# ENFORCEMENT PATTERNS AND COMPLIANCE OUTCOMES IN BC: LESSONS LEARNED FROM THE ROLLOUT OF EAO'S WATCHDOG PROGRAM

by

Allison Franko B.A. Environmental Geography, The University of British Columbia, 2012

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#### ABSTRACT

In 2011, the Office of the Auditor General of BC reported that post-certification monitoring of projects certified through the environmental assessment (EA) process was largely absent (OAGBC, 2011). In response, the BC Environmental Assessment Office (EAO) implemented a compliance and enforcement (C&E) program and began conducting inspections. A total of 103 inspections on 42 active projects have been conducted by EAO between August 2011 and March 2016. Although many regulatory theories detail factors that affect compliance, empirical evidence evaluating patterns of enforcement and compliance outcomes directly related to EA requirements is lacking. This research examines patterns in compliance oversight and compliance outcomes through collection, verification and analysis of a wide range of publically available data. Findings indicate that certain aspects of EAO's C&E strategy are effective and warranted; while other strategies are not being properly implemented and require reassessment. Based on key findings, a range of recommendations, including suggestions for further research, is provided to improve EAO's C&E strategy, which will in turn enhance environmental management in BC.

#### PREFACE

The questions shaping this research were developed in association with my supervisor at the University of British Columbia (Hadi Dowlatabadi) and National Sciences and Engineering Research Council (NSERC) industrial advisor (Archie Riddell). I also benefited from early input from Jackie Lerner. Additionally I benefited from on-going feedback on research methodology and content of my thesis from my supervisory committee and Autumn Cousins. The data used in the study were collected from various public sources and curated into a database by me. Jackie Lerner provided additional data on current project stages and locations. Data quality assurance was provided by the EAO. Analysis and interpretation of data was completed by me, as were the graphics and text comprising this thesis. Hadi Dowlatabadi and Archie Riddell have reviewed the material as presented here and remaining errors, as there invariably are with human endeavours, are mine.

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#### LIST OF ACRONYMS

#### AG. Auditor General

- BC. British Columbia
- BCEAA. British Columbia Environmental Assessment Act
- BCUC. BC Utilities Commission

**CEAA 2012**. Canadian Environmental Assessment Act 2012

**CEAA**. Canadian Environmental Assessment Agency

**CEMP**. Construction Environmental Management Plan

**C&E.** Compliance and Enforcement

CPD. Certified Project Description

CR. Compliance Rate

DFO. Department of Fisheries and Oceans Canada

**EA.** Environmental Assessment

EAC. Environmental Assessment Certificate

EAO. British Columbia Environmental Assessment Office

ECCC. Environment and Climate Change Canada

**EPA.** US Environmental Protection Agency

e-PIC. Project Information Centre (EAO website)

**EPP**. Environmental Protection Plan

**EVD**. Environmental Violations Database

FOI. Freedom of Information Request

IEM. Independent Environmental Monitor

**MEM**. Ministry of Energy and Mines

MNFLRO. BC Ministry of Forests, Lands, and Natural Resources

MOE. BC Ministry of Environment

**NEB.** National Energy Board

NEPA. US National Environmental Policy Act

**OAG**. Office of the Auditor General of BC

OGC. BC Oil and Gas Commission

PAC. Project Approval Certificate

QA/QC. Quality assurance and quality control

TC. Transport Canada

**TOC.** Table of Conditions

VC. Valued Component

#### 1 INTRODUCTION

British Columbia (BC) is a province blessed with enviable natural resources. For thousands of years, the pre-colonial wellbeing of the people of BC has been founded on the health and bounty of the natural environment. Since colonization, for the better part of two centuries, the economic development of BC has largely been fuelled by resource extraction. While we are past the peak of forestry and mining booms, resource extraction continues as a pillar of BC's economy. In 2014, the natural resources sector accounted for 11% of BC's nominal gross domestic product (GDP) and 111,000 direct and indirect jobs (Natural Resources Canada, 2016). As this pattern of economic activity continues, we put at risk the sustainability of our natural resources. Recognition of this has led to evolving efforts in managing the environmental impacts of extractive and other developments in the Province. This thesis focuses on one element of this process: the checks and balances on proponents by the Environmental Assessment Office (EAO) to ensure the health of the environment while providing for sustainable resource development. To understand what EAO's new compliance and enforcement (C&E) program encompasses and how it is functioning, this research explores:

- Data associated with EAO's risk-based criteria for inspection (section 1.4.1) to see how the criteria influence inspection priorities in practice; and
- Potential patterns in compliance to see what compliance rates look like; and discover whether there are other factors that should be considered in strategically allocating resources.

The current system of checks and balances for large projects has a number of steps whereby proponents and regulatory agencies identify potential risks posed by the project and stipulate how these ought to be mitigated, with input and review from First Nations, a variety of government agencies, and other stakeholders. This thesis focusses on the risk mitigation pledges made by proponents as part of obtaining their Environmental Assessment Certificate (EAC). Schedule B of the EAC, the Table of Conditions (TOC) describes *how* a project is to be developed. The TOC includes components, activities, or valued components of concern, which should receive specific attention by the proponent in order to mitigate risks identified during the assessment process. These stipulated conditions can then be monitored and inspected using a risk management approach. Since 2012, most EACs also include a Certified Project Description (CPD) in Schedule A of the EAC, which stipulates project components and their locations that have been reviewed and approved (BC Environmental Assessment Office, 2015a). Project components and their siting can also be inspected for conformance. Once a proponent receives an EAC they become a certificate holder<sup>1</sup> (*ibid*).

This system of checks and balances is important to consider, especially in light of the recent scrutiny of EAO by the Office of Auditor General (OAG) of BC. In 2011, the OAG found that post-certification monitoring of approved projects was largely absent (Office of the Auditor General of BC, 2011), 2011). Consequently, the OAG also found that EAO was not ensuring that enforcement actions are effective (*ibid*). In response, EAO implemented a C&E program to oversee compliance, conduct

<sup>&</sup>lt;sup>1</sup> This is the term that will be used in this thesis to describe proponents of approved EA projects.

inspections and investigations, review self-reports submitted by proponents, take enforcement action, and to review inspection reports completed by other agencies on EAO's behalf (*ibid*).

A total of 92 inspections of projects' compliance with EAC conditions<sup>2</sup> (2 administrative and 90 onsite) were conducted between August 2011 and September 2015. During this period few inspection reports were shared with the public, unless requested through a Freedom of Information (FOI) Request, and no monetary fines<sup>3</sup> were imposed on firms whose projects were found in noncompliance with one or more conditions on repeat inspections. Projects in compliance did not receive any public recognition either.

Compliance with social and environmental regulations depends on the financial ability of a regulated firm to comply as a precondition, and a firm's awareness of rules (Winter & May, 2001). However, compliance is also a function of the will or motivation of a firm to comply (*ibid*). The issue is that such voluntary behaviour (intrinsic motivation) may not be enough to achieve policy goals. Traditional thinking would lead to a reinforcement of such voluntary behaviour by applying legal or monetary carrots (incentives for good behaviour) and sticks (penalties for misbehaviour) (Swanson, 2002). Deterrents, such as inspections and penalties may be used in complement to largely cooperative regulatory environments. The analysis of inspection patterns and compliance outcomes can help identify potential factors affecting compliance rates.

Although many regulatory theories detail factors that affect compliance, empirical evidence evaluating the effectiveness of enforcement strategies on compliance outcomes for EA specifically, is lacking (Burby & Paterson, 1993). The more empirical evidence that can be gathered for different jurisdictions and their contexts, the more likely informed enforcement strategies will be able to achieve overall compliance goals. A better understanding of what factors are associated with different compliance outcomes can serve to strengthen EA practices, leading to the achievement of higher rates of compliance. Considering these issues, this research seeks to provide insights for improving and/or legitimizing EAO's current C&E strategy based on the extent to which risk-based criteria influence oversight priorities and whether other factors associated with compliance outcomes should be considered.

<sup>&</sup>lt;sup>2</sup> A typical example of an enforceable EAC condition: "Ensure that the design, construction and operation of the Project is advanced in a way that avoids, or minimizes potential impacts to known archaeological sites, including the Nottingham Farm, St. Mungo and the Glenrose Cannery sites, as well as other sites that may be encountered during project planning and development" (South Fraser Perimeter Road Project Environmental Assessment Certificate, July 24 2008).

A typical example of an EAC condition that is less enforceable: "Ensure that the design, construction, and operation of the project, avoids where practical and technically feasible, impacts to vegetation and wildlife" (South Fraser Perimeter Road Project Environmental Assessment Certificate, July 24 2008).

<sup>&</sup>lt;sup>3</sup> EAO's C&E team does not have the authority to issue monetary fines; this responsibility rests with the legal system (see section 1.4.1)

## 1.1 ENVIRONMENTAL ASSESSMENT

Environmental assessment (EA) is a process designed to aid decision makers with whether a project should proceed with development and under what terms. Environmental assessment was formally legislated first in the USA, in 1969 with the passing of the *National Environmental Protection Act* (NEPA). In Canada, the *Canadian Environmental Assessment Act* (CEAA) was passed in 1992. The Act was most recently redefined in 2012 (CEAA, 2012). The Canadian Environmental Assessment Agency (CEAA) defines EA as:

"...a process to predict environmental effects of proposed initiatives before they are carried out. An environmental assessment:

- identifies potential adverse environmental effects
- proposes measures to mitigate adverse environmental effects
- predicts whether there will be significant adverse environmental effects, after mitigation measures are implemented
- includes a follow-up program to verify the accuracy of the environmental assessment and the effectiveness of the mitigation measures." (CEAA, 2015)

In Canada, many environmental approval and enforcement activities are the responsibility of the provinces. This is especially true for EA and since the enactment of CEAA 2012, which introduced 'substitution'. Substitution allows the EA process of another jurisdiction (e.g. BCEAA in BC) to be substituted for the EA process that would otherwise be conducted by CEAA. In BC, 1995 was the year the BC Environmental Assessment Act (BCEAA) came into force and was subsequently revised in 2002. Since 1995, the amount of time, money, and resources spent on environmental assessment, by both proponents (and the government, although budgets have not increased to the same degree), has increased alongside more involved requirements. In light of the significant amount of money and time put into planning these projects (proponents can spend approximately seven million or more, and on large pipelines, around \$20 million, depending on the level of consultation and effort put in), one would expect EAO to carry out program evaluations such that project outcomes can be assessed in relation to the assessment process. In 2011, the OAG published a report on EAO's lack of attention to "monitoring, compliance, and enforcement" (see figure 1.1), which is essential if data on project outcomes is to be fed back into the planning process for continuous improvement. This feedback loop, shown in hashed markings, is currently not functioning. Figure 1.1 depicts the environmental assessment process in BC.

#### Figure 1.1 Environmental Assessment Process in BC



Source: adapted from the Office of the Auditor General of BC (2011)

#### 1.1.1 Auditor General's Report on the Environmental Assessment Office

The AG's report concluded that "EAO's oversight of certified projects is not sufficient to ensure that potential significant adverse effects are avoided or mitigated" (Office of the Auditor General of BC, 2011). More specifically, the report found that EAO was not ensuring:

- Environmental Assessment Certificate (EAC) conditions were measureable and enforceable
- Compliance and Enforcement (C&E) actions were effective.
- Public accountability, by publishing appropriate monitoring, compliance and outcome information (*ibid*)

In response, EAO implemented a C&E program to oversee compliance, conduct inspections and investigations, review self-reports submitted by proponents, take enforcement action, and to review inspection reports completed by other agencies on EAO's behalf (*ibid*). The pilot program began in 2011 with the appointment of a manager who remained with the team until May 2013 when a new manager was hired in replacement (A. Cousins, personal communication, March 6, 2016). A senior compliance officer was also appointed to the pilot program in fall 2011 and was hired full-time in September 2012; subsequently an additional full-time EA compliance officer was appointed June 2012 and one full-time administrative person in October 2012 (A. Cousins, personal communication, February 29, 2016). Additional full time EA compliance officers were added in March 2014, July 2015, and most recently in January 2016 (*ibid*).

The OAG found that EAO had fully or substantially ensured that conditions were written in a measurable and enforceable manner when issuing new EACs, in response to the OAG report (2015); however, the OAG reviewed 17 EACs drafted after the audit to follow-up on this recommendation and found that 12 of these 17 EACs still contained the use of words such as minimize, without stipulating a threshold (Office of the Auditor General of BC, 2015). The 17 EACs drafted after the audit (between July 31, 2011 and December 31, 2014) that were reviewed by the OAG are listed in table 1.1. Bolded projects represent active projects<sup>4</sup>.

<sup>&</sup>lt;sup>4</sup> For the purposes of this research, an active project is defined as a project approved through the BC EA process and in construction, operation, or decommissioning at some point between 2011 to 2015 (the inspection period). Activity of a project was determined through online research including corporate websites, government news releases, and other media articles; active projects were verified using data provided by EAO as necessary.

Project	Application submitted	EAC issued
Nahwitti Windfarm Project	March 9, 2011	Dec 22, 2011
Tumbler Ridge Wind Energy Project	April 1, 2011	March 27, 2012
Tretheway Creek Waterpower Project	December 19, 2011	August 17, 2012
Shovel Creek Waterpower Project	December 19, 2011	August 17, 2012
Roman Coal Mine Project	March 26, 2010	December 14, 2012
Kitsault Mine Project	April 30, 2012	March 18, 2013
Line Creek Operations Phase II	December 2011	September 25, 2013
Fortune Creek Gas Plant	January 21, 2013	October 7, 2013
Vancouver Airport Fuel Delivery Project	February 18, 2011	December 11, 2013
Narrows Inlet Hydro Project	August 21, 2012	January 15, 2014
Meikle Wind Energy Project	November 2013	June 24, 2104
KSM (Kerr-Sulphurets-Mitchell) Project	July 2013	July 29, 2014
Site C Clean Energy Project	August 7, 2013	October 14, 2014
Coastal Gas Link Pipeline Project	March 2014	October 23, 2014
Westcoast Connector Gas Transmission Project	March 2014	November 25, 2014
Pacific North West LNG Project	February 2014	November 25, 2014
Prince Rupert Gas Transmission Project	May 2014	November 25, 2014

Table 1.1 EACs Reviewed by the OAG for Measurable and Enforceable Language

Once an Application for environmental assessment is submitted by a proponent and is accepted by EAO, a legislated 180-day review period begins. During this review period various documents are prepared and a public comment period along with an open house is held for the Application. Key project documents are reviewed by the working group, which is established by EAO and comprised of various federal and provincial agencies and First Nations. The working group provides technical advice and guidance, in addition to voicing concerns that the proponent must address. During the 180-day review, a draft EAC may be prepared by the proponent and consultants and then provided to EAO for changes and review by legal counsel, or the EAC may be initially drafted by EAO. Once the EAC is finalized by EAO, it is provided to the Minister of Environment (and another minister depending on the project sector) along with an assessment report, recommendations from the executive director about whether to issue an EAC or not, and the draft EAC. Once the ministers receive this package they have 45 days to make a decision. In some cases, the 180-day limit for Application review will be suspended if there is outstanding information required from the proponent in order for EAO to complete its review (EAO, 2015b).

Since the Nawitti Wind farm Project<sup>5</sup> and the Tumbler Ridge Wind Energy Project submitted their Applications before the audit was published (table 1.1), it's possible that these EACs were drafted without consideration of the AG's recommendation about measurable and enforceable language. There still remain many EACs issued prior to the OAG's recommendations that have not been (and cannot be) addressed, especially for projects prior to 2002 with project approval certificates (PACs) pre-dating

<sup>&</sup>lt;sup>5</sup> The Nawitti Wind farm Project did have its TOC reviewed by the manager of the C&E program and by natural resource officers at MFLNRO; it is acknowledged however that the processes and standards to ensure conditions are measurable and enforceable were in the very early stages of development (A. Cousins personal communication, April 22, 2016).

the latest amendment to BCEAA in 2002. BCEAA does not provide the means for EAO to require changes to the wording of conditions for projects that have less than desirable wording (A. Cousins, personal communication, January 25 2016 and April 22, 2016). The only method BCEAA provides for EAO to require new or amended conditions to an EAC is activated when a certificate holder is in default of one or more conditions, relying on Section 37 of BCEAA (Appendix A). Certificate holders can ask EAO for revisions to a condition(s) if they find the wording to be confusing or misleading (*ibid*). Amendments are not solely requested to increase clarity in conditions, although there are limited examples where such requests have been made in conjunction with a broader amendment request for proposed project changes (*ibid*). A significant amount of consultation is required should a condition be revised, which may act as a deterrent to certificate holders (*ibid*).

Older EACs often do not contain the TOC in Schedule B, and instead refer the reader to commitments made throughout the Application, and in some cases have a separate "table of proponent commitments" in the Application; these tables are legally binding in the same way as EAC conditions. Grandfathered projects approved prior to the enactment of BCEAA in 1995, do not have any documentation on EAO's e-PIC (project information centre) in almost all cases. All projects under EAO's jurisdiction, including grandfathered projects, are included in the inspection mandate, regardless of whether typical conditions exist (*ibid*).

