APPENDIX Q

Pipeline Integrity and Emergency Response Measures
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Summary of Enbridge’s Pipeline Integrity and Emergency Response Measures

Enbridge Pipelines (Southern Lights) L.L.C.

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Enbridge addresses pipeline integrity in a variety of aspects including initial system design, materials, construction practices, and operation, maintenance, and inspection procedures. Enbridge is committed to operating and maintaining the pipeline system in a manner that protects the environment and ensures the safety of the public, contractors, and employees. The main elements of pipeline integrity are discussed below.

**Release Prevention**
Release prevention starts with the design and construction of new facilities and carries through the operational life of all Enbridge facilities. Aspects of system design and operations are discussed below.

**Route Selection**
Enbridge conducts extensive surveys and research to identify the optimal route for a new pipeline and aboveground facilities. Typically, the safest and least environmentally damaging route is within an existing pipeline corridor but in some cases it is advantageous to deviate from an existing corridor in sensitive environmental areas or areas of intensive human activity.

**Pipeline Materials**
The manufacture of various components of a pipeline system (e.g., pipe, valves, gaskets) is guided by specific standards, which account for substantial margins of safety. Mainline pipe is subject to the American Petroleum Institute (API) Standard Specification 5L, which includes stringent requirements for non-destructive and destructive testing, hydrostatic testing, welding, and material tolerances. New fusion bonded epoxy coatings have been developed which bond much better than field-applied hot and cold wraps. These coatings are now typically applied at the pipe fabrication mill in a controlled environment, which enhances the overall quality of the coating system. Technology and quality control in the areas of the pipe milling, coating, component manufacturing, and shipment have improved significantly over the years resulting in high quality, leak resistant materials.

**Compliance with PHMSA Regulations**
The Pipeline and Hazardous Materials Safety Administration (PHMSA), under the U.S. Department of Transportation (USDOT), regulates and inspects new pipeline construction to ensure compliance with the applicable pipeline regulations (49 CFR Part 195 for liquid petroleum lines). Enbridge's specifications are typically more stringent than PHMSA requirements.

**Coating**
Enbridge has precise specifications for the field coating of welds. Thorough inspections are conducted of field coating and the entire fusion bonded epoxy system by qualified technicians. Coating is the primary line of defense against external corrosion; therefore ensuring correct field coating is a key factor in release prevention.

**Post-Construction Testing**
Once pipeline installation is complete, two tests are performed to verify the integrity of the pipeline. First, an electronic inspection tool called a "caliper pig" is run through the pipeline to assure that no dents or buckling occurred during construction. If deformities are discovered beyond acceptable tolerances, the affected pipe section is replaced or repaired.

On completion of a successful caliper pig run, water is placed into the line and is pressurized to between 90 percent and 100 percent of the specified minimum yield strength of the pipeline, which is considerably higher than the maximum 72 percent of yield at which the pipeline may be operated. Hydrostatic testing is guided by rigorous specifications, and a successful test verifies the pipeline is ready to be put into service.
Operation, Maintenance, and Inspection

Many of Enbridge’s ongoing operation and maintenance procedures focus on petroleum release prevention. Company procedures which are guided by over 200 industry standards meet and generally exceed government requirements. Enbridge provides comprehensive training for employees and contractors. Enbridge is subject to inspections by federal and state pipeline safety regulatory agencies, including on-site compliance reviews of operating facilities and/or construction activities.

Pipeline Operation and Control

The Enbridge Control Center is staffed by pipeline operators 24 hours per day. The computerized pipeline control system allows operators to monitor and remotely control the pipelines and related facilities. Landlines and satellite communications are used to exchange computerized data for pipeline monitoring and control. The Company maintains a UHF radio system, supplemented by cellular phones as needed to facilitate personnel communications during operation, maintenance, and emergency activities.

Protection of Pipelines from Third-Party Damage

Enbridge pipelines are typically buried three or more feet deep to prevent damage from normal human activities. The Company has an aggressive program to inform third parties about the location of the pipelines and about requirements to call state excavation one-call systems prior to excavation. The pipeline right-of-way is well marked by signs at strategic locations.

Protection of the Pipeline from Corrosion

In addition to protecting coatings, Enbridge's pipelines are protected against corrosion by a well-maintained cathodic protection system. Cathodic protection systems are regularly monitored and adjustments to the cathodic protection system are made on an ongoing basis.

Maintenance

Enbridge invests substantially each year in ongoing maintenance of its pipeline system. The Company conducts on-site inspections as specified by pre-established preventive maintenance requirements. Examples of components inspected on-site include isolating valves, overpressure safety devices, pipe coatings for aboveground portions of the system, vapor monitoring equipment, etc. Inspection records are available for review by agency inspection personnel during scheduled and unscheduled inspections.

