WORLD OF DESERTION: FOSSIL CAPITALIST LIABILITIES AND CONTRADICTIONS IN ALBERTA'S CONVENTIONAL HYDROCARBON ECONOMY

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ABSTRACT

In this dissertation, I analyze the political-ecological and economic conditions of 'orphaned' conventional oil and gas infrastructural assets in the province of Alberta, Canada. Specifically, I research fossil capitalist firms' legal obligations to these *deserted*, rather than orphaned, infrastructural assets through the lens of liability management. To my knowledge, I offer the first critique of this region's fossil capitalist liability management regime through a combined critical physical geologic and political economic framework utilizing geoscientific scholarship, political ecology, theories of capitalist crisis, and Marxian critique of statecraft. Specifically, this dissertation explores 1) the conditions under which infrastructure can be deserted; 2) the history and design of the provincial Alberta Energy Regulatory (AER), which is responsible for the ongoing mismanagement of corporate liability and ecological restoration; 3) the conditions under which geotechnical labour operates within the industry to produce capitalist value; 4) the relationships, both in terms of competition and cooperation, between the two major factions of fossil capital and finance capital in the province. To analyze these processes, I consider the geotechnical aspects of wells, pipelines, and processing facilities and their fate in becoming deserted assets. I then turn to analyzing the province's historic and modern liability management regime of fossil assets. I argue that the failure of the region's environmental governance follows from the overwhelming political power of the fossil capitalist hegemonic bloc, as understood by Marxist theories of the capitalist state. The dissertation concludes by arguing that the industry's Orphan Well Association (OWA) was founded as an attempted socioecological fix to the structural contradictions of fossil capitalism manifesting in the 'slow-motion landslide' of deserted fossil assets. I qualify these structural crises in hydrocarbon extraction and production present in Alberta, undermining the ability of fossil capitalism to reproduce itself, through document analysis and semi-structured interviews with key informants. Through this research, it is evident that the province has been subject to fossil capitalist political power which has led to ecological mismanagement, the sidelining of scientific expertise, and the continual destruction of the physical conditions of production which fossil capital relies on to (re)produce itself.

DEDICATION

For Kyle and Alex. Rest now and know that I await our reunion in the afterlife.

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AER	Alberta Energy Regulatory
ARO	Abandonment and Reclamation Obligations
CAPP	Canadian Association of Petroleum Producers
CAOEC	Canadian Association of Energy Contractors
CEO	Chief Executive Officer
CIM	Canadian Institute of Mining, Metallurgy, and Petroleum
CNRL	Canadian Natural Resources Limited
COGEH	Canadian Oil and Gas Evaluation Handbook
CPE	Critical Political Ecology
CPG	Critical Physical Geology
EPAC	Explorers and Producers Association of Canada
EPEA	*Environmental Protection and Enhancement Act*
ERCB	Energy Resources Conservation Board
EROEI	Energy Return On Energy Invested
EUB	Energy and Utilities Board

FOIPPA	*Freedom of Information and Protection of Privacy Act*
GHG	Greenhouse Gas
IBC	Interest-Bearing Capital
LFP	Large Facility Liability Management Program
LIT	Licensed Insolvency Trustee
LLR	License Liability Rating
LMR	Liability Management Rating
NRTA	Natural Resources Transfer Acts
OFL	Orphan Fund Levy
OGCA	*Oil and Gas Conservation Act*
OWA	Orphan Well Association
PA	Pipeline Act
PHC	Petroleum Hydrocarbon
REDA	*Responsible Energy Development Act*
ROI	Return on Investment
SCC	Supreme Court of Canada

SCO	Sweet Synthetic Crude Oil
WCSB	Western Canada Sedimentary Basin
WTI	West Texas Intermediate

Chapter 1: Introduction

Dig out our coal

Turn it into cash

Starve out our homelands

But keep your wallets fat

Shake down our house

With your big old draglines

And bury our families

Deep in them mines

- The Local Honeys, *Cigarette Trees*

Introduction

There are thousands of so-called 'orphaned' wells, pipelines, and processing facilities wasting away in the plains of Alberta, Canada, living out their days as wards of the provincial government regulatory institutions. These deserted fossil assets are pieces of conventional oil and gas infrastructure which no longer have any legal or financial guardians to take care of them in their life after viable production; this arises from the overwhelming financial stress and the intentional desertion by capitalist firms which once held their operating licenses. Subsequently, these bankrupt fossil firms offload the responsibilities and financial costs of decommissioning this deserted infrastructure onto other fossil capitalist firms, the province's quasi-judicial energy regulator and, as will be argued, the public. While much attention in scholarly literature has been paid to extraction within Alberta's infamous tar sands megaprojects—collectively the largest deposit of bitumen-laced tar sands in the world across the Athabasca, Cold Lake, and Peace River project sites—the province's 'orphan' inventory today stems from its older and much more mature conventional hydrocarbon regions, which largely produce crude oil and fossil gas.[1]

Overseeing the province's expansive hydrocarbon regime is the Alberta Energy Regulator (AER, which I use interchangeably with the Regulator dependent on the timeframe).[2] This organization is the province's singular regulatory authority for downhole, technical, and financial oversight of oil and gas exploitation licensing. From 'cradle-to-grave', including obligatory closure and site reclamation work outlined in provincial environmental statutes, they supervise the development of all energy and mineral resources. The AER has licensed around 444,000 kilometres of pipeline, 464,000 fossil gas and oil wells, 45,000 oil and gas facilities, five oil upgraders, and five coal mines in the province. Once these assets are no longer producing hydrocarbon commodities, in principle their corporate licensee must shut down these wells, pipelines, and facilities and reclaim the associated project sites to a 'pre-disturbance' state accordingly. These environmental-financial liabilities can be very costly and can take quite a long time to complete. According to the OWA, average costs to just shut down a well in 2024 was $16,500 while reclaiming the site to its pre-disturbance state averaged $27,400 (OWA, 2024). But this number can increase several fold depending on the complexity of the site at hand and if there have been any hazardous releases into the surrounding environmental media (soil or water, namely).

[1] Rather than naming this class of hydrocarbons as 'natural,' I defer to the use of 'fossil gas.' These hydrocarbon fuels have historically been referred to as 'natural gas' simply since they are naturally occurring, obscuring the truer nature of their chemistry and extraction/production.
[2] As will be discussed in later chapters, the AER has gone through several personality changes over its life. With these changes has come its continual rebranding and renaming. As such, I often use the term 'Regulator' to refer to the organization when not discussing a specific iteration of it.

Unfortunately, these infrastructural assets are not all promised a quick and peaceful death like the environmental law stipulates. Many of the fossil firms[3] who operate the infrastructure end up in precarious financial states and do not manage these legally required abandonment and reclamation obligations (often referred to as the assets' 'AROs').[4] Eventually, their creditors–the financial capitalist firms who have lent them money as collateralized loans so they can pay for the costly fossil operations–may petition the failing firm into bankruptcy proceedings with the hopes that they can recover as much of their lent capital as possible. Historically, assets will be 'disclaimed' onto the province, because there is no legally responsible party to take care of them and pay for the asset AROs. Depending on how things play out in said legal proceedings, Alberta's Orphan Well Association (OWA) may be tasked with the responsibility of seeing through the AROs of this now *deserted* infrastructure and their project sites.

The OWA is an independent, not-for-profit funded by industry operators, the province of Alberta, and the Canadian federal government, and the organization falls under the legal purview of the AER. Their stated mission is to try to affordably decommission as many of Alberta's deserted fossil assets as possible through their funding streams. While their inventories are always fluctuating, as of January 2024 they had 2,679 sites for decommissioning (including 1,724 wells and 207 facilities), 1,632 pipeline segments for decommissioning, and 7,175 sites

[3] I use the term 'fossil firms' to denote the corporations who originally sought–or bought out existing–licenses to extract, upgrade/refine, transport, or sell hydrocarbon commodities to end consumers. In the context of this dissertation, I use the term 'fossil' descriptively when discussing other aspects of the oil industry's story and power network. This includes the broader capitalist economy attached to extraction/production, lending relations, personnel, and more (i.e., 'fossil assets,' 'fossil loans,' 'fossil economy,' 'fossil elite,' 'fossil intellectuals'). Sometimes, I use the term hydrocarbon in lieu of this or when speaking specifically about the geologic category of 'hydrocarbons' and not the commodities which they are transformed into during extraction/production.

[4] For this dissertation's purposes, I will use the acronym ARO when I am generically referring to the entire process of closure work, including decommissioning the infrastructure and project sites through the site receiving an AER-issued reclamation certification. When necessary, I will differentiate the specific parts. It is critical to note that 'abandonment' does not refer to the same thing as 'orphaning' or 'desertion.' Abandonment is the industry-specific term for an early phase of a well's decommissioning.

awaiting reclamation. Unfortunately for the OWA and the impacted peoples and local ecologies of this oil patch, there appears to be a coming tidal wave of deserted assets; this tidal wave of assets comes with huge financial-environmental liabilities that will tower far above the current inventories. Collectively, these outstanding liabilities are in the tens of billions of dollars. No one wants to be left holding this multi-billion-dollar bag as the conventional hydrocarbon sector slowly sundowns in the 21st century, but someone ultimately will. Thus, this dissertation examines the political-economic and ecological conditions under which these assets can be deserted in Alberta and offers an analysis of this problem.

But there are many forms through which these pieces of oil and gas infrastructure will pass during and after their functional life of serving fossil capitalism. Likewise, there are also myriad types of hydrocarbon fuel commodities in the Albertan extractive landscape: crude bitumen (from the tar sands), crude oil (typically from conventional wells), 'natural'/fossil gas (either from conventional or unconventional reserves), 'natural'/fossil gas liquids (from low permeability or shale bed methane reserves), or raw coal (strip mined). Each of the principal hydrocarbon reserve types can be broken down based on unique geophysical/geochemical properties of the reserves. This dissertation narrows in on the infrastructure specifically related to *conventional oil and gas reserves*[5]. I am interested in the physical characteristics of the province's geophysics to unpack the physical, economic, and political dimensions of the resources fueling fossil capitalism. This is because the extractive-scientific fields situate themselves ambiguously with relation to political economic relations. Economic geology, for

[5] The distinctions between conventional and unconventional are blurry at best, but I defer to calling the main reserves in this study conventional. This is because much of the unconventional sector in the province focuses on tar sands mining and upgrading. Still, some operators in the province use unconventional recovery techniques in once conventional wellbores to retrieve more of the once unrecoverable reserves (i.e., using hydraulic fracturing in a well tapping a crude oil reserve).

instance, articulates itself as external to social and political influence, yet simultaneously acknowledges that such issues are central to a reserve's viability. In doing so, the field and its authors appear to abdicate themselves from social or political responsibility, rendering both the political-economic and ideological value of these professionals' work all but absent from explanations of the field.

In a similar vein, the Regulator has adopted this anthropomorphic language of 'orphaning' to help explain the phenomenon of asset desertion, muddying the water of responsibility. Orphans are typically thought of as human children whose parents or other immediate family caregivers have died and thus become wards of the state or private foster care systems. The least thought about orphan class are so-called *social orphans*, whose caregivers cannot be in their lives due to extreme social conditions like "incarceration, extreme poverty, physical abuse and abandonment" (OLI, 2024). This distinction between the 'traditional' Bruce Wayne-style[6] orphan and the 'social orphan' is peculiar but relevant in considering the language that the Regulator employs for this hydrocarbon asset class. The history of the term 'orphan' can be traced back to many different biblical references, with it usually boiling down to 'a fatherless person' (no mention or care of the child's mother is discussed in these cases). Psalm 68:5 of the King James Bible claims God as the caregiver of these orphans as "a father of the fatherless." Orphans are even granted special legal status according to Talmudic law, including an exemption from taxation (King James Bible, 2008). Interestingly, these biblical privileges granted to orphans do have some similarities to the deserted hydrocarbon assets at hand, but I reject the anthropomorphic language of the Regulator as it only obscures the responsible fossil capitalist firms, financial lenders, and other corporate helpers who have benefited from loopholes and

[6] The child who grows up to become the *nouveau riche* fictional superhero Batman. His parents die by gunshot during a confrontation when Bruce is a child in the comic.

shortcomings in the regulatory regime. So, while they are legally referred to as 'orphans' in the regulatory language, these assets should rather be read as 'deserted' capital left for dead by fossil capitalist producers. Consequently, this dissertation presents analysis through the lens of *desertion*.[7] These assets have not been orphaned because their 'parents' have passed away, but rather they have been 'socially orphaned' due to the design and enforcement of provincial liability management.

Research Questions and Objectives

Primarily, this dissertation research is interested in the problem of unfunded socioecological-financial liabilities in Alberta's conventional hydrocarbon fields. This has required an examination of the medley of tactics that the fossil capitalist class elite have employed over the preceding years in attempts to maximize their profit streams and, most recently, to resolve the structural contradictions manifest in their regime of accumulation. The capitalist mode of production is rife with contradiction and fossil capitalist accumulation is no different. One such contradiction now percolating is the desertion of this hazardous fossil infrastructure. As capital writ large causes the physical conditions of commodity production (that is the life and land we all share on earth) to deteriorate, it is breeding interruptions in its own reproduction (O'Connor, 1998). Capital has created a two-fold, socioecological crisis. It is **first** a crisis in the mass creation of deserted fossil assets which are socioecological-financial liabilities and **second** a biophysical crisis in that industry is degrading the quality of the socioenvironments in the province, with implications for global ecology. To analyze the problem of these unfunded

[7] While I might use 'orphan' when referring to the OWA and AER's empirical data on their inventory, my own analysis herein works to avoid it.

liabilities and the capitalist class, this dissertation is animated by four central research questions:

1. What are the political ecological and political economic conditions under which fossil capitalist infrastructure is deserted in the province of Alberta?
2. How has the history and design of the AER and OWA related to shifts in the province's regulatory framework and management of corporate insolvency?
3. What are the conditions under which geotechnical organic intellectuals and labour help to produce value for fossil capitalism?
4. What are the relationships, both in terms of competition and cooperation, between the major factions of fossil capital and finance capital in these economies?

In responding to these questions, I aim to fill an important gap in the critical political ecology of conventional oil and gas extraction, with relation to the fixed capital that propels Canada's fossil extraction/production. The first question prompted some conclusions concerning why oil and gas licensees end up deserting their once-productive capital: a firm's financial health slips either due to firm-specific reasons, like poor management, or sudden spot and futures hydrocarbon market downturns. Suddenly, they cannot be stewards of this fixed capital and oversee their legally required asset AROs. Their financial lenders (or, in extreme cases, the Regulator) force the firm into bankruptcy in the hopes that they can make good on the secured loans they are owed. The fossil assets are then taken into receivership (by business management consultants or accounting firms), 'salvage sales' are organized to sell off the still-viable capital including wells and pipelines to cover the outstanding loans, and whatever unproductive equipment is left is deserted or 'disclaimed' onto the province (our *orphans)*. But, as several chapters below will argue, the story is much more complicated due to fossil capital's political power swaying the design and enforcement of the province's regulatory regime.

My initial research around question 2—how has the history and design of the AER and OWA related to shifts in the province's regulatory framework and management of corporate insolvency prompted a deeper exploration of the history of the Regulator. This was largely informed by some salient interviews with a former AER Vice President of Industry Operations and Closure and Liability and another anonymous source. While I knew from the beginning that charting the history of the AER and OWA was important to deserted assets, I did not realize the centrality of this history until I began interviewing informants. What I also knew from my firsthand experiences as a geotechnical labourer in the oil and gas industry was that little of this fossil world is possible without mobilizing the expertise of environmental engineers, mechanical engineers, geologists, environmental scientists, physical geographers, and other technical specialists. Thus, my third question–exploring the ways in which geotechnical labour and knowledge helps produce fossil capitalist value–was generated from epiphanies during my time in the environmental consultancy industry; consequently, several of my interviewees were specialists from these disciplines as well.

The fourth question concerning the relationships between extractive/productive (fossil) and finance capital developed from my readings of the legal battles which have sprouted up regarding fossil bankruptcy and the province's regulatory law regarding asset AROs. Both factions of capital rely on each other for their reproduction and the securing of profit, but they do not always get along or have congruent goals. Every firm has its own interest at heart, required to post satisfactory financial returns to its investors and make good on repayment of its debt financing. As discussed in greater depth in chapters 4 and 5, the two factions of capital are antagonistically intertwined and, like youthful sparring siblings, necessarily must cooperate at times to ensure the interests of capital as a whole in the oil patch.

The Dissertation's Arguments

Further detailed in the next section, the first half of this dissertation addresses the materiality of hydrocarbon production and regulation in Alberta. It employs political ecological and, what I term, a critical physical geological frame to analyze and critique the mobilization of techno-scientific knowledge towards profit accumulation. It goes on to analyze the recent approaches to liability management which have allowed for mass asset desertion. As I will argue, the abundance of inactive and deserted assets presents multiple compounding socio-ecological and economic problems. The fossil capitalists of the province have long been able to externalize these socio-ecological costs of doing business as they prioritize profitability and continuity of extraction above all else, possible through their political power. On the economic front, deserted assets have significant financial costs, meaning the high price tags associated with the costs of ARO.[8] The most conservative AER estimates for outstanding conventional infrastructure ARO ranges from \$60 to \$120 billion (Auditor General, 2023; Yewchuck, 2023). The socioecological threat from fallow assets, on the other hand, is the immediate and cumulative environmental health impacts stemming from aging wells and sites. The impacts of hydrocarbon development on the health of people and ecologies have been showcased in numerous studies across the physical sciences and environmental health literature. Hydrocarbon development in the province has been explicitly linked to the presence of multiple contaminants of concern including the presence of polycyclic aromatic compounds in the Athabasca watershed from fugitive tar sands emissions (Kelly et al., 2009), and dissolved methane in drinking water from leaking well bores

[8] Especially the final years-long phase of land reclamation.

