics are scored monthly and reported on a quarterly basis.

The Board found Pembina Operating Management System ("OMS") Committee creates Plans, Objectives and Targets to ensure the development, implementation and maintenance of processes, procedures and practices. Pembina indicated when creating objectives, pipeline incident data is reviewed during monthly scorecard meetings, quarterly HSE Committee meetings, quarterly OMS Committee meetings and bimonthly Incident Review Panel meetings. During these meetings, incidents are discussed and potential corrective action items or potential gaps in process or programs are identified. Corrective action items may be assigned as required. Examples of monthly and quarterly reports and records were provided to the Board for review.

Conclusion:

The audit verified that Pembina has goals, objectives, targets and performance measures for the prevention of ruptures, liquid and gas releases, fatalities and injuries. Pembina tracks the relevant performance metrics and identifies where actions are required to improve performance. Based on the review conducted and considering the scope of this audit, the Board did not identify any issues of non-compliance in relation to Question 2.3 - Goals, Objectives and Targets.



2.4 Organizational Structure, Roles and Responsibilities

Expectations: The company shall have a documented organizational structure that enables it to meet the requirements of its management system and its obligations to carry out activities in a manner that ensures the safety and security of the public, company employees, the pipeline, and protection of property and the environment. The documented structure shall enable the company to determine and communicate the roles, responsibilities and authority of the officers and employees at all levels. The company shall document contractor's responsibilities in its construction and maintenance safety manuals.

The documented organizational structure shall also enable the company to demonstrate that the human resources allocated to establishing, implementing, and maintaining, the management system are sufficient to meet the requirements of the management system and to meet the company's obligations to design, construct, operate or abandon its facilities to ensure the safety and security of the public and the company's employees, and the protection of property and the environment. The company shall complete an annual documented evaluation of need in order to demonstrate adequate human resourcing to meet these obligations.

Regulatory References: OPR s. 6.4 and CSA Z662-15 Clauses 3.1.2 (b),(c)

Question 2.4:

- a) Has your company identified and staffed the positions necessary for meeting the requirements of sub-element 4.2 (i.e. incident reporting, investigation, implementing corrective actions, communication and learning)? If so, explain those positions and their roles and provide the names and titles of staff in these positions.
- b) How has the company communicated and documented its roles, responsibilities and authority for the above positions?

NEB Assessment:

Pembina's document titled **Principle 1 – Leadership and Accountability Roles and Responsibilities Standard 1.1.02** – provides roles and responsibilities for all levels of staff at Pembina from executive leadership to employees and contractors. The roles and responsibilities vary dependent upon what level staff is within the organization.

Pembina's document titled **Principle 1 – Leadership and Accountability Safety Communications Standard 1.1.03** sets the expectations for safety communication, information sharing and follow-up. Additional information is provided on sharing learnings from incidents and how they are important for prevention of future incidents.

Conclusion:

Based on the review conducted and considering the scope of this audit, the Board did not identify compliance issues in relation to Question 2.4 - Organizational Structure, Roles and Responsibilities.



3.0 IMPLEMENTATION

3.1 Operational Control-Normal Operations

Expectations: The company shall have an established, implemented and effective process for developing and implementing corrective, mitigative, preventive and protective controls associated with the hazards and risks identified in elements 2.0 and 3.0, and for communicating these controls to anyone who is exposed to the risks.

The company shall have an established, implemented and effective process for coordinating, controlling and managing the operational activities of employees and other people working with or on behalf of the company.

Regulatory References: OPR s. 6.5(1)(e),(f) and (q) and CSA Z662-15 Clause 3.1.2(f).

Question 3.1:

The assessment of this sub-element is not included in the scope of this audit.

NEB Assessment:

N/A

3.2 Operational Control-Upset or Abnormal Operating Conditions

Expectations: The company shall establish and maintain plans and procedures to identify the potential for upset or abnormal operating conditions, accidental releases, incidents and emergency situations. The company shall also define proposed responses to these events and prevent and mitigate the likely consequence and/or impacts of these events. The procedures must be periodically tested and reviewed and revised where appropriate (for example, after upset or abnormal events). The company shall have an established, implemented and effective process for developing contingency plans for abnormal events that may occur during construction, operation, maintenance, abandonment or emergency situations.

Regulatory References: OPR s. 6.5(1)(c),(d),(e),(f) and (t), and CSA Z662-15 Clause 3.1.2 (f).