When consultants prepare the draft EAC conditions, these conditions are often influenced by (if not verbatim reproductions of) commitments designed by the consultant, and vetted by the proponent, during the EA process. This has been the case in BC—although the final set of conditions is the sole responsibility of EAO, vetted by the C&E team and often by legal counsel. Moreover, consultants may lack training in designing enforceable language—coupled with influence from the proponent (consultants are hired and compensated by the proponent)-- ensuring that these conditions has been cited by policy makers and researchers as the overriding factor for improved environmental management in developed countries (Gray & Shimshack, 2011; Kagan & Gunningham, 2003). When inspecting older projects' requirements with less than ideal wording for enforcement, EAO inspection officers may need to assess a broad amount of EA material to interpret the meaning of the condition or commitment. When enforcement is issued, there is no provision for appeal under the EA Act; only a judge can overturn an officer's enforcement (A. Cousins, personal communication, January 25 2016).

## 1.1.2 Environmental Assessment Follow-up

Although the merits of EA-follow up (also called monitoring and post-auditing) have been discussed at length in the literature since at least the 1980s (Tomlinson & Atkinson, 1987), there is little if any routine follow-up today (Munro & Arts, 2005). Some exceptions exist for individual projects typically of greater size and investment, with a greater likelihood of potential significant adverse effects. The Diavik and Ekati diamond mines in the Northwest Territories are two examples. However, this researcher has not been able to identify a specific jurisdiction that conducts and documents EA follow-up in a consistent manner.

EA follow-up has been conceptualized as a series of four activities: monitoring, evaluation, management, and communication (Morrison-Saunders, Marshall, & Arts, 2007; Munro & Arts, 2005). EA follow-up goes beyond simply ensuring compliance with EAC conditions, and includes measuring their effectiveness. Different parties are responsible for different EA follow-up activities. Auditing and enforcement may be undertaken by the same organization that carried out the EA, by another government agency, or not completed at all (Wasserman, 2011). Monitoring, reporting, management, and communication is typically the responsibility of the certificate holder, or consultants hired by the certificate holder. Although EACs today often contain requirements for monitoring and follow-up, including the certificate holder hiring "qualified professionals" as environmental and/or independent environmental monitors (IEMs). Data collected is not necessarily reported consistently or in usable formats. Again, not all aspects of EA follow-up are necessarily completed. Auditing and enforcement responsibilities need to be clearly outlined; should ownership change during the lifetime of a project, accountability for the results of auditing and enforcement are transferred to the new owner (*ibid*).

Early and still relevant definitions of EA follow-up activities were developed by Tomlinson and Atkinson (1987). Their definitions can be grouped into those activities that are perceived to have limited value for the improvement of EA and those that have potential for greater feedback power (ibid). One post approval follow-up activity (termed 'auditing' by Tomlinson and Atkinson) that is not thought to contribute to the improvement of EA is the "implementation audit" (ibid). The purpose of an implementation audit is to evaluate the degree to which EAC conditions and mitigations have been applied and whether they are operating as intended (ibid); these audits are usually conducted by regulatory agencies. "Project impact audits" on the other hand, as Tomlinson and Atkinson (1987) theorize, have more promise as a feedback mechanism as their objective is to examine the impacts from a project as a result of construction and operation. The first two audits mentioned are directly related to compliance oversight and enforcement (Wasserman, 2011). Several methods may be used to monitor compliance: self-reporting and monitoring by the certificate holder, public participation in monitoring through complaints, inspections by the government, and independent auditing (*ibid*). Going a step further are "predictive technique audits", which seek to improve or validate predictive techniques by comparing actual impacts with predicted impacts (Tomlinson & Atkinson, 1987). Although the separation and classification of follow-up activities can be useful, researchers have argued that "implementation audits", "project impact audits", and "predictive technique audits", to use Tomlinson and Atkinson's terminology, are inextricably linked-- dependent on the existence of the previous (Dipper, Jones, & Wood, 1998; Munro, 1987; Sadler, 1988; Wood, 1995). Thus these activities are most important and reach their greatest potential for identifying necessary improvements to EA when in combination (Dipper et al., 1998; Munro, 1987; Sadler, 1988; Wood, 1995).

Adapting Morrison-Saunders & Arts framework and considering Tomlinson and Atkinson's audit terminology, EAO's C&E program is captured under the umbrella of EA follow-up activities represented largely by the compliance phase as depicted in Figure 1-2. All black text in Figure 1-2 is generally the responsibility of government. The purple text is generally the responsibility of the certificate holder or third party consultants. Communication of findings to stakeholders from each phase of follow-up is a responsibility of both the certificate holder and government.

#### Figure 1.2 Environmental Assessment Follow-up



Source: adapted from Munro & Arts (2005)

Although EAO has committed to the activities associated with evaluation and feedback in figure 1.2, this has not been carried out in a consistent manner. In follow-up to the 2011 audit, the OAG acknowledged that a well-established framework for rigorous implementation audits and enforcement is the first step in assessing whether EAC conditions are effective (Office of the Auditor General of BC, 2015). Currently, EAO's EAC inspections can be understood as primarily 'implementation audits', and secondly as 'project impact audits' (defined earlier in this section), not yet having reached their full potential. EAC inspections conducted by EAO sometimes include officers'6 judgements on what aspects of the environment have been impacted by construction or operation of a project. EAC inspections and compliance self-reports have the potential to cover off all three audit classifications, if a consistent method of data collection and reporting is employed. The current practice during EAC inspections in BC is to focus for the most part on conditions related to environmental values (ibid). In order to fully implement effective follow-up, the other four pillars- health, social, economic, and heritage- and their related conditions will need to be measured for compliance and eventually evaluated for effectiveness (*ibid*). The literature is in consensus that whatever level of C&E and follow-up has been conducted in various jurisdictions, it has largely focused on environmental components, leaving much to be desired in terms of socio-economic outcomes.

There is no debate whether EA follow-up is necessary for continuity of environmental management objectives. Without it, we cannot learn from experience nor identify out-dated, ineffective, or sub-

<sup>&</sup>lt;sup>6</sup> The term officer is used for EAO's C&E officers (or inspectors) throughout this thesis.

optimal practices in the EA process (Baker, 2004; Sadler, 1988). Many have argued that the need for EA in decision making, by design necessitates the need for consistent and rigorous follow-up (Munro & Arts, 2005). The scale at which follow-up should be carried out at is another question many researchers have grappled with. Generally a holistic or regional-level approach is preferred over a piecemeal or project-level approach (Arts, Caldwell, & Munro, 2001). However, since EAs are largely carried out at the project level, there have not been many attempts at regional level follow up (Baker, 2004).

Most empirical studies of C&E with environmental regulations are focused solely on legislation and permits related to environmental protection (not including environmental assessment follow-up). Thankfully the similarity of EAC conditions with permit requirements makes environmental C&E research relevant for EA follow-up in general.

# 1.2 ENVIRONMENTAL REGULATION: COMPLIANCE AND ENFORCEMENT

Gray and Shimshack analyze quantitative empirical evidence on the impacts of environmental enforcement actions on compliance, and whether the empirical evidence supports theoretical economical predictions (Gray & Shimshack, 2011). Given the literature's focus on US institutions, their analysis focuses on the USA's Environmental Protection Agency (EPA) and state-level enforcement and the deterrence effects of such enforcement activities. One of the rare studies of environmental deterrence not focused on the USA (*ibid*) found that the greatest source for environmental pressure for seventy percent of Canadian pulp and paper mills was the government (Doonan, Lanoie, & Laplante, 2005). The regulatory backdrop of the USA is similar to many developed countries (Gray & Shimshack, 2011) and thus USA-focused studies present useful methods and conclusions relevant to Canada.

The USA delegates many environmental approval and enforcement activities (e.g. permits, inspections, and fines) to state-level (or provincial) agencies *(ibid)*. Similarities exist between Canada and USA because of the significant roles provinces and states play in environmental regulation. Within the EPA, the Office of Enforcement and Compliance Assurance (OECA) works with regional EPA offices and in partnership with state and other federal agencies to enforce numerous environmental laws (US EPA, 2015), such as the *National Environmental Policy Act* (NEPA).

Several studies (Earnhart, 2009; Gray & Shadbegian, 2005) have found that enforcement initiated deterrence varies over time, within and across project types, and more specific project characteristics such as types of conditions or permits (Gray & Shimshack, 2011). More empirical data is needed to understand the common drivers behind enforcement and compliance (response) variability (*ibid*). Such data can inform targeted enforcement strategies that achieve cost effective and efficient regulatory oversight (*ibid*).

# 1.2.1 Enforcement theories in practice

Gray and Shimshack (2011) summarize several useful trends and themes of enforcement indicators in the USA from their literature review. They found considerable variability in enforcement over time *(ibid)* as we know regulatory agencies to be influenced by government budgets and by local economic conditions (Deily & Gray, 1991), interest groups (Peltzman, 1976), and political forces (Kleit, Pierce, & Hill, 1998) to name a few. Gray and Shimshack (2011) highlight three main conclusions from their review of literature on environmental C&E:

- 1. Enforcement activities (inspections and penalties) produce considerable specific deterrence<sup>7</sup>
- 2. Enforcement activities produce considerable general deterrence<sup>8</sup>
- 3. Enforcement activities promote over-compliance (*ibid*).

Although the practice of indiscriminate and varied inspections is accepted by various disciplines as basic best practice for achieving high levels of compliance (*ibid*), this is not necessarily carried out in reality due to resource and budget constraints. Is targeting projects with histories of noncompliance effective and efficient? By targeting 'troublemaker' projects, are compliance rates going up? One study (Shimshack & Ward, 2010) hypothesized that such projects may have higher compliance costs and thus don't react as expected to enforcement. Others have argued that the maintenance of elevated levels of enforcement for problem projects is expensive monetarily and costly in resources and time (Gray & Shimshack, 2011). More evidence is needed to answer these questions.

Significant research has yet to be carried out to understand whether publication of inspection patterns and enforcement actions would increase compliance rates (*ibid*). Presently, EAO's inspections are seldom published and only in some cases where significant or continued noncompliance was observed. This could lead to firms underestimating enforcement threats, since few are published, or overestimating enforcement threats since only substantial enforcement actions are published. Moreover, the OAG found that efforts to publicize C&E activities undertaken by EAO since the 2011 audit are not adequate to foster accountability to the public (Office of the Auditor General of BC, 2015). How firms ascertain regulatory effort (whether accurate or not) is another uncertainty in many jurisdictions.

## 1.2.2 Effect of enforcement on compliance

In measuring industry responses to enforcement, models measure deterrence or the inclination of a firm's compliance status to respond to various enforcement actions. Gray and Shimshack (2011) explain that nearly all studies use observational data on C&E for many projects over extended time periods (months-years). Regression models examine associations between (i) compliance and the firm's perceived likelihood of an inspection and/or sanction; (ii) recent C&E actions taken at the project; and (iii) control variables *(ibid)*. Models predict increased compliance in the face of perceived increases in the likelihood of enforcement actions and/or observed increases in enforcement actions *(ibid)*. These

<sup>&</sup>lt;sup>7</sup> Specific deterrence occurs when enforcement actions targeting a single project deter ensuing noncompliance at the same project (Gray & Shimshack, 2011).

<sup>&</sup>lt;sup>8</sup> General deterrence occurs when regulatory actions targeting a single project generate spillover effects that influence compliance at other facilities (Gray & Shimshack, 2011)

models are difficult to calibrate however, and encounter several difficulties in measuring deterrence effects of enforcement.

If variables excluded from the model simultaneously affect both firm-level C&E actions (such as community pressure), then the omitted variable bias can distort measurements (*ibid*). Additional data on projects, firms, and communities (Earnhart, 2004) or corrective statistical techniques (Shimshack & Ward, 2005) have been used in various studies to minimize the omitted variable bias (Gray & Shimshack, 2011). Other researchers consider variables beyond (i) and (ii) (see above paragraph) as potentially associated with compliance responses. Scholz (1984a) has argued that compliance is more likely when parties perceive others to be in compliance. This represents an infectious sort of compliance motivation and has contributed to the occurrence of 'oscillatory enforcement' (Chu, 1993) characterized by very intense, intermittent surges of enforcement (Swanson, 2002).

Two additional issues exist with these models (i) the indiscernibility of firms' perceptions about the probability of enforcement actions, and (ii) reverse causality from targeted enforcement strategies (Gray & Shimshack, 2011). Operations with a history of noncompliance may be targeted by regulators and receive more frequent inspections and enforcement actions, thus revealing a negative correlation between C&E (*ibid*). Several methods have been employed to reduce these two issues:

- Lagged C&E variables examines associations between a project's current compliance and lagged values of enforcement (as opposed to current values of enforcement)
- Proxy variables these models include observable characteristics (as substitutes for unobservable firm perceptions about enforcement likelihood), such as changes to legislation or news about a regulatory 'crack down'
- Predicted probability method these models statistically predict a project's likelihood of receiving enforcement actions (inspections and penalties) based on observable factors such as project characteristics, media attention, community involvement, and time since the last inspection. Associations between compliance rates and statistical predictions of enforcement activities are studied (*ibid*).

Although similarities exist between the USA and Canada in terms of environmental regulation, there are important differences in environmental regulatory agencies, and enforcement strategies and intensities (*ibid*); this is especially true when focusing on EA follow-up activities. When considering EA C&E in BC, where no fines have been given out for infractions to date, BC's enforcement style looks much different from the USA's.

# 1.2.3 Other Motivations that Contribute to Compliance

Effective C&E of EAC conditions requires a robust understanding of a variety of factors. Firms may comply with regulations for a variety of economic and non-economic reasons. In either case, one cannot assume that a party will voluntarily comply with EAC conditions without a clear understanding of the factors that contribute to compliance outcomes. Traditionally, much of the literature on compliance has focused on calculated motivations and deterrent factors. While these motivations may play an important role in adversarial regulatory regimes (such as in the USA), they are unlikely to be the

only or major factor in contexts where sanctions, fines, and inspections are less of a threat. In regions where a firm's social license is economically valuable, this is indeed a likely motivation for compliance.

Commonly used terms to describe compliance motivations include those classified under adversarial<sup>9</sup> regulatory regimes such as calculated motivations (a deterrent factor or force), and those found in more cooperative regimes such as normative and social motivations (largely non-deterrent forces, though not necessarily classified as incentives). The terminology used in the literature about motivations and compliance behaviour varies by discipline. Economics, psychology, law, management, political science, or public policy, all have a rich and overlapping literature and increasingly collaborate with each other in exploration of the topic.

#### Social and Normative Motivations

Strategies that encourage voluntary compliance by enhancing commitments based on social and ethical factors, as opposed to direct fear of penalties, have been developed in response to the shortcomings of deterrence-based enforcement strategies (Burby & Paterson, 1993; Scholz, 1984b). Social motivations stem from a firm's desire to earn approval of regulators, peers, stakeholders, the community and public. Sanctions, if published, are even more effective from this perspective by the social disapproval of violations and direct costs as a result of violations (Burby & Paterson, 1993). In fact, the existence of a publically accessible list of noncompliant mills in BC created motivations equivalent to a monetary fine (Foulon, Lanoie, & Laplante, 2002). Burby and Paterson (1993) commend enforcement systems which employ social incentives for compliance (such as publication of compliant or beyond compliant behaviour) and relationship building between parties. Normative motivations can be inspired when firms perceive that regulators apply rules fairly and when firms conform to ethical behaviour (*ibid*).

Results from Winter and May's (2001) research into Danish farmers' compliance with agroenvironmental regulations support alternative theories to adversarial regimes that capitalize on deterrent forces and largely calculated motivations. They found that normative and social motivations were just as important as calculated motivations. Winter and May (1999) also highlighted contextual factors, such as the complexity of regulations, value of reputation, community involvement, and underlying focus on business goals of the Danish farming industry that contributed to the study results. It seems plausible that many of the contextual factors mentioned by Winter and May would apply to the BC context of EA regulation.

#### Combining Motivations for Compliance

Winter and May's research demonstrates the need for non-deterrent methods, in addition to deterrent strategies, to foster compliance. This requires an approach that will influence a firm's social and normative motivations, paired with strategies to increase awareness of rules (Winter & May, 2001). Swanson (2002) confirms that "many individuals and firms will often engage in pro-social behaviour (like not polluting) even in the absence of (say) monetary incentives, or of penalty for wrong-doing".

<sup>9</sup> An adversarial C&E context is one in which there are two distinct opposing parties (regulators and the regulated) whose interests are frequently in conflict. This situation results in the imposition of more complicated and prescriptive laws, more costly adjudication, and more severe penalties (the most common example is that of the United States) (Kagan, 2003).