(Alboiu & Walker, 2019).

Unfortunately, the province has a large problem with inactive and deserted well sites which cause settler landowners and Indigenous nations multiple problems: landowners whose lands are subjected to extraction due to Crown ownership of subterranean minerals cannot use un-reclaimed extractive lands for alternative purposes; inactivity means that no land rents are being paid to the local governments or landowners, despite the presence of the wells; issues with wellbore integrity can lead to oil and gas releases into the local environmental media (Doluweera et al., 2017). There are at least 78,000 of these inactive wells as of 2025, with little headway being made in lowering that number. But these are just issues with inactive wells which may be owned by solvent companies with cash flows such that they could shut down and reclaim the sites. This does not consider the pending onslaught of deserted infrastructure that may soon be the province's responsibility. Thus, if solvent operators/licensees are allowed to let inactive well sites sit dormant without repercussion, they will continue to externalize costs of production.

As such, I demonstrate that the continued externalization of socio-environmental costs of production onto the province of Alberta, its public, its and local ecologies is a product of fossil capital's regional (and country-wide, arguably) hegemony. But simultaneously, this asset class threatens fossil capital's hegemony, creating fissures in the broader hegemonic capitalist power bloc. James O'Connor theorized that if these exposed contradictions of production accelerate enough, they might prompt a restructuring of the conditions of commodity production - an approach I discuss further below.

In working to understand the *who* and *why* of asset desertion, the second half of this dissertation investigates some of the political practices that are representative of fossil capitalist political power in the province. I argue that the province's environmental bureaucracy (specifically the AER) can be viewed as a reflection of the society it governs. Rather than join the chorus of arguments in the literature claiming that this is a product of 'regulatory capture,' I argue that this capitalist regulatory bureaucracy was *always* designed to manage the messiness of production for the industry. It was never some 'ambivalent' and abstractly good arbiter of the public will just needing to be 'freed' from capital. Here, I am informed by the late Marxist theorist Nicos Poulantzas' theories of capitalist statecraft and the creation of what are known as hegemonic power blocs (1975b, 2008; see also Bernauer, 2020). As Bob Jessop says in synthesizing Poulantzas' view on the state as a social relation

> The state should be seen as an *institutional ensemble* rather than as a unitary political subject. It is shot through with contradictions and has no political power of its own. The power of the state is the power of the class forces that act in and through the state. (1985, p. 337, emphasis in original)

This argument is supported by document analysis of regulatory missives and communications, and thematic analysis of interviews with my key informants. I show how the political position of the fossil capitalist class in relation to the Regulator has allowed for the growth of deserted assets and their unfunded liabilities.

Altogether, this dissertation reveals a number of elements in this strange world of fossil extraction and production: (i) the complexity of the material world of hydrocarbons and their commodification under capitalism; (ii) the calcification and the utility of intensive capitalist state bureaucracy in environmental governance; (iii) the shadowy extents to which firms and their executives will go to produce shareholder and personal returns; and (iv) the nature of inter-capitalist competition between and within different factions[9] of capital vested heavily in this

[9] I will explain how I conceptualize the different 'factions' of capital (namely fossil and finance) later in the dissertation. Additionally, some theorists refer to these as 'fractions' of capital, rather than 'factions.' Nicos

accumulation base. On the latter point, one of the dissertation's key contributions centres on this inter-capitalist competition between the two major, interlocking capitalist factions in the region: fossil capital and financial capital. In Alberta, domestic oil and gas (i.e., fossil) firms are the leading extractors of hydrocarbons. Simply put, these capitalist firms extract surplus value through the lever of hydrocarbon production and commodification. Herein, I understand 'fossil capital' and 'fossil capitalists' firms as specializing in the physical extraction and circulation of hydrocarbon commodities. As discussed below, this contrasts with 'finance capital' or 'finance capitalist' which specializes in lending, and the extraction of value from, interest-bearing capital (IBC). Both the types of commodities which fossil capitalist firms extract and the necessary tools and processes for that extraction are discussed in Chapter 2.

Fossil capitalists, like other private capitals in other sectors of the capitalist economy, have long been politically organized and able to coordinate in lobby groups, usually under the title of 'association.' Today, the Canadian Association of Petroleum Producers (CAPP) represents a combination of producer and associate members who account for around 75% of Canada's total hydrocarbon extraction. The 'Big Five' corporations today in the province are Cenovus Energy, Suncor Energy, Imperial Oil, Enbridge Inc., and Canadian Natural Resources Limited (CNRL).[10] This ensemble cast that makes up the Big Five and largely leads CAPP today is an apt

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Poulantzas, one of the Marxist theorists who appears throughout this work, and his followers tend to use 'fractions.' In my own writing, and outside of direct quotes, I use 'factions,' acknowledging that I am referring to the same thing as other authors.

[10] I adopted the 'Big Five' term from Hussey et al. (2021) but modified the list from their original following the acquisition of Husky by Cenovus in 2024. While they are all headquartered in Calgary and listed on the Toronto Stock Exchange, they are not all integrated producers (a distinction in petroleum geology discussed in Chapter 2). I have ordered them according to their trailing 12 months revenues, with Cenovus leading the pack. In Husky's place I have included Enbridge, a notorious, multinational, midstream firm that ranks fourth in Canada by revenue. (Enbridge is known best in some circles for the Line 3 spill which was the largest inland crude oil release in US history).

representation of ‘fossil capital.’ But there are hundreds of other firms who also fall into this category, despite having less political power on their own.

On the other hand, there are the financial capitalist firms who bankroll fossil capitalists with the necessary credit lines to extract. Finance is very important to fossil firms due to the extent of fixed capital which extraction (as essential to fossil capitalist production) necessitates. Before a company can begin to generate any revenue from hydrocarbon extraction, it is met with huge upfront expenses in the form of seismic prospecting, license acquisition fees, buying wells, pipelines, and facilities, labour costs of infrastructure installation, and many smaller and novel pieces of their projects. This tendency grows due to the complexity of extracting more boutique reserve types (subterranean ‘heavy oils’ like what is beneath surficial tar sands deposits, for instance). As Malm and Carton argue, "there is *a tendency of fixed capital in hydrocarbon exploration to rise over time*, as absolute volumes and in relation to any quantity of oil discovered" (2024, p. 116, emphasis in original). Hence, financial capitalist firms are present to lend collateralized loans to fossil firms so they can begin or expand extraction. These financial firms make their profits from fossil capitalist firms through lending money and charging their borrowers interest on the loans. They also profit from the trading of financial instruments such as publicly traded firms’ common stock or futures contracts.

Thus, the division between fossil and financial capital for my purposes is found in the main way in which they generate profit. Fossil capitalists extract, process, upgrade, and distribute hydrocarbon commodities while financial capitalist firms lend interest-bearing capital to fossil firms or invest in them through financial instruments. Fossil capital is a type of productive capital, producing surplus value through the extraction and sale of hydrocarbons. Finance capital realizes surplus value through the interest on the money it loans producers.[11] Within this world of desertion we can observe inter-capitalist competition between extractive/productive[12] capital and finance capital, expressed through legal battles between who should be responsible for financing and overseeing the ARO of fossil assets.

With this stage set, I turn to the structure of the dissertation, noting the arguments advanced in each chapter. Following this, I outline my conceptual understanding of research methodologies and theoretical frameworks, followed by a treatment of the four semi-discrete fields/approaches which have informed my thinking around the research questions. I then discuss the three discrete methods which I used to obtain data throughout (and before) the research process.

Structure of the Dissertation

This dissertation has six chapters and is organized thematically. The remainder of Chapter 1 offers an overview of the use of methodologies and theoretical frameworks, followed by a review the academic literature about the four discrete subfields which have methodologically and theoretically influenced the project: critical political ecology, critique of the political economy of fossil capitalism, crisis theories in ecological Marxism such as the second contradiction of capitalism, and Marxian theories of capitalist statecraft, bureaucracy, and hegemony.

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[11] It is worth noting that today many corporations have their own investment portfolios, full of other publicly traded firms' stock or other financial derivatives. Fossil firms are no different in this regard. Still, as will be discussed, the financialization of hydrocarbon markets has not meant that fossil capitalist firms are transforming into financial firms. Rather, it has meant an increase in the volume of fictitious capital circulating in the industry as 'paper oil' (Labban, 2013). Much more can be said on this, so the distinctions between these two factions of capital are further broken down in Chapter 4.

[12] I sometimes use ‘extractive capital’ where ‘fossil capital’ might otherwise make sense. This is because I find it a more inclusive term for the various oilfield service providers implicated in extraction who are part of the productive process (intentionally excluding finance capital): geotechnical and environmental consultants, drillers, energy data managers, equipment maintenance firms.

Chapter 2 begins by discussing the basic biophysical and geophysical components of conventional hydrocarbon development. It is here that I introduce my conceptual tool known as critical physical geology. This charts the path to understanding how exactly deserted assets come to exist and how they are mobilized to extract and produce fossil capitalist commodities. I outline the basic steps that a firm must take to extract/produce and move hydrocarbon commodities to market, and some of the physical geologic components of this commodity production. I also discuss the e politics of hydrocarbon reserve reporting and debate the contentions and problems associated with the processes of 'conventional' and 'unconventional' reserve designation. Scholars have shown reserve reporting to be one of the principal ways that geotechnical expertise is used to create fossil capitalist value today - securing investor faith by means of geotechnical speculation; this is important context for research question 3 (see Labban, 2008; 2015; Valdivia, 2015). Understanding these geotechnical elements of fossil capitalist production is a critical component of this dissertation. My research consistently reinforced that it is almost impossible to understand the development of the regulatory regime or have substantive conversations with industry insiders without understanding the machinations and discursive terrain of these processes. Following this, I present what I call a 'conventional'[13] view of the two key organizations in Alberta's regulatory regime, the AER and OWA, detailing their establishment, historical identity changes, the portfolio of extractive assets which they oversee, and the design of their corporate governance. Within this discussion, I outline how the AER has bureaucratically organized the 'life' of a hydrocarbon well.

Chapter 3 turns to explaining the evolution of the province's hydrocarbon liability management regime, one that has changed according to the sway of fossil capital, often in

[13] A pun on the conventional vs. unconventional hydrocarbon reserve debate.

contention with the desires of finance capital in the region. I walk through the important components of the early 21st century framework that the AER first used to address the issues of insolvency and desertion. I analyze the AER's Liability Management Rating system (LMR), which has been the benchmark for determining on paper whether a firm is solvent or not (and whether they are likely to have the money necessary to pay for asset AROs). My analysis shows how these liability calculations are misleading and inaccurate, something well known by critics of the Regulator (Boychuk et al., 2021; Timoney, 2021; Yewchuk et al., 2023). I then turn to the Government of Alberta's 2020 Liability Management Framework, which has been directing the recent shifts in the Regulator's work. While the potential positive outcome of this shift will take many years to realize, it is evident that the design of the program maintains the Regulator's status quo, still under the sway of fossil capital, and acts as another tool in securing social license to continue operation and ongoing fossil fuel development.

The second half of the dissertation, starting with Chapter 4 marks a departure from the previous two chapters. I turn to a more central focus on the role of fossil capital and its strong hegemony in the province's statecraft, especially in shaping the regulatory environment. I put several of my key informants' arguments about the poor enforcement and oversight habits of the regulator in conversation with critical political economic and Marxist theories of the capitalist state. It is here that I lay out the argument that the anemic environmental regulation of the province (Carter, 2020) is a manifestation of fossil hegemony, rather than a condition stemming from regulatory capture. I problematize the theories of regulatory capture and pit them against literature theorizing fossil capitalist hegemony, rooted in the work of Gramsci's theory of hegemony (2010) and Poulantzas (1975b) theories of the capitalist state as a social relation.

I argue that the Albertan state and its regulatory regime should not be viewed as just a tool of fossil or financial capital, but rather as a container of the existing social relations present in society. As different factions of capital compete for profits within the province's hydrocarbon reserves, they also compete for political dominance and decision-making via the capitalist state. What we observe presently is that fossil capital is the regional hegemon in Alberta (and arguably neighboring provinces and the country as a whole), leading the diverse capitalist power bloc. I argue that public policy studies on the Regulator should focus on this fossil capitalist hegemony and the capitalist state's work of "organiz[ing] the long-term political interests of capital in general" (Bernauer, 2020, p. 163). This mode of analysis allows me to frame the AER in a new light, quite different from the views presented in the organization's hagiographies. In doing so, I present a type of counter-history, arguing that the purpose of this institution has been to better organize the messiness of fossil capital accumulation in the province, rather than to protect the people and local ecologies as some sort of benevolent steward. Further, I argue that the choices made in modifying the liability management regime have always been to protect fossil capital returns over other factions of capital. I examine the changing design, and specifically its 21st-century metamorphosis, of the AER over recent decades, as its focus has narrowed toward the sundowning of the conventional sector during the growth of its unconventionals in the tar sands.

Chapter 5 then turns specifically to the OWA. I examine how the OWA was founded by the fossil elite as a socioecological/regulatory fix to the crisis of asset desertion in the province. I argue that the crisis of mass asset desertion is one manifestation of the second contradiction of capitalism, à la O'Connor's work (1988, 1998) discussed in the theoretical overview section of this chapter. As I demonstrate through analysis of internal and external policy documents, the OWA was founded to ensure the industry's continued access to the province's reserves, despite the growth of socioecological externalities of production which are hazardous to the people, local ecologies, and the province's coffers. I further deepen this argument via the theoretical framing of Kevin Surprise (2018) to argue that the OWA was an attempt to overcome this second contradiction of capitalism. Nonetheless, it appears that the contradictions of fossil production are proving too strong, as elite attempts to manage the growing crisis are too weak to stymie the coming waves of desertion, potentially threatening their class hegemony.

Exemplar of both the hegemony of fossil capitalism in the province and the OWA's manifestation as a fix for crisis, I examine what are colloquially known as the *Redwater* decisions, a series of legal cases which rose to the Supreme Court of Canada (SCC) and contemplated who is responsible for ARO in the case of a licensee's bankruptcy. The *Redwater* case illustrated the ways in which inter-capitalist competition and fossil capitalist hegemony has manifested in the province. It likewise highlights the way that the OWA—and, by virtue, the AER—has worked to constrain finance capital in the province. I show how the AER and the country's court systems adjudicate between the competing factions of capital to support the long-term goals of capitalist accumulation rather than the more immediate goals of one particular unit of capital. But the Regulator mediates under the sway of fossil hegemony as this faction remains the leader of a fractured and delicately balanced capitalist power bloc today. In forecasting the future of this asset class, I argue that these attempts by the fossil capitalist elite to resolve these contradictions of production–the province's liability management framework and enforcement, and the creation of the OWA–will not stymie the coming waves of mass asset desertion.[14]

The concluding chapter reviews the dissertation's findings, the limitations of the research

[14] This ultimate point lends itself to analysis of how the fossil elite are actively planning to employ climate capitalist fixes to problems like the deterioration of the biosphere via the overproduction of carbon dioxide. Private fossil capitalists' and the petro-state's desire to continue extraction at any cost is exemplified through the rapid greenlighting of firm's own carbon capture and storage projects, ensuring unconventional reserve extraction—as the geophysical base of accumulation continues to pivot towards the province's unconventional tar sands reserves—can continue. This point is explored briefly in Chapter 6 but certainly merits its own unique case study.

design, and broader theoretical implications of this study, including for broader debates in Marxist political economy and the stats. I note its contributions to the broader study of fossil capital in Canada including with relation to the role of the petroleum sector in modern capitalist statecraft and policy creation. I consider the implications of the study for different readers, including the relevance of this research for fellow scholars in the field, along with policy makers, and activists struggling against the hazards of fossil capitalist extraction.

Research Methodologies, Methods, Theoretical Frameworks

I followed Sue L.T. McGregor's contour of 'methodology' as "the philosophical assumptions underpinning research, assumptions that inform how these data are interpreted, leading to new knowledge. Methodology determines methods, not the other way around" (McGregor, 2018, p. 183). Methodologies also flow from, and co-constitute, theoretical frameworks. Another way of thinking about this is that "methodology is the interface between ontology (how the world is), epistemology (how the world can be known), substantive theory (how the world is understood), and method (how the world is examined)" (Montgomerie, 2017, p. 4). Anfara and Mertz define a theoretical framework as, "any empirical or quasi-empirical theory of social and/or psychological processes, at a variety of levels (e.g., grand, midrange, and explanatory), that can be applied to the understanding of phenomena" (2015, p. 55). Thus, methodology and theoretical frameworks are definitionally intertwined here in that they both are based on a select philosophy which determines the approach to some object of analysis.

My mixed-method frameworks tended towards the qualitative and fall into the catchment of several semi-discrete research approaches including critical political ecology (CPE), political economic critique of fossil capitalism, ecosocialist theories of capitalist contradiction and its crisis tendencies, and Marxian theories of capitalist statecraft including the function of its bureaucracies and the role of ideological hegemony. While these are the broad methodological frameworks that guided my thinking and writing, I also examine the theories surrounding capital's 'fixes' to crisis, which I have applied to narrow my understanding of the relationship between the Regulator and the industry. In Chapter 5, I look at socioecological 'fixes' to capital's structural contradictions to explain the founding of the OWA.

Finally, there are also several fields of techno-scientific study which I do not review but are germane to my interviews with the study's key informants including environmental health, toxicology, and forest ecology, I engage these, particularly in chapter 2, through an approach I refer to as 'critical physical geology,' following on the literature in critical physical geography. Most of these physical scientific subfields are not central enough to merit their own overview in this work, but the worlds of physical and petroleum geology took on leading roles in my research as I collected data and developed critique. Departing from this methodological context and overview of my methods, the remainder of this chapter synthesizes the four overarching, and intersecting, fields of theory that inform the dissertation.