Question 3.2:

The assessment of this sub-element is not included in the scope of this audit.

NEB Assessment:

N/A



3.3 Management of Change

Expectations: The company shall have an established, implemented and effective process for identifying and managing any change that could affect safety, security or protection of the environment, including any new hazard or risk, any change in a design, specification, standard or procedure and any change in the company's organizational structure or the legal requirements applicable to the company.

Regulatory References: OPR s. 6.5(1)(i) and CSA Z662-15 Clause 3.1.2 (g).

Question 3.3:

- a) Does the company have a Management of Change (MOC) process that could be applicable to changes that could result from incidents or near misses?
- b) Describe how the company applies its MOC process to corrective and preventive actions in relation to sub-element 4.2 (as applicable)?

NEB Assessment:

Pembina's **MOC policy** states that *"The purpose of Pembina's MOC Program is to confirm that changes to existing and future facilities, controlled documents and key personnel are properly recognized, reviewed, approved, communicated and documented. It is the intent of the MOC Program to highlight temporary and permanent changes which impact Pembina's operations and that are not replacements in kind; administration of controlled documents; and organizational personnel structure. All Business Units, Service Units and any other employees of Pembina doing work for Pembina shall follow this MOC program."* The Board has found that Pembina provided documentation that indicated its MOC process could be applicable to changes that result from incidents or near-misses. When inputting data into an investigation or near-miss in the SMART system, the system tracks if an MOC is associated with the incident.

While reviewing incident investigations, the Board reviewed documentation where corrective and preventative actions indicated an MOC was required to change a procedure.

Conclusion:

Based on the review conducted and considering the scope of this audit, the Board did not identify compliance issues in relation to Question 3.3 - Management of Change.

3.4 Training, Competence and Evaluation

Expectations: The company shall have an established, implemented and effective process for developing competency requirements and training programs that provide employees and other persons working with or on behalf of the company with the training that will enable them to perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment.



The company shall have an established, implemented and effective process for verifying that employees and other persons working with or on behalf of the company are trained and competent and for supervising them to ensure that they perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment. The company shall have an established, implemented and effective process for making employees and other persons working with or on behalf of the company aware of their responsibilities in relation to the processes and procedures required by the management system or the company's protection programs.

The company shall have established and implemented an effective process for generating and managing training documents and records.

Regulatory References: OPR s.6.5 (1)(j),(k),(l) and (p) and CSA Z662-15 Clause 3.1.2(c).

Question 3.4:

Describe the training for the company employees related to the reporting of incident and near misses, and the training for staff conducting investigations and developing corrective and preventive actions.

NEB Assessment:

The Board has found that Pembina demonstrated staff receive several types of incident investigation training including:

- Complete incident Investigation Training - 5 Why training;
- Comply with incident reporting, investigation and analysis standard – Internal training to internal standards;
- Complete incident investigation and root cause analysis course - (TapRoot) offered by a third party vendor; and
- Complete incident investigation course - (DNV) offered by a third party vendor.

Based on their assigned job role, Pembina employees received 5-Why training and/or internal SMART system introduction training. Board staff reviewed a portion of both the training courses and found the training contained information on the basics steps to an investigation and using the database system. The Board found that competency evaluations are built into the training and the student must complete these as part of the training package.

The Board found that some employees within Safety Advisory roles received additional incident investigation training in external providers' advanced root cause analysis techniques.

The Board requested the training records for all employees that were interviewed as part of this audit. All records sampled were up to date and where the employee's assigned job required investigation training, the records indicated that it had been completed.

The Board did identify some non-compliances of the OPR s.6.5(1)(r) as noted in Appendix I of this report that are associated with Pembina's internal standards and processes for incident investigation and reporting. However, the Board did not find any non-compliances with the training and competency as required for this sub-element. It is the expectation of the Board that where changes and modifications are made to standards and processes in sub-element 4.2, and new or revised training is identified as the best method to communicate these changes, that Pembina will promptly provide the training to all employees who require it for their job functions.



Conclusion:

Pembina demonstrated that it has provided various types of training on the current version of their new SMART system to a broad base of its employees over a short time span. While the Board identified non-compliances with Pembina's incident investigation and reporting, Pembina did demonstrate that they take training their staff seriously and that they took steps to provide what they believed to be a comprehensive training package. Based on the review conducted and considering the scope of this audit, the Board did not identify compliance issues in relation to Question 3.4 – Training, Competence and Evaluation.

