

Canada Energy Regulator – A Lifecycle Approach to Contamination Remediation

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1) Introduction and Regulatory Context

The Canada Energy Regulator (**CER**) is the federal regulator of interprovincial and international pipelines.² The CER regulates approximately 73,000 km of pipelines, amounting to approximately 10% of the pipelines in Canada. The CER is responsible for ensuring that pipelines are constructed, operated, and abandoned in a safe and secure manner that protects people, property and the environment. As part of this responsibility, the CER provides oversight for remediation of contamination related to CER-regulated pipelines and fulfills this work through the remediation process.

The updated 2020 Remediation Process Guide (**RPG**, CER, 2020b) describes the remediation process and provides the framework by which companies can demonstrate they are meeting CER requirements for environmental protection related to contamination. The CER's Filing (CER, 2020a) Manual provides filing requirements and guidance for companies seeking approval for a project. These two primary guidance documents support the legislation that enables the CER's regulatory powers, duties and function.

The CER's enabling legislation is the CER Act. The CER is also responsible for administering parts of the Canada Oil and Gas Operations Act (**COGOA**) and the Northwest Territories' Oil and Gas Operations Act (**OGOA**). Regulations under the CER Act and the COGOA include provisions requiring that operators have environmental protection programs or plans in place. Most significant for CER oversight, the Onshore Pipeline Regulations (**OPR**) under the CER Act includes a requirement to “develop, implement and maintain an environmental protection program that anticipates, prevents, manages and mitigates conditions that could adversely affect the environment” (OPR Section 48). Contaminated sites are reported and managed within this program as part of the company's management system (OPR Section 6). The OPR and RPG are performance-based which allow companies the flexibility to develop progressive and tailored solutions to their unique scenarios across the country.

The current paper focuses on contamination and remediation associated with oil and gas pipelines from project application through abandonment, the CER's recent guidance updates related to contamination remediation, advancements and regulatory challenges.

2) Lifecycle Regulation

The CER has oversight throughout the full lifecycle of a regulated project, across which both the Filing Manual and the RPG apply. Major stages in the project lifecycle include the following:

- Application;
- Construction, operation and maintenance; and
- Decommissioning and abandonment.

¹ The views, judgements, opinions and recommendations in this paper are those of the authors alone and do not necessarily reflect those of the CER, or the Commission.

² The term “pipeline” means the entire facility regulated by the CER, including all branches, storage or loading facilities, pumps, compressors and any connected works (full definition can be found in the CER Act)

A. Application

The lifecycle of a project begins with an application to the CER, which includes an environmental and socio-economic assessment (see Guide A of the Filing Manual). Within the assessment a company will identify any potential existing contamination that may be disturbed as a result of the project construction and the applicable regulatory standards, remediation, mitigation and monitoring to be undertaken. The Commission of the Canada Energy Regulator (Commission), with support from CER technical experts, assesses all aspects of the application to determine it is safe, will protect people and the environment and is in the public interest.

Approval of a project typically comes with conditions that hold the company accountable to environmental commitments and include identification, assessment and management of contamination during construction, operation and maintenance activities. As an example, on Trans Mountain Expansion Project – Reconsideration, the Board (predecessor to the Commission) required the company to file a Contamination Identification and Assessment Plan prior to construction, to demonstrate the adequacy of the identification and assessment procedures (CER, 2018).

Application filings, authorizations and other documentation from the application process are publicly available on the CER website (**REGDOCS**).

B. Construction, Operations and Maintenance

Compliance Verification and Enforcement

The CER conducts compliance verification activities (**CVAs**) to ensure that companies are meeting requirements as set out through their application and authorization. These can include provisions outlined in Acts and Regulations, commitments made during an application process, conditions on authorizations and Orders and company procedures and plans. For contaminated sites, CVAs likely involve information exchange meetings, implementation assessment meetings, audits of the company's management system, report reviews and potentially field inspections.