My Mixed Methods and Theoretical Frameworks

My research follows the idea that "political ecology retains a *methodological commitment* to in-depth, direct observation involving qualitative research of some sort, often in combination with quantitative methods and/or document analysis" (Bridge et al., 2015, p. 7, emphasis in original). In the iterative, mixed-methods approach to this study, I employed document analysis, semi-structured key informant interviews, secondary analysis of ecological scientific gray literature, and some autoethnography.

Document Analysis and Autoethnography

Hobbs identifies ethnography as "a cocktail of methodologies that share the assumption that personal engagement with the subject is the key to understanding a particular culture or social setting" (2006, quoted in Kozinets, 2010, p. 59). Thus, this dissertation falls into the ethnographic realm. But before the ethnographic components of my research began, my cocktail of methodologies included extensive document analysis of government gray literature. This was an iterative, mixed-method (qualitative and quantitative) process, combining content analysis and thematic analysis in seeking out patterns and recurrent themes across the material. My empirical data collection centered on filings and reports from the AER, OWA, the Auditor General of Alberta, the Society of Petroleum Evaluation Engineers, the Petroleum Society of Canadian Institute of Mining, Metallurgy, and Petroleum (CIM), and various records obtained through Alberta's *Freedom of Information and Protection of Privacy Act* (FOIP).[15] At the beginning, this included the AER and OWA's annual reports, largely from the 2015 to 2023 fiscal years. I analyzed the OWA's annual reports because they provide detail of ongoing reclamation projects and numbers (sites already decommissioned), year-over-year orphan well inventory fluctuation, facility decommissioning (sites not in reclamation), and fiscal statements that include revenues (from industry operators required to pay tariffs to the association), and general expenditures. I analyzed the litany of different directives, manuals, and operational frameworks from the AER

[15] I did not make the FOIP requests for these documents but one of my sources was kind enough to share a tranche of disclosures with me. Likewise, many authors who focus on this field have had to make their own FOIP requests and kindly accompany their publications with the reports generated for them. As such, I quote both these reports and the authors' analyses at different times.

that inform policy decisions and enforcement.

Document analysis was an apropos method for this project because of its many advantages to a novice researcher: it is an efficient use of time; there are many documents available without authors' permissions; it is cheap; it is unobtrusive; it is stable insofar as the documents go unchanged once published; it is exact and broad. Document analysis is also a great approach to the study of institutions (like the province's regulatory bodies) as these texts are where the state formally negotiates its biddings, explains its rationale for projects, and accounts for its public coffer expenses with its subjects. In a sense, this was dually a discourse analysis with a lot of reading between the lines. Rapley here says, "when studying texts, you are also interested in *the rhetorical work of the text*, how the specific issues it raises are structured and organized and chiefly *how it seeks to persuade you* about the authority of its understanding of the issues" (2007, p. 113, emphasis in original). I found a great deal of rhetorical spin, obfuscation, and omission throughout these texts when compared to the analysis and calculations of my interviewees. More than not, the most important material circumstances of the situation were occluded in the province's reporting. More than anything, the province has been working to assure readers that things are under control, that industry players are paying their financial and proverbial social dues, and that the Regulator continues to have the situation under control.

During my analysis I focused on the formal rules, regulations, and organization of the province's institutions more than anything else. When I conducted interviews or developed a political economic critique, I focused on less transparent elements that were absent from the official records. This included things like the miscalculated ecological and social costs of extraction and human and non-human livelihoods impacted by development. Beyond the formalities, there were countless threads that showed the informal, sometimes illegal, ways that private capital operated against institutions' policy and law, albeit sometimes the Regulator's implicit consent. Accounting for both is "important for politics because they shape who participates in a given decision and, simultaneously, their strategic behaviour" (Steinmo, 2008, p. 124). Taking this view helped to prevent the flattening of my objects of analysis and stopped me from chalking everything up to simple explanations such as this all being a product of the inherently exploitative relations under fossil capitalism, or the pure pursuit of capitalist profit. That said, the document analysis method at large has some disadvantages worth mentioning: the insufficient detail within the documents analyzed; documents may be deliberately blocked from access by their producers; and there can be selection bias within the process (Bowen, 2009, p. 31).

I was inspired to follow O'Leary's process for interrogating texts: gathering relevant texts → organizing them →exploring the text's agenda → exploring background information on the creator → asking questions about the text → exploring the content itself (2017, p. 843). Bowen's and Rapley's approaches and procedures for conducting document analysis were also important to this process. Bowen says that the purpose of this analysis is to "provide background and context, additional questions to be asked, supplementary data, a means of tracking change and development, and verification of findings from other data sources" (2009, p. 30-31). Most crucially, Rapley led me to "*focusing on what is said*–and how a specific argument, idea or concept is developed—as well as *focusing on what is not said*—the silences, gaps or omissions" (2007, p. 111, emphasis in original). This process was generative and allowed me to craft more interesting and insightful questions and conversations within my interviews which were critical in finding new threads within this tangled web. The reviewed documents needed to be analyzed and contextualized alongside data from the semi-structured interviews to properly piece together the puzzle.

As my employment history has been shot through with work in and around a medley of extractive industries of Turtle Island, I was compelled to include some autoethnographic notes throughout the dissertation. According to Ellis & Adams, “autoethnography implies connection: the stories we write connect self to culture; the way we research and write these stories blends social science methods with the aesthetic sensibilities of the humanities” (2014, p. 255). This method is different from academic convention in that it is in the first person, thus reading more like a biography or novel full of vignettes, is more readable than academic writing, “highlights emotional and bodily experience,” and subsequently invites emotional response (Ellis, 2008, p. 50). While I was not actively working in the industry at the time of researching and authoring this dissertation, I was reflexive during my professional field work, where I first began developing the questions to which it responds. In many senses, my experiences in the field informed my initial insights into my research questions, especially regarding how geotechnical labourers fit into the equation of the fossil capitalist value creation. I join many in making “a turn” towards this research approach which helps “shift from viewing our observations of others as non-problematic to a concern about power, praxis, and the writing process” (Ellis, 2008a, p. 48). But this was not a primary method through which I collected my data and as such, my reflections do not live in the body of the text. Like in the beginning of this chapter, I make my personal interjections randomly, largely in the footnotes of the text, where my personal knowledge and stories are relevant to my analysis.

Secondary Analysis of Ecological and Technical Grey Literature

There is a great deal of technical, quantitative data on the fossil industry produced in-house by firms and made available either via annual reporting or product of self-investigation following high profile environmental releases.[16] As such, this dissertation included analysis of government, independent, and industry-produced reporting on the biophysical ecological and geophysical conditions and consequences of hydrocarbon production. This body of research was essential to this project as to avoid accusations of not "engag[ing] questions of biophysical ecology or environmental change in more than a glancing manner" (Walker, 2005, p. 76). Like document analysis writ large, this method is great for a junior researcher as it saves on cost and time, gives access to high-quality data, can offer new interpretations of data, and gives more time to analysis over collection. There are likewise some limitations to this approach, stemming from the fact that I was not the primary researcher (Bryman, 2012, p. 312-315). For one, I was not familiar with the datasets, and it took a prolonged period of familiarization as there are many independent variables across most studies which make them complex. Second, I was unable to control the

[16] Consider here Imperial Oil's Kearl tar sand processing plant and mine tailings pond releases of 2022 and 2023. While there are many everyday muted disasters (Engel-Di Mauro, 2014) in the slow leakages from tailings ponds, the Kearl pond releases made national headlines for the 5.3 million litres of waste process water released into the Athabasca River watershed. This has sparked both a federal investigation by Environment and Climate Change Canada (ECCC) along with a lawsuit against the AER from the Athabasca Chipewyan First Nation for alleged failures in regulating releases (Kamnitzer, 2024). This has created a medley of industry and government research into the ecological impacts, clothed in political spin. The ECCC is mandated to respond to issues that threaten the habitats of fish-bearing waters as a product of the *Fisheries Act*. Fossil capitalist firms, on the other hand, have emergency preparedness teams that respond in the event of environmental releases. As important as the physical responses to releases (cleaning, remediating, and reclaiming impacted environmental media) is a firm's public perception of preparedness and environmental stewardship. Despite, say, tailings ponds being known sources of fugitive emissions including volatile organics, carbon dioxide, and methane, it is imperative that firms mitigate negative investor sentiment and issues of public trust when discussing internal findings on environmental impacts. The patchwork of responses has come to include periodic dated updates, recorded videos of monitoring results, and the employ of mid-level public relations positions including a 'Socioeconomic Advisor,' in Imperial's case (Imperial, 2024).

For my own part, the first time I sampled a drainage pond filled with process affected water, I had little idea what it was. In my time as a staff environmental scientist conducting groundwater sampling events after self-reported process water or liquid hydrocarbon releases, I dealt with a great deal of contaminated water, not so different from process water. After a release occurred, groundwater monitoring wells made of perforated one-inch PVC pipe would be installed to the depth of the first groundwater aquifer with a hollow-stem auger. The PVC wells will fill with the aquifer's water which can then be extracted with a peristaltic pump and collected for assessment of BTEX/MTBE, as described above. But, to capture an accurate sampling of the aquifer, several gallons would have to be purged from the sampling well before a representative sample could be captured, according to the U.S. Environmental Protection Agency's Science and Ecosystem Support Division's standard operating procedure for groundwater sampling, SESDPROC-301-R3.

quality and what variables are examined, which is a substantial issue in the case of industry-produced reports and calculations. In this case, I was made to accept the industry numbers in some instances, while simultaneously critiquing them for known shortcomings in other instances. Nonetheless, this method of investigation was important as there remains strict corporate control over large tranches of internal data (see Gilbert & Zalik, 2019; Watts & Zalik, 2020), important as I do not have the tools, expertise, or access necessary to collect this type of primary data at this point in my career. I benefited in that my physical scientific background allowed me to assess and interpret datasets and research on subjects including petroleum processing technology and methods, petroleum reserve reporting, and impacts to local ecosystems.

Semi-Structured Qualitative Key Informant Interviews

Alongside the document analysis, I collected data through semi-structured qualitative key informant interviews. These interviews were made to be "exploratory and qualitative, concentrating on the distinctive features of situation and events, and upon the beliefs and personal experiences of individuals" (Vromen, 2010, p. 258). This is an ethnographic method which specifically seeks out informants (interviewees) who are experts and insiders in the field and, as such, large wells of information (Marshall, 1996). Prioritizing participants like these saves time and resources and can produce high quality data in an abbreviated period, compared to large in-depth studies with dozens of interviewees, which necessitates multiple rounds of coding and analysis. The purpose of these interviews was to "attempt to understand themes of the lived everyday world from the subjects' own perspectives" (Brinkmann & Kvale, 2018, p. 3). The specific themes of their worlds being the ways that desertion and wasting happen throughout the hydrocarbon economy they are embedded in. While much can be gleaned from publicly available state documents and reports there is much in the hidden abode of production (to, once again, invoke Marx) which industry critics and veterans know well.

There are limitations with selecting a sample group such as this as bias of interviewees and distance from society's majoritarian views of the phenomenon may be evident. Further, maintaining interviewee anonymity due to the limited size of the professional community involved can be challenging. These interviewees also have public facing professional lives and they are limited in what they say for fear that it will become part of their organization's public record. So, while their profiles and contact information may be easy to find via their public facing organizations or networking websites, this is simultaneously a large limitation in what they are willing to share. As such, "key informants might only divulge information that is politically acceptable and social rules could discourage the researcher from publishing potentially sensitive data which may be ascribed to a particular informant" (Marshall, 1996, p. 93). I was faced with these issues of anonymity and public scrutiny in multiple interviewee groups.

I conducted seven interviews with people from four broad groups connected to Alberta hydrocarbon development. These groups were: current OWA/AER staff, former OWA/AER staff, OWA prime contractors, and not-for-profit organization members (including landowner advocates, ecologists, and a toxicologist). I interviewed all the way up the regulatory food chain, including the President of the OWA, and a former Vice President of the Closure and Liability Branch of the AER. I used convenience sampling to identify interviewees, relying on networking sites like LinkedIn or their publicly available contact information to make first contact. My sampling snowballed through interviewees suggesting additional interviewees with greater knowledge on specific subjects including liability management, environmental health, and other interrelated fields.

I had several generic questions for each participant group including their background, relevant education, how they came into their current career, their tenure in the Alberta hydrocarbon industry, their knowledge about deserted assets in the province, and what they think should be done going forward. The sample interview questions I began with are in Appendix B. The interviews lasted anywhere from 30 minutes to two hours, and all interviews were conducted via Zoom or telephone. Barring those who wished to remain anonymous or not be recorded, all interviews' audio was recorded. Zoom now provides automatically generated transcriptions which I used as the basis for transcription. I checked the generated transcriptions against the audio files and corrected them where necessary. Since I did not code and analyze the interview data *en masse*, I did not require precise transcription and software like NVivo for my analysis. I now will turn to the theoretical frameworks which informed my research agenda.

(1) Critical Political Ecology

As the CPE field is very broad, much of my analysis and methodology is informed by scholars who address Canadian hydrocarbon production through studies of the Canadian fossil capitalist elite (Carroll, 2021a; Hussey et al., 2021; Zalik, 2008) and the political economics of production (Adkin, 2016; Carter, 2020; Janzwood & Harrison, 2023; Janzwood et al., 2023; Zalik, 2015a, 2015b). The *critical* element of CPE comes from its pursuit of knowledge which is emancipatory and which critiques taken-for-granted power structures towards an either symbolic or literal liberation (McGregor, 2018). For Timothy Forsyth (2003) this means, "the successful integration of political analysis with the formation and dissemination of understandings of ecological reality" (p. 20). According to Forsyth, critical political ecology follows from "critical science," critical realism, and critical theory (2003, p. 262). He puts it another way, simply as: "a 'critical' political ecology is an ability to reveal the hidden politics within neutral statements about ecological causality" (2003, p. 51). The critical scientific influence pays attention to the inherent political condition of the physical sciences and critiques orthodox scientific principles (the Philosophy of Science) and practices towards socially just ends. According to O'Leary, the broad preconditions for the project and researcher in the CPE practice are: "criticality; radical views; and emancipatory goals" (2017, p. 602). Likewise, Carter and Zalik outline the critical political ecology framework as a transdisciplinary approach informed by "critical political economy, cultural geography, colonial history, and environmental sociology" (2016, p. 54) which accounts for mutually constituted conditions of the "natural world" and human social relations. I have long been attracted to this methodology as my research is dedicated to emancipating our world from the violent hegemony of the fossil empire (Malm & Carton, 2024). Or, more simply as Fernando Coronil put it "the struggle for life is the matter" (Coronil, 2019).

Political ecology writ large is also necessarily *socio*political or *socio*environmental. Adkin here says, "all of the crises confronting us today—from global poverty to climate change—are dual in this sense: they are simultaneously and dynamically, both social and ecological" (2016, p. 5). Or, for Robbins, "politics is inevitably ecological and that ecology is inherently political" (2012, p. 3). Addressing the fabric of social relations, as through analyses of class and power within political economy and capitalist statecraft, or the territorialization of colonized land upon which research is done, appears inescapable within the field. Further, it also seems unavoidable that CPE, or liberation ecology à la Watts and Peet, be linked to social movements and political organizing in resistance to extraction and exploitation. Indeed, the struggle over power and autonomy is directly correlated to the control of "resources".[17]

While subsoil and subterranean research have not always been front and centre in the political ecology tradition (Bebbington & Bury, 2012), the Canadian hydrocarbon subterranean and surficial socioenvironments have been extensively researched. Laurie Adkin's edited volume, *First World Petro-Politics; The Political Ecology and Governance of Alberta* (2016) significantly informed my approach. As Adkin states, the volume's focus on Alberta aims "to make a broader contribution to the development of political ecology as a theoretical approach and to its application in a first world context" (2016, p. 5). The contributors address media framings of hydrocarbon development (Davidsen, 2016), environmental governance on impacted Indigenous nations' territory (Parlee, 2016), Alberta's potential towards a green energy transition (Weis et al., 2016), and more. Carter and Zalik specifically use political ecology as an approach to account for the transnational nature of externalities of extractive operations in Alberta as "all local or regional objects of study are in fact constituted by socio-political relations encompassing diverse actors and sites" (2016, p. 54).

Like many in the field of political ecology, Adkin's, Carter's, and Zalik's approaches are in-part informed by historical materialism and/or Marxist political economy and geography and this, too, influenced my orientation from writers throughout the historical materialist framework (Altvater, 2007; Fast, 2014; Foster, 1999; Foster & Burkett, 2016; Moore 2016). Many of these writers have adopted the specific terminology and view of modern capitalism as fossil capitalism (Carroll, 2021a, 2021b; Huber, 2009; McCreary, 2022; Scott, 2013; Zalik, 2008). It has been a

[17] While I did not have space to seriously take up the work of advocacy groups and social movements struggling against capital in the province (like the Alberta Liabilities Disclosure Project, Action Surface Rights, and Keepers of the Water) in subsequent work, I hope to examine how these resistances have formed and to understand what information and analysis they need to grow. Though I disagree with some of the tactics and specific arguments groups might make, I hope the disagreements can lead to a strengthened collective vision of a different future.

useful heuristic for my research agenda as it attends to the many historical and contemporary institutions and actors in the hydrocarbon economies across multiple scales.