3.5 Communication

Expectations: The company shall have an established, implemented and effective process for the internal and external communication of information relating to safety, security and environmental protection. The process should include procedures for communication with the public; workers; contractors; regulatory agencies; and emergency responders.

Regulatory References: OPR s. 6.5(l),(m) and (q) and CSA Z662-15 Clause 3.1.2(d)

Question 3.5:

This sub-element is partially assessed in Appendix I, section 4.0. The other aspects of this sub-element are not part of the scope of this audit.

NEB Assessment:

N/A

3.6 Documentation and Document Control

Expectations: The company shall have an established, implemented and effective process for identifying the documents required for the company to meet its obligations to conduct activities in a manner that ensures the safety and security of the public, company employees, the pipeline, and protection of property and the environment. The documents shall include all of the processes and procedures required as part of the company's management system.

The company shall have an established, implemented and effective process for preparing, reviewing, revising and controlling documents, including a process for obtaining approval of the documents by the appropriate authority. The documentation should be reviewed and revised at regular and planned intervals.

Documents shall be revised where changes are required as a result of legal requirements. Documents should be revised immediately where changes may result in significant negative consequences.



Regulatory References: OPR s. 6.5(1)(i),(n) and (o), s.6.5(3) and CSA Z662-15 Clause 3.1.2 (e).

Question 3.6:

The assessment of this sub-element is not included in the scope of this audit.

NEB Assessment:

N/A

4.0 CHECKING AND CORRECTIVE ACTION

4.1 Inspection, Measurement and Monitoring

Expectations: The company shall have an established, implemented and effective process for inspecting and monitoring the company's activities and facilities to evaluate the adequacy and effectiveness of the protection programs and for taking corrective and preventive actions if deficiencies are identified. The evaluation shall include compliance with legal requirements.

The company shall have an established, implemented and effective process for evaluating the adequacy and effectiveness of the company's management system, and for monitoring, measuring and documenting the company's performance in meeting its obligations to perform its activities in a manner that ensures the safety and security of the public, company employees, the pipeline, and protection of property and the environment.

The company shall have documentation and records resulting from the inspection and monitoring activities for its programs.

The company management system shall ensure coordination between its protection programs, and the company should integrate the results of its inspection and monitoring activities with other data in its hazard identification and analysis, risk assessments, performance measures, and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.

Regulatory References: OPR s. 6.5(1)(g),(s),(u),(v),(w), s.53(1),s.54(1), and CSA Z662-15 Clause 3.1.2(h)(v).

Question 4.1:

The assessment of this sub-element is not included in the scope of this audit.

NEB Assessment:

N/A



4.2 Investigations of Incidents, Near-misses and Non-compliances

Expectations: The company shall have an established, implemented and effective process for reporting on hazards, potential hazards, incidents and near-misses, and for taking corrective and preventive actions. This should include conducting investigations where required or where hazards, potential hazards, incidents and near-misses have or could have resulted in the safety and security of the public, workers, the pipeline, and protection of property and the environment being appreciably significantly compromised.

The company shall have an established, maintained and effective data management system for monitoring and analyzing the trends in hazards, incidents and near-misses.

The company should integrate the results of their reporting on hazards, potential hazards, incidents and near-misses with other data in hazard identification and analysis, risk assessments, performance measures, and annual management reviews, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.

Regulatory References: OPR s. 6.5(1)(r),(s),(u),(w),(x) and s.52, and CSA Z662-15 Clauses 3.1.2(h)(ii), 10.3.6, and 10.4.4.

Question 4.2:

This sub-element is assessed in Appendix I

NEB Assessment:

N/A

4.3 Internal Audit

Expectations: The company shall have an established, implemented and effective quality assurance program for the management system and for each protection program, including a process for conducting regular inspections and audits and for taking corrective and preventive actions if deficiencies are identified. The audit process should identify and manage the training and competency requirements for staff carrying out the audits.

The company should integrate the results of their audits with other data in identification and analysis, risk assessment, performance measures, and annual management review, to ensure continual improvement in meeting the company's obligations for safety, security and protection of the environment.

Regulatory References: OPR s. 6.5(1)(w) and (x), s.55, and CSA Z662-15 Clauses 3.1.2(h)(v),(vi), and (vii).