However, cooperative strategies alone are no more likely to succeed than deterrent strategies alone, when context is not considered. In litigious jurisdictions, such as the USA, cooperative strategies are severely limited due to the lack of opportunity or incentives to regulatory agencies to use such enforcement methods (Bardach & Kagan, 2010; Burby & Paterson, 1993). There is also the potential for regulators to overvalue cooperative relationships and lose sight of policy goals (Burby & Paterson, 1993; Lowi, 1972; Scholz, 1984a). Further, normative motivations for compliance may be undermined by regulators' lenience towards minor violations (Burby & Paterson, 1993; Silberman, 1976). In light of these theories, cooperative strategies may only be effective with firms who value social motivations, favour lawful behaviour, and subscribe to ethical norms; when any of these factors are not present, a more predominant use of adversarial approaches may be necessary (Burby & Paterson, 1993; Scholz, 1984b). In addition, a very limited number of studies have explored the effects of combined cooperative and adversarial strategies concurrently (Gray & Shimshack, 2011)

Motivational factors are highly context specific; thus, it becomes crucial to test regulatory theories of compliance in different contexts using empirical evidence. Research into compliance outcomes for US and Canadian mills found lower rates of compliance in the more cooperative Canadian setting (Harrison, 1995). Empirical evidence and analysis of the newly implemented C&E program for EA in BC will provide a basis for research into motivations behind compliance, although not addressed in this thesis.

# 1.3 THE REGULATORY ENVIRONMENT IN BRITISH COLUMBIA AND CANADA

The BC Environmental Assessment Act is an important piece of environmental legislation, however, it is just one component of the overall regulatory structure that applies to major project development in the Province. Environmental regulation in BC is complex, with certain overlaps between municipal, provincial and federal agencies. In Canada, neither the federal nor provincial government have exclusive jurisdiction when it comes to the environment. Legislation relating to the broad category of 'environment' is thus spread out and organized under numerous agency mandates, resulting in a complex regulatory framework for both the regulated and regulator. Historically, BC has played a larger role than the federal government with respect to environmental management and protection (Blake, Cassels & Graydon LLP, 2014), .

Compliance and enforcement of environmental regulations is similar to that for EAC conditions (also called EA requirements or EA commitments). In BC, some EAC conditions are related to other forms of environmental protection legislation. In fact, some conditions (e.g. those related to fish and fish habitat or wildlife) may be viewed as redundant when considered alongside permit requirements.<sup>10</sup> When EAC conditions are similar to permit requirements, proponents are legally bound to both

<sup>&</sup>lt;sup>10</sup> An EAC condition likely to be related to permits is "All temporary stream crossings at fish-bearing streams...will be constructed with clear span bridges with abutments above the high water mark, as per DFO's...Clear Span Bridges Operational Statement. Closed bottom culverts will be installed on all non-fish bearing stream crossings" (EAC M09-01 for the Mt Milligan Copper-Gold Project, March 16 2009).

requirements. EAC holders can usually achieve compliance with both conditions by ensuring compliance with the 'stricter' requirement (A. Cousins, pers. communication, Nov 5 2015). This is counterintuitive to some certificate holders understandings, which is that it is the most recent approval with which they must comply (i.e. permits) *(ibid)*. If an EAC condition and a permit requirement conflicts or if one is more permissive, the certificate holder may apply for an amendment to one of the authorizations (A. Cousins, pers. communication April 24, 2016). A decision maker may then consider if there are reasons why there is a difference in what is allowed by the two authorizations and/or if an amendment may be appropriate (ibid).

The audit by the OAG of BC in 2011, also found that some conditions create unnecessary complications for certificate holders since these conditions are incorporated in varying degrees into permits finalized by different regulatory agencies (Office of the Auditor General of BC, 2015). As of April 2016, EAO has yet to finalize guidance to prevent duplication and gaps created by EA and permit approval documents, although staff and some consultants are using a beta version (A. Cousins personal communication April 22, 2016). EAO has specified C&E responsibilities for 90% of EAC conditions (in 17 EACs) issued after the 2011 audit (Office of the Auditor General of BC, 2015).

While there can be some situations where overlap between EAC and permit requirements is warranted, generally EA conditions are developed to address matters that are not covered fully by permitting. In addition to environmental requirements, these conditions often fall under the categories of socio-economic and First Nations consultation and accommodation (Office of the Auditor General of BC, 2011).

Permits can be applied for in a concurrent manner as the EA process progresses, and granted once an EAC is received, or can be applied for after an EA approval is received. Depending on the project, provincial and federal permits may be required. The Ministry of Forests, Lands, and Natural Resources (MFLNRO) grants the most permits in BC. MFLNRO is responsible for regulating individuals and businesses across a variety of provincial environmental protection legislation (table 1.2b). Other approvals may be required from additional agencies, such as the BC Oil and Gas Commission (OGC), Ministry of Energy and Mines (MEM), or Ministry of Environment (MOE), depending on the nature of the project. Table 1.2a and b list relevant provincial and federal environmental legislation for many projects subject to EA in BC. The middle column has been color coded by regulatory agency and the far right column highlights legislation typically applicable to a pipeline project in BC. Tables 1.2a & 1.2b are not an exhaustive list

Some federal environmental agencies, such as the Department of Fisheries and Oceans Canada (DFO), continue to play a significant role in specific types of developments and activities. Although BC and Canada have a moderate history of environmental regulation, today's legislation maintains a certain degree of ambiguity which can lead to discretionary enforcement of environmental requirements (Blake, Cassels & Graydon LLP, 2014).

	Primary Federal Agency	Typical for a
		pipeline
Fisheries Act	Department of Fisheries and Oceans Canada (DFO)	✓
Canadian Environmental Protection Act	Environment and Climate Change Canada (ECCC)	$\checkmark$
Canada Wildlife Act	ECCC	$\checkmark$
Migratory Birds Convention Act	ECCC	√
Species at Risk Act	ECCC	$\checkmark$
Hazardous Products Act	Health Canada (HC)	✓
Explosives Act	Natural Resources Canada	$\checkmark$
Canada National Parks Act	Parks Canada	
Canada Shipping Act	Transport Canada (TC)	
Navigation Protection Act (previously Navigable Waters Protection Act)	Transport Canada (TC)	V
Transportation of Dangerous Goods Act	Transport Canada (TC)	
Canadian Environmental	Canadian Environmental Assessment Agency (CEAA)	$\checkmark$
Assessment Act		

# Table 1.2a Agencies Responsible for Federal Environmental Legislation

# Table 1.2b Agencies Responsible for British Columbia's Provincial EnvironmentalLegislation

	Primary Provincial Agency	Typical for
		a pipeline
Agricultural Land Commission Act	Agricultural Land Commission	$\checkmark$
Park Act	BC Parks	
Protected Areas of BC Act	BC Parks	
Oil and Gas Activities Act	BC Oil and Gas Commission (OGC)	~
Pipeline Act	BC Oil and Gas Commission (OGC)	✓
Utilities Commission Act	BC Utilities Commission (BCUC)	
Mines Act	Ministry of Energy and Mines (MEM)	
Petroleum and Natural Gas Act	Ministry of Energy and Mines (MEM) / OGC	~
Environmental Management Act	Ministry of Environment (MOE)	~
Fish Protection Act	Ministry of Environment (MOE)	✓
Integrated Pest Management Act	Ministry of Environment (MOE)	~
Transport of Dangerous Goods Act	Ministry of Environment (MOE)	
Wildlife Act	Ministry of Environment (MOE)	✓
Forest and Range Practices Act	Ministry of Forests Lands and Natural Resources (MFLNRO)	√
Heritage Conservation Act	MFLNRO	~
Land Act	MFLNRO	✓
Water Act	MFLNRO	✓
Water Protection Act	MFLNRO	✓
Drinking Water Protection Act	Ministry of Health	
Public Health Act	Ministry of Health	✓
Transport Act	Ministry of Transportation and Infrastructure	✓
Environmental Assessment Act	Environmental Assessment Office (EAO) – branch of the Ministry of the Environment	✓

# 1.3.1 Enforcement of Environmental Legislation in BC<sup>11</sup>

Contravention of federal or provincial environmental legislation is punishable by monetary fine, restorative justice, or imprisonment. Most regulations inflict liability on company employees, regardless of whether the company is prosecuted (Blake, Cassels & Graydon LLP, 2014). Should an employee or company take all reasonable steps to prevent a contravention, it may be possible to avoid liability (*ibid*).

In BC, many regulations allow the government to levy administrative fines, avoiding a formal court process (*ibid*). Additionally, certain authorized branches of the provincial government (e.g. the MOE's Conservation Officer Service) can issue tickets, similar to traffic police, for non-compliance (*ibid*). The EAO does not have the power to issue either of the aforementioned penalties. Some agencies (e.g. OGC) in table 1-2a and b publish enforcement and compliance information online or in quarterly or annual reports.

A total of 308 corporations (not including guide outfitter businesses) were fined \$575 to \$325,000 by MOE and MFLNRO, between 2006 and 2015 (MOE, 2015). The majority of infractions were against the *Environmental Management Act* (EMA), but also for contravention of other provincial environmental protection legislation including the *Integrated Pest Management Act* and the *Wildlife Act*, and one piece of federal legislation, the *Fisheries Act* (Canada). Fifty-one of these enforcement actions were court convictions, six were restorative justice measures, and the remaining 251 were tickets given out under MOE or MFLNRO statutes (*ibid*). A total of 17 tickets and court convictions were given out to six different companies on various active projects (as defined in this thesis under footnote 2) between 2006 and 2015, totalling \$1,131,445 (*ibid*).<sup>12</sup> Although no fines have been sought legally as result of noncompliance with EAC conditions, EAO has issued orders and compliance agreements, which specify a timelines for mitigation (as determined by EAO) to be implemented. Section 1.4.1 describes the enforcement actions EAO can take as legislated by BCEAA.

The majority of violations were against the EMA (16) and one for a contravention of the *Fisheries Act* (Canada). Environment and Climate Change Canada (ECCC) has recorded 16 convictions for corporations operating in BC since 2009 (the earliest year on record) for offences committed against four federal environmental laws (ECCC, 2015). Fines ranged from \$6000 for contravention of the *Migratory Birds Convention Act* to \$325,000 under the *Pollution Prevention Provisions of the Fisheries Act* (S 36.3) (*ibid*).

Data sharing between agencies is an ongoing challenge. This issue is perpetuated in part by the paper trail associated with EA filings. Unfortunately, until compatible electronic data are collected for each project, attempts for data access for any objective, including coordinated permitting, monitoring and enforcement, will suffer (Wasserman, 2011). The wordiness and complexity of EA Applications and EACs makes finding, identifying, and tracking compliance with conditions more than cumbersome *(ibid)*. This issue has been at least somewhat addressed in the USA. The EPA has developed a webbased tool to track EA Applications from the start of the assessment process through to the auditing

<sup>&</sup>lt;sup>11</sup> This section does not discuss BCEAA, see section 1.4.1 for BCEAA

<sup>&</sup>lt;sup>12</sup> Discussed in section 3.1, v.

of commitments post-approval (*ibid*). This system has provided the government with usable data to identify compliance issues and patterns, and has facilitated increased accountability and transparency by allowing industry, stakeholders, and the general public access to such pertinent information (*ibid*). Data collected and organized for this thesis will help to address some of these issues in BC.

Although there is a severe lack of literature and empirical evidence specifically focused on C&E of EA requirements, empirical evidence on C&E with permits and other environmental legislation in BC offers additional insight owing to the linkages between EAC conditions and permits.

# 1.4 ENVIRONMENTAL ASSESSENT LEGISLATION AND POLICY ON FOLLOW-UP IN BRITISH COLUMBLA

# 1.4.1 C&E Policy Guidelines

Part 5 of BCEAA provides the legal mechanisms for EAO to inspect projects, and deal with noncompliance through enforcement. While EAO relies on voluntary mechanisms for achieving compliance, inspections, complaint reviews, investigations, and enforcement actions are also conducted. The C&E team at EAO prepares inspection plans yearly (fiscal year April 1 to March 31) to meet the targets set out in the MOE and EAO's annual service plan. The projects to be inspected each year are selected using a risk-based set of criteria. The inspection plan is adapted throughout the year in cases where complaints are received or new information on noncompliance becomes available during the fiscal year (BC Environmental Assessment Office, 2015a).

Compliance oversight is not solely EAO's responsibility. Some certificate holders are required to submit regular compliance self-reports that break down the compliance status of each EAC condition. The number and timing of self-reports is variable depending on the project (*ibid*) and self-reporting requirements are not published online. After EAO reviews a self-report it is made available to the public on e-PIC, typically within six weeks of receipt. These non-standardized reports are lengthy pdf documents, taking up more time and resources for EAO to review, effectively reducing the C&E team's time budget for inspections and other forms of compliance oversight. A draft guidance document has been developed by EAO for use by certificate holders in preparing self-reports (A. Cousins personal communication April 24, 2016). The guidance is intended to standardize the format of self-reports and their content-- enabling more efficient review by C&E Officers (*ibid*).

In addition to self-reports, some certificate holders are required to employ an independent environmental monitor (IEM), most often during construction. IEMs report directly to EAO although they are compensated by the certificate holder and often have the authority to issue a stop work order should they observe a noncompliance with an EAC condition (BC Environmental Assessment Office, 2015a). A requirement of an IEM or environmental monitor for some duration of project development is stipulated in 12 of 17 EACs issued after the 2011 audit (Office of the Auditor General of BC, 2015).

The following risk-based criteria are the primary means for determining whether a project should be inspected in a given year, and whether the project warrants an administrative or field inspection.

- **Potential risk** assessment of the potential risk to environmental, economic, social, heritage, and health values.
- **Project phase** projects in the construction phase are prioritized given the higher risk of construction activities.
- **Compliance record** based on previous inspections findings with regard to noncompliance and awareness.
- **Time of year or project schedule** inspections are carried out during higher risk natural seasonal events (e.g. spring thaw) or higher risk project activities (e.g. clearing) (BC Environmental Assessment Office, 2015a).

Additional criteria include:

- Coordination with other agencies to facilitate information sharing and issue identification across agencies when a mutual concern exists.
- Location distribution of inspections geographically.
- Government priorities key priorities identified by the Minster of the Environment, EAO, or the natural resources sector influence annual inspection plans (BC Environmental Assessment Office, 2015a).

EAO charges fees to certificate holders for inspection-related time spent on planning, travelling, on site, reviewing, and report writing. Fees are determined based on the number of hours spent on inspection related tasks. For inspections occupying 30-60 hours of time, a \$1700 fee payment is ordered; between 60 and 90 hours, \$4500 in fees is ordered; and for inspections requiring 90 or more hours, \$6500 (BCEAA 2002, 7(2)). Inspection fees are collected as general revenue to the BC government (A. Cousins, pers. communication, January 25 2016).

## Enforcement Actions

If a noncompliance is confirmed through an inspection, EAO has a set of escalatory responses to choose from depending on the severity of the infraction and the perceived likelihood that the certificate holder will correct the issue voluntarily (BC Environmental Assessment Office, 2015a).

- i. The least significant response is an advisory, simply advising the certificate holder they are out of compliance with a condition or conditions.
- ii. A warning notifies certificate holders of non-compliance and the possibility of escalatory enforcement action should the noncompliance persist.
- iii. An order under Section 34 of BCEAA can be issued by EA compliance officers to cease activity or remedy a noncompliance.
- iv. Compliance agreements under Section 36 of BCEAA are used in cases where a structured approach to compliance is appropriate and is entered into voluntarily by the certificate holder indicating a willingness and ability to comply.
- v. The Minister of the Environment can also suspend, cancel, or amend an EAC.

Actions i to v are classified as administrative sanctions; all have been implemented at some point by EAO between August 2011 and April 2016 (EAO, 2015; A. Cousins personal communication April 22, 2016). Judicial enforcement measures are also stipulated in BCEAA, which include monetary penalties. These measures are reserved for cases where administrative sanctions have not achieved satisfactory results and/or the noncompliance is severe (BC Environmental Assessment Office, 2015a). Potential monetary penalties include fines up to a maximum of \$200,000. EAO has not used judicial measures due to the lengthy process involved and the availability of other tools such as orders, which allow for tailored remedies to be specified (A. Cousins personal communication April 24, 2016). Appendix A summarizes the legislation that empowers EAO to take enforcement actions. Some of the challenges typically encountered in enforcing EA requirements, such as a lack of effective sanctions and insufficient available monetary penalty levels (Wasserman, 2011), don't exist in BC-- although a lengthy judicial process is required before any monetary penalty can be imposed by EAO. Whether the available sanctions and penalties are being utilized effectively, and whether the resources exist to do so is a different question.

The nature of non-compliance and the likelihood of achieving compliance are measures included in an enforcement guidance matrix that can influence what would be an appropriate and consistent enforcement response(BC Environmental Assessment Office, 2015a). The use and/or efficacy of the enforcement decision matrix are not considered in this research due to incomplete and inaccurate data as discussed in section 2.1.1 (compliance ratings).