(2) Critique of the Political Economy of Fossil Capitalism

Again, for the purposes of this dissertation, I am particularly interested in studies which have examined the power and control of the Canadian fossil capitalist elite, including Adkin (2021), Bernauer (2020), Carroll (2020; 2021a), Carter (2020), and Zalik (2008; 2015a). Many, but not necessarily all, centre the concept of fossil capital/ism. Fossil capitalism is an analytic concept used to 'energize historical materialism' (Huber, 2009) which has appeared over the last two decades and helps account for the relationships between hydrocarbons and capitalist accumulation. This approach has led to a reformation of some ecological Marxist theory and methodology, even amending Marx's circuits of capital (Malm, 2016). I understand fossil capitalism as the modern, hegemonic mode of production and accumulation of global capitalism which has multi-scalar impacts across peoples' everyday lives, their local communities, state institutions, national governance models, and transnational policy and planning (Carroll, 2020; Huber, 2013). It is a historical-materialist approach to energy (especially hydrocarbons) and the political economy of nature, based on a critique of capitalist political economy as set out by Marx, Engels, and other 19th century libertarian socialist philosophers. Suffice it to say, there have been many more explicitly ecological Marxist and ecological socialist analyses of energy-systems, critiques of mainstream ecological economics, and approaches to ecological crises (Angus, 2016; Burkett, 1999; Foster et al., 2011; Deleage, 1989; Foster & Burkett, 2000; Holleman, 2015; Saito, 2020).

Fossil capital's global omnipresence is a product of many specific historical and/or social processes but, most centrally, it is borne of capitalism's "inherent and unavoidable dependence on fossil fuels, and particularly on oil" (Altvater, 2007, p. 39). The reasons which Altvater and his interlocutors provides for this are threefold: 1) industrial manufacturing does not need to be fixed to certain geographic spaces where energy resources are available as hydrocarbons can be transported anywhere in the world today, notwithstanding the extreme risk offloaded onto local ecologies and people along these routes (Gilbert & Zalik, 2018; Pasternak & Schabus, 2019; Tienhaara & Walker, 2021); 2) hydrocarbons can be constantly consumed, day and night, independent of social and/or biological schedules as they are stores of energy awaiting combustion, unlike solar or wind which must be consumed or stored immediately; 3) hydrocarbons are a very flexible energy input which frees capitalist production from previous constraints and "mobilization and acceleration of economic processes and in a degree of individualization of social life never before experienced" (Altvater, 2007, p. 41). This multi-faceted flexibility of hydrocarbons has allowed human activity to expand faster and farther than ever before and is a perfect bedfellow for capitalism.

That said, Scott (2013) complicates the premises of Altvater's first two points by explaining the difficulty inherent in exporting some fossil fuels from their extractive frontiers: vast landscapes with difficult to terraform terrains; extensive resistance to extraction, especially with the country-wide, Indigenous-led resistance to 21st century pipelines, processing facilities, and export terminals in Canada; and financial investor weariness and aversion to social risk translated to economic risk in the face of these barriers and difficulties. Weathering the storms of resistance has necessitated that fossil capitalist elites be active in lobbying government officials, realizing their political power through capitalist states and international organizations. Limiting state commitments to international environmental agreements like the Kyoto Protocol or Paris

Accord and reducing too much oversight of environmental monitoring and assessment are imperative to this elite as well (Scott, 2013). As will be examined throughout Chapters 3 and 4, I describe how, to address the problem of desertion, the fossil capitalist elite develops policy and monitoring programs and entire organizations (like the OWA) in cooperation with the state. The most important to this dissertation is how this system sustains its cultural and political economic predominance (both the economic base and superstructural components of society, in a Marxian sense). As an engine of the global world economy, fossil capitalism reproduces itself in many insidious ways at multiple scales of life. Carroll identifies several scales of fossil capitalist hegemony beyond the immediate harm to workers and local ecologies. On the smallest scale, in the everyday life of people as consumers, we can consider the hegemony of "fossil-fueled consumer capitalism as a way of life," exemplified in the use of private cars as transportation thanks in part to extensive suburbanization. Moving up in scale, small settler communities that benefit and/or are impacted by hydrocarbon production adopt an identity aligned with the oil industry. Indigenous nations in the geographic and social way of production may work with extractive firms as "a way of asserting their right to self-determination and of influencing management decisions regarding environmental sustainability" (Atleo, 2021, p. 355). Extractive firms' interests seep into public education programming and 'petro-universities' in oil-rich locales are "expected to perform functions that correspond to specific industry needs… as training centres for graduates who go to work for the fossil fuel companies" (Adkin, 2021, p. 274). On the next rung up, the entire sub-national province or state may be dedicated to the industry's continued production, as is the case with Alberta's disposition as a hydrocarbon-rich place. This is marked by "spending on government 'communication strategy,' branding exercises, international promotion of the government's 'clean energy' brand for the province and subsidization of research aimed at extending the life of fossil capitalism" (Adkin & Stares, 2016, p. 190-191). In the case of hydrocarbon-rich countries with export-based hydrocarbon economies, like Canada, this becomes a matter of national interest and public policy becomes dedicated to continued production through "low-tax, light-regulation neoliberalism" (Carroll, 2020, p. 11). At the most macro scale, we see transnational collusion to "maintain fossil-capital predominance" through the drafting of extractive-friendly international environmental policy which helps manage the intrinsic crises of fossil capital like production gluts or social pressures in opposition to extraction (Carroll, 2020, p. 9). In zooming in on a provincial register, we will see in Chapters 4 and 5 ways in which this hegemony has normalized political and policy practices designed by major players in the industry to preserve profits and allow for continued capital accumulation.

In attempting to account for this specific form of statecraft, this research is also interested in understanding the clustering of the fossil capitalist oligopoly (Hussey et al., 2021). The Canadian industrial corporate elite guiding the production and distribution of hydrocarbons naturally organize around hydrocarbon reserves, especially the Alberta tar sands today. While hydrocarbons have allowed great flexibility to capitalist production (à la Altvater above) extractive firms are still very much tied up with largely immovable, fixed capital: "The equipment, physical structures, and other tangible property bound up in the flow of bitumen from pit to refinery" (Hussey et al., 2021, p. 36). This capital is geographically or spatially fixed and used in the means of producing commodities where it stays. It is fixed in the sense that it is absent from the ongoing circulation of money capital, and its value is imbued into commodities as it wears down through the production phase of the circuit of capital.

In this research project, the deserted infrastructure throughout the province is a form of fixed capital as its title, ownership, and liability can be exchanged between extractive firms, but it never actually moves through the circuits of capital as a commodity itself. One example is the OWA-run salvage sales that sell used oil field equipment from defunct companies at discounted costs in attempts to repay creditors and fund cleanup costs. As such, this fixed capital "can then still circulate in the same sense as immovable property generally - as title; but not as use value; it cannot circulate in the physical sense" (Marx, 1993, p. 740). For reference, the Big Five operators had more than $278.8 billion worth of such fixed capital assets in 2017 (Hussey, et al, 2021). But all these productive flows of fossil capitalism are rife with structural contradictions and often foment crises, as their unsustainability reaches fever pitch. Thus, theorizing capitalism's crisis tendencies is also a critical piece of this puzzle.

(3) Crisis Theories and The Second Contradiction of Capitalism

We now arrive at the leftist critique of capital's intrinsic contradictions, originally spurred by Proudhon (1847) and Marx (1867) and popularized later by many thinkers including Rosa Luxembourg (1917), Louis Althusser (1962), and David Harvey (2010), to name a few. The ecological Marxist theorist James O'Connor's theorizing made a special addendum to this body of work, and he co-founded the journal *Capitalism, Nature, Socialism* with Barbara Laurence in 1988 as a place for international and interdisciplinary ecosocialist/anti-capitalist debate. In particular, he is best known today for his ecological Marxist writings on economic crises vis-a-vis the second contradiction of capitalism. I will note again that while this dissertation is deeply indebted to O'Connor's work on the second contradiction, I focus on moving beyond ecological Marxist thinking alone. Still, this theory is valuable to my analysis, and I believe it to be very useful in explaining the puzzle of production and desertion in the province today.

The second contradiction of capitalism refers to the destruction of the 'external conditions of production' vis-a-vis hazardous outputs like hydrocarbon waste and environmental health threats posed by spills and leaks. This dissertation considers the potential of the continued externalization of socioenvironmental and financial costs of hazardous, deserted infrastructure to undermine capital's ability to reproduce itself and, even, spur a shift towards the socialization of energy production. While the impacted lands and local ecologies surrounding hydrocarbon development are not produced as commodities, similarly to labour and money itself, they are often treated as commodities, prompting socio-ecological degradation and crisis (Polanyi, 2001). According to O'Connor, the "most important meaning of crisis, including ecological crisis, would seem to be 'turning point,' and thus 'time for decision'" (1998, p. 137). In traditional Marxist thinking, this turning point can get a society on the road towards democratic planning around the production of commodities and use of collective resources. In ecosocialist traditions, this can translate as "a new society based on ecological rationality, democratic control, social equality, and the predominance of use-value over exchange-value" (Löwy, 2007, p. 294). In the first instance, this would begin through the restructuring of both productive forces and the production relations through, again, planning, nationalizing production, and collective sharing in the profits (O'Connor, 1988). In the ecosocialist tendency, it is through a restructuring of the internal and external conditions of production that undergird the system. But what precisely foments these crises of production and what else makes these 'two roads to socialism' different?

The 'first' crisis of capitalism, which is more central to orthodox Marxist theory, is the contradiction between the forces and conditions of production in its class divided society. In the case of overaccumulation, the first contradiction of capitalism (juxtaposed with O'Connor's second contradiction centering on the socio-ecological destruction) is expressed as the ever-increasing exploitation of its workers as capital continues to expand, causing a crisis in aggregate demand and an inability for workers to socially reproduce themselves (their circuit of C - M - C is interrupted when the sale of their commodified labour power does not enough garner enough money to buy all the commodities they collectively work to produce). Overaccumulation by capitalists can create a short in the circuits of capital as value and surplus value from increasing exploitation cannot be realized (Surprise, 2018). Capitalists' profits end up being lowered in their hunt to defend or improve them through the driving down of wages and the use of advanced technology that reduces the socially necessary labour time of a commodity's production. This contradiction is strictly a profit realization crisis for the capitalist. As O'Connor queries, "[w]here does the extra commodity demand that is required to buy the product of surplus labor originate?" (1998, p. 162). If severe enough, this might lead to a crisis-induced change and restructuring in both individual capitalist production and in production relations "between capital, within the state, and/or between the state and capital which are introduced with the aim of exercising more control of production, investment, markets, and so on" (O'Connor, 1998, p. 164). This is how various Marxist analysts, and notably Polanyi (2001), argue that such crises can precipitate a transformation of the social/productive forces to form countermovements - socio-political organizations making demands of the state which seek to constrain and regulate capitalism.

All of this "crisis talk" has been a mainstay in anti-capitalist or socialist theory since even before Marx. But, as O'Connor argues, "the point of departure of an 'ecological Marxist' theory of economic crisis and the transition towards socialized production is the contradiction between capitalist production relations (and productive forces) and the *conditions* of capitalist production, or "capitalist relations and forces of social reproduction'" (1988, p. 16, emphasis in original).

This is precisely the reason for the genesis of O'Connor's work on the *second* contradiction. His 'conditions of production' can be divided in three: the conditions that allow labourers to socially reproduce labour power, the land as the physical, external, "natural" conditions necessary for production, and the more general and collective social and physical infrastructure like roads, education, health services, or means of mass communication. But these 'production conditions' are not commodities crafted and brought to market but instead are fictitious commodities, much like labour power and money (not money capital). As Polanyi says:

> Labor is only another name for a human activity which goes with life itself, which in its turn is not produced for sale but for entirely different reasons, nor can that activity be detached from the rest of life, be stored or mobilized; land is only another name for nature, which is not produced by man; actual money, finally, is nearly a token of purchasing power, which, as a rule, is not produced at all, but comes into paying through the mechanism of banking or state finance. (2001, p. 75-76)

Thus, the second contradiction is borne from the ways that the environment, along with human labor and other physical human-made space and infrastructure, absorbs ecological externalities of capitalist production. These conditions of production (air, water, soil) can be regulated by the state through the creation of environmental law and policy as they continue to be toxified by capitalist production. The second contradiction economically manifests as a tendency toward underproduction of capitals due to the degradation of the fictitious commodities that are outside of the production of value and a subsequent threat to profit realization due to liquidity shortages. The capitalist state's expansive, and highly bureaucratized, policy networks enter here to govern private capitals' access to natural resources, labour power on the market, and access to infrastructure and space. This has an especially important consequence: "The state places itself (or mediates) between capital and nature, with the immediate result that the conditions of capitalist production are politicized" (O'Connor, 1998, p. 164-165). This is important as the state's policies may even lead to either a crisis of legitimacy or political crisis for the ruling parties determining the policy decisions. This politicization can be contradictory and uneven among private capitalists with some benefiting and some losing out due to their specific industrial, financial, or commercial bent or geographic location. This results in private capitals attempting to protect their corners of the market (and profits) through protracted struggle that ensures their access to the conditions of production. This will be evident in discussion in Chapter 5 regarding the frustration which financial capital experienced as the Supreme Court of Canada ruled that ARO outlined in provincial environmental statute legally superseded components of federal bankruptcy law. The Canadian state's legal intervention had policy impacts meant to preserve and do necessary maintenance within the geophysical base of fossil capital accumulation. As will be argued, this has created new competition, as finance capital is no longer so easily able to reap profits once their borrowers went belly up. How I have understood and analyzed such law and policy decisions has not been informed by orthodox law and policy readings. Instead, I have turned towards Marxian theories of capitalist statecraft and the role of ideological hegemony in shaping the networks of environmental governance, policy, and enforcement practices.

(4) Marxian Theories of Capitalist Statecraft, Bureaucracies, and Fossil Capitalist Hegemony Against 'Regulatory Capture'

My final methodological approach is a synthesis of three related approaches to understanding capitalist institutions and their bureaucracies: theories of capitalist statecraft, Marxian critique of the formation and function of bureaucracies, and a theory of modern fossil capital's hegemony, which all collectively function in "organiz[ing] the long-term political interests of capital in general" (Bernauer, 2020, p. 163). Several researchers critical of hydrocarbon industries and capitalist state regulatory regimes argue that modern regulators are subject to regulatory and/or corporate capture, deflating their ability to oversee and constrain the industry they regulate.[18] Regulatory capture is a variable term, but can loosely be described as "the result or process by which regulation, in law or application, is consistently or repeatedly directed away from the public interest and toward the interest of the regulated industry, by the intent and action of the industry itself" (Carpenter & Moss, 2014, p. 13). According to the literature, this can happen for many reasons, across any regulated industry, and the mechanisms causing capture can be interlinked. It is argued that this happens in the cases of industry-funded regulators (as with the AER/OWA), or as a product of political lobbying and donations (CAPP's persistent policy work), or via the allure of much higher paying jobs within the industry they are regulating (Kwak, 2014). This theory leads to the idea that a 'captured' organization need only be 'released' from the spell of the special, private interests, inducing, say, a more egalitarian or environmentally protective regime. The suggestion of capture then (also regularly found in popular discourse) is that the blame should be laid on various factions of capital alone for causing climate change, as the amorphous capitalist state is just another 'subject' of the industry's empire. But rather than conceptualizing the capitalist state through this instrumentalist perspective as just a "thing, instrument, machine, or tool" (Khachaturian, 2021, p. 175), I argue that the focus of this scholarship should turn away from reified or instrumentalist views of state apparatuses.

[18] In the case of the AER or national Canadian regulation, see: ALDP, 2021; Nikiforuk, 2011; MacLean, 2016; Timoney, 2021; Yewchuck et al., 2023.

In my case study, I pivot to theorizing the rise and design of Alberta's hydrocarbon governance, the necessary law and policy creation, positioning in commodity production, and lesser actions of its apparatuses as historically specific to capitalist relations of production. As Rob Hunter says, "they do not subsist independently of the capitalist economy, and they are not pre-capitalist institutions that have been captured by capital or capitals" (2023, p. 264). Here, my theoretical approach to this part of the study is informed by Ernest Mandel's work (1992), especially in his *Power and Money* (1992), Nicos Poulantzas' later theories of the state as a social relation, and both Gramscian and Poulantzian uses of ideological hegemony within and outside of a hegemonic power bloc (in this case currently controlled by fossil capital and its elites).

In theorizing the functions of state apparatuses earlier in his writing, Mandel argued in *Late Capitalism* (1975) that the main purpose of the state is providing the capitalist class with the general conditions of production (certainly some relation to Polanyi and O'Connor's visions), the repression of class antagonisms which threaten the mode of production through the interdependent pieces of the legal system, and the work of integrating these repressed classes into the capitalist fabric through hegemony (with a nod to Lukacs and Gramsci) (p. 475). This is why he repeats again that, "the bourgeois state thus plays a vital role for the reproduction of capitalist relations of production, without which capital accumulation cannot take place" (Mandel, 1992, p. 153). The creation of this specific state form, and its accompanying explosion of bureaucratic management, equated to higher rates of taxation which would subsidize this bureaucratic class. Inter-capitalist disputes arose from this (and still exist today), as not all were excited to undercut their profits to fund this burgeoning administrative machine. This is something that still exists inter-factionally in Alberta's case, with smaller firms lamenting the perceived high provincial royalties, municipal ground rents, and regulatory levies they must cough up. And with the growth of the state, comes the necessary growth in its bureaucracies: "When one says, 'the bourgeois state has a tendency to become a stronger and stronger state,' one implies the growth of capitalist state bureaucracies. The first tendency is impossible without the second; indeed, it is identical with it" (Mandel, 1992, p. 156). Here, there is an interesting connection to Poulantzas theory of the capitalist state in that Mandel argues that these maturing bureaucracies reflect hierarchy among the classes in the societies. While there is not the extreme inequality represented in late capitalist society, there are many levels and positions of power with higher pay grades and varying seniority throughout them.