Question 4.3:

Has your company conducted an audit that included and evaluated the requirements of sub-element 4.2?



NEB Assessment:

The Board has found that Pembina had two recently completed audits including: **Pembina Emergency Management Audit DNV GL-2016-10-18-3.14** completed in October 2016, and the other titled **Health and Safety National Energy Board Audit 2016 DRAFT** completed in September 2016 (still in draft).

The external provider of one of the audits found Pembina to be compliant in the area of Incident Reporting and Investigation during their audit. Through an Information Request the Board requested the completed protocols for the external audit, which was to include who was interviewed and what was sampled for this audit. Pembina responded to the Board that the audit was to be done to the most stringent requirements of the three regulators (NEB, Alberta Energy Regulator, and BC Oil and Gas Commission) and the audit protocol was based on the 17 elements set out in the **NEB Management System and Protection Program Protocol**. Also provided was a list of documentation reviewed by the external auditor and the list of positions who were interviewed. There is no indication of sampling of past incidents as part of the external audit activities contained in the provided information.

As outlined in the Introduction Section of the **Health and Safety NEB Audit 2016 DRAFT** audit report, the audit was completed using a partial list from the NEB pipeline integrity audit protocol sub-elements with a focus on the health and safety sections. The sub-elements reviewed included the following:

- Policy and Commitment Statements;
- Hazard Identification, Risk Assessment and Controls;
- Goals, Objectives and Targets, Training;
- Training, Competency and Evaluation;
- Investigating and Reporting Incidents and Near Misses; and
- Internal Audits.

One finding was identified in the draft report under the section of **Investigating and Reporting Incidents and Near-Misses**. However as the report was in draft at the time of the Board's audit, no further discussion will be provided.

While reviewing some of the incident investigations conducted by Pembina staff, the Board identified a concern with the quality assurance program currently in place for this sub-element. The following are some of the deficiencies identified through a sampling by Board staff:

- Some incidents were categorized as a safety or a vehicle incident but the investigation had it categorized as an environment incident and no other incident report was made;
- Some incidents were given a likelihood of occurrence as remote in the industry, or remote in the company and occasional in the industry, but the Board observed multiple occurrences of similar incidents in the incident data reviewed.
- Through the SMART system, there are multiple levels of review and approval and the ability to reject the investigation and to have it updated or re-done. The Board did not see this quality assurance activity being applied to correct inaccurate data entries. As this data is then used for trending and analysis, using faulty data can lead to poor trending and analysis.

Conclusion:

Pembina was not able to demonstrate that they had conducted internal audits on all programs as required under OPR s. 6.5(1)(w). The Board recognizes that a newly developed standard for audits is now in place at Pembina for the Damage Prevention Program, but it is the Board's opinion that the standard is too new to be considered fully implemented at the time of this audit.



The Board has additional concerns with the quality assurance requirements of the management system with respect to incident investigations and near-misses. As discussed in Appendix I of this report, during sampling of Pembina incident investigations, potential errors in the selection of incident categories, severity and likelihood could lead to inaccurate determinations of potential severity and poor trending and analysis of data.

The audit verified that Pembina does not have a fully implemented internal audit and quality assurance program for their management system. Based on the review conducted and considering the scope of this audit, the Board identified a non-compliance with OPR s.6.5(1)(w) in relation to Question 4.3 – Internal Audit.

4.4 Records Management

Expectations: The company shall have an established, implemented and effective process for generating, retaining, and maintaining records that document the implementation of the management system and its protection programs and for providing access to those who require them in the course of their duties.

Regulatory References: OPR s. 6.5(1)(p), s.56 and CSA Z662-15 Clauses 3.1.2(e) and 10.4.4.1

Question 4.4:

Describe how the company meets the record retention requirements set out in OPR s. 56 and CSA Z662-15 Clause 10.4.4.1.

NEB Assessment:

Pembina uses various methods and processes for managing operational, management system, and program related records. Examples were provided through their integrity program records which are connected to the OPR and CSA Z662 requirements for storage and retention. Another example provided was for their employee training program for learning and competency tracking associated with individual job roles.

The Board has found that Pembina has not demonstrated an established and implemented process for records management related to incident investigations. Additionally, Lead Investigators are not aware of what relevant and required documents associated with an investigation are required to be retained and uploaded to the SMART system to ensure they are traceable and trackable.