# 1.5 RESEARCH QUESTIONS

To examine potential factors associated with inspection patterns and compliance outcomes a series of research questions has been developed in consideration of available data. These questions have been selected to provide insight into the relative role of different factors associated with C&E. Several questions under 1.5.1 and 1.5.2 directly relate to EAO's risk-based inspection selection criteria. By exploring data pertaining to EAO's risk-based inspection selection criteria, the current C&E strategy on the ground can be understood and evaluated.

# 1.5.1 Compliance Rate

- i. Are project characteristics and approval requirements associated with a project's average compliance rate (CR)?
  - Does the amount of conditions attached to a project approval affect its CR?
  - How do compliance rates differ for projects approved under BCEAA 1995, BCEAA 2002, and post-2011 (post-OAG report)?
- ii. Do the requirements for self-reporting relate to compliance rates?
- iii. Are there any other identifiable trends in compliance?
  - Are projects in the construction phase more likely to have lower CRs than projects in operation?
  - Do multiple inspections positively influence CRs?

- Is there a difference in compliance rates based on a projects' capacity?
- What is the distribution of inspection effort throughout the year and is compliance higher or lower at certain times of the year?

# 1.5.2 Compliance Oversight

To what extent are EAO's risk-based inspection selection criteria (see section 1.4.1) influencing inspection priorities?

- iv. Which potential risk indicators influence inspection priorities?
  - Are projects in the construction phase more likely to be inspected than those in operation? (and is this necessarily appropriate see bullet iii under compliance?)
  - Does a project's compliance record influence inspection priorities?
    - What is the probability of receiving a second inspection based on compliance?
    - Do requirements for self-reporting result in a lower or higher likelihood of inspection?
  - What is the distribution of inspection effort throughout the year? (see section 3.1, iii, last heading)
- v. Are older projects given a pass?
  - Are projects with formal EACs (post-2002 projects) inspected more than pre-2002 projects?
  - Are projects that were approved after the OAG report in 2011 inspected more than pre-2011 projects?
- vi. Is there a difference in the amount of political attention received for inspected projects versus projects that are not inspected?
- vii. What is the geographic distribution of inspections?

#### 2 RESEARCH METHODS

This research utilizes a combination of methods and techniques; literature review of best practice and lessons learned in environmental C&E; data analysis from inspection reports, EA documents and other sources (see section 2.1); and expert elicitation with the manager of C&E responsible for EA follow-up. The first phase of the research involved a literature review of studies specific to C&E of EA requirements. Preliminary data collection then began, to confirm what data could reasonably be collected in the study timeline and a database was created (Filemaker) to organize and link the data as research progressed. The development of research questions to explore patterns of C&E in BC was then compiled based on EAO's C&E mandate, available data, and the literature review. As data collection further advanced, EAO provided information for specific projects and/or inspections as necessary. The following sections describe the data collection and methodology used to address the research questions.

Although all data used in this thesis is publicly available, it has previously not been digitized into a database so that it can be used for formal statistical analysis. During the research we did not refer to projects by their names or certificate holders in the hope of remaining as objective as possible. This same approach is adopted for the presentation of findings. Individuals intimately familiar with BC projects will be able recognize some of these projects, but by avoiding naming them, we are hoping to draw attention to overall findings rather than adding an element of potential finger pointing. It is hoped that these findings will inspire subsequent research and further in-depth case studies.

## 2.1 DATA SOURCES

Data for this research has been collected from various sources since January 2015 to the end of September 2015. Both quantitative and qualitative data have been organized into a database. EAO has provided a review for quality assurance and quality control (QA/QC) on data obtained from inspection reports, in addition to what projects are defined as active and classification of noncompliance. The nature of the data and its source is explained in detail in the sections that follow.

Inspection reports obtained from EAO function as the primary source of data. Supporting data on project details came from several other sources, including e-PIC, expert knowledge, the Legislative Assembly of BC (Hansard website), and corporate sites. Figure 2.1 categorizes data by source. Both quantitative and qualitative data were collected. Not all data collected was used in analysis due to availability issues (lack of data for certain projects). Expert elicitation was also employed to confirm and contextualize data from EAC inspections and compliance oversight.

# Figure 2.1 Data Sources



# 2.1.1 EAC Inspection Reports

As the primary source of data, 92 inspection reports were obtained from EAO. Normally a FOI request is required to obtain access to these reports, but in this case EAO elected to email the reports as available without a formal FOI request. Reports were received throughout 2015 and into the

beginning of 2016. As EAC inspections cannot be released until they have been effectively "closed off", meaning EAO and the certificate holder have confirmed the content and findings in the report, 11 of the 92 reports are still being processed and have yet to be released.

Reports were received in pdf format and relevant data entered into a database (Filemaker) created for the research. The reports vary in their format and completeness over time. The majority of data collected from these reports is listed in figure 2.1 under "EAC Inspections". When possible, qualitative data was subsequently converted to quantitative data for use in analysis. EAO has completed a QA/QC of the retrieved inspection data in excel format.

## Number of conditions inspected

EAC inspections break down conditions into discrete commitments or mitigations that can be verified<sup>13</sup>, this practice makes the comparison between number of conditions inspected and total conditions in the TOC or table of proponent commitments inappropriate. Moreover, EAO cannot and does not strive to inspect all conditions, as some may not be applicable (e.g. operations phase conditions for projects in the construction phase). EAC inspections are formatted in such a way that each condition or portion thereof is typically written verbatim, then the inspection findings are presented for that condition, and then a determination is made as to whether the project is in or out of compliance with that particular condition. When counting the number of conditions inspected, if an officer breaks a condition up for practicality in determining compliance, these are counted as separate conditions, regardless of whether the condition statement is just a portion of the actual condition as written on the TOC or table of proponent commitments.

## Rate of Compliance

The number of conditions in compliance is determined by counting the instances where the compliance determination reads "in". The overall rate of compliance is determined by dividing the number of conditions found to be in compliance, by the total number of conditions inspected minus the number of conditions where compliance could not be determined.

## Noncompliance

The number of conditions in noncompliance is determined by counting the instances where the compliance determination reads "out". A compliance determination of "not determined" is possible, but is not counted as a noncompliance. A not-determined rating may be used when the C&E Officer requires additional information prior to concluding the compliance determination. In some cases the information may require a significant amount of time for the certificate holder to collect. For example,

<sup>&</sup>lt;sup>13</sup> Typical phrasing in an EAC inspection for one condition referencing the construction environmental management plan (CEMP): "A very complex condition as non-compliance with any component of it will result in a non-compliant determination for this condition. Findings will be broken up into separate categories below. Section 6 of the CEMP outlines the Environmental Protection Plan (EPP) that are the sub components of the CEMP that detail the mitigation methods for environmental effects associated with the appropriate activity."

if a study or report by a qualified professional must be developed or if monitoring must be conducted.

# Compliance ratings

Officers typically select one of five options in rating overall compliance for a given inspection:

- Level 0 in compliance
- Level 1 no impact likely
- Level 2 minor temporary impact likely
- Level 3 moderate temporary impact likely
- Level 4 significant impact likely

In addition to the compliance rating, one of five categories should be selected to classify compliance: in compliance, no previous non-compliances, few non-compliances, many non-compliances/capable to comply, wilful violation, or obstructing ministry official. The classifications of wilful violation and obstructing ministry officials have not been used since the inspections were implemented in 2011. Yet, wilful violations have occurred to an extent when a certificate holder misunderstands how permits and EACs are related. At times EAC holders assume the most recent approval is the one to which they are legally bound (e.g. permits), and fail to consider the related EAC conditions (A. Cousins, pers. communication, Nov 5 2015); however, all regulatory requirements must be complied with (*ibid*).

An additional category, "not specified", was created for the database, as some inspections that detected a noncompliance or non-compliances, did not specify a rating or classification.

Usage of these ratings and classifications has become a source of confusion and debate for officers and EAC holders alike (*ibid*). As discussed in section 1.4.1, the nature of non-compliance (related to the compliance rating) and the likelihood of achieving compliance (related to the classification of noncompliance) are measures used in the enforcement guidance matrix that can influence what would be an appropriate and consistent enforcement response. EAO is in the process of developing a new digital inspection form (*ibid*) that will not include such categories and will presumably use a different method to classify overall compliance. This research does not consider compliance ratings and classifications further (in analysis) due to inconsistencies inherent to the data.

# Classifying Noncompliance

Using details on non-compliance as reported in EAC inspections, a method for classifying noncompliances was developed such that a minimum degree of standardization could be achieved to aid in analysis. To use such methodology, QA/QC was necessary from EAO and has been completed. Various categories created include (in order from least to most specific):

• Topic – the overall topic to which the condition in noncompliance is related (e.g. environmental management and protection, design and planning considerations, environmental monitoring and follow-up programs)
- Category more specific than the section as more closely related to the valued component (VC)<sup>14</sup>. Common categories include sediment and erosion control; construction practices; spill prevention, preparedness, and response; waste management.
- Mechanism the specific activity causing the non-compliance or precise topic/action item of condition not being complied with. Frequent mechanisms contributing to non-compliance include culverts, clearing, soil storage, stream crossing.
- VC affected the most likely VC or VCs (e.g. water quality or fish and fish habitat) that could be or have been affected by the non-compliance. This was not reviewed in depth by EAO and has not been a focus of analysis.

# Enforcement responses

For inspections reporting non-compliances, whenever an enforcement response is explicitly mentioned, it is recorded in the database. Responses include advisories, warnings, orders, and compliance agreements (for more details see section 1.5.1).

Several inspections do not indicate a formal response even though a noncompliance was found; in these cases "not specified" is entered into the database. For inspections that report zero non-compliances, "not applicable" is entered. In some cases, more than one response may be utilized, resulting in the number of responses outpacing the number of inspections (table 2.2).

# Chief Inspector

EAC inspections generally identify the chief inspector (lead officer), and any other government attendees in addition to certificate holder attendees. Considering the chief inspector for each inspection is important to consider when analyzing consistency in enforcement responses across projects and officers.

# 2.1.2 Expert Elicitation

Since requesting EAC inspections from EAO, the manager of the C&E team has provided expert knowledge and context to this research. This includes email communications to provide background and context about specific projects or inspections, and documented telephone conversations. All knowledge gained from these communications was provided to the manager of C&E for accuracy. Interpretation of findings was also provided to EAO's C&E team for review and input as appropriate.

# 2.1.3 E-PIC website

EAO's e-PIC is a valuable source of data. Data was retrieved (see figure 2.1, for the "e-PIC" data vector) largely in pdf format and then organized into a database with appropriate linkages to related data.

<sup>&</sup>lt;sup>14</sup> Valued components are the typical way an EA is organized and assessed. Common VCs include fish and fish habitat; hydrology; soils; wildlife and wildlife habitat; land and resource use; aboriginal use; etc.

# Conditions

The number of conditions in Schedule B (contains the TOC) of EAC certificates was counted for all projects approved after 2002. For projects approved prior to 2002, when a "Table of Proponent Commitments" was available on e-PIC this was analyzed for the number of conditions. For projects without TOCs or "Tables of Proponent Commitments", a value of zero was recorded for conditions. Typically one condition is counted as one row in the pdf table, however in some tables, separate rows may be labeled 1.1, 1.2, and 1.3. In these cases, these separate rows were counted as separate conditions (i.e. 1, 2, 3) to attempt to achieve as much consistency as possible between project tables.

One inspected project was actually approved as two separate projects, resulting in the summation of the conditions for those projects. The database records 95 conditions for the Mica Dam Expansion Project; this is because the project was inspected as one project, not two as listed on e-PIC. Mica Generation Station Unit 6 (38 conditions) and 5 (57 conditions) were approved under BCCEA separately, but were inspected as one project.

# Primary EA Consultant<sup>15</sup>

EA Applications typically include a list of all consultants that contributed to the Application and what sections they authored. One consultancy is generally responsible for more chapters, and in addition provides review for the overall Application to ensure a singular voice. When available in a project's Application, the primary EA consultant was recorded in the database.

# Length of approval process<sup>16</sup>

This value (in years) was calculated for all inspected projects by subtracting the date of approval from the date on which the project entered into the EA process. The value ranges from 0.3 to 12.2 years.

# EA Legislation<sup>17</sup>

Each EA Application has a section that outlines whether the project is subject to provincial and/or federal approval under BCEAA and/or CEAA, or additional legislation. This information was entered into the database when available for inspected projects; when unavailable it is typically due to the age of the approval (e.g. grandfathered projects).

# Sector and type of project

The sector of each project is listed on e-PIC (e.g. energy, transportation). This along with project details was used to assign a specific "type" to each project (e.g. wind farm, linear transit).

<sup>&</sup>lt;sup>15</sup> Obtained for inspected projects only (40 projects). A total of 42 projects were inspected, however two of these projects are not included in the definition of "active project" for the purposes of this research. One of these projects began construction before receiving an EA approval, and the other was approved post 2002 but remains inactive during 2011-2015 (i.e. has an EAC); in both cases the inspections are unreleased.

<sup>&</sup>lt;sup>16</sup> Calculated for inspected projects only (40 projects).

<sup>&</sup>lt;sup>17</sup> Calculated for inspected projects only (40 projects).

# Capacity

In absence of consistent information available to record the project footprint for each active project, capacity was recorded instead. This information was extracted from project assessment reports and EA Applications; if information was not available in these documents, private company websites were utilized. The type of project determines the capacity units recorded, as each type of project has a respective BCEAA trigger (i.e. coal mines that produce over 250,000 tonnes per year are subject to review under BCEAA; so for each active mine the production capacity in tonnes per year was recorded) (Reviewable Projects Regulation BCEAA Reg. 370/2002). In some cases capacity may be lower than the threshold, and this could be due to the either the opt-in process available to proponents of projects who do not meet a threshold but wish to undertake an environmental assessment; or ministerial designation by which the Minister of Environment designates a project as reviewable even though it does not meet the given threshold.

# Number of jobs and investment<sup>18</sup>

When available on e-PIC the number of jobs (broken down into construction and operation jobs) and dollars invested in a specific project has been included in the database.

# Compliance reports

Certain projects are required to submit self-reports on progress with EAC conditions. Data provided by EAO was used to determine whether a project is required to submit self-reports and at what frequencies.<sup>19</sup> Under the link "compliance reports/reviews" for each project, the number of these reports has also been recorded in the database. This number was derived based the amount of self-reports available to view on e-PIC under each project link "compliance reports/reviews".

# Location

Project regions (e.g. lower mainland) are recorded on the e-PIC website and have been included in the database.

# 2.1.4 Ministry of Environment

# Environmental Violations Database

Using MOE's environmental violations database (EVD), certificate holders (or parent companies) violation history was evaluated. A total of 17 tickets and court convictions were given out to six different certificate holders of active projects (as defined in this thesis, see footnote 5 or section 2.1.5) between 2006 and 2015, totalling \$1,131,445 (MOE, 2015). Whether a certificate holder had received a fine from MOE and in what amount is included in the database.

<sup>&</sup>lt;sup>18</sup> Calculated for inspected projects only (40 projects).

<sup>&</sup>lt;sup>19</sup> Data provided by EAO on self-reporting requirements may not be complete or entirely accurate. Some projects that are required to submit self-reports may not have been noted.

# 2.1.5 Corporate websites and search engine results

### Active projects

A list of active projects was compiled for the database. For the purposes of this research, an active project is defined as a project approved under BCEAA and in construction, operation, or decommissioning at some point from 2011 to 2015 (the inspection period). There is no one government entity that has such a list so multiple corroborating sources were necessary to obtain this data. Often project activity is mentioned in online local media, corporate updates and reports, or on the EAO's website. Depending on the project, various multiple sources were used to compile this list, which was ultimately reviewed for QA/QC by EAO.

There are a total of 97 projects defined as active. Two inspected projects are not considered active; both of these inspections remain unreleased and are not considered in this research. One of the two projects was inspected as a result of information indicating that the proponent had began construction prior to approval.

# Certificate Holder

The parent company responsible for each active project was obtained through Google searches, certificate holder names listed on EACs, online news articles, and corporate websites. Often the certificate holder name on an EAC is different than the parent company (e.g. Dokie Wind Energy Project's certificate holder listed on the EAC is Dokie Wind Energy Inc., but the parent company is Alterra Power Corp). In these cases, the name of the parent company is input into the database. This allows for analysis of C&E data across various projects that belong to the same parent company and in relations to parent companies fined by MOE.

# Prime contractor<sup>20</sup>

Information about which contractor was selected for the majority of project construction work was obtained through Google searches. Often this information is published on consulting or contracting websites, in addition to corporate and local news media websites and articles. This information is used in conjunction with personnel in attendance (including roles and employers) as noted on EAC inspections.