If a company is found to be out of compliance with a requirement, the CER uses escalating enforcement tools to bring the company back into compliance. For example, in an escalating scenario, a report review may be followed by a field inspection, an inspection officer order and an administrative monetary penalty.

CER Remediation Process

Contamination, including third party contamination, is required to be reported to the CER through the online submission of a Notice of Contamination (**NOC**). In addition to notifying the CER of contamination, companies are required to notify potentially affected persons and communities. This could include notification to landowners, Indigenous Peoples and communities, other regulators or other land users. The CER also requires that companies engage with potentially affected persons throughout remedial activities and prior to submitting a closure report to the CER.

The actions required by the CER following submission of the NOC are dependent upon several factors including:

- the complexity of remediation
- the risk of off-site migration
- the potential for exposure to sensitive receptors
- contaminant extent and characteristics
- preferential pathways for contaminant migration
- third party interest in the site

The CER administers various provincial and federal numerical remediation criteria, as applicable, based on the location of the site. We also work closely with other regulatory bodies in cases of overlapping jurisdiction.

Companies are required to report annually on each contaminated site regulated by the CER. Companies most commonly submit a remedial action plan or risk management plan³. These plans are reviewed and accepted, if satisfactory, by CER staff. CER oversight is conducted using a risk based approach; in high risk scenarios, the CER may require action with an imposed timeline to protect people and/or the environment. Once remediation is complete, a closure report is submitted to the CER for review. If the closure report demonstrates that remediation has been completed, it will be accepted, and a closure letter issued.

NOCs and annual updates on sites reported to the CER from mid-2018 onward are publicly available on REGDOCS.

Contaminated Sites Reported to the CER

There are currently 473 active contaminated sites proceeding through the CER's remediation process. The following data summary presents an analysis in exploration and is directionally accurate.

Of the contaminated sites reported to the CER, more have been reported per 1,000 kilometres (km) of oil pipeline than gas pipeline (Table 1).

Table 1: Active Contaminated Sites Reported per 1,000 Kilometres of Pipeline

Pipeline Contents	Contaminated Sites Per 1,000 km of Pipeline (Number/1,000 km)
Oil	15
Gas	4

More reported contaminated sites are associated with facilities (e.g., pump or compressor stations, valve sites, etc.) than the pipeline right-of-ways (Table 2). Greater than 80% of contamination is reported to the CER during the operation and maintenance stage of the pipeline lifecycle (Table 3). The

³ From RPG (2020b). Risk Management means the selection and implementation of a strategy to control (e.g., reduce or eliminate) risk followed by monitoring and evaluation of the effectiveness of the chosen strategy. This incorporates both scientific (risk assessment) and non-scientific (e.g., social, economic) considerations. (Department of Fisheries and Oceans, 2011)

electronic collection of information on contaminated sites starting in 2018 resulted in higher data quality for more recent sites, hence Table 2 and Table 3 present data for sites that have been submitted since 2018.

Table 2: Contamination reported at Facilities and Pipeline Right-of-Ways (2018 to current)

Contaminated Site Location	Contaminated Sites Reported (%)
Facility	68
Pipeline Right-of-Way	29
Both	3

Table 3: Lifecycle Stage when Contamination was Reported (2018 to current)

Lifecycle Stage	Contaminated Sites Reported (%)
Construction	17
Operation and Maintenance	81
Abandonment	2

C. Decommissioning and Abandonment

If a company decides to take a pipeline out of service temporarily (decommission) or permanently (abandon), the operator must file an application with the CER. These applications also include an environmental and socio-economic assessment as described in Guide K for decommissioning and Guide B for abandonment in the Filing Manual. The CER requires companies to submit a Phase I Environmental Site Assessment (**ESA**), a list of contaminated sites previously reported to the CER, and a plan for a Phase II ESA⁴, if warranted. The CER expects companies to address contamination in accordance with the CER's Remediation Process Guide. If the Commission approves the decommissioning or abandonment application, it will issue an authorization that could include any conditions.