Poulantzas, a Marxist theorist and social activist, conceptualized the state not as a neutral arbiter under a spell, nor just as an instrument to be played by a ruling faction of capital, but as an expression of the class antagonisms and forces in the society it is a part of. Much like how historical materialists have understood and analyzed capital as a social relation, Poulantzas saw the relational state as "a relationship of forces, or more precisely, the material condensation of such a relationship among classes and class fractions, such as this is expressed within the State in a necessarily specific form" (1978, p. 128). The state is not constituted of some "impenetrable kernel" beneath layers of ruling class control. As such, there is little possibility of generating a 'general theory of the state,' but there can be specific theorizations of *the capitalist state* (Poulantzas, 2000). Such theory is a natural extension of the historical materialist position on the capitalist mode of production which gives analytical pride of place to social relationships between people. To put it plainly, in borrowing from Paul Sweezy, "society is more than a number of individuals. It is several individuals among whom certain definite and more or less stable relations exist" (1962, p. 3).

As an illustration, we can consider the Regulator here. The Regulator–just one specific apparatus of one geographic region of one advanced capitalist state–governs as an expression of 21st century social relations of force among classes and various factions of capital, with all the difficulties, contradictions, and fragile compromises made to keep extraction and surplus profit realization ongoing. A Poulantzian position, then, is that this environmental regulatory arm of the state is a *condensation* of the social relations of the regional capitalist (that is, class divided) social order, not an instrument of specific class rule alone, nor something that stands above its society. Within this brew of relations, the capitalist state acts as "the privileged terrain for the formation and consolidation of capitalist class hegemony" (Khachaturian, 2021, p. 176). The state becomes filled with institutional structures that allow a power bloc to take shape, organizing and attempting to reconcile the different class interests of the many combative or cooperative factions of capital in society. This manifestation of the contradictions and antagonisms between the different factions of capital is unique to the capitalist state, Poulantzas argues. A bloc manifests in the political sphere, but its political objectives are necessarily tied to its economic interests:

> The hegemonic class or fraction *polarizes* the specific contradictory interests of the various classes or fractions in the power bloc by making its own economic interests into political interests and by representing the general common interest of the classes or fractions in the power bloc. (Poulantzas, 1975, p. 239, emphasis in original)

Naturally, this generalized, dually economic and political class interest is the continuity of the exploitation of workers and the realization of profit. Although these different factions realize profit in some unique ways, their general interests are together 'shielded' under the leading hegemon (although these manners continue to converge in the 21st century as fossil capitalist firms continue to financialize).

Bob Jessop, one of the leading scholars on Poulantzas' work, argues that the state is what ordains classes (and factions) with their political life force, as they do not have "unifying consciousness" prior to their encounters with the bourgeois state (2021). It is "not a sort of neutral arena in which social groups seek to influence the government's legitimate power, as if this were what the state's force really consists of. The state does not in itself have any power; rather, it is a social relation, which must be reproduced" (Demirovic, 2019, p. 50). In short, classes do not forge themselves in civil society or at work and home, but their very identities, internal contradictions, and the fragile compromises that allow continuity of capital accumulation are realized with and through the state. At the highest level of abstraction, the evidence of this dissertation research suggests that the Albertan's state decisions vis-a-vis resource management of its main base of fossil capital accumulation is representative of this 'material condensation of forces' (Poulantzas, 2008).

It is within the state apparatus that the struggle for hegemony unfolds, often between different factions of capital vying for a dominance that may favour them specifically. But the state must act in the long-term interest of these different capitals as the 'ideal total capitalist,' discussed briefly above. Thus, the state is subject to an onslaught of influence from these various factions which are seeking to advance their own interests, but the true hegemon of the capitalist power bloc leads because it can cut through the inter-capitalist competition to secure the collective future of the class. This, for instance, is why fossil capital currently maintains its hegemony in Alberta. As the longest enduring and most omnipresent class force in the province, it has had to balance the need to maintain the physical conditions of production (in the sense of O'Connor's work) against the rapacious drive by individual firms and other competing capitals to maximize extraction and revenue streams through the skirting of environmental-financial obligations. Fossil capital leadership must discipline delinquent firms who might further tarry the name of the industry and create more enemies for it. Fossil capital's hegemony in the province has manifested in a panoply of material, political practices beyond just this.

While much ink has been spilled interpreting 'hegemony,' I use it in two separate ways, as Poulantzas does. First, I use it in a broad sense in the tradition of Antonio Gramsci's work as, "the capacity of dominant groups to establish and maintain political, intellectual, and moral leadership and secure the 'broad-based consent' of allied and subordinate groups" (Jessop, 2024, p. 263). Rather than only being expressed in civil society, as a cultural phenomenon, it applies to political economic statecraft too. Ralph Miliband argues, for instance,[19] that a capitalist state which finds itself within an environment of certain, strong class hegemony, will behave according to that class's interests:

> Where a dominant class is truly hegemonic in economic, social, political and cultural terms, and therefore free from any major and effective challenge from below, the chances are that the state itself will also be subject to its hegemony, and that it will be greatly constrained by the vapour forms of class power which the dominant class has at its disposal. (1983, p. 61)

In the second sense, there is also hegemony within a capitalist power bloc itself, "essentially expressed in the profit rates that the dominant fraction is able to extract within the given relations of production, on account of its own dominant position" (Demirovic, 2019, p. 52). The state will necessarily establish the 'general and long-term interests' of the whole bloc, but there will still be a leading hegemon within the bloc, which contributes to the many unstable compromises between the different factions. This instability is observed in the flux between competition and

[19] The 'Poulantzas-Miliband debate' in the 1960's and 70's which concerned the nature and position of the capitalist state within the pages of *New Left Review* will not be considered within this dissertation.

cooperation between factions of the bloc, complicated further by the fact that many firms have directorate and financial interlocks in a huge, complicated web of corporate relationships (with regards to personnel and financial funding commitments). If you had not yet guessed, fossil capital has a strong ideological hegemony throughout the province. Much research has been dedicated to fossil capital's strong ideological hegemony in the province, so I do not consider it at length here. I think William Carroll puts it nicely in a broad theoretical stroke, explaining the global hydrocarbon industry's hegemony as *a regime of obstruction*:

> A regime of obstruction, rooted in the political economy of fossil capitalism and expressed through a panoply of hegemonic practices that reach into civil and political society and into Indigenous communities whose land claims and world views challenge state-mandated property rights. (2021, p. 4)

Throughout this dissertation, I read the enforcement practices of the Regulator as a manifestation of fossil capitalist hegemony in this power bloc. Likewise, the political practices of the Albertan state's ruling parties (in the 2020's, Danielle Smith's United Conservative Party) are heavily influenced by this, but such a treatment of the province's wider politics is beyond the scope of this dissertation.

As will be explored in Chapter 5, I argue that the ongoing competition between fossil capital and finance capital in the province can be fruitfully analyzed through the heuristic of hegemony. Fossil capital's strong hegemony has lent to its decision making over the massive pool of defunct oil companies, their assets, and their AROs. In following this line of thought, I argue it is necessary to pivot away from the regulatory capture heuristic towards theorizing how political practices stem from fossil capitalist hegemony, situating the deep, historical roots of the hydrocarbon industry within the province's life as a colonial resource basin. The whole of the early Canadian capitalist state was organized to facilitate resource extraction on Turtle Island and subsequent transport across the Atlantic. The current Canadian capitalist state likewise facilitates this work, while taking on the load of an expansive and maturing hydrocarbon industry that is overflowing with contradictions and tensions arising from extraction. Regulatory regimes help capital reproduce as smoothly as possible, constraining or delaying it at times to contain dissent and antagonisms against it. This is why I join Warren Bernauer[20] in arguing that, "on its own, the concept [regulatory capture] is unable to account for, or sufficiently challenge, the role of assessment and regulatory functions in producing the hegemony of extractive capital" (2020, p. 164).

The power bloc led by fossil capital in the province has allowed for a winnowing of environmental policy enforcement via reduced oversight in project approvals, rather than a bureaucratic tidying up meant to make the Regulator more efficient and effective, as often claimed by the industry.[21] To be sure, it is also in the interest of finance capital to have lax policy and enforcement as it also benefits them via strong returns on their investments in publicly traded companies and better odds that their borrowers will be able to pay back their debts. But, as we shall see, this approach is the opposite of what this damaged hydrocarbon landscape (Timoney, 2015) needs to be ecologically repaired after extensive disturbance, an oft stated critical mandate of the Regulator.

The final piece that I am interested in here is the role of the fossil capitalist class 'organic

[20] I want to thank Warren for taking the time to discuss Poulantzas and Canadian extractive capital with me. It is always a relief to have an interlocutor willing to get on the phone with you at a moment's notice.

[21] While my research is rooted in a different approach, I want to recognize the scholarship of Carter, Fraser, and Zalik (2017) in analyzing the province's neoliberal governance, policy convergence, and project streamlining. As they have identified, there is a "dynamic of government dependence and industry pressure result[ing] in entrenching "sub-governments" in which energy industry players, elected officials, and government departments prioritize mutually beneficial oil and gas development (Davis 2012, 178) as well as particular approaches to environmental policy" (Carter et al., 2017, p. 62).

intellectuals' who infill the ranks of the province's regulatory regime. These intellectuals advance capitalist class interests and help negotiate public consent, not through force, but through political power. Poulantzas's early position was to argue that it is less relevant who exactly infilled state ranks, much like what certain Open Marxists believe: "What makes the state in capitalist society a capitalist state is not the class composition of the personnel of the state apparatus but the position occupied by the state in the capitalist mode of production" (Holloway & Picciotto, 1978, p. 5)., Nevertheless, I would argue that the class composition does have serious, material implications in the petro-provinces of Canada and cannot be disregarded as Holloway and Picciotto suggest. As I argue throughout several sections of this dissertation the specific, factional class character of the personnel throughout the regulatory and provincial state does influence the direction of accumulation. The overwhelming class nature of the executives and board members of this apparatus of the state are professionals from the realms firstly of fossil capital and secondly of financial capital. As Carroll says, "politically active capitalists serve this function as 'business leaders,' but most organic intellectuals are 'specialized employees,' professionally socialized into world views that identify markets and private property with equality and freedom" (2024, p. 35). So, while the state is positioned in an historically specific way within the modern capitalist mode of production, the factional character of the personnel also matters.

For example, this is apparent in the ways that the fossil capitalist bloc in the AER and OWA have organized industry-wide concessions on pre-emptive spending towards ARO as per *Directive 088; Licensee Life-Cycle Management*.[22] As will be argued in Chapter 5, the Canadian

[22] This directive is part of the province's new Liability Management Framework which will be discussed in chapter 3. In short, it sets 'spending goals' for solvent industry operators aimed at reducing the province's inventory of inactive wells.

state's judiciary up to and including the Supreme Court of Canada has disciplined finance capital for its attempted work arounds to the province's 'polluter pay' environmental statutes. These workarounds–namely, 'disclaiming'[23] junk assets onto the OWA, causing levies on operators to increase exponentially, and forcing the industry to pay for the AROs–have been frowned upon by many segments of the state, legal and regulatory, along with the leaders of the fossil bloc. Thus, "the dominant branch organizes hegemony by subordinating apparatuses representing other classes or fractions and by forcing the hegemonic class (fraction) to make sacrifices to sustain its twofold hegemonic class leadership" (Jessop, 1985, p. 69). In other words, fossil capital disciplines unruly members of the financial bloc trying to undermine its environmental regulations and the lesser fossil capitalist members of the broader bloc. The financial capitalists in the bloc would love to maximize their returns by ignoring tedious and costly environmental statutes. Unfortunately for them, the organic fossil intellectuals who have arisen in the Regulator's ranks have ensured that delinquency is disciplined through legal avenues.

The intellectuals who help sustain this hegemony are not just the high-ranking C-suite executives of hydrocarbon firms but are the technical experts who have helped craft and care for the regulatory mosaic in the province. As Carroll argues, "although capitalists themselves dominate in accumulation, within political and civil society corporate power is exercised by capital's *organic intellectuals,* 'deputies' or members of the capitalist class" (2021a, p. 12, emphasis in original). The industry may rely on "a series of rhetorical strategies, including 'astroturf' campaigns, that portray critics as naive, reckless, and dangerous, while representing industry as moderate, rational, and even progressive" (Eaton & Enoch, 2021, p. 314). The Regulator depicts production and monitoring in the province precisely like this: clean, thorough,

[23] This is an industry term which refers to the overturning of infrastructural licenses to the care of the OWA. It will be further explained in Chapter 3.

well-organized, handled by experts (the geotechnocratic/fossil organic intellectuals), and requiring some semblance of objective and even enforcement. This has allowed hydrocarbon development to come online even faster in the 21st century, in the face of less professional scientific or community oversight, and in more opaque ways despite the apparent widespread mistrust of extractive industries in the 21st century. Unsurprisingly, this had led to a "privilege [of] market access over public safety" (Gilbert & Zalik, 2018, p. 654), operationally putting socio-environmental health on a back burner.

Chapter 2: The Materiality of Alberta's Hydrocarbons and the 'Conventional' Views of the State's Environmental Regulatory Apparatuses

Introduction

In this chapter I focus on an explanation of which hydrocarbons are being developed in the province and the phases which fossil capitalist infrastructure (the fixed capital of extraction) move through during their life. This ties directly to my overarching theoretical analyses based on O'Connor's second contradiction of capitalism and the 'fixes' of fossil capitalist contradiction, notably the conditions under which the capital state and factions of capital seek to pre-emptively address and/or are forced to confront the second contradiction of capital accumulation (the wasting practices and the destruction of the physical conditions of production). Teasing out details of who operates hydrocarbon production infrastructure, and some of the geophysical properties of the resources produced, is crucial as the OWA exclusively deals with *deserted conventional assets from upstream and integrated producers*. While the AER is the one-stop shop for all energy development regulations, the OWA is more limited. I have found that missteps in analyzing the industry often stem from confusion about this tedious classification. Without this tedium, confusion arises around matters like cash flows, assets, liabilities, the position and nature of geotechnical labourers, the accounting of reserves, the distinction between types of reserves and required infrastructures, and its (in)direct state subsidies. Just as understanding who constitutes the fossil capitalist elite is necessary for social transformation and transition away from this mode of production and consumption, I argue that understanding the tools and geophysical bases of accumulation is equally important.

Thus, the chapter explains the organizational makeup of the modern AER and OWA. To advance my argument about the strong class hegemony of the fossil bloc, I analyze the structure and the personnel of both organizations. While the OWA is proudly positioned as a child of the industry, the Regulator does not have the same history and is not necessarily viewed in the same way. My approach is informed by the above-reviewed Marxist theories of the capitalist state and the formation actions of its bureaucracy.

The first section of this chapter briefly articulates my own theoretical approach to understanding the simultaneously geophysical and political economic flow of fossil commodities which I call Critical Physical Geology (CPG). I outline the contours of this theory as it relates to my theoretical deployment of political ecology and economy, one that I plan to develop further in subsequent work. **The second section** employs the CPG framework to analyze the specifics on what is being extracted, upgraded, and circulated on markets from the hydrocarbon landscapes of Alberta. This broadly includes explaining and critiquing the politicization of hydrocarbon reserve designations, the contested languages of 'conventional' versus 'unconventional' hydrocarbon extraction, and the 'streams' of the productive process. With this knowledge in hand, the **third section** gives a high-level, 'conventional' overview of the AER's establishment, its multiple identity changes, the portfolio of extractive assets which it regulates, and the design of its corporate governance. Today, the AER is the single authority responsible for all energy regulation in the province, including the management of infrastructure licensing and taking care of deserted assets. Understanding a brief, mainstream history and design of the Regulator sets the stage for the arguments in the subsequent chapters where I draft a counter-history of the organization and their choices. The **fourth section** pivots from the reserves and the regulator to focus more directly on fossil firms' work and the steps that they take to realize the extraction of hydrocarbon commodities. This necessarily includes the phases that a well transitions through in life after production, once its associated reserve has dried up (in the subsection 'After Activity') and thus introduces the OWA. The stages vary case-by-case, as not every piece of infrastructure ends up, for example, in a period of long-term inactivity, as some licensees do properly close and reclaim production sites. The suspension of a well's production is a critical moment in the phenomenon of desertion as a well, and its owner, can navigate two distinct routes at that moment. In one instance, the well may simply become 'inactive' where it can linger for years. In the second instance, it may face desertion, determined by its owner's corporate health and predisposition. **The fifth section** concerns steps that lead to the desertion of infrastructure and, offering a more the 'conventional' history of the OWA including the OWA's establishment, design, mandate, portfolio of assets, and corporate governance.

Understanding Production through a Critical Physical Geology

I see the set of social relationships within and beyond fossil capitalist firms and state agencies, the specific deployment of geotechnical expertise in producing value under fossil capitalism, and the current (but impermanent) global energy hegemony of the industry writ large as a unique manifestation of 21st century capitalist political economy. I would argue that a *political economy of geology itself* - one that examines the centrality of geotechnical experts and the geosciences in both industrial and financial-speculative value creation is warranted. Or, perhaps, this is just one piece of the totality that is the modern 'fossil economy' (Malm, 2016, p. 4). Jason Moore might argue that this is just part of modern capitalist world ecology (2003a), and the hydrocarbon economies of late are just capital after one of the Cheap Natures (hydrocarbons as raw material).