# Stock type and ownership changes

Information about the certificate holder, including whether the certificate holder is a public or private company, government ministry, crown corporation, or affiliated with a First Nation, was collected from corporate websites. Over time, typically during the EA process or after approval, projects may change ownership with a new certificate holder, or experience a merger. When ownership change information is available for inspected projects it has been included in the database to provide additional context.

<sup>&</sup>lt;sup>20</sup> Collected where available for inspected projects only (40 projects).

### 2.1.6 Legislative Assembly of BC (Hansard website)

The BC legislative assembly (or Hansard) website was used to gauge the degree of public, media, and political attention received by individual projects. An agenda setting study by Soroka identified the debates in legislature as the "single best measure of the policy agenda in Canada" (2002). The study found that topics related to the environment mentioned in the media had a significant impact on both public and political agendas (*ibid*). Another study on issue attention related to nuclear energy and acid rain on agenda setting found evidence that the policy agenda drives the public agenda at least as much as the reverse (Howlett, 1997). For the purpose of this research, parliamentary transcripts and debates have been used as a rough proxy to measure the amount of media, public, and political attention received by a project.

Each project name (or variation thereof) was entered into the parliamentary debates and transcripts (Hansard) search engine in February 2016. The total number of "hits" that resulted from the search was recorded for each project, ranging from zero to 90. The parameters of the search were limited to "parliamentary debates and transcripts" and the 39<sup>th</sup> and 40<sup>th</sup> sessions:

- 40<sup>th</sup> parliamentary session which includes:
  - $\circ$  4<sup>th</sup> session (2015)
    - $\circ$  3<sup>rd</sup> session (2014)
    - o  $2^{nd}$  session (2014)
    - o  $1^{st}$  session (2013)
- 39<sup>th</sup> parliamentary session which includes:
  - o  $5^{\text{th}}$  session (2013)
  - o 4<sup>th</sup> session (2011/12)
  - o  $3^{rd}$  session (2011)
  - o  $2^{nd}$  session (2010)
  - o  $1^{st}$  session (2009)

# 2.2 APPROACH TO ANALYSIS

The methods of analysis have been selected as those to best represent the diverse data, answer the individual research questions, and not overcomplicate interpretations due to inherent issues with complex statistical models (as mentioned in sections 1.2.1 and 1.2.2). Frequency tables, relative frequency tables, scatterplots, and column, line, and bar graphs are used to analyze and describe the data. In order to cater analysis and presentation of data to each research question, inspection and project data has been summarized appropriately; when the number of observations differs (is less than 40 inspected projects, 92 inspections, or 97 active projects) this has been noted below the tables and charts. Data has been summarized by project category, project phase, whether a project has been inspected or not, certificate holder classification (publicly traded, private, municipal, crown corporations), and month and season. Interpretation of analysis has considered information obtained from expert elicitation, the literature review, practitioner knowledge, and details about individual data not readily discernible from graphs and tables. The method of analysis and presentation of results used

will help foster future research by allowing for replication of results and easy understanding of how and why conclusions were drawn.

# 2.3 DESCRIPTIVE STATISTICS

A total of 92 EAC inspections have been carried out (of these 81 have been released) between August 2011 and September 2015.<sup>21</sup> Data collected indicates that there are 97 active<sup>22</sup> projects in BC. Forty active projects have been inspected with some projects receiving numerous inspections. The highest number of inspections since 2011 for any given project is 10. Of the 40 projects that have received at least one inspection, the majority are run-of River (11 projects), mining (7 projects), wind farm (5 projects), and landfill (4 projects) projects. Eleven of the 92 inspections have not been fully released because EAO requires additional information from the certificate holder to complete compliance determinations, and/or because of the need to prioritize workload on other more time sensitive matters (A. Cousins personal communication April 24, 2016). Not including unreleased inspections, detailed inspection data was obtained from the 81 released inspections. MFLNRO staff, on behalf of EAO, conducted seventeen of the 81 released inspections; these 17 inspections were conducted between August 2011 and October 2012 as part of EAO's pilot program. MFLNRO and other natural resource agencies continue to inspect EA projects (*ibid*). While the agencies and EAO coordinate about the planning and results of the inspections, the number of inspections of EA projects conducted by other agencies is not tracked by EAO (*ibid*).

Each fiscal year (12 month period from April 1 to March 31), EAO has a target number of inspections to carry out. Table 2.1 compares the actual number of inspections against targets since the program was initiated.

<sup>&</sup>lt;sup>21</sup> An additional two inspections were conducted on inactive projects and remain unreleased; these inspections are not considered in this research. One inspection conducted in July 2015 is also not counted due to the late receipt of this data.

<sup>&</sup>lt;sup>22</sup> For the purpose of this research an "active project" is defined as a project that has been approved through the BC EA process and was in construction, or decommissioning at some point between 2011-2015

Year	2011/12 <sup>1</sup>	2012/13	2013/14	2014/15	2015/16 <sup>2</sup>
Actual	11	20	23	26	12 <sup>23</sup>
Target <sup>3</sup>	n/a	10	17	21	23

### Table 2.1 Number of EAC Inspections 2011/12-2015/16

Notes:

One of the 20 inspections in 2012/13 was office-based; two of the 26 inspections in 2014/15 were office based.

Inspections include a small number of inspections led by other agencies or conducted on EAO's behalf.

<sup>1</sup>The first ever EAC inspection conducted was August 25, 2011; thus the 11 inspections were over an eight month period, not 12.

<sup>2</sup>2015/16 inspections only counted up until end of September 2015, a period of six months. One inspection conducted in July 2015 is also not included due to the late receipt of this data. Two unreleased inspections conducted on projects not considered active are excluded from the table.

<sup>3</sup>Targets from MOE and EAO Annual Service Plan Reports from 2011/12 to 2015/16.

When a noncompliance is confirmed through an inspection, EAO has a set of escalatory responses to choose from depending on the severity of the infraction and the perceived likelihood that the certificate holder will or will not correct the issue voluntarily (BC Environmental Assessment Office, 2015a). These actions are described in section 1.4.1. Since 2011, no judicial enforcement measures, which include monetary penalties, have been handed out. Table 2.1 highlights patterns of enforcement responses each fiscal year, also providing an indication of compliance levels.

<sup>&</sup>lt;sup>23</sup> After data collection and analysis, the full list of inspection dates for the 2015/16 fiscal year was received. A total of 23 inspections were conducted, thus meeting the target. The 23 inspections do not include the two inspections conducted on projects not considered active.

	2011/12	2012/13	2013/14	2014/15	2015/16	Total
Advisory		4		2	2	8
Warning		1	4	5	3	13
Order		1	1	2	2	6
Compliance Agreement				2		2
Amendment	1					1
Other agency enforced				1		1
Enforced on follow-up inspection	1				1	2
Not specified (non-compliant) <sup>a</sup>	5	1	1			7
Not warranted (minor NC)	1		1	2		4
Not required (NC remedied)				1		1
Not applicable (in compliance)	3	14	14	7	1	39
Unreleased			1	6	4 <sup>c</sup>	11
Total	11	21	22	28	13	95 <sup>b</sup>

## Table 2.2 Response to Non-compliance 2011/12-2015/16

Notes:

<sup>a</sup>Not specified indicates nothing was written on the inspection form as to one of the possible responses to noncompliance, even though a noncompliance was confirmed.

<sup>b</sup> Inspections do not add up to 92 because more than one response was given out on three occasions. In 2012/13 an advisory and an order was issued on the same inspection. In 2014/15, an order and a compliance agreement were issued on the same inspection and a warning and an order were issued on another inspection.

<sup>c</sup>Two unreleased inspections in 2015/16 were conducted on projects not considered active; and are excluded from this table and this thesis.

Which project types are inspected? Figure 2.2 depicts the fraction of projects that have been inspected or not for each project category (on the y axis). The bracketed number next to the project category is the total number of active projects in that category. The purple bar represents the percentage of projects in that category that have been inspected. The figure shows that 100% of wind farms that were approved through the BC EA process have been inspected by EAO, compared to only 33% of natural gas processing plants. Are wind farms more risky than natural gas processing plants? What factors are actually influencing regulator decisions about which projects to inspect? Several potential factors, including EAO's risk-based inspection selection criteria listed in section 1.5.2, are explored in section 3.2. The orange portion of the bar is the percentage of projects yet to be inspected for compliance with EAC conditions at all. This is not to say that these projects have never been inspected; certain categories of projects, such as mines and pipelines, may be inspected for compliance with other legislation by the OGC and the MEM.



# Figure 2.2 Inspection Patterns, summarized by Project Type

Notes:

"Other" includes one each of: commercial building, ferry terminal, port. The port is the project that has been inspected.

Bracketed numbers represent the number of active projects falling into that category.

How has the rate of compliance changed since the start of the pilot program? For the 81 released inspections, the rate of compliance has increased then decreased (unreleased inspections are unknown), and overall the rate is 66% (figure 2.3). This pattern could be because of targeted enforcement strategies-- meaning that operations with a history of noncompliance may be targeted by regulators and receive more frequent compliance oversight activities (Gray & Shimshack, 2011). Indeed, this is true for specific projects; differences in CRs for repeat inspections are discussed in Section 3.1, iii and Section 3.3. The blue bars in figure 2.3 represent the average rate of compliance for inspections conducted in a fiscal year. The year with the lowest overall CR is 2015/16.

100.0% 82% 79% 69% 75.0% 6<u>6%</u> 5<u>6%</u> 50.0% 43% 25.0% 0.0% 2011/12 2012/13 2013/14 2014/15 2015/16 Overall

## Figure 2.3 Rate of Compliance by Fiscal year

Notes:

Data does not include 11 unreleased inspections.

- 1 unreleased inspection for 2013/14
- 6 unreleased inspections for 2014/15
- 4 unreleased inspections for 2015/16 (2015/16 fiscal year only includes inspections to September 2015)

When looking at the rate of compliance by project type, a different picture emerges (figure 2.4). The following categories of projects have relatively high rates (>75%) of compliance overall:

- Groundwater extraction (1)
- Ports (1)
- Natural gas plants + ports (1)
- Transmission pipelines (1)
- Run-of-river (11)
- Linear transit (2)
- Wind farms (5)

Certain categories of projects have substantially lower overall rates of compliance:

- Electric transmission lines (2)
- Mines (7)
- Dams (2)

- Ski resorts (1)
- Power plants (1)
- Landfills (4)

Patterns and factors potentially associated with CRs are explored in section 3.1. It's important to remember that some project categories represent only one project. The bracketed number in the above bulleted lists indicates the number of projects represented by the category. As shown in figure 2.2, only 33% of active mines have been inspected, even though mines have the second lowest average CR overall (figure 2.4). We don't have any compliance information on hazardous waste facilities or forest products mills and plants (figure 2.2), which are two categories of projects that have not received any inspections.



Figure 2.4 Rate of Compliance summarized by Project Type

### Notes:

This data does not include 11 unreleased inspections:

- 5 unreleased inspections for mines
- 2 unreleased inspections for electric transmission lines
- 1 unreleased inspections for landfills
- 1 unreleased inspection for linear transit
- 1 unreleased inspection for transmission pipelines
- 1 unreleased inspection for ports

Figure 2.5 has been created to show which types of projects are receiving repeat inspections (left chart) and what the average number of conditions inspected per inspection is for each project type (right chart). One might expect the number of conditions inspected to be similar for linear projects, such as

transmission pipeline, linear transit, and electric transmission projects; however, transmission pipelines have had nearly triple the amount of conditions inspected on average than other linear projects (even without considering an administrative inspection for the pipeline). Certain project categories with fewer projects have received more inspections than categories with higher numbers of projects (i.e. transmission pipelines and electric transmission lines). A likely explanation might seem to be that these categories of projects have had issues with compliance and thus have been revisited by officers. Indeed, this is clearly the case for the two electric transmission lines, each receiving 10 inspections—double the amount of any other project. There are also other factors to consider such as requirements for selfreporting and the number of conditions attached to EACs. Section 3.0 examines other factors that might be contributing to such patterns.



### Figure 2.5 Inspection Effort and Distribution

#### Notes:

Project type is sorted from left to right, (in both charts) from the lowest to highest number of inspected projects in each category (purple bars; a total of 40 active projects have been inspected).

Two administrative inspections are not included in these figures (one for a ski resort, and one for a pipeline), as they inflate the number of conditions inspected significantly.

Some inspections are classified as "older" as they were conducted prior to the currently used inspection form, which now requires officers to provide details about the inspection by condition. On some "older" inspection forms (typically in 2011 and 2012), very little detail is provided by the officer, often a single sentence explaining that no non-compliances were observed, but not specifying which conditions were inspected. These inspections are not used in the calculation of the average number of conditions inspected

### 3 RESULTS AND DISCUSSION

In order to provide a useful exploration of the data, select data from the database is presented in tabular or graphic form. Unused data is discussed in section 4.1 on future research directions. The numbering of headings (i.e. i, ii, iii, iv, etc.) under sections 3.1 and 3.2 is linked to the numbering of research questions in section 1.5 for clarity.

# 3.1 COMPLIANCE RATE

# i. Are project characteristics and approval requirements associated with a project's average compliance rate?

### Does the amount of attached conditions affect a project's compliance rate?

Some projects have a significant amount of conditions attached to their EAC (>500 for a transmission pipeline); could CRs be associated with the number of conditions attached to a project's EAC? Figure 3.1 provides data on the number of conditions attached to a project's EAC in relation to that project's CR as recorded on the initial inspection. As the number of conditions increases (after approximately 125), the variability in compliance goes down and CRs are relatively high. Projects with lower amounts of attached conditions also have high CRs. Interestingly; compliance is very high for most projects with between 21 and 43 conditions (inspections for two projects in this group are not released and compliance is unknown). From 44 to 125 conditions, variability increases, with some projects having exceptional CRs and others 0% CRs.



### Figure 3.1 Compliance Rates of First Time Inspections, by Number of Conditions

Notes:

Four mines are not included in this graph due to the first inspections being unreleased. One wind farm is also not included due to a lack of detail on the inspection form. An additional four projects approved prior to 2002 (PAC only) are not included as no table of conditions was available. These four projects have an initial inspection CR of 100%. A total of 30 active projects (not 40) are included in the chart.

# How do compliance rates differ for projects approved under BCEAA 1995, BCEAA 2002, and post-2011 (post OAG report)?

As mentioned in section 1.1.1 the presence and wording of conditions has changed over time. From 1995 to 2002, projects received project approval certificates (PACs) upon completing the BCEAA process. Some projects with PACs do have a list of commitments similar to the list of conditions attached to EACs today, while some do not. The OAG report was published in 2011, which highlighted the need for conditions to use enforceable and measurable language. Table 3.1 separates out projects according to which period they received their EA approval in and compares average CRs and average CRs of first time inspections. Projects approved between 1995 and 2002 have the highest overall CRs on first inspections. This could be for a number of reasons, such as the phase of the project, the year of inspection, officer, etc., but it is still an interesting figure. Projects approved in 2011 or later have the lowest CRs out of the three approval periods of interest. This could be an indication that language used in conditions is becoming more strict, thus making officers more comfortable determining noncompliance; however, more clear and enforceable language could also mean that

certificate holders may find conditions more easily understandable and can readily plan for compliance. More in depth analysis on a number of factors (including project type and certificate holder) is required to make definitive conclusions about these differences.

	PAC (1995-2002)	EAC (2002-2011)	2011 or later
Average CR 1st inspection	80.0%	79.5%	73.3%
Average CR	77.5%	77.8%	74.0%
# Projects	5	22	9

Table 3.1	Average	Compliance	e Rates of Pro	ojects summar	rized by Ap	proval Period

Notes:

Four mines are not included in this graph due to the inspections being withheld. A total of 36 active projects (not 40) are included in the chart.

# ii. Do the requirements for self-reporting relate to compliance rates?

Does self-reporting lead to greater compliance? Does the act of self-reporting, and thus being aware and accountable for compliance with EAC conditions beyond inspections promote compliance? Of the 40 inspected projects, only three projects are not required to submit at least one self-report. The three project types are mine, run-of-river, and natural gas processing plant and marine port. The run-of-river project and the mine were approved before 2002 (before EACs and the now typical list of conditions). The natural gas processing plant and marine port was approved in 2006, with a total of 235 conditions. The run-of-river project and the natural gas processing plant and marine port each received one inspection and had a 100% CR. The mine received two inspections; the first received a CR of 100% and the second 75%, for an average CR of 87.5%. Observed compliance is high for these three projects that have no self-reporting requirements.

The other 37 inspected projects are required to submit self-reports (varying amounts and frequencies). Six of these projects (three mines, 2 landfills, and one port) had not submitted any self-reports however (based on information published on e-PIC in November 2015). Inspections for two of these projects (both mines) remain unreleased, therefore compliance information is unknown and these projects are not included in figure 3.2. Inspections for another two mines (required to submit self-reports) also remain unreleased; in total four projects have no released inspections and are not included in figure 3.2.



# Figure 3.2 Compliance Rates and Number of Self Reports Submitted

Notes:

Four mines are not included in this graph due to the inspections being withheld. A total of 36 active projects (not 40) are included in the chart.