Patrol

The pipeline right-of-way is patrolled by air at least once every three weeks. The Company-employed pilot notes unusual excavation activity or conditions that could indicate inadvertent petroleum releases. If abnormal conditions are noted, ground crews are immediately dispatched for further investigation. In the event of a suspected release, the pilot will notify the Control Center by radio and the affected pipeline may be shut down pending on-site investigation. As a supplement to the aerial patrol, Enbridge employees visually inspect the right-of-way from the ground in selected locations on a periodic basis.

Enbridge also uses sophisticated internal inspection devices to clean the walls of the pipe and to detect corrosion or dents. Enbridge is an industry leader in the application of these devices. Discovered defects may not be significant when initially identified but may have the potential to result in a rupture or small release over time if not repaired. Pipeline aerial patrol, inspection, and landowner awareness programs are included in the federal pipeline regulations. Enbridge's procedures meet and often exceed these requirements.

Release Detection

In the unlikely event of a release, the Company has several provisions to enable early detection. Aerial patrols, foot patrols, and internal inspections are described in the previous section. The Company's public awareness program, which includes information on how to recognize and respond to pipeline releases, is also a key component in Enbridge's pipeline release identification and notification program.
Pipeline Control System

Enbridge's Supervisory Control and Data Acquisition (SCADA) system is the central component of the Company's pipeline control system. The SCADA system includes pipeline sensing devices (i.e., pressure, temperature, density, and flow sensors), a remote computer at each Enbridge station, a real-time communication network, a centralized data processing system, and a complete data display available to the pipeline control operator. The SCADA system includes automated alarms to warn operators of abnormal conditions when measurements depart from pre-determined maximum and minimum limits.

The SCADA system reduces control errors and can automatically initiate pump station shutdowns to maintain a pipeline within safe operating pressures. Pipeline control operators can also manually initiate pipeline shutdown when they observe abnormal conditions. Since 1991, Enbridge has enforced a strict "10-minute rule" that requires operators to shut down a pipeline within 10 minutes if an abnormal condition is observed that cannot be attributed to normal fluctuations in pressures and operating conditions. Enbridge is a leader in the industry in applying advanced SCADA systems. Studies using SCADA simulations indicate that the system can reliably identify a release as low as approximately five percent of system capacity.

Small Release Detection System

Since even sophisticated SCADA systems cannot accurately detect very small releases, the pipeline industry has been researching and developing approaches to improve remote detection of small releases. Enbridge implemented a subsystem, referred to as a Computational Pipeline Monitoring System (CPM), which refines data monitoring to better analyze much smaller deviations in flow than is possible with the existing SCADA system. Enbridge installed these additional components, such as pressure transmitting devices, in sensitive areas to increase the ability to remotely and swiftly detect very small releases.

Release Response

While Enbridge's goal is to prevent emergencies on its system, it is imperative that the Company be prepared to respond to an emergency should one occur. The Company's emergency response program includes pre-planning, equipment staging, notifications, and emergency and release containment procedures. Key components of Enbridge's release response program are discussed below.

Emergency Response Plan

The Company's emergency response plan has been approved by the USDOT. The plan demonstrates the Company's response capabilities in accordance with the regulations set forth in 49 CFR Part 194 as well as requirements by the Occupational Safety and Health Administration (OSHA) final rules on Hazardous Waste Operations and Emergency Response (HAZWOPER). Enbridge's plan addresses compliance with public and employee safety issues including implementation of the Incident Command System, training of response personnel, protection requirements, site control procedures, and decontamination.

Enbridge maintains detailed mapping of its system using both publicly available map resources and electronic geographic information system (GIS) platforms. Enbridge can evaluate potential impacts on sensitive environmental and human use areas and develop site-specific plans as needed to respond to emergencies.

The emergency response plan is maintained at District, Area, and Pipeline Maintenance (PLM) offices. Company employees are provided a copy of an Emergency Response Directory that provides checklists, summaries from the plan, internal and external contacts, and notification/reporting procedures.

Staffing

In North Dakota, Minnesota and northwestern Wisconsin, Enbridge employs three PLM crews strategically located along the pipeline system. Each PLM employee is trained and equipped to respond
to an emergency. Each maintenance facility has available mobile response units (equipped for both land- and water-based releases) and heavy equipment. In addition, pre-staged containment and recovery equipment is maintained and available at several other locations along the Enbridge system.

The Company has pre-defined response contractors to supplement Company resources if necessary. Further, Enbridge is active in several industry and government cooperatives and mutual aid groups to facilitate emergency response.

Training
Enbridge personnel receive classroom and practical training in safety and emergency response procedures. Employees must demonstrate knowledge and proficiency in these areas as appropriate to their responsibilities. All PLM, electrical, and mechanical staff are trained to a "Hazardous Materials Technician" designation (HAZWOPER (1910.120(q))). In addition, Enbridge employees receive job-specific training as dictated by the USDOT operator’s qualification program. Enbridge’s resources and response capabilities are subject to periodic inspection by agencies with jurisdiction to enforce the Oil Pollution Act of 1990 through on-site inspections or performance of unannounced drills conducted by the appropriate agency.
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