But there is a lively debate within critical political ecology arguing that the field is lacking engagement with biophysical ecological research (Bassett & Zimmerer, 2004; Walker, 2005). These criticisms come from within and without the community of self-identified political ecologists. Leftist soil scientist and critical geographer Salvatore Engel-Di Mauro is one of the most vocal on this: “Any interest in studying biophysical processes meets mostly with disinterest among leftists” (2014, p. xv). While this is a hyperbolic, over-generalization evidence suggests that there has been some overcorrection from a previous age of ecology without politics towards modern politics without ecology (Vayda & Walters, 1999). Lave echoes Walker on this, claiming that “political ecology has increasingly distanced itself from the environmental sciences and from consideration of the physical characteristics of the landscapes it studies” (2015, p. 572). And just as leftist critics are quick to judge their own research communities, they also gaze at physical scientists for their ideological commitments to global capital or collecting power through knowledge - “the biophysical sciences tend to be the sort of capitalism-friendly, classist, patriarchal, Eurocentric, racialized milieu” (Engel-Di Mauro, 2014, p. xv). Unsurprisingly, many political ecologists get negative feedback in return from physical scientists for the gaps in their primary research methods and data. Physical scientists make claims (not necessarily unfounded) that some political ecologists’ work is “selective and ideologically driven” (Walker, 2005, p. 77).

Thus, I in-part organize my reading and subsequent critique of the industry from the starting place of the scientific fields–the geological sciences of hydrocarbon development informed by fields such as geophysics, economic geology, or petroleum geology–which I am working to understand. Rather than conforming to the interests of capital, as fossil capitalist-friendly sciences do, I am attempting to craft ecosocialist counterarguments from similar epistemological starting points. I am indebted to Rebecca Lave[24] and her colleagues (2014; 2018)

[24] I want to thank Rebecca for taking the time to discuss with me the merits and drawbacks of trying to flesh out an entire subdiscipline while authoring this dissertation. She was right in identifying that this was not exactly the best time to sort this all out!

for developing the emergent field of Critical Physical Geography which has been an inspiration to me in this research. I have found these scholars' work indispensable in organizing my own thoughts and purpose here. As they explain, their framework "*allows us to investigate material landscapes, social dynamics, and knowledge politics together, as they co-constitute each other*" (Lave et al., 2018, p. 6, emphasis in original). This is precisely one of the goals of this chapter's cursory analysis of the production flows and geophysics of this certain base of accumulation. The hydrocarbon industry, unsurprisingly, has long held domain over the knowledge of extraction and its deleterious effects. Industry has alternatively amplified and silenced selected outcomes of extraction: championing the great expanse of Canadian oil reserves while ignoring the externalization of waste and its contribution to the widespread destruction of ecosystems. Critical techno-scientific knowledge can be vital in countering pervasive petro-ideologies and political power and creating a counter-hegemonic position. Although developing such a novel field of study rooted in the geologic sciences is beyond the scope of this dissertation, I hope the early fragments of such a field offer a tool for understanding points of interruption in the current flows of fossil capital and in the unfolding transition to climate capitalist strategies of accumulation.

The Materialities of Hydrocarbons

Hydrocarbons as Geological Forms

The shared components that make fossil fuels one of the dominant commodities in the modern world's energy landscape are known as petroleum hydrocarbons (PHCs). These organic chemical compounds are called *hydrocarbons* precisely because of their molecular makeup of exclusively hydrogen and carbon atoms (Adipah, 2018). More specifically, PHCs are known as saturated hydrocarbons, and are the simplest and least reactive of the earth's hydrocarbons. In organic chemistry, they are often divided between aliphatic and aromatics, denoting whether they have single or double bonds between their carbon atoms. They fall into a group known as 'alkanes,' a generic name for "any saturated [single bonds between carbon atoms], aliphatic hydrocarbon, i.e., a compound consisting of carbon and hydrogen only and containing no double or triple bonds" (Gooch, 2007, p. 39). These linear alkanes have a general formula of C_nH_{2n+2}, meaning that they have some carbon molecules, as little as one, and at least two hydrogen molecules. Within the petroleum matrix, there are additional hydrocarbon compounds which have double carbon bonds or ring structures, unlike the PHC used as fuel. These cyclic alkanes form the basis of the petrochemical manufacturing industry. Ethylene, a PHC with a double carbon bond, is used in the production of the polymer polyethylene, which is the most used plastic in the world in the production of "milk jugs, drinking straws, bottle caps, detergent bottles, cream tubs, waste bins, water pipes, children's toys, and films" (Egbuhuzor et al., 2022, p. 95).

The organic composition (not in the sense of the ratio of capital to labour, but in the biophysical sense) of any petroleum reserve determines three important components in its future in the matrix of fossil capitalist: 1) its efficiency as a fuel source when combusted for thermal energy, 2) what potential it has in the production of petrochemicals, and 3) the volume of byproducts it will produce upon combustion. In the first instance, thermal energy as heat (the product of exothermic reactions) is the desired output of hydrocarbon combustion, so the more efficient this reaction, the more desirable the fuel will be. In the second matter, the presence of additional PHCs, like Ethylene, which can be processed into capital goods for the petrochemical industry is critical. Lastly, carbon dioxide and water are *invariable* chemical byproducts of hydrocarbon combustion. Carbon dioxide and water cannot be eliminated from this chemical equation, no matter the efficiency of the industrial processes surrounding combustion. The general formula of hydrocarbon combustion reads as such: $C_xH_y + N\ (0_2) \longrightarrow X(C0_2) - y/2(H_20)$ $\Delta H\circ$. The variable *x* represents the number of carbon atoms in the hydrocarbon, *y* represents the number of hydrogen atoms, and *N* is the amount of oxygen molecules that combustion of the hydrocarbon necessitates. $\Delta H\circ$ is the symbolic description of the heat energy produced, explained as the standard enthalpy change. As a specific example, we can consider methane combustion, where methane and oxygen are the reactants. Methane's chemical formula is CH_4, meaning it is composed of only one carbon and four hydrogen atoms. Its chemical formula of combustion reads $CH_4 + O_2 \longrightarrow C0_2 + 2H_2O$. Methane is the simplest hydrocarbon and the most common hydrocarbon in fossil gas (up to 90% by volume) used to heat residential and commercial spaces, feed electricity generation stations, and even fuel natural gas vehicles. It is no coincidence that it is such a common hydrocarbon fuel source as it produces less of the undesired byproducts of combustion (carbon dioxide and water) and requires less oxygen to combust. The more hydrogen in a particular deposit, the heavier, more viscous, and slower it will or will not flow when pumped during extraction (MacFadyen & Watkins, 2014). But more hydrogen content also equates to more thermal energy output per carbon unit and less emission of $C0_2$, the most popular greenhouse warming gas (Pohl, 2011, p. 522).

I find the composition of PHC's fascinating, as their constituent parts have come to not only fuel our daily lives but also become part of our bodily biomes in the 21st century. As you read this, your body is filled with and surrounded by derivatives of PHCs in the form of micro- and nanoplastics. These tiny particles end up in processed salt, sugar, and packaged dairy products, synthetic toothpastes, shampoos, deodorants of morning routines, or the acrylic, polyester, and nylon fibres in clothing that cover our bodies. Today, the average human brain contains enough microplastics and nanoplastics to make a disposable spoon, around seven grams (Nihart et al., 2025). In modern Canada, the 'petrodollar' has taken on a new meaning as federal bank notes are made exclusively from polyethylene terephthalate, a petrochemical made from ethylene glycol and terephthalic acid (Sin & Tueen, 2023). But how have these PHCs come to capitalist markets, both literally and in the political economic sense? PHCs are constituent parts of the crude oil, tar sands bitumen, and fossil gas which are extracted from ancient geologic reserves and shuffled daily through complicated networks of international markets in incredible and diverse ways. While this dissertation is a dissection of hydrocarbons' political dispositions, it pays close attention to the infrastructure which extracts, refines, upgrades, and circulates them throughout the world in the age of biospheric polycrisis. This analysis reflects the approach of the discipline of critical physical geography (Lave, 2018; Lave et al., 2018).

For my own part, I was first brought to the world of hydrocarbon extraction, processing, and distribution through academic and professional experiences between 2012-2017. Prior to my move into the social sciences, I studied historical geology, hydrogeology, water quality analysis, and ecology, eventually working in third-party environmental consulting for numerous extractive industries throughout Turtle Island. I collected surface water samples from acid mine drainage impacted watersheds throughout Southeastern Ohio; monitored mercury output from cement manufacturers in Arizona; surveilled particulate matter in gasification plants in North Dakota; looked for endangered cacti and succulent through Utah's deserts; calculated destruction ratios of volatile organics in Southern Californian printing factories; and worked the terraformed fields of Weld County, Colorado doing thousands of groundwater sampling events following known hydrocarbon releases throughout the Niobrara-DJ Basin. The plains of Weld County are vast, flat grasslands packed with industrial agriculture (cattle, grain, sugar beets) and oil and gas production sites. The producers of Weld extract its natural gas through a once-unconventional process of horizontal drilling and hydraulic fracturing—colloquially known as “fracking”—which releases deposits of fossil gas accumulated in shale and similar tight sedimentary rock deposits. It was here, for one, that I stepped onto my first horizontally drilled well pad, collecting drill cuttings to sample volatile organic compounds. Weld County is a key place to me; I mention it here in this complex story of extraction and desertion because it was in this oil patch that I began to understand the scale and complexity of fossil capitalism’s geophysical bases of accumulation and regulation.

Spending a great deal of time alone conducting environmental sampling events led me to conceptualize questions about the regulation of hydrocarbon extraction and its discontents. These questions eventually informed the research questions that have guided this dissertation. I soon realized that my fellow low-wage workers and I were caught in the mire of regulating an industry only to ensure the successful extraction, upgrading, and consumption of energy stores that were helping destroy the biosphere through their environmentally hazardous byproducts. The complexity that underpinned (or continues to underpin) the state and federal regulatory regimes we worked with generated my questions about the role of the capitalist state in the continuation of the fossil economy. Indeed, I have come to see capitalist states and fossil economies as regimes obstructing (Carroll, 2021b) a transition to alternative, low-carbon energy futures.

Before going further, I must stress that my research is distinctly separated from the tar sands reserve basins which are now dominating Alberta’s hydrocarbon economies. The deserted infrastructural assets I analyze in this dissertation are present strictly throughout Alberta’s *conventional* hydrocarbon fields, not from the tar sands. That said, the phenomenon of deserted oil and gas assets is undoubtedly one piece of a larger puzzle of Canadian fossil capitalism, which includes the more complicated, difficult-to-extract 'extreme oil' projects such as the tar sands (Hussey et al., 2021; Pineault, 2018). I am responding to this dearth of studies on oil and gas in the province by ecosocialist or otherwise liberatory thinkers in critical research fields like political ecology and economy or human geography. Thus, I organized this dissertation research agenda as just the first leg in a longform, monographic, materialist environmental history of this desertion.

The word petroleum comes from the Latin for rock (*petra*) and oil (*oleum*), as they are the product of source rocks which generated oil. Petroleum is the product of extreme heat and pressure compressing organic matter like dead algae, plankton, and plants into the seafloor (ERCB, 2013). The nascent hydrocarbons join deposits of silt, clay, and sand (of other eroded rocks and minerals), seeking paths of least resistance within evolving sedimentary formations during this time, finding the most porous and permeable options around which include sandstone, siltstone, or claystone. At some point, the hydrocarbons have nowhere to go and become entrapped between a basement and cap rock (Speight, 2013). They then finish their formation into the hydrocarbons we know and are designated by geologists as 'reservoirs.' These reservoirs eventually become 'reserves' once they are prospected by parastatal organization or private capital through the work of technical experts like petroleum engineers, geophysicists, or economic geologists. Reservoirs are frequently discussed in petroleum engineering but are germane to any of the geologic sub-disciplines, whereas reserves are distinctly used in extractive geologic disciplines and in the forecasts of extraction and profitability. Conventional extraction in Alberta happens upon the Western Canada Sedimentary Basin (WCSB), which is some 1.4

million square kilometres sitting mostly below Manitoba, Saskatchewan, Alberta, and British Columbia (Mossop & Shetsen, 1994). The WCSB is considered one of the largest collections of petroleum systems and reserves in the world. According to the AER's latest calculations, the province has at least 157 billion barrels of crude bitumen (in the tar sands), 1.8 billion barrels of crude oil, and 718 billion cubic metres of fossil gas remaining in its established reserves (AER, 2024a).

Reserves

Many parastatal organizations serving national and international hydrocarbon economies are involved in classifying and defining distinct types of reserves. They take on the name of 'reserves' based on a measure of profitability "as defined by physical, technological, economic, and political factors" (MacFayden & Watkins, 2014, p. 84). Development is, first, dependent on appropriate technological innovation and the flow of investment capital which will support exploration and extraction. As history progresses, this has led to extraction of environmentally riskier projects, often extracting lower quality reserves like the tar sands' crude or heavy bitumen. Second, the expansion of these reserves is fueled by political will and power of the extractive sector with its social license to operate ebbing and flowing depending on the project time and place. For the curious reader, the Regulator and CAPP have long assessed and published established reserves estimates for the entire country, but these numbers are difficult to follow as they consistently swing (CAPP, 2023b). The volatility in spot market prices of crude oil and fossil gas, for example, has made the extraction of unconventional, extreme, or difficult-to-extract reserves more viable. As spot prices for hydrocarbons increase, cash flows to fossil firms increase accordingly, and finance capital can be more easily tempted to invest in more exotic projects necessitating enhanced oil recovery techniques which yield products with low energy return on energy invested (EROEI).[25] This helps explain the boom in tar sands production on Canadian soil, and the trillions of cubic feet of shale gas extraction in reserves like the Marcellus Formation within the U.S. Appalachian Basin. Thus, while the political climate influences extraction, the biophysical and geological characteristics of different reserves also in-part dictate these fluctuations, according to their extractive methods, required refining and upgrading, and the volume of waste or hazardous externalities they produce.

In the case of Alberta, the Canadian Institute of Mining, Metallurgy, and Petroleum (CIM), the Society of Petroleum Evaluation Engineers (SPEE), and the Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) all have inputs into resource definitions, evaluation guidelines, and standards of practice related to prospecting and reporting reserves (Elliott, 2013). For the AER, the Alberta Securities Commission, and Alberta's hydrocarbon economy writ large, the SPEE Calgary Chapter's Canadian Oil and Gas Evaluation Handbook (COGEH) reigns supreme. This tome was made in cooperation with all the above organizations and, by its own admission, has been riddled with inconsistencies since its first edition publication in 2002 (COGEH, 2022, p. 2). Technical understandings of the extraction of petroleum reserves have changed drastically over the last half century as increases in capital investment have unlocked the potential for the exploitation of the more extreme hydrocarbon reserve classes. And it is not just capital investment that changes mineral reserve status, as it always needs to accompany changes to regulatory statutes also. Labban here says,

Removal of legal and political obstacles, such as economic sanctions, stringent laws of

[25] This is a ratio of the energy that is produced from consuming the energy source versus how much energy it took to extract, upgrade, and/or circulate the commodity. Synthetic crude oil and high-quality fossil gas have good EROEIs, as far as hydrocarbons go. Crude and heavy bitumen, on the other hand, have bad EROEIs.

> investment, or protected wildlife sanctuaries, expands oil production into hitherto inaccessible reserves. The size and productivity of oil reserves, therefore, are not fixed, and are not determined by geological limits as much as by economic, political, and technological developments in production. (2008, p. 2)

Interestingly, despite extensive work on the relationships between oil and capital, like in Labban's research, the role of the geotechnical experts and labourers who craft and interpret the industry's guiding geotechnical documents appears understudied in political economy, political ecology, and geography. Fossil capitalist firms rely on this geotechnical labouring class to produce value through new extractive techniques and prospecting which translate into financial speculation and subsequent returns. Modern fossil firms' annual reports universally have sections dedicated to past and future reserve calculations with a careful system of arithmetic and trade employed to ensure they do not have too many or too few at any given time. These geotechnical experts are responsible for the production, collection, and dissemination of this knowledge which allows for not only the exploitation and upgrading of hydrocarbons, but also for the creation and verification of the different reserve categories which generate cash flows through speculation. These experts are also the ones who develop the technology and approaches for new and novel means of extraction, especially prescient today. This explains why this group of experts have climbed to the top of Alberta's regulatory regimes and serve as a type of organic intellectual (Carroll, 2021a; Gramsci, 2010) indispensable to both fossil capitalist production and the attached speculative-financial capitalist accumulation.

Antonio Gramsci first theorized and described the role of these intellectuals in his canonical *Prison Notebooks* (1971). These intellectuals are important to a social class (whether capitalist or proletarian) as they can advance the hegemony of their class. While I will discuss the formation and dispersion of the fossil capitalist class's intellectuals, consider Gramsci here for the moment:

> If not all entrepreneurs, at least an *elite* amongst them, must have the capacity to be an organizer of society in general, including all its complex organism of services, right up to the state organism, because of the need to create the conditions most favourable to the expansion of their own class. (1971, p. 5-6)

The work of manufacturing hydrocarbon supply and demand through preventing gluts and producing scarcity, for example, would be incomplete without this class of fossil geoscientists. In any event, for this dissertation's purposes, understanding reserves are especially important for assessing the production assets which a firm has, which has been long used to calculate their outstanding liability, which is the amount of money they will have to spend to decommission their assets (the ARO work). But the arithmetic of reserves is a complex and shadowy affair.