Figure 3.2 shows that after six self-reports, as the number of self-reports submitted increases, compliance is high (above 85.7%) and generally less variable than projects that have submitted 6 or less self-reports. A total of four projects in the graph were required to submit self-reports but none were posted on e-PIC at the time of data collection. Two of these projects have a 100% CR recorded for the first inspection, while the other two have a 0% CR. A total of nine projects had one self-report posted on e-PIC; CR of first inspections varied greatly with a mean of 54%, median of 47%, and standard deviation of 35%.

# iii. Are there any other identifiable trends in compliance?

# Are projects in the construction phase more likely to have lower compliance rates than projects in operation?

EAO prioritizes inspecting projects in the construction phase over operations—so how do CRs differ by phase? Looking at table 3.2, which compares the number of 1<sup>st</sup> time inspections and associated CRs for each phase by fiscal year, it does appear that projects in the construction phase have lower rates of

compliance when considering first inspections only, by about 12%. When considering only subsequent inspections, projects in the construction phase have lower average CRs than projects in the operation phase by even more, 28%. This is surprising as one might expect projects to perform better on subsequent inspections as a result of understanding what officers are looking for and correcting past issues. Conversely, projects inspected more than once may be more complex projects with higher potential for issues with compliance, making correcting issues of compliance complex. Lower average CRs on subsequent inspections could also indicate budgetary choices of certificate holders in respect to considering the consequences (or lack of) of continued noncompliance.

	2011/12	2	2012/13	•	2013/14		2014/15		2015/16		Total	
	# Insp	Avg CR	# Insp	Avg CR	# Insp	Avg CR	# Insp	Avg CR	# Insp	Avg CR	# Insp	Avg CR
Initial Inspect	ions											
Construction	6	59%	7	99%	3	100%	7	81%	4	30%	28	75%
Operation	1	0%	3	100%	4	100%					8	88%
Difference	5	59%	4	-1%	1	0%	7		4		20	-12%
Total	7	51%	10	99%	7	100%	7	81%	4	30%	35	78%
Subsequent In	spection	is										
Construction	3	72%	9	63%	10	57%	13	60%	2	50%	37	60%
Operation			1	100%	4	94%	1	100%	2	64%	8	88%
Difference			8	-37%	6	-37%	12	-40%	0	-14%	9	-28%
Total	3	72%	10	66%	14	68%	14	63%	4	57%	45	65%
Grand Total	11	57%	20	83%	21	79%	21	69%	8	44%	80	71%

Table 3.2 Differences in Compliance Rates for Inspections Conducted during Construction

Notes:

Table does not include 5 initial inspections, as CR is unknown. Only first time inspections (released) are considered in the first half of the table; 45 subsequent inspections are included in the second half. Second half of the table does not include 7 unreleased inspections, as CR is unknown (3 during construction, 4 during operation). A total of 12 inspections are absent from the entire table (12+80=92 inspections).

Percentages may not add up due to rounding.

Five projects were inspected in both the construction and operations phases, unfortunately inspections from only two projects' that are required to compare CR across phases were released: a wind farm and a natural gas processing plant. Compliance during construction for the wind farm is unknown due to a lack of detail on the inspection form; the inspection during construction was conducted in 2011 and used the older version of inspection forms. A CR of 100% during the subsequent inspection (~11 months later) during operations was observed for the wind farm. The natural gas processing plant was inspected during construction in 2012, and again (~10 months later) during operations in 2013; both inspections resulted in a CR of 100%. The rate of compliance did not differ between construction and operations for the natural gas processing plant.

# Do multiple inspections positively influence compliance rates?

Looking at figure 3.3, 12 out of 15 projects that received only one inspection had a very high CR. Three projects that had a 0% CR were not inspected again (at least not until after September 2015). With two, three, four, and five inspections, average CR overall is quite high, with the exception of a mine, ski resort, power plant and wind farm. Only two projects were inspected more than five times and even with a high number of inspections, average compliance is still quite poor for the two electric transmission lines. What is interesting is that a natural gas transmission pipeline has a significantly higher average CR over five inspections than two electric transmission line projects do over 10 inspections each. These three projects are linear and their lengths are comparable:

- Transmission pipeline 480 km
- Electric transmission line 247 km
- Electric transmission line 344 km

Why is average CR so much lower for the two electric transmission lines? A publicly traded company is the certificate holder of the pipeline, while a crown corporation is responsible for the two electric transmission lines. More in depth study is required, and ideally several case studies to understand underlying factors and make appropriate comparisons.





Notes:

Four mines are not included in this graph due to the inspections being withheld. A total of 36 active projects (not 40) are included in the chart. A total of seven unreleased inspections exist for these 36 projects; these inspections thus have not affected the calculation of average CR. Lowercase letters after a project type indicates the certificate holder. For example, the certificate holder for dam c and electric transmission line c is the same.

Figure 3.4 shows average CRs for each project and labels the project according to the type of company (either private, publicly traded, government, or crown corporation) and number of inspections. Crown corporations are responsible for three of 11 projects with relatively low compliance (under 75%); publicly traded companies are responsible for six; and local government for two. Private companies interestingly have relatively high average CRs, with no projects having an average CR of below 87.5%.



Figure 3.4 Average Compliance Rates, summarized by Company Type

### Notes:

Four mines are not included in this graph due to the inspections being withheld. A total of 36 active projects (not 40) are included in the chart.

How much does compliance increase with each subsequent inspection, or does it? Figure 3.5 shows that for projects with perfect compliance, subsequent inspections mostly result in no change to the CR. Interestingly for projects with less than 100% CR that receive a subsequent inspection, the direction of change in CR is highly variable, although variability decreases as the number of inspections increases. Further analysis of other factors, such as what type of response was issued by EAO in response to non-compliances (e.g. advisory, warning, compliance agreement, order) or how certificate holders assess the risk/reward of compliance, is required to understand why subsequent inspections aren't producing more consistently positive results.



Figure 3.5 Changes in Compliance Rates for Subsequent Inspections

Notes:

The blue diamond series represents 17 subsequent inspections on 12 different projects. The red square series represents 26 subsequent inspections on 10 different projects. Only subsequent inspections that are released and whose previous inspection CR is known are considered in the graph.

# Is there a difference in compliance rates based on a projects' capacity

Capacity as a proxy for project extent or footprint does not appear to be associated with compliance for most categories of projects. The only projects for which capacity may be associated with compliance are the two electric transmission lines and two linear transit projects (table 3.3). However, there is one more substantial linear project, the transmission pipeline (at 480 km) that has a higher CR than any of the above-mentioned four projects. Capacity may or may not be associated with compliance for mining projects; however, not enough inspections have been released to describe any potential relationship further. The lettering at the end of each project type indicates the certificate holder (i.e. dam 1a, 1b and electric transmission line 1a and 1b share the same certificate holder).

Table 3.	3 Capacity	and Pro	ject Com	pliance
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				Units	CR 1 <sup>st</sup>	Avg	
	Projects	Inspections	Capacity		Insp	CR	Unreleased
Dam	2	2	1,900	MW	42%	42%	
Dam 1a	1	1	900	MW	0%	0%	
Dam 2a	1	1	1,000	MW	83%	83%	
Power Plant	1	3	335	MW	40%	52%	
Run-of-river	11	23	885	MW	97%	97%	
Run-of-river 1b	1	2	18	MW	100%	100%	
Run-of-river 2b	1	1	23	MW	86%	86%	
Run-of-river 3b	1	1	36	MW	88%	88%	
Run-of-river 4	1	4	45	MW	100%	95%	
Run-of-river 5	1	1	45	MW	100%	100%	
Run-of-river 6b	1	2	50	MW	90%	95%	
Run-of-river 7c	1	3	66	MW	100%	100%	
Run-of-river 8b	1	3	81	MW	100%	100%	
Run-of-river 9d	1	1	130	MW	100%	100%	
Run-of-river 10c	1	2	195	MW	100%	100%	
Run-of-river 11d	1	3	196	MW	100%	100%	
Wind farm	5	8	688	MW	68%	86%	
Wind Farm 1	1	1	99	MW	100%	100%	
Wind Farm 2c	1	3	102	MW	0%	58%	
Wind Farm 3	1	2	142	MW		100%	
Wind Farm 4d	1	1	165	MW	100%	100%	
Wind Farm 5	1	1	180	MW	72%	72%	
Electric Transmission Line	2	20	591	km	57%	34%	2
Electric Transmission Line 1a	1	10	247	km	100%	42%	
Electric Transmission Line 2a	1	10	344	km	14%	26%	2

			<u> </u>	Units	CR 1 <sup>st</sup>	Avg	xx 1 1
	Projects	Inspections	Capacity	Irm	Insp	CR	Unreleased
Linear transit	2	4	51	K111	93%	96%	1
Railway g	1	1	11 80	km km/hr	100%	100%	
Public Highway g	1	3	40	km	86%	93%	1
Groundwater Extraction	1	1	75	Litres/second	100%	100%	
Ski resort	1	3	5,500	Bed Units	91%	42%	
Landfill	4	7	150	hectares	62%	58%	1
Landfill 1f	1	3	32	На	100%	85%	
Landfill 2	1	1	33	На	47%	47%	
Landfill 3	1	1	40	На	0%	0%	
Landfill 4f	1	2	46	На	100%	100%	1
Mine	7	10	53,540,150	Tonnes/year	44%	35%	5
Coal 1	1	1	1,000,000	Tonnes/yr			1
Coal 2	1	1	1,300,000	Tonnes/yr			1
Industrial mineral quarry	1	2	100,000	Tonnes/yr	100%	88%	
Mineral 1	1	1	40,150	Tonnes/yr	0%	0%	
Mineral 2	1	2	10,950,000	Tonnes/yr			2
Mineral 3	1	1	18,250,000	Tonnes/yr			1
Mineral 4	1	2	21,900,000	Tonnes/yr	33%	17%	
Natural Gas	3	8			100%	99%	1
Natural Gas Processing Plant	1	2	800,000,000	m³/day	100%	100%	
Nataral Cas Drasaning Diant   Dart -	1	1	5,634,000	$m^3/day$	1000/	1000/	
Natural Gas Processing Plant + Port e	1	1	2.75	na (toresnore) KPa	100%	100%	
Transmission Pipeline e	1	5	1,067	mm (pipe diameter)	100%	98%	1
Port	1	3	1.8	Ha (foreshore)	100%	100%	1
Grand Total	40	92			78%	77%	11

# What is the distribution of inspection effort throughout the year and is compliance higher or lower at certain times of the year?

Table 3.4 shows that 39% of inspections are carried out in the fall; 33% during summer; 20% in spring; and 9% during winter (may not add up to 100% due to rounding). Although only 20% of inspections are carried out in spring, this season has the lowest average CR at 47%, followed by winter at 55%. The numbers are similar when considering CRs from first inspections only (figure 3.6). One of EAO's risk-based inspection selection criteria used in determining when to inspect a project is the time of year (i.e. during higher risk natural seasonal events such as spring thaw). Data shows that fall is the preferred season for carrying out inspections, followed by summer, spring, and then winter. Figure 3.6 provides a graphical summary of the distribution of first time and subsequent inspections by season along with compliance rates.

	# Inspections (all)	Average CR
Fall	3	47%
September		
October	13	73%
November	16	80%
December	4	100%
Summer	30	80%
June	2	98%
July	14	66%
August	9	85%
September	5	97%
Spring	18	47%
March	3	34%
April	2	100%
May	8	37%
June	5	50%
Winter	8	55%
January	3	33%
February	1	
March	4	71%
Total	92	71%

### Table 3.4 Distribution of Inspections across the Seasons

Notes:

Some months (i.e. March, June, and September) appear more than once due to the season change on the 21<sup>st</sup> day of these months. For example, inspections carried out on or after September 21<sup>st</sup> are included under the season Fall, while those carried out before September 21<sup>st</sup> are included in Summer.

Average CR does not include 12 inspections, as CR is unknown.



### Figure 3.6 Distribution of Inspections by Season

Notes:

Average CR does not include 12 inspections, as CR is unknown. Unreleased inspections exist for the following seasons:

- Fall: 2 unreleased 1st inspections, 2 unreleased subsequent inspections
- Spring: 2 unreleased 1st inspections, 3 unreleased subsequent inspections
- Summer: 1 unreleased 1st inspection, 1 unreleased subsequent inspection
- Winter: 1 unreleased subsequent inspection

# 3.2 COMPLIANCE OVERSIGHT

# Are projects in the construction phase more likely to be inspected than those in operation?

Current to February 2016, a total of 17 projects are actively in construction, and 80 projects are in operation. Table 3.5 below uses the phase current to February 2016 for projects that have not been inspected. Since some inspected projects have graduated from construction to operations between 2011 and 2015 (the data collection and inspection period), the left half of the table considers the phase of the project upon first inspection, while the right includes an additional five inspections (five projects were inspected during construction *and* during operations). Ninety four percent of projects in the

construction phase were inspected during construction (current to September 2015), while only 14% of projects in operations were inspected during operations. This finding confirms that EAO has prioritized projects in the construction phase.

Table 3.2, section iii, found that projects in the construction phase have lower rates of compliance when considering first inspections only, by about 12%. When considering only subsequent inspections, projects in the construction phase have lower average CRs than projects in the operation phase by even more, 28%. Whether the significant prioritization by EAO of construction projects over those in operation is appropriate for this difference in compliance requires further analysis. Whether prioritizing construction over operations is a valid strategy for all types of projects is another important question to ask. Mining projects in particular are of interest during operations and unfortunately five inspections remain unreleased, two during operations and three during construction.

	Inspected or	Inspected of	or not?			
Phase	Yes <sup>1</sup>	No	Total	Yes	No	Total
Construction	31 (94%)	2(6%)	33	31 (94%)	2(6%)	33
Operation	9 (14%)	55(86%)	64	14ª (20%)	55(80%)	69 <sup>b</sup>
Total	40	57	97	45 <sup>b</sup>	57	102 <sup>b</sup>

### Table 3.5 Probability of Inspection

Notes:

<sup>1</sup>Since phase has changed for some inspected projects between 2011 and 2016, the phase of the project upon first inspection is used in the left half of the table. Only nine projects received their first inspection during operations.

<sup>a</sup> Of the 31 projects inspected during construction, five of these projects were subsequently inspected during operations. Adding this to the nine projects that received their first inspection during operations results in 14 inspections on projects in the operations phase.

<sup>b</sup>Numbers are inflated by five as a result of five projects being inspected during construction and during operations.

### Does a projects' compliance record influence inspection priorities?

A total of 17 tickets and court convictions were given out to six different companies responsible for permits on various active projects (as defined in this thesis, see footnote 2 or section 2.1.5) between 2006 and 2015, totalling \$1,131,445 (MOE, 2015). These six companies are the certificate holders of 11 active projects, only one of which has received an inspection by EAO. Section 1.3.1 describes EAO's guidelines on C&E, including risk-based criteria used in the selection of projects to be inspected each year. A certificate holder's "compliance record" is listed as a core criterion, in addition to "coordination with other agencies", yet it seems that EAO's risk-based inspection selection criteria are not being considered to the extent indicated by C&E policy guidance.

## What is the probability of receiving a second inspection based on compliance rate

Why are some projects inspected multiple times and others not? Are projects that have been inspected only once 100% compliant? In fact, 87.5% of projects that received only one inspection were in 100% compliance, while the other 12.5% had less than 100% compliance. Table 3.6 shows that 65% of projects with 100% compliance on the first inspection are in fact inspected again. Eighty-eight percent of projects with less than 100% compliance have received a second inspection. It is clear that the likelihood of receiving a second inspection is higher for noncompliant projects. Table 3.6 only considers projects that received their first inspection prior to November 2014, to allow one year for a second inspection to occur (data collection ceased as of November 2015).

# Table 3.6 Probability of Inspection based on Compliance Rate of First Inspection

	Inspected again	Not Inspected again	Total
100% CR 1st Inspection	13 (65%)	7 (35%)	20
< 100% CR 1st inspection	7 (87.5%)	1 (12.5%)	8
Total	20	8	28

Notes:

Seven projects are not included because the 1<sup>st</sup> inspection took place between November 2014 and November 2015, to allow enough time for a second inspection to have been conducted. Five projects are not included due to the first inspections being unreleased. A total of 12 projects are not included in the table (12+28=40).

# Do requirements for self-reporting result in a lower or higher likelihood of inspection?

Table 3.7 shows that 89% of projects with no requirements for self-reporting have not been inspected. A lack of requirements for self-reporting could indicate that the project was approved before self-reporting became the norm, or that the project was perceived at the time of approval as less risky and thus self-reporting was not perceived as a valuable requirement. With no self-reports and no inspections, there is little information on compliance with EAC conditions if any for EAO to consider. About half of projects that are required to submit self-reports have been inspected.