To ensure that any historical contamination issues are addressed, whether they are currently known, identified during the Physical Abandonment Activities or discovered during Abandoned Pipeline Monitoring, the CER continues to have regulatory oversight of the abandoned pipeline and has the authority to order further remedial work if it is not satisfied that a site has been adequately remediated (CER, 2018b). The CER does not provide regulatory closure for abandonments unless remediation is completed and sites under long-term risk management are not eligible for closure until remediation endpoints are met.

The CER requires its regulated companies to set aside funds for eventual abandonment. On 21 December 2010, the NEB (predecessor to CER) issued an abandonment costs table to help companies

⁴ Definitions for Phase I and Phase II ESAs from Canadian Standards Association (R2016) and Canadian Standards Association (2013), respectively are included in the RPG (CER, 2020b).

estimate their abandonment costs.⁵ With the coming into force of the CER Act in 2019, orphan pipeline provisions were introduced to deal with pipelines for which the pipeline certificate-holder is unknown, insolvent, dissolved or cannot be located.

3) Recent Updates

Recently, the CER updated certain sections of the Filing Manual which included guidance around decommissioning and abandonments. The CER has outlined clear expectations for contamination identification, assessment and management. These updates are consistent with the RPG and ensure environmental protection in cases where contamination was discovered during abandonment or decommissioning activities.

The RPG was first published in 2011. Major revisions and new content were added in 2020 including: the CER approach to transparency, management system requirements, application to abandonment, engagement requirements, requirement to report third party contamination and company off-site contamination, and expectations for risk management both on and off company owned lands.

4) Advancements

Some advancements in contamination management include the following:

- Performance-based approach which allows for flexibility and innovation by companies and less prescriptive guidance.
- Engagement requirements in the remediation process work toward reconciliation with Indigenous peoples.
- Working with provinces/territories in overlapping jurisdictions as contaminated sites across the country are regulated.

5) Regulatory Challenges

Some current regulatory challenges include the following:

- Expectations around timing of clean up can vary between landowners, regulated companies, regulators, and potentially affected persons and communities (e.g., landowners, Indigenous).
- Risk managed sites could remain actively under CER oversight for a long time, presenting a need to track and oversee remedial activities under potentially different operators. For example, when contamination associated with a pipeline is present in a shared corridor with other active pipelines, delineation and complete remediation can be challenging and abandonment may not be achieved until the active pipelines are abandoned.
- The CER needs to ensure remediation costs are sufficiently accounted for in the event an orphaned pipeline is abandoned.

6) Conclusions

The CER's regulations and guidance documents (e.g., Filing Manual and RPG) support the legislation under which the CER mandate, responsibilities and powers for protecting people and the environment

⁵ Unit Costs and Process for Consideration of Group 1 May 2011 Cost Estimate Filings – RH-2-2008 ([A27778](#)), Table A-3 Unit Costs for Abandonment Activities.

are established. Using this structure, the CER oversees the management of contaminated sites to ensure that people and the environment are protected from adverse effects of contamination across the whole lifecycle of a project.

Our performance-based and lifecycle legislation allows for progress and case-specific solutions for contaminated site management across Canada.

7) References

CER.2018a. National Energy Report, Trans Mountain Expansion Project ([MH-052-2018](#))

CER. 2018b. Reasons for Decision, NOVA Gas Transmission Ltd ([MH-002-2017](#)).

CER. 2020a. [Filing Manual](#).

CER. 2020b. [Remediation Process Guide](#).

CSA (R2016) Phase I Environmental Site Assessment (Z768-01). Toronto. Canada: Canadian Standards Association. Referenced in CER (2020b).

CSA (2013) Phase II Environmental Site Assessment (Z769-00). Toronto. Canada: Canadian Standards Association. Referenced in CER (2020b).

DFO (Fisheries and Oceans). 2011 Framework for Addressing and Managing the Aquatic Contaminated Sites under the Federal Contaminated Sites Action Plan (FCSAP). Referenced in CER (2020b).