What makes reserve catalog reporting so problematic is 1) difficulty in determining their sizes and the technological ability to extract them, and 2) the economic and political spin and tactics of creating scarcity that are organized by parastatal organizations and fossil capitalist firms. In the first instance, reserve discrepancies could be chalked up to the fact that calculations are a difficult matter for even the best trained petroleum geologists and engineers to tackle. For the geotechnical expert, being able to confidently say what portions of a petroleum system are recoverable is less immediately a political question and more one of technological constraints. In the second instance, the economic and political spin or manufactured scarcity is an intentional device to promote favourable industry outcomes through deceit. This phenomenon is nearly as old as the industry itself, with John D. Rockefeller's Standard Oil employing supply restrictions through delays and interruptions which limited supply to consumers to maximize profits as early as the beginning of the 20th century. Here Timothy Mitchell says, “their goal was not to maximize production, but to raise prices by restricting output to ensure a shortage” (2011, p. 40).

The necessity of controlling flows and avoiding overproduction stems from the fact that conventional oil requires relatively little labour power to extract due to geologic conditions that propel it to the surface once a reserve has been tapped with a well. While the startup capital needed to extract can be costly and unique–including everything from the seismic prospecting to the drilling and setting of the fixed infrastructure of extraction–once the wells are in place the energy flow can be consistent and fast with relatively little labour. In Marxist terms, this is tabulated as the organic composition of capital, a measure of the ratio between the constant capital like the wells, pipelines, and processing facilities versus the amount of waged labour required to extract. Most hydrocarbon extraction is heavy on fixed capital, but human labour is still vital to the process. As Adam Hanieh puts it, "a key factor driving the limitless expansion of commodity output is capitalism's propensity to displace, replace, and augment human labour by machinery, and capital-intensive technologies. Machines can be operated continuously and do not agitate or go on strike" (2024, p. 10). Once those extractive machines are operational, cash flows quickly. The EROEI of newly tapped conventional fields is relatively very high, unless compared with, say, solar energy (Altvater, 2007). The fossil firm Cenovus, for example, had an upstream production rate of over 800,000 BOE/d at the end of 2023 (Cenovus, 2023). The entire nation of Canada, a particularly hydrocarbon-hungry country of 39 million people, consumes around 2.4 million barrels daily. This means that one domestic operator—albeit a large, integrated operator that spans conventional, unconventional, and offshore production alike—can produce one third of the hydrocarbon energy needs of the entire country with only its 6,000 employees.

But production schemes need to mirror consumer demand while not exceeding it. This is an important fossil capitalist tool of profit maximization, and it has had a change of face in recent years while maintaining the same purpose. Historically, the tools of restricting supply included

> Government quotas and price controls in the United States, cartel arrangements to govern the worldwide distribution and marketing of oil, consortium agreements to slow the development of new oil discoveries in the Middle East, and political agencies to manage the threat of those in the Middle East and elsewhere who opposed the oil companies' system of sabotage. (Mitchell, 2011, p. 40)

Matthew Huber (2013) argues that the overproduction of oil and the subsequent moments of glut that threaten industry accumulation is rooted in hydrocarbon property rights (at least in the U.S.), while Mitchell focuses more on inter-firm collaboration that throttles supply. For now, I am interested in the narrower political dimensions of modern reserve reporting, especially the contested language of reserve designations.

The ambiguities around what counts as a 'recoverable' versus a 'proved' versus a 'probable' reserve are informed by both the technology available for extraction and the price conditions (Labban, 2010). Private firms and various states have many ways to make these reserve calculations. There is no transnational golden rule but across jurisdictions it seems to hold that "the variation in the probability of reserves is a variation in the estimate of a given, fixed quantity; what varies is the ability to extract oil reserves, not their ultimate size" (Labban, 2010, p. 543). The COGEH (and, thus, Alberta) has a few categories specific to this: Reserves, Contingent Resources, and Prospective Resources. The former is the most immediately important and to be considered as such "estimated recoverable quantities must be associated with a project(s) that is in a known accumulation with a COC [Chance of Commerciality] that is effectively 100 percent" (COGEH, 2022, p. 16). Securities commissions in Canada and the US, like the Alberta Securities Commission (ASC) and the US Securities and Exchange Commission (SEC), responsible for enforcing laws related to market manipulation, have had to adopt their own definitions of 'proven reserves' due to the omnipresent reporting issues. The World Petroleum Congress uses the concept of 'proven reserves' as well, but 'established reserves' sometimes makes it into the Albertan regulatory frameworks, depending on what you are reading. COGEH only considers resources as 'reserves' if they are "recoverable using existing and proven technology" (COGEH, 2022, p. 328).

Firms today outsource reserve calculations to third-party, licensed geologists, geoscientists, or engineers to calculate reserve figures. There is a small cottage industry of professionally licensed 'Independent Qualified Reserve Evaluators' (IQREs) and 'Qualified Reserve Auditors' (QRAs) who determine firms' published 'proven' and 'probable' reserves. All the upstream Big Five employ these IQREs annually to update their reserve numbers. These people are

> Often assisted by professionals, paraprofessionals, and clerical personnel. QREs and QRAs may be employees of an entity itself or stockholders, proprietors, partners, or employees of an independent firm of petroleum consultants with chip an arrangement has been made of 4th estimating or auditing of Reserves information. (Society of Petroleum Engineers, 2019, p. 9)

It is worth noting that according to the SPE, the people most interested in the financial valuation of the company (stockholders) could potentially be a firm's QRE or QRA. This cottage industry of consulting firms is made up of, you guessed it, geophysical and petrophysical specialists who conduct geo-modelling for upstream producers. In the 2023 fiscal year, for instance, CNRL's

Board's Reserves Committee retained Sproule Associates Limited, Sproule International Limited, and GLJ Ltd., two firms (and one subsidiary) which deal in technical and commercial analysis of reserves and resource evaluations.

Politically motivated reporting has been documented across the world, not just in the Canadian Big Five producers, and is notable across the Organization of Petroleum Exporting Countries (OPEC) cartel. This phenomenon seems to have bloomed in the late 80's during an international quota war thanks to a flash oil price collapse in 1986, precipitated by a production glut in the years prior. OPEC member countries added 300 billion barrels to their proven reserves. Overnight, the UAE, Iran, Iraq, Venezuela, and several other member nations all added tens of billions of barrels to their proven reserves, almost all doubling their previous numbers (Clark, 2005). In 2004, Shell (then the largest publicly traded extractive firm) was exposed as having over-reported its international reserve figures by some 3.9 billion barrels, or more than 20% of its then-proven reserves. The firm corrected the number to satisfy its own stock market supervisors prior to the publication of its annual report (Altvater, 2008; Labban, 2010). Shell had artificially inflated its reserve numbers in Oman, Nigeria, and Australia since the year 2000 which led to resignation of the company's chairman and chief executive of exploration and production, Sir Philip Watts and Walter van de Vijver respectively (Limbert, 2015).

In the case of modern Canadian extraction, Zalik argues that the blooming of unconventional reserves serves to replace the "relative weight of holdings in regions portrayed as risk laden in financial assessments, particularly the Middle East, parts of the African continent and Venezuela" (2015, p. 2449). Through the replacement of these reserves with Alberta's unconventionals, firms attempt to maintain investor appetite and trust. The advance of investment capital, development of new recovery technologies, and declining availability of ‘conventional’ reserves has led the hydrocarbon industry towards this new frontier. The phenomenon of ‘reserve replacement’ can provide a spatial-temporal fix (à la David Harvey and the critical geography literature discussed in later chapters) for capital where firm’s waning proven reserves are replaced with new, unconventional, and much more energy intensive ones. Replacement is meant to ‘fix’ the spatial and temporal crises of capitalist production like over-accumulation through promises on returns to investment by whatever means are available. In the spatial sense, increased investment in new hydrocarbon technology and infrastructure (‘spatial sinks’ as Zalik (2015) calls them) allows firms to spend capital, thus avoiding over-accumulation, while stabilizing the near future of the industry and ensuring shareholders that new extractive horizons are viable sources of return. In Alberta, tar sands bitumen is one such fix, as the easy-to-extract conventional reserves of the WCSB play basin unavoidably diminishes.

These cases highlight the politicized nature of reserve reporting, continually changing under the relations of fossil capital. It becomes even more politicized and unclear when considering the financialization of the hydrocarbon market over the last decades. Labban suggests that “the availability of physical supplies has no direct bearing on the price of oil and that a high market price does not automatically induce investment in exploration and production capacity” (Labban, 2010, p. 542). The sociopolitical negotiation of more extreme oil, whether in crude bitumen, hydraulically fractured reserves of tight and shale gas, or deepwater exploration, requires that these numbers be impressive and reassuring to shareholders. In some cases, these immense and reassuring numbers are meant to push spot and futures market prices of oil higher to make unconventional exploration worthwhile and give a rationale for the direction of investment capital toward those projects. Importantly, high reserve numbers may attract foreign investment or allow the taps to be turned up during spot market slumps (Labban, 2010). This is especially so with OPEC member countries all seeking higher outputs. Higher reserves equate to higher production quotas and reassurance that "in the future there will be no shortage of oil, and that therefore the search for alternatives (i.e., renewable energy) is an unnecessary expense" (Altvater, 2008, p. 47). Thus, this is a negotiation with private shareholders, common citizens, and governments of hydrocarbon-rich countries alike. These numbers are often uncritically parroted by the media, interested politicians, petroleum industry geologists, and, especially, extractive-financial firm report authors. As Labban says, "this is where we can see the logic of crises expressed in reverse: to bring (inevitable) future crises into the present, it is necessary to make (uncertain) future production a function of the geological and economic conditions of the present" (2010, p. 543).

The extractive technologies that these fossil engineers develop are crucial to navigating the contradictions of overproduction and underproduction and the corollaries of oversupply and undersupply. Reanalyzing and updating reserve quantities (known, recoverable, probable, etc.) is an important component of the industry as fossil elites grapple with this flow of capital and oil to prevent the fall in the rate of profit and diminishing demand. The balancing act is one of maintaining high profits for producers which ensures that petro-states can realize rents and tariffs, while maintaining a high aggregate downstream demand without increasing reserve production too much. New reserve production spells the migration of capital and additional reserves in the production cycle which will lead to the dreaded decline in the rate of profit (Labban, 2008). From a technical perspective, prospectus on reserves may change (or grow, here) as they are discovered in newly prospected strata. As Aguilera et al. remark, "the quantity of available conventional petroleum is greater than often assumed, given the tendency to overlook unassisted provinces and future reserve growth" (2009, p. 156). Financially and environmentally riskier extraction via more (or less) sophisticated technology can develop and prove certain reserves viable for extraction. From here, things only become opaquer as these reserve types are complicated by the language around what 'conventional' and 'unconventional' development constitutes, briefly mentioned above via Zalik's work.

Conventional vs. Unconventional

According to the COGEH, "the terms 'conventional' and 'unconventional' resources are commonly used but are ill-defined and there is no universal agreement as to what is included" (Society of Petroleum Evaluation Engineers, 2022, p. 6). As this comes directly from the province's bible of hydrocarbon prospecting and identification, you might have guessed that the terminology of conventional and unconventional resources is antiquated and not up to the analytical task of categorizing modern extraction. But these hydrocarbon designations are subject to change according to industry needs when "resources hitherto considered unconventional can migrate into the conventional category" (Zalik, 2015a, p. 2450). Still, the terms are commonly used in both professional texts and industry disclosures and in public discourse on extraction. Most important to my analysis is how the different resources are extracted along with the geological and ecological consequences of their extraction and processing. It is important to identify the difference between these reserve types for this dissertation as, again, the OWA only adopts conventional fossil infrastructure in the case of corporate insolvency and subsequent receivership. The province's regulatory mosaic has an entirely different prescription of liability management for unconventional mining and in-situ recovery in tar sands reserves.

Conventional oil development is, to put it bluntly, conventional. The traditional vertical well drilling and pumping from the days of old is still a viable approach to extracting subterranean, low viscosity hydrocarbons that are liquid at atmospheric temperature and pressure (CAPP, 2023a). These reserves are held in stratigraphic ‘traps,’ the small recesses within and between the layers of bedrock in the earth’s crust discussed in the section above. Conventional crude oil is usually made up of a medley of PHCs along with novel amounts of other elements like Sulphur or nitrogen (MacFayden & Watkins, 2014). Geotechnically, the Regulator and the province’s Geological Survey identify conventional reserves as “high in porosity, permeability, or both. They typically require *little or no stimulation* to produce the fluids and are often accessed with vertical or deviated wells” (Alberta Geological Survey, 2020, emphasis added). This means that the hydrocarbons flow easily when tapped with traditional, vertical wells. The conventional name tag does not limit which phase of matter the hydrocarbon presents as and both liquid petroleum and gaseous petroleum commodities can be considered either conventional or unconventional. The best-known conventional resources are crude oil and fossil gas. Conventional crude is “a liquid mixture of paraffin and other hydrocarbons spanning a wide range of molecular weights and containing varying amounts of Sulphur, nitrogen, and other elements” (MacFadyen & Watkins, 2014, p. 3). Overall, the industry was long able to extract sufficient conventional reserves to satisfy the global demand (artificially orchestrated by fossil capitalists as it was) and much of Alberta’s half-million well inventory is made up of these conventional oil and gas wells.

While the energy outputs of ‘unconventional’ reserve development are not hugely different from the conventional ones—more dirty and dense hydrocarbons requiring more refining and upgrading but which become the same or similar fuels and capital goods in petroleum product manufacture—the energy *inputs* required for their extraction are much more extreme. So-called unconventionals have much more widespread distribution, as this category can include the tar sands' crude bitumen, coalbed methane, shale oil, shale gas, methane hydrates, and more. Unconventional reserves derive their name from the unique and more modernized processes of extraction that these petroleum systems require. The "stimulation" technology includes that which is deployed in the now-infamous multi-stage hydraulically fractured horizontal wells (AKA 'fracked' wells). This unconventional approach to extraction has opened the door to new, more complicated, and riskier extraction worldwide. It has also led to higher recovery rates of known reserves in conventional petroleum systems which have been retapped to be hydraulically fractured. This is part of the complication of the 'conventional' versus 'unconventional' dichotomy. If a once conventional reserve goes through multi-stage hydraulic fracturing so that additional volumes can be recovered, has its production transitioned to unconventional? Are those segments of the reserve which cannot be recovered with traditional recovery uniquely unconventional, while the rest remain conventional? The AER, naturally, has run into these problems over its durée. In contemplating tight oil reserves they say, "it is often difficult or impossible to separate the tight portion of the reserves or production of a conventional reservoir and, therefore, any unconventional tight oil volumes are included within the AER's conventional crude oil reserves and production reporting" (AER, 2015b, p. 4-1). These are the political and economic questions for firms discussed in the narrative around reserve replacement above, and they can be existential in a very concrete sense for firms. Without the prospect of future recoverable reserves on firm balance sheets, crisis may strike through shareholder anxiety and capital flight towards other projects and investments which may better guarantee the gratuitous shareholder returns that hydrocarbon investment is notorious for.

Streams of Production

The industry identifies the stages of oil and gas development and their relevant commodity supply chains as three semi-discrete ‘streams’: upstream, midstream, and downstream. These three vignettes in a hydrocarbon’s life all require different pieces of extractive infrastructure which the AER permits the construction and use of. This nomenclature of commodity streams applies to conventional and unconventional production alike. The purpose of understanding this technical language is manyfold, including understanding (a) which companies are involved at which point(s) in the extractive network to help explain firms’ motivations for wanting certain deregulation; (b) specific points of anti-extractivist contestation at different moments along the extractive life way, which target different types of operations; (c) the regulation surrounding asset AROs dependent on the type of infrastructure and what streams that operator works within; (d) furthering an understanding of geotechnical aspect of fossil capitalism from a critical physical geology perspective.

The extractivist web starts in the upstream realm where exploration companies' prospect for reserves, contract out seismic studies, obtain necessary initial licenses, draw up contracts, remove overburden or drill wells, and then pump, pry, carve, and/or haul away the raw materials they seek. In the case of deserted assets, companies specializing in this stream may be the best-known names as they birth and operate the assets that most often make it into the news cycles - oil and gas wells. This part of production has many technical and regulatory moving parts, and it requires a fleet of specialists including geotechnical labourers, scientists, engineers, and myriad contractors (Library of Congress, 2024). As for the permitting process in Alberta, things have really changed since the turn of the century. Upstream permitting was a historically complex process due to the variety of laws that applied and the fact that many different provincial agencies had regulatory purview for different components of the stream. In the case of unconventional production in the tar sands, for example, project proponents historically received mining exploration permits from Alberta Energy, were required to a consult with the Crown Mineral Disposition Review Committee, request surface access via Alberta Environment, and eventually submit a more holistic plan for each stream of production to the AER's predecessor, the Energy Resources Conservation Board (ERCB). But the 2013-2014 metamorphosis of the Regulator into the modern AER came with the shift to a 'single-window' regulatory approach which has meant that all development permitting now goes through the AER alone, discussed below (Carter, 2020).