# Table 3.7 Self-reporting Requirements and Likelihood of Inspection

	Inspected or not						
Requirement for self reports	No	Yes	Total				
No	25 (89%)	3 (11%)	28				
Yes	32 (46%)	37 (54%)	69				
Total	57	40	97				

# Are older projects given a pass?

After learning that only 14% of projects in operation have been inspected, it is not surprising that 88% of projects that were approved prior to 2002 (Table 3.8) have not been inspected. Projects approved prior to 2002 are less likely to have any construction going on, although some type of projects do still

have the potential for construction such as mines and landfills. Seventy-three percent of projects approved in 2011 (the year the OAG report was published) or later have been inspected. Indeed, and in keeping with the EAO's risk-based inspection selection criteria to prioritize projects under construction, these projects are more likely to be in construction. All projects approved prior to 2002 (under BCEAA 1995) also only have PACs, meaning they don't have the same attached list of conditions as projects with EACs, although some projects do have a separate document that contains a "table of proponent commitments". Projects approved prior to 2002 also include grandfathered projects (those approved prior to 1995 when BCEAA first came into force), and these projects often don't have any approval or compliance documentation online. A total of 10 grandfathered projects fall under the mandate of EAO, and of these, five have been either in construction, operation, or decommissioning between 2011 and 2015 and have been included in the analysis. Are older projects in the operations phase just as risky as newer projects in the construction phase? More inspections on older projects need to be conducted to begin understanding any relationships between older projects' efforts in environmental protection compared to recent projects.

	Inspected on	not	
	Yes	No	Total
Active projects with an EA	C (e.g. appro	ved after 200	2)
Yes	35 <b>(</b> 65%)	19 (35%)	54
No	5 (12%)	38 <b>(88%)</b>	43
Total	40	57	97
Active projects approved in	n 2011 or later		
Yes	11 <b>(73%)</b>	4 (27%)	15
No	29 (35%)	53 (65%)	82
Total	40	57	97

### **Table 3.8 Project Approval Timelines and Inspections**

Is there a difference in the amount of political attention received for inspected projects versus projects that are not

#### inspected?

Is it reasonable to think that projects that receive greater political attention would be more likely to be inspected? Overall, inspected projects have received more political attention on average by 10 hansard hits (table 3.9). However, both wind farm and ROR projects have not received much political attention, yet both types had a high proportion of projects inspected compared to other categories (figure 2.2). Not inspected projects range in their hansard hits from 0 to 147; while the range for inspected projects is 0 to 137. Eleven inspected projects have zero hansard hits; 38 non-inspected projects have zero hansard hits. Since the data for political attention only includes mentions from the 39<sup>th</sup> and 40<sup>th</sup> parliamentary sessions (2009, 1<sup>st</sup> session, to 2015, 4<sup>th</sup> session), and we know that projects approved more recently are more likely to be inspected (more frequently in construction), it's unlikely

that political attention for older projects has much effect on the likelihood of inspection. Case studies on recent projects, especially those that have received significant amounts of political attention would be interesting to explore in examining whether controversial projects are treated differently when it comes to enforcement.

	Average Har	sard Hits for:	
	Not Inspected	Inspected	Overall
Туре	Projects	Projects	Average
Dam		69	69
Linear transit	50	95	63
Ferry terminal	42		42
Electric Transmission Line	0	45	30
Ski resort	0	53	27
Natural Gas Plant + Marine Port		23	23
Mine	8	15	10
Commercial building	3		3
Wind farm		3	3
Run-of-river	0	3	3
Power Plant	1	12	2
Natural Gas Plant	0	11	1
Port		1	1
Forest Products Mills + Plants	1		1
Transmission Pipeline	0	2	1
Landfill		1	1
Natural Gas Plant + Transmission			
Pipeline	0		0
Hazardous Waste Facility	0		0
Groundwater Extraction	0	0	0
Total	7	17	11

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# What is the Geographic Distribution of Inspections?

Figure 3.7 clearly indicates that the South Coast is experiencing the more inspections than other regions. Regions with the least amount of projects inspected have plenty of projects in operation and few in construction (which we know to be a criteria for inspection). All projects in the Lower Mainland and Kootenay, with the exception of one from each region are in operation; two of the three projects on Vancouver Island are in operation; and the one project in the Okanagan is in operation. Figure 3.7 is not that useful in assessing why one region receives more inspections than another, as we know

other more important factors that are at play. What figure 3.7 does show is how the distribution of development projects in construction has shifted over time.



Figure 3.7 Inspection Effort by Region

Notes:

The bracketed number indicates the total number of active projects in that region.

# 3.3 INTERPRETATION AND IMPLICATIONS

Although many regulatory theories detail factors that affect compliance, empirical evidence evaluating the effectiveness of enforcement strategies on compliance outcomes for EA specifically, is lacking (Burby & Paterson, 1993). This thesis contributes valuable empirical evidence that can allow for informed and credible inspection strategies more likely to achieve compliance goals and environmental protection. The key findings summarized below serve to provide a better understanding of some of the factors associated with inspection patterns and compliance outcomes.

Key findings for compliance rates are summarized below:

- i. Number of conditions and approval timeline
  - a. The variability of CRs for projects with greater than approximately 125 conditions is decreased and these projects have higher average CRs overall than projects with less conditions. Projects with between 21 and 43 conditions have very high average CRs; these projects are wind farm, run-of-river, and groundwater extraction projects. Average CRs for projects with between 44 and 125 conditions is highly variable.

- b. Projects approved between 1995 and 2002 have the highest overall CRs on first inspections. Projects approved in 2011 or later have the lowest CRs out of the three approval periods of interest.
- ii. Self-reporting
  - a. Generally, CRs of first inspections increases as the number of self-reports posted on e-PIC increases. After six self-reports, as the number of self-reports submitted increases, compliance is high and generally less variable than projects that have submitted six or fewer self-reports.
- iii. Other trends in compliance rates
  - b. Phase. Projects in the construction phase have lower first inspection CRs by about 12%. When considering subsequent inspections only, projects in the construction phase have lower average CRs than projects in the operation phase by even more, 28%
  - c. Multiple Inspections.
    - With two, three, four, and five inspections, average CR overall is quite high, with the exception of a mine, ski resort, power plant (same certificate holder at the electric transmission lines) and wind farm. Only two projects (electric transmission lines) were inspected more than five times and even with a high number of inspections, average compliance remains very low.
    - Company classification. Crown corporation projects have significantly lower average CRs regardless of the number of inspections (1 to 10).
    - Change in CR produced by subsequent inspections. For projects with perfect compliance, subsequent inspections mostly result in no change to the CR. Projects with less than 100% CR and that receive a subsequent inspection, the direction of change in CR is highly variable, although the amount of variability decreases as the number of inspections increases.
  - d. Project size. Capacity as a proxy for project extent or footprint does not appear to be associated with compliance for most categories of projects. A potential relationship may exist for mining projects, however not enough inspections have been released to make any conclusions.
  - e. Time of Year. Fall is the preferred season for carrying out inspections (39% of inspections), followed by summer (33%), spring (20%), and then winter (9%). The two seasons with lower levels of compliance oversight (spring and winter) also have the lowest average CR at 47% and 55% respectively.

Key findings on compliance oversight (inspection) patterns are summarized below:

- iv. Risk Indicators
  - a. Phase. Ninety four percent of projects in the construction phase were inspected during construction (current to September 2015), while only 14% of operational projects were inspected.

- f. Compliance record. The likelihood of receiving a second inspection is higher for projects with a previous noncompliant inspection. Still, 12.5% of projects that had less than a 100% CR were only inspected once, while 65% of projects with 100% compliance on the first inspection are in fact inspected again. Only one of 11 projects whose certificate holder received a ticket and/or court conviction under other environmental legislation as published in the EVD was inspected by EAO.
- b. Self-reporting. 89% projects with no requirements for self-reporting have not been inspected. Fifty-four percent of projects that are required to submit self-reports have been inspected.
- v. Age of project. 88% of projects that were approved prior to 2002 have not been inspected; 65% of projects approved prior to 2011 have not been inspected.
- vi. Political attention. Overall, inspected projects have received more political attention on average by 10 hansard hits.
- vii. Geography. The South Coast region is home to the most projects that have received at least one inspection, followed by the Peace and Skeena regions. The Peace region also has the highest number of projects that have not been inspected.

How can these findings serve to strengthen EA practice, policy, and compliance oversight leading to the achievement of higher rates of compliance? The first key finding of this analysis is that projects in the construction phase do in fact have lower rates of compliance than projects in the operations phase. This information supports EAO's mandate of prioritizing construction projects for inspection. It also helps certificate holders understand when compliance efforts could be considered most valuable. Data also shows that EAO significantly prioritizes projects in construction in practice; more data on projects' compliance during operations (especially older projects) and further research is required to assess whether this strategy is the most effective use of resources. As EAO's C&E team grows, inspections will be planned to include older projects (A. Cousins personal communication April 24, 2016).

The second key finding is that subsequent inspections don't produce consistent improvements in compliance; on the contrary they often report worse performance. This finding demonstrates the need to reassess the efficacy of existing deterrent forces such as enforcement responses, and what other methods could be employed to achieve compliance, such as monetary fines and the publication of compliance or non-compliance. EAO is already planning to post all historical inspections; should summary statistics also be publicly available, accountability to the public would be increased and certificate holders may change their compliance behaviour in response to this dual incentive and deterrent force. Scholz (1984a) has argued that compliance is more likely when parties perceive others to be in compliance. Currently, EAO does not publish information on compliance oversight (number of inspections), and only publishes enforcement actions (such as orders and compliance agreements) in more serious cases of noncompliance. How firms ascertain regulatory effort (whether accurate or not) remains an uncertainty. Additionally this finding indicates that targeting 'troublemaker' with histories of noncompliance may not be effective or efficient. Whether such projects may have higher compliance

costs and thus don't react as expected to enforcement, or whether other factors are at play, deserves further research.

EAO's risk-based inspection selection criteria specify that inspections be conducted at times in the year during higher risk natural seasonal events as much as possible. Findings indicate that the two seasons that produce inspections with the lowest average CRs are spring and winter, but only 29% of inspections are carried out over these two seasons. Based on this finding, a reassessment of the allocation of inspections during various times of the year to target months or seasons with historically lower compliance rates may be appropriate. Whether compliance rates are higher during summer and fall as a result of higher levels of inspections during these seasons, or for other reasons such as environmental and weather conditions is unknown. Regardless, EAO could allocate more resources to inspections during spring and winter and re-evaluate compliance rates after one to two years.

EAO's criterion for determining inspections in a given year also states that compliance records and coordination with other agencies are considerations. Data shows that only one of 11 projects whose certificate holder received a ticket and/or court conviction between 2006 and 2011 under environmental legislation enforced by MOE and MFLNRO (as published in the EVD) was inspected by EAO. This finding demonstrates that EAO may not be aware of (and thus be able to consider) other environmental agencies' (EC, MOE, MFLNRO) compliance information in their evaluation of a certificate holder or project's compliance record. EAO receives compliance intel verbally and by email from other agencies, which EAO considers when planning inspections; however, the EVD is generally not reviewed (A. Cousins personal communication April 24, 2016). This means that EAO primarily relies on information from their own inspection reports (which we know are not entered into a database) and self-reports submitted by certificate holders. Fifty-four percent of projects that submit self-reports have been inspected; do the contents of self-reports is required to answer this question. The data from MOE's EVD, in conjunction with the compliance data collected for this thesis, will be useful in further exploring patterns in compliance oversight in future work.

Crown corporation projects have relatively low rates of compliance compared to private and publicly traded companies and local government certificate holders. Figure 2.4 also shows that certain categories of projects have substantially lower overall rates of compliance. The two categories with the lowest overall CRs are electric transmission lines and dams; a crown corporation owns the projects in these categories. A case study or studies could provide insight into crown corporations' motivations to comply and unique challenges in achieving compliance to understand how compliance could be more effectively increased for these projects. Already, crown corporation projects have received higher than average inspections per project than other types of companies and compliance is not increasing with repeat inspections consistently. Is targeting projects with histories of noncompliance effective and efficient? One study (Shimshack & Ward, 2010) hypothesized that such projects may have higher compliance costs and thus don't react as expected to inspections and enforcement. This theory could be tested using a case study, specifically focused on crown corporations. Regardless, the maintenance of elevated levels of enforcement for problem projects is expensive monetarily and costly in resources and time (Gray & Shimshack, 2011).

The relationships between self-reporting and compliance, conditions and compliance, and political

attention and compliance oversight require further study.

Overall this research has shed light on the level of compliance oversight carried out by EAO and provided valuable insight into compliance levels. Lack of transparency and evaluation of EA follow-up, compliance oversight, and enforcement is not limited to BC or EAO. Other regulatory bodies, such as the NEB and MEM, have been criticized for their lack of consistent follow-up and have significant work to do to restore public trust in the process (Government of Canada, 2016; OAG, 2016).

# 3.4 STRENGTHS AND LIMITATIONS

One important limitation of this research is that, in the calculation of compliance rates, all conditions are considered equal. In reality, each condition varies in topic, length, and wording; the result is that some conditions may be short, straightforward, and relatively easy to comply with while other conditions are complex and more open to interpretation. In calculating the compliance rate for each inspection, this research did not account for such differences in conditions (or portion of the condition, as conditions are frequently broken up for ease of inspection reporting). The method used to determine the compliance rate could be improved by taking a closer look into the characteristics of conditions being inspected for each project, and the characteristics of all the conditions on that project's EAC that are available to inspect. This would provide a more accurate figure of compliance. The content and wording of conditions could also affect the degree of enforceability—another factor to consider in a more detailed review of conditions.

Additional limitations related to data characteristics exist. The amount of political attention received by a project was derived by counting the number of hansard hits in the parliamentary debates and transcripts. The content of hansard mentions (whether positive or negative) and how substantial was not evaluated. Similarly for self-reports, only the number of self-reports available on e-PIC for each project was counted, and not evaluated for detail or content.

All findings are limited by the existence of inspections that were not released (12% of total) and thus could not be included as data. Differences in inspection forms as the pilot program progressed also contribute to less detailed data or unavailable data. For example, older inspections that simply state "no non-compliances observed at the time of inspection" do not provide any information on how many conditions were inspected. Older inspections often do not outright state "non-compliance observed, not determined, or in compliance"; best judgement based on the information provided was used to determine the most appropriate category which was subsequently reviewed by EAO. Differences in inspection styles are also a factor in data consistency, as each officer brings their own focus and expertise to the inspections they conduct.

Findings about specific project types, companies, and operation phase inspections may have limited merit when the number of observations is low. Since data collection had to cease at some point, inspections up to October 2015 (end of September) for the 2015/16 fiscal year are included; this means that for the latter six months of 2015/16, detailed inspection data was not considered in this
research. Ideally, further research will take place once EAO's C&E program has been functioning for additional years to provide more data. Overall, more consistent and reliable data will be available in future years as the C&E program is fully developed and the wording of conditions becomes more standardized.

## 4 CONCLUSIONS

One of the goals of this research was to suggest improvements to environmental management in BC. Another was to provide insight to improve and/or legitimize the current C&E strategy based on the relative role of different factors associated with compliance outcomes (good and bad). This research has led to the creation of a database of active projects in BC, enabling the analysis of certificate holder compliance with EAC criteria and evaluation of the effectiveness of EAO's C&E strategy.

The database and analysis are both new contributions to the field and have provided hitherto unavailable empirical evidence to evaluate compliance oversight priorities and compliance outcomes for EA projects in BC. This was carried out by examining potential factors associated with inspection patterns and compliance outcomes through collection, verification and analysis of a wide range of publically available data. The knowledge gained from this research and the recommendations based on key findings will help to improve environmental management in BC. Key findings are summarized below along with associated recommendations to EAO's C&E team and policy makers to improve C&E strategies, and to certificate holders to aid in the achievement of higher rates of compliance. Applications and recommendations are discussed further in section 4.1.

Findings demonstrate that EAO prioritizes inspection of projects that are in the construction phase. However, further research is required to assess whether this strategy is the most effective use of resources. Differences in compliance rates for inspections conducted during construction versus operation support EAO's current strategy of prioritizing construction projects for inspection. However, relatively few inspections were conducted on projects in the operations phase and more data (and thus inspections) on compliance during operations (especially for older projects) is required. Regardless, certificate holders can benefit by placing extra focus on compliance efforts during construction.

The lack of consistent improvements in compliance rates with subsequent inspections demonstrates the need to reassess the efficacy of existing deterrent forces such as enforcement responses, and what other methods could be employed to achieve compliance, such as monetary fines and the publication of non-compliance. Crown corporation projects have relatively low rates of compliance compared to private and publicly traded companies and local government certificate holders. Already, crown corporation projects have received higher than average inspections per project than other types of companies and compliance is not increasing with repeat inspections consistently. Indeed, several studies (Earnhart, 2009; Gray & Shadbegian, 2005) have found that enforcement initiated deterrence varies over time, within and across project types, and more specific project characteristics such as types of conditions or permits (Gray & Shimshack, 2011). These conclusions are consistent with the findings from this research.