Conclusion:

Pembina has demonstrated they have incident investigation database to track and store information incident investigation records. Pembina was not able to demonstrate that they had an established and implemented process for records management related to incident investigation to ensure required records and associated material are traceable and trackable.

The audit verified that Pembina does not have a fully implemented records management process. Based on the review conducted and considering the scope of this audit, the Board identified a non-compliance with OPR s.6.5(1)(p) in relation to Question 4.4 – Records Management.



5.0 MANAGEMENT REVIEW

Expectations: The company shall have an established, implemented and effective process for conducting an annual management review of the management system and each protection program and for ensuring continual improvement in meeting the company's obligations to perform its activities in a manner that ensures the safety and security of the public, company employees, the pipeline, and protection of property and the environment. The management review should include a review of any decisions, actions and commitments which relate to the improvement of the management system and protection programs, and the company's overall performance.

The company shall complete an annual report for the previous calendar year, signed by the accountable officer, that describes the performance of the company's management system in meeting its obligations for safety, security and protection of the environment; and the company's achievement of its goals, objectives and targets during that year, as measured by the performance measures developed under the management system and any actions taken during that year to correct deficiencies identified by the quality assurance program. The company shall submit to the Board a statement, signed by the accountable officer, no later than April 30 of each year, indicating that it has completed its annual report.

Regulatory References: OPR s. 6.5(1)(w) and (x) and s.6.6, and CSA Z662-15 Clause 3.1.2 (h)(vii).

Question 5.0:

Describe the company process for conducting management reviews as it relates to sub-element 4.2.

NEB Assessment:

As part of conducting a management review, Pembina completes an **OPR Gap Analysis** annually and the Pembina 2015 version of the analysis was provided for review by the Board. The Gap Analysis breaks down the OPR management system and program requirements into individual clauses as required. Pembina then provides an analysis of where they perceive their compliance is with each requirement. For each requirement they link it to a specific Pembina program or document they feel substantiates their compliance, or where compliance has not been achieved they provide a description of the steps being taken to reach compliance. The Gap Analysis includes all programs and helps to demonstrate Pembina's continuous improvement efforts in various program areas.

Conclusion:

The audit verified that Pembina has a process for conducting management reviews as it relates to sub-element 4.2. Based on the review conducted and considering the scope of this audit, the Board did not identify compliance issues in relation to Question 5.0 - Management Review.

APPENDIX III

Pembina Energy Services Inc. and Pouce Coupé Pipe Line Ltd.

MAPS AND SYSTEM DESCRIPTION

Pembina's NEB regulated assets that make up this audit are located in north western Alberta and north eastern B.C. as shown on Figure 1.

Pouce Coupé System

The Pouce Coupé system is an 8 inch 26.19 km pipeline from Dawson Creek Meter Station 6-26-78-12 W6M in B.C. to Pouce Coupé Meter Station 7-20-78-12 W6M in Alberta and includes all connected facilities.

Northern System

The Northern System consists of a 10 inch 174.7 km pipeline from 7-36-82-18 W6M in B.C. to 2-5-78-2 W6M in AB and includes all connected facilities.