The upstream production phase is risky as it has a high potential to expose local terrestrial and subsurface ecologies to all sorts of environmental contaminants. Drilling wells is a complicated and environmentally sensitive operation as it can be difficult to ensure the full isolation of hydrologic and geologic formations through which the well passes on its way to the reservoir. Many pathways to contamination are present in the drilling and producing of wells, including "inside or outside the well casing across various different pathways due to pour well competition, corrosion of steel casings, deterioration of cement during production," which may be due to "the development of channels in cement, poor removal of mud cakes that developed during drilling, cement shrinkage, or high cement permeability" (Alboiu & Walker, 2019, p. 4). There are also multiple leakage pathways that even properly abandoned wells (that is wells which have been cut, capped off, and plugged with cement according to the regional environmental statutes) still host:

> (1) between cement and surrounding rock formation; (2) between casing and surrounding cement; (3) between cement plug casing or production tubing; (4) through cement plug;

(5) three cements between casing and rock formation; (6) across cement outside the casing and then between the cement and casing; (7) along a sheared wellbore. (Alboiu & Walker, 2019, p. 5)

But once the well drilling is complete, regardless of the contamination of any surrounding environmental media, the sought after reserve's hydrocarbons can be extracted to the surface. Following the withdrawal, the commodities must be transported, processed, stored, or sold to the next handler. This vignette is known as the midstream sector. This sector is most associated with the transport of crude oil and fossil gas from the point of extraction to the point of upgrade and distribution to later downstream operators. But this sector is also constituted by a vast network of facilities either responsible for some treatment of the resource or for ensuring that pipeline or tanker flows do not stop. Oil and gas processing facilities are prolific throughout the province and all told, there are some 26,000 oil facilities and 18,000 gas processing plants and gas facilities in Alberta. That equates to one facility for every 10 wells in the province. This stream technically begins with the raw, extracted resources being sent to storage facilities, treatment facilities, refineries, or upgraders either by road tankers or via pipelines. There are different types of pipelines for different moments in the supply chains. Gathering pipelines, as one example, gather unprocessed hydrocarbons and are used just for transport to the first processing facilities that they will arrive at. Some amount of upgrading happens within this vignette at these facilities, including physical or chemical treatment, and gas processing or liquification (that is, the condensing of fossil gas into so-called liquified natural gas which can be more easily and quickly distributed via pipeline).

Once they have had their first pass, they may be ready for transport to a downstream operators' processing facility, or they may end up in a storage facility. Either way, this transport is made possible by a network of pumping and compressions stations which move the hydrocarbons along pipeline segments by continually re-pressurizing them at hubs along their routes. Transmission lines are pipelines which send the semi-treated hydrocarbons to downstream production facilities which complete the upgrading or diversify the hydrocarbons into petrochemicals and other commodities. This stream can be a little amorphous as it can include components of both upstream and downstream production processes. This explains why many producers become 'integrated' across the upstream, midstream, and downstream production segments. Ultimately, this dissertation research is not concerned with the downstream processing and sale of fossil commodities. Instead, its focus is on the infrastructure found in the upstream and midstream vignettes. Now that we have a broad enough understanding of the materialities of the hydrocarbons and some of their relevant commodity circuits, we can more closely examine the productive process at the point of extraction. The point of extraction in the upstream world (a fossil oil or gas well, say) is highly regulated by the AER's regulatory regime. As such, it is a good time to make a first pass at understanding the organization, mandate, and corporate governance structure of the AER.

A "Conventional" (or Mainstream) View of the AER

The Regulator can be traced back to the 1938 establishment of the Petroleum and Natural Gas Conservation board. The early 20th century began with the typical Canadian tradition of shuffling responsibility and stewardship (and jurisdiction, to a lesser extent) of provincial resources. Prior to 1930, the province did not even have control over its mineral resources. The Natural Resources Transfer Acts (NRTA) changed this by handing over authority of the prairie provinces' resources from the federal government to the provincial ones (King & Pasternak, 2019). At this dawn in the province's hydrocarbon history, the Turner Valley oil field was the only regional producer of crude or fossil gas. Turner Valley had several small production booms over the first decades of the 20th century thanks to wet gas and crude deposits in the Lower Cretaceous sections, along with a deep pool of crude in the Rundle formation. Commercial production in the field lasted for a nominally successful decade, spanning 1936-1946 (Carter, 2020). But as the 1940s progressed, many hopeful exploration companies seeking new slices of black gold throughout and beyond Turner Valley became disenchanted. It was not until the winter of 1947 that an Imperial drilling crew first struck a 330-million-barrel deposit in the Leduc-Woodbend field in the central plains, dramatically increasing extraction, upgrading, and export, putting Alberta on the global map of major producers (Parks Canada, 2024). The preceding years saw the unveiling of multiple oilfields in the province, like the 1948 discovery of the Redwater field and the 1949 discovery of the Golden Spike field, holding more than 1 billion barrels of crude between them. With the ensuing expansion, the provincial government began to expand the scope of its regulation, partly to ensure that financial kickbacks from production were being adequately captured by the state. The 1935 election of the Social Credit Party's William "Bible Bill" Aberhart led to a two-fold increase of hydrocarbon royalties from five to 10%. Premier Ernest Manning's government raised the royalties another 6.6% on top of that in 1951, and Peter Lougheed, the first Progressive Conservative (PC) premier in the ensuing 43-year dynasty of the party, raised it again to over 20% in 1972 (Jaremko, 2013).

1970 led to the first rebranding of the board as the Energy Resources Conservation Board (ERCB). But in 1995, Alberta Premier Ralph Klein changed the ERCB to the Energy and Utilities Board (EUB), a name change which only lasted 13 years, as the PC's Ed Stelamach changed the name *back* to the ERCB (Carter, 2020). The perennial identity shifts of the

Regulator over the last years since the organization's founding align with the dynamic changes in hydrocarbon regulation, in both the increase in relevant environmental statutes, and the mandates of the organization. Charting this whole history is far beyond the scope of this dissertation. That said, of note is David Breen's 1993 *Alberta Petroleum Industry and the Conservation Board*, exhaustive on the early to mid-20th century development of provincial natural resources management. But so much has changed over the last 30 years since its publication that a second edition would likely outsize the original. What can be said is that while the AER has been assigned as the province's current, singular, regulatory authority for downhole, technical, and financial regulation of hydrocarbon licensing and production in Alberta, this was far from the case during the 20th century.

Prior to the passage of the province's 2013 *Responsible Energy Development Act* (REDA), the Regulator's life as the ERCB saw it fill a similar role, authority, and purpose as an "independent and quasi-judicial agency of the Government of Alberta" (Ministry of Energy, 2013, p. 88). Under REDA the Regulator is mandated "to provide for the efficient, safe, orderly and environmentally responsible development of energy resources in Alberta through the Regulator's regulatory activities" (2012, s2(1)(a)). With this legislation's passage, the AER absorbed the responsibilities of the former Alberta Environment and Sustainable Resource Development (and the ERCB, of course) and became the sole regulator for all permitting of environmental and water permits in the province. This pivot to a single regulatory body via REDA was important as it broadened the AER's regulatory scope to include "responsibility for sections of the *Public Lands Act,* Part 8 of the *Mines and Minerals Act*, the *Environmental Protection and Enhancement Act* (EPEA), and the *Water Act* as they relate to energy resource development" (AER, 2014, p. 3). Some commentators argue that the earlier ERCB was made more independent of the industry and provincial government to achieve arm's length determination of proceedings around hydrocarbon development, considering guidance from outside professional scientific communities like the Alberta Geological Survey, rather than from technical experts who have long laboured within the ranks of fossil firms.

Regardless, they are now mandated to be an industry-funded "full life-cycle regulator, responsible for all stages of development—from exploration and production to closure and reclamation" (AER, 2021a, p. 1). They report to the Government of Alberta and answer to the province's Ministry of Energy and the Ministry of Environment and Protected Areas (AER, 2024a). Per its legal mandate, the AER produces directives, manuals, and operational frameworks to address hydrocarbon licensee's infrastructure management, closure, and abandonment (among other things). These directives are a scaffold upon which the province's regulatory regime expands according to problems that operators and the regulator face (or create for themselves) in all phases of energy development. There are many directives of interest in this puzzle of expanding desertion which I will not systematically outline but, suffice it to say, many focus on staving off increasing numbers of deserted hydrocarbon assets. Recently, the province's 2020 *Liability Management Framework* and *Directive 088: Licensee Life-Cycle Management* both work towards this end, exemplifying modern shifts in liability management.

As the AER is the sole energy regulator in the province their portfolio of assets and project approvals extends beyond just crude oil, fossil gas, or tar sands bitumen. For this dissertation's sake, I will only present discussion about the infrastructure related to conventional reserve development. While the numbers are always ebbing and flowing based on continued expansion of the industry, as of 2024, they oversee at least 447,000 kilometres of pipeline, 464,000 natural gas and oil wells (157,000 of which are operating), 26,000 oil facilities, 18,000 gas facilities, 460 operating gas processing plants, 157 oilfield waste management facilities, 26 heavy crude thermal recovery projects, 160 primary or enhanced in-situ heavy crude projects, eight tar sands mines, five bitumen upgraders, and five coal mines. More specifically, this includes 156,023 active wells, 83,679 inactive wells, 89,275 decommissioned/abandoned wells, and 133,529 reclaimed wells. This industry generated $167 billions of value in the 2022 fiscal year and there are still a projected 1.7 billion barrels of conventional oil, 159 billion barrels of bitumen (in the tar sands), and 24.3 trillion cubic feet of natural gas in the province (AER, 2024b). Although, as discussed, these numbers grow just as much as they deplete.

The Regulator is also responsible for overseeing hearings for energy development applications related to said extractive infrastructure, though not every application is granted such a hearing. The AER decides which projects merit a hearing, and they then post notice of the hearings on their website, outlining how people can get information about scheduling and how they might participate in them. The hearing commissioners in charge of these proceedings are important to the AER's public-facing conduct as this is where members of the public, such as landowners whose property is atop mineral leases, can be involved in energy application processes. These public forums are also open to people who may be less directly impacted by project development. In cases of inter-jurisdictional development, such as a pipeline which crosses provincial borders, the AER may team with the Impact Assessment Agency of Canada to decide the fate of a project. These hearings, judicial tribunals, are "formal court-like processes" which can be held for applications on any infrastructure development project related to extraction in the province. Such tribunals are like civil cases heard before a judge, but the judges in this case are hearing commissioners, independent adjudicators appointed by Orders in Council from the Government of Alberta. Participants in these hearings can "present evidence, ask questions, and make arguments about energy projects" to the commissioner(s) adjudicating the hearing (AER, 2025d). These hearings are particularly important to landowner advocates, including some of interviewees, as they are the legal avenue through which citizens can contest the industry and Regulator's actions. They act as an administrative tribunal, an ostensibly democratic locus for concerned citizens to find remedy to issues with operators or with the Regulator's unitary power. Similarly to how environmental impact assessments do, the hearings act as a public forum for discussing the negative impacts of the projects on people and local ecologies.

Executive Leadership, Board of Directors, and Hearing Commissioners

The AER is technically led by a five-member executive leadership team and its Board of Directors, the latter appointed by an Order in Council, which currently has seven members and a chairperson. The directors "are not involved in our day-to-day operations and decisions but instead set the general direction of our work" (AER, 2025a). The Chief Executive Officer (CEO), on the other hand, does oversee the operations of the Regulator, including everything from "receiving and making decisions and delegating decision making on applications, monitoring and investigating energy resources activities for compliance, and closing energy developments through the processes of remediation and reclamation" (AER, 2024b, p. 2). The Board controls who is appointed as CEO (though subject to the above Ministers' approval) and they report directly to the board Chair. The sitting executive leadership team is composed of a heterogenous group of public servants who have expertise in a medley of matters including public administration, provincial governance, public opinion research, emergency management, compliance assurance, risk management, supply chain management, and financial auditing

(AER, 2025c).

The Board, although it is made up exclusively of people who have spent their lives working within the province's, and nation's, hydrocarbon economies. While some directors have stated experience outside of the industry, each one foremost highlights their ties to the hydrocarbon industry. Industry control of the board has been the standard since the AER was minted in 2014 beginning with Gerry Protti, the first ever Chair. Protti had been an executive Vice-President of Encana and was also the founding president of the biggest hydrocarbon lobby group in the province, the Canadian Association of Petroleum Producers (CAPP) (Adkin, 2016, p. 99). David Goldie, Protti's predecessor until 2020, is an industry elite with a background in geophysics who spent 30 years working for Imperial Oil/Exxon, PanCanadian Petroleum, Encana (as a Vice-President), and Cenovus. The current Chair as of 2025, Duncan Au, was the president and CEO of his own energy services firm and later held the same roles within an oilfield services firm which was acquired by Precision Drilling in 2023. He has sat on multiple industry advocacy group boards including the Canadian Association of Energy Contractors (CAOEC) and the Canadian Energy Executive Association (CEEA). Likewise, director Corrina Bryson sits on the Canada-Nova Scotia Offshore Petroleum Board and the Alberta Petroleum Marketing Commission, having begun her career with Shell in the early 1990s. Director Gary Leach was president of the Explorers and Producers Association of Canada (EPAC) along with a senior international executive position in an oil services company prior to his lobbying work. My personal favourite, David Yager, has worked in the industry for the past 50 years on everything surrounding the industry from wellbore construction to business journalism, to industry lobbying. He is the author of *From Miracle to Menace: Alberta, A Carbon Story*, which frames Alberta and its fossil economy as hostages in the ongoing global transition to low-carbon energy sources.

Not so different from the professional make-up of the Board, the AER's hearing commissioners are also largely people who have spent their professional lives within the hydrocarbon industry. These commissioners are responsible for overseeing all AER hearings for energy applications and any ensuing regulatory appeals on project approval decisions, as discussed in the section above. The commissioners hold these formal court-like processes in advance of approving project applications, from wells and pipelines to tar sands and other strip-mining projects. They can hear appeals related to the Regulator's decisions on things like reclamation certificates and approvals or rejections of applications pursuant to Section 42 of *REDA*. One of my interviewees, Mark Dorin, associated with two landowner advocacy organizations, the Polluter Pay Federation and the Alberta Liabilities Disclosure Project (ALDP), routinely helps and represents landowners at these tribunals.[26] He argued that within this process there is "a huge hole that somebody has to fill" (personal communication, March 15, 2023), as thousands of landowners are impacted by development projects, and this is the main avenue to express their concerns and have regulatory deliberation. The chief hearing commissioner at the AER, Alex Bolton, spent at least 15 years working for different hydrocarbon firms prior to beginning his time at the ERCB in 2010 as a Board member. According to their AER profiles, six of the nine sitting commissioners have direct ties to the hydrocarbon industry through working for regional and international producers. As the commissioners are not a central focus here, I will not list out their backgrounds and credentials. Suffice it to say, it is fair to read them as representatives of fossil capital's organic intellectuals.

While this is a short and conventional overview of the AER, it is sufficient for now to

[26] You do not need to practice law or be a lawyer to represent people in front of these tribunals.

move onto the lifecycle of a hydrocarbon well. Understanding the lifecycle of these wells is imperative to meaningful critique of the Regulator's liability management regime. It is especially important to pay attention to what happens after the productive life of a well, or any other piece of extractive infrastructure.

Life of a Well

While there are many pieces of infrastructure involved in the production of hydrocarbons, I will consider the life stages of a crude oil and/or fossil gas well in this section. This makes sense as wells have become emblematic of the problems of desertion due to their high visibility as terrestrial obstructions on public and private lands, as opposed to the subterranean and far-removed lives of pipelines or geographically remote processing facilities. The life of a crude oil well begins with a fossil firm assessing the prospective project site, including the surface and subterranean conditions. This assessment includes notifying any communities who would be impacted by development, like the local municipalities, landowners, or Indigenous nations and communities. Depending on who owns the land atop the reserves, the leasing or purchase process of the subterranean mineral rights varies. The Crown in Right of Alberta, or simply the Crown within Alberta's provincial jurisdiction, owns 81% of the mineral rights beneath Alberta today. This is a product of the 1930 NRTA discussed earlier, which transferred mineral resource ownership from the federal Canadian government to the provincial governments of Manitoba, Saskatchewan, and Alberta (King & Pasternak, 2019). The 19% of non-Crown minerals are known as 'freehold' mineral rights in the province: 9.20% are under federal jurisdiction *held on behalf of* Indigenous nations or Parks Canada (via national parks), 7.28% are owned by private railroad firms or trusts (including CN Rail, Canadian Pacific Railway, and the Hudson's Bay

Company), 0.55% owned by private individuals (including homesteaders and individual freehold mineral owners), and the last 2% falls into an ambiguous ‘Other’ category (Government of Alberta, 2020). Even still, “certain minerals are not included in a particular freehold mineral title” (Government of Alberta, 2018). These non-crown freehold mineral rights in the province were obtained through historical grants, acts, and regulations.

If the prospective project site is on public land, owned by the Crown, the company applies for permission per the *Public Lands Act*. If it is privately owned or Freehold land, then the firm negotiates a private surface agreement with the owner. Since it is rare for individuals to own the subsurface mine and mineral rights in the province, most applications from potential licensees seeking approval to initiate a project are just seeking Crown approval via the AER. According to the AER, they receive some 40,000 applications each year related to production, which include “everything from a request to access a parcel of land, to a request to drill a well, to request to build a pipeline” (AER, 2024a). In principle (although research suggests that this does not happen on a routine basis) the company must go on to publicly notify anybody who is considered a stakeholder with plain language material regarding everything from how process waste will be handled to how the firm will organize emergency responses. Only then can the firm apply to the AER for project approval. At this point, they must have considered all the relevant regulatory directives and manuals which govern production. If there is resistance to project approval from community members, the Regulator may choose to hold one of the formal hearings, overseen by its commissioners, as discussed above. Barring any regulatory interruption, the firm can then begin the actual construction of the project site and drilling of the well. Depending on the scope and scale of the project, this can include everything from building access roads, to installing waste facilities, to excavating and laying pipelines. Now, the extraction can begin. This phase can last for decades, depending on the volume of the reserves from which the commodities are being extracted. In short, this stage of life is categorized as the 'Active' period by the regulator. Inevitably, all wells will leave this productive phase, as the natural creation of petroleum reserves takes millions of years and extraction may only last decades.

After Activity

An 'inactive' well has "stopped due to technical or economic reasons," but, importantly, "not all sites in this category are orphaned" (Romaniuk, 2017, p. 1). The technical reasons for inactivity are that the recoverable reserves are so low that the well cannot extract any