Is targeting projects with histories of noncompliance effective and efficient? One study (Shimshack & Ward, 2010) hypothesized that such projects may have higher compliance costs and thus don't react as expected to enforcement. This theory could be tested using a case study, specifically focused on crown

corporations. Regardless, the maintenance of elevated levels of compliance oversight for problem projects is expensive monetarily and costly in resources and time (Gray & Shimshack, 2011). At least one of the three conclusions Gray and Shimshack highlighted (discussed in section 1.2.1) from their review of literature on environmental C&E does not hold for EA projects in BC. Enforcement activities (those given out by EAO, so not monetary) have not produced considerable specific deterrence<sup>24</sup>. However, enforcement activities and compliance oversight do seem to produce at least a minimal level of general deterrence<sup>25</sup>; more data on inspections for certain project categories is required to make a definitive conclusion. Whether or not enforcement activities have promoted overcompliance requires further study.

Judicial enforcement measures (including monetary penalties) under BCEAA are reserved for cases where administrative sanctions have not achieved satisfactory results and/or the noncompliance is severe (BC Environmental Assessment Office, 2015a). Although the data shows noncompliance after repeat and escalatory administrative sanction on specific projects, no judicial enforcement measures have been utilized, even in the face of consistent noncompliance either with the same or different conditions. Whether the resources exist to utilize judicial enforcement is a different question. Judicial enforcement is a lengthy process and the availability of other tools which officers have authority to issue directly, such as orders, allow for tailored remedies to be specified (A. Cousins personal communication April 24, 2016).

What about enforcement strategies that encourage voluntary compliance by enhancing commitments based on social and ethical factors, as opposed to direct fear of penalties (Burby & Paterson, 1993; Scholz, 1984b)? Empirical evidence and analysis of the newly implemented C&E program for EA in BC has provided a basis for research into motivations behind compliance. EAO is already planning to post all historical inspections; should summary statistics also be publicly available, accountability to the public would be increased and certificate holders may change their compliance behaviour in response to this dual incentive and deterrent force. We can safely assume that certificate holders of EA projects in BC generally consider the approval of regulators, peers, stakeholders, the community and public to be of value. Indeed, Scholz (1984a) has argued that compliance is more likely when parties perceive others (peers) to be in compliance. Currently, EAO does not publish information on compliance oversight (number of inspections), and only publishes enforcement actions (such as orders and compliance agreements) in more serious cases of noncompliance. How firms ascertain regulatory effort (whether accurate or not) remains an uncertainty.

EAO's risk-based inspection selection criteria specify that inspections be conducted during higher risk natural seasonal events as much as possible. Findings indicate that the two seasons that produce inspections with the lowest average CRs are spring and winter, but only 29% of inspections are carried out over these two seasons. One recommendation would be to reassess the allocation of inspections during various times of the year, such that months or seasons (e.g. spring and winter) with historically

<sup>&</sup>lt;sup>24</sup> Specific deterrence occurs when enforcement actions targeting a single project deter ensuing noncompliance at the same project (Gray & Shimshack, 2011).

<sup>&</sup>lt;sup>25</sup> General deterrence occurs when regulatory actions targeting a single project generate spillover effects that influence compliance at other facilities (Gray & Shimshack, 2011)

lower compliance rates are targeted.

Data indicates that EAO may not be fully aware of (and thus be able to consider) other environmental agencies' (EC, MOE, MFLNRO) compliance information in their evaluation of a certificate holder or project's compliance record as stated in EAO's published C&E guidelines. This finding underscores ongoing issues with inter-agency data sharing and efficiency. Such issues are perpetuated in part by the paper trail associated with EA filings. Unfortunately, until compatible electronic data are collected for each project, attempts for data access for any objective, including coordinated permitting, monitoring and enforcement, will suffer (Wasserman, 2011). Extensive work is underway to achieve integrated IT and data for the natural resource C&E community in BC (A. Cousins personal communication April 24, 2016). The database curated, and the figures and tables created for this thesis are steps in the right direction in addressing these issues in BC.

EA follow-up is necessary for continuity of environmental management objectives. Without it, we cannot learn from experience nor identify out-dated, ineffective, or sub-optimal practices in the EA process (Baker, 2004; Sadler, 1988). Many have argued that the need for EA in decision making, by design necessitates the need for consistent and rigorous follow-up (Munro & Arts, 2005). Data collected on compliance outcomes for this research will benefit future studies that aim to understand feedback mechanisms between project outcomes and project planning in the endeavour of strengthening accountability and credibility in EA. Table 4.1 positions EAO's EAC inspections within the framework of EA follow-up activities discussed in s

ection 1.1.2. EAC inspections and compliance self-reports have the potential to cover off all three audit classifications described in section 1.1.2, if a consistent method of data collection and reporting is employed.

	Implementation Audits	Project Impact Audits	Predictive Technique Audits
Definition	Evaluate application and function of mitigation	Examine actual impacts from a project	Compare actual impacts with predictive impacts. Goal is to validate or improve predictive techniques
EAO's EAC Inspections	$\checkmark$	Inconsistent	Not yet attempted, requires consistency with project impact audits first.

Source: adapted from Tomlinson & Atkinson (1987)

This research has provided new insights that can be used as a basis for improving the current C&E strategy and increasing the effectiveness of environmental management. Extensive empirical evidence evaluating patterns of compliance oversight and compliance outcomes is one of the main contributions of this study. Even in light of these contributions, empirical evidence evaluating enforcement strategies and compliance outcomes directly related to EA requirements is still in short supply; section 4.2 provides an overview of interesting directions for future research.

## 4.1 APPLICATION AND RECOMMENDATIONS

The findings from this research are most applicable to oversight of and compliance with EAC conditions in BC. However, other agencies besides EAO can also benefit from insights gained due to the similarities between permit requirements and EAC conditions, when dealing with similar projects and company types. Provinces and their institutions responsible for EA-follow up, in addition to federal authorities can review the findings relative to their own processes for C&E of environmental legislation and requirements and decide whether similar data exercises would be useful. Recommendations discussed in sections 4 and 3.3 are summarized below according to their applicability to EAO, other environmental government agencies in BC (and Canada), and certificate holders.

#### Key recommendations for EAO

To better address effectiveness management (the continuous improvement of EA and the C&E program), one of four core components of the C&E program and a service principle, the following recommendations are made:

- Review the tools used to select appropriate enforcement responses. Given the knowledge that compliance ratings and classifications have not been a source of clarity or consensus among officers (section 2.1.1), it seems unlikely that the enforcement decision matrix has functioned as an effective tool for selecting enforcement responses. Evaluate the decision-making process for the use of judicial enforcement measures and appropriate thresholds for justified action (e.g. repeat receipt of more serious enforcement actions). Considering the lengthy process of judicial enforcement, perhaps authorizing officers to issue fines in conjunction with another action such as an order, deserves consideration. Establishing and maintaining consistency and fairness across officers and inspections is important; the development of a tool or tools better able to achieve these objectives will benefit both certificate holders and officers.
- Given the inconsistency with which subsequent inspections improve compliance, track and evaluate the efficacy of existing deterrent forces, such as enforcement responses. Consider other methods and sanctions better suited to specific projects and potential motivations, such as monetary fines when enforcement actions such as orders are repeatedly handed out and the publication of compliance or non-compliance.
- Expand the scope of inspections to include more operational projects, specifically older projects to gain insight into performance and assess whether the current strategy (of prioritizing inspections during the construction phase) is the most effective use of EAO's resources for environmental protection.
- Target specific project types (e.g. mines) based on historical compliance rates (figure 2.4) and inspect project categories that have still yet to be inspected (figure 2.2) to gain information on compliance. Additionally, monitor the number (figure 2.5) and type of conditions inspected. It is important to gather data on compliance with socio-economic conditions

(often in the form of promised benefits), as these are used in the weighing the risks and benefits of a project during the EA process.

- Document how other environmental agencies' (EC, MOE, MFLNRO) compliance information has influenced (or has not influenced) EAO's inspection priorities as stated in the C&E guidelines. Inspecting projects and certificate holders that have received tickets and/or court convictions under other environmental legislation will provide new data about cross-agency enforcement and compliance outcomes. This recommendation is related to the previous recommendation of inspecting projects during the operations phase.
- Monitor the level of compliance oversight during various times of the year to target months or seasons with historically lower compliance rates and evaluate how inspections and enforcement actions affect compliance (see figure 3.6). Data from 2011-2015 indicates that spring and winter have low compliance rates and also experience low levels compliance oversight compared to summer and fall.
- Develop and refine inspection forms that allow the full range of EA follow-up activities to be undertaken consistently and provide data necessary for feedback between compliance outcomes and the EA process (project impact audits and predictive technique audits).
  - How, or if, any field experience gained from inspections is incorporated into future EAs should be documented as prescribed by EAO's C&E Policy and Procedure.
- To better achieve one of the main objectives of the C&E program, to provide information about C&E that is readily available to the public, and one of the key service principles—transparency, EAO should develop a one-stop shop for all projects under the C&E mandate. Currently, access to active projects' C&E history is disjointed, if available. EAO should provide access to EAC conditions, follow-up activities (such as self-reports), inspection and compliance history, and associated enforcement actions such that they can be tracked and analyzed.
- Continue ensuring that EAC conditions are written in language that can be easily understood, complied with, monitored, and enforced (Wasserman, 2011).

Additional budget and/or personnel will be required for EAO to realistically consider these recommendations, although several of them are already being pursued.

# Key recommendations for other environmental government agencies:

- Enhance government access to and knowledge of proponents' compliance records across a variety of environmental legislation.
- Ensure that compatible electronic compliance data is collected for each project. Projects should have a portfolio of information spanning all interactions with government.
- Develop a notification system that will alert other agencies, such as EAO, when a common proponent has a history of noncompliance or has been recently found in noncompliance.

## Key recommendations for certificate holders:

• Increase compliance monitoring efforts during construction

Some of the recommendations made here will require additional research to be appropriately implemented. Ideas for future research, as related to the recommendations, are described in section 4.2 below. Suggestions for further research will help to provide recommendations for certificate holders to better protect the environment by increasing compliance with EAC conditions.

## 4.2 FUTURE RESEARCH

This thesis has only scratched the surface of the type and depth of research that could be carried out in this field. Now that data is available and public agencies are willing to actively participate in research, future research directions are vast. Some of the data collected for this thesis was not used in analysis to remain focused on key questions; other data was analyzed but would benefit from further research and analysis including case studies of specific projects.

What should future research efforts in this area focus on? A good starting point would be to take a closer look at specific projects, certificate holders, or types of projects and examine the deterrence effect of inspections, repeat inspections, and different enforcement actions. Whether subsequent inspections consistently produce greater compliance and under what conditions is an important area for future research. Further research on this topic will help to identify more effective enforcement strategies, and potentially customize compliance oversight and enforcement based on project characteristics. Some interesting questions include:

- Do officers treat controversial projects differently when determining enforcement action?
- How consistent are enforcement actions?
- Does the officer matter?
- Should inspections target repeat offenders (Gray & Shimshack, 2011)? (idea: case study that focuses on crown corporations in BC).
- Does deterrence vary depending on the enforcement action, and if so to what degree (*ibid*)?
- Does the *content* of self-reports influence whether a project receives an inspection or not? At a minimum, content analysis of self-reports is required to answer this question.
- Do certificate holders choose to over-comply with one risk mitigation in order to be given a pass on failing to comply on another? A certificate holder may seek to limit total risk by risk- trading. Further data collection would be necessary to answer this question.
- Is the greatest source of environmental pressure the government? [As in (Doonan et al., 2005)] Does the source of pressure (e.g. First Nations) vary based on the type of project or type of company?
- How do certificate holders gain information about compliance oversight (i.e. from e-PIC, news, industry contacts, peer companies, etc.)?
- What effect would broad dissemination of inspection reports (in the form of summary statistics and key findings) have on compliance?
- Does lower compliance oversight during spring and winter have any effect on compliance? This could be tested empirically by conducting more inspections during spring and winter, in addition to conducting research to understand what other factors may contribute to

compliance at different times during the year, such as environmental and weather conditions, and the types of projects inspected.

Whether or not there are any identifiable patterns in the frequency of what type of conditions (e.g. conditions relating to sediment and erosion control) are reported as noncompliant for specific projects or project types was not addressed in this research, although data has been collected and reviewed for quality to explore this. The refinement of categories and methods used to classify conditions should be undertaken before meaningful analysis can take place in future research. Exploring trends in what types of conditions have been inspected and which types are most frequently in compliance or noncompliance will allow both certificate holder compliance monitoring efforts and C&E enforcement strategies to be focus on 'problem' conditions and allow for increased efficiency.

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# APPENDIX A

## BCEAA - Part 5 Sanctions

## 34 - Minister's Order to Cease or Remedy

(1)If the minister considers that a reviewable project is not being constructed, operated, modified, dismantled or abandoned or, in the case of an activity that is a reviewable project, carried out, in accordance with an environmental assessment certificate, the minister,

(a) if an environmental assessment certificate for the reviewable project has not been issued or has been issued but does not remain in effect, may order that construction, operation, modification, dismantling or abandonment of the project cease, or that the activity cease, either altogether or to the extent specified by the minister, until the proponent obtains an environmental assessment certificate, or

(b) if an environmental assessment certificate for the reviewable project has been issued and remains in effect, may

- (i) order that construction, operation, modification, dismantling or abandonment of the project cease, or that the activity cease, either altogether or to the extent specified by the minister, until the holder of the certificate complies with it, or
- (ii) order that the holder of the certificate carry out, within the time to be specified in the order, measures specified by the minister in order to mitigate the effects of non-compliance.

(2) If the minister considers that a person is not complying or has not complied with an order under this Act, in this section called the "original order", the minister may

(a) order the person to comply with the original order, and

(b) specify in the order measures to address the non-compliance and the time within which it must be remedied.

35 - Supreme Court order for compliance

(1)If the minister considers that any person or organization is in noncompliance with a Minister's order made under BCEAA, the minister may apply to the court for either:

- a) an order directing the person or organization to comply with the order or restraining the person or organization for violating the order
- b) an order directing the directors and officers of the person or organization to cause the person or organization to comply with or cease violation of the order.

36 – Compliance agreement

(1) If the minister considers it appropriate to do so, the minister may give the holder of an environmental assessment certificate an opportunity to make a written compliance agreement with the minister, by which the holder undertakes to comply with the environmental assessment certificate

within the time and on the terms specified in the agreement.

(2) Despite a written compliance agreement, the minister may make an order referred to in section 34 in respect of the holder of an environmental assessment certificate or another person that is the subject of an order under section 34

- a) on matters not covered by the agreement,
- b) if the agreement is not complied with, on matters covered in the agreement, and
- c) on matters covered in the agreement if all the material facts related to those matters were not known by the minister at the time of the agreement.

(3) On the application of a holder of an environmental assessment certificate that has a compliance agreement with the minister, the minister may approve an alteration of the agreement.

37 - Suspension, cancellation, or amendment of a certificate

(1)For any of the below reasons (only those reasons relevant to this research have been included), the minister by order may suspend all or some of the rights of the holder of an EAC or cancel an EAC, or may amend or attach new conditions to an EAC

- a) the holder of the environmental assessment certificate does not substantially start the project by the deadline specified in the certificate;
- b) the minister has reasonable and probable grounds to believe that the holder of the certificate is in default of
  - i. an order of the Supreme Court made under section 35, 45 or 47,
  - ii. an order of the minister made under section 34 or 36 (2), or
  - iii. one or more requirements of the certificate;
- c) the holder of the certificate has been convicted of an offence under this Act;
- 41 Offences
- (2) A person commits an offence who
  - a) contravenes section 8 (1) or (2) requirement for an EAC,
  - b) does not comply with
    - i. an environmental assessment certificate, or
    - ii. an order referred to in section 34 or 35, or
  - c) makes a statement in a record filed or provided under this Act that is false or misleading with respect to a material fact or that omits to state a material fact, the omission of which makes the statement false or misleading.

(3) A person does not commit an offence under subsection (2) (c) if at the time of the statement the person did not know that the statement was false or misleading and, exercising due diligence, could not have known that the statement was false or misleading.

(4) If a corporation commits an offence under this Act, any employee, officer, director or agent of the corporation who authorizes, permits or acquiesces in the offence commits the same offence whether or not the corporation is convicted of the offence.

## 45 - Penalties

A person who commits any offence under section 41 is liable,

a) in the case of a corporation on a first conviction, to a fine of not more than \$100 000 and, on

each subsequent conviction, to a fine of not more than  $200\ 000$ , and

- a) in the case of an individual
  - i. on a first conviction, to a fine of not more than \$100 000 or to imprisonment for not more than 6 months or to both, and
  - ii. on each subsequent conviction, to a fine of not more than \$200 000 or to imprisonment for not more than 12 months or to both.