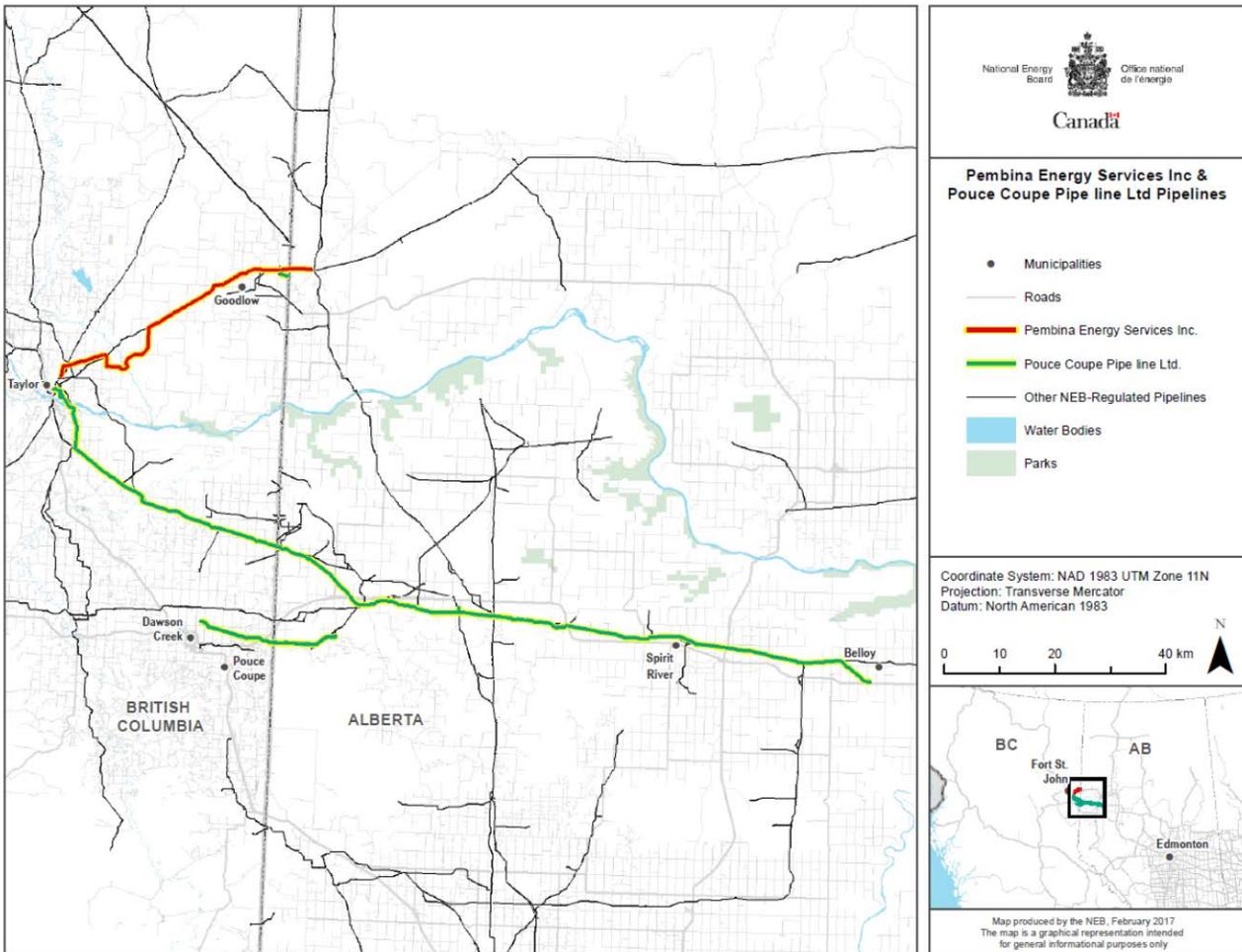
Northwest System

The Northwest System is comprised of a 4 inch 1.6km crude oil pipeline from 6-9-85-13 W6M AB to 12-8-85-13 W6M in B.C. including all connected facilities. The system is part of the 20 km Boundary Lake Crude Gathering System in Pembina's Deep Basin District.

Pembina Energy Services Inc.

This system consists of 60 km of high vapour pressure hydrocarbon 8 inch pipeline from the Taylor Gas Plant at Taylor 3-8-83-17 W6M B.C. to 5-5-85-14 W6M B.C. Boundary Lake including all connected facilities. The original 36.1 km pipeline was built in 1961 under B.C. jurisdiction, and a 17 km addition built in 1997 brought the pipeline into the Board's jurisdiction. Pipeline replacement work was undertaken in 2011/12.

Figure 1: Pembina Energy Services Inc. and Pouce Coupé Pipe Line Ltd.



APPENDIX IV
PEMBINA ENGERGY SERVICES INC.
COMPANY REPRESENTATIVES INTERVIEWED

Company Representative Interviewed	Job Title
██████████	Advisor, Regulatory
██████████	Senior Manager, Safety, Security &ERP
██████████	Supervisor, Emergency Response & Security Management
██████████	Analyst, SSER
██████████	Senior Manager, Operations
██████████	Specialist, Environment
██████████	Contractor – Safety Advisor Project Group
██████████	Coordinator, Pipeline Outages & Control Centre Systems
██████████	Project Coordinator, Control Centre
██████████	Area Supervisor
██████████	District Manager
██████████	Safety Advisor
██████████	Operations Foreman
██████████	Maintenance Foreman
██████████	Senior Advisor for Environmental Liability & Compliance
██████████	Senior Advisor, Pipeline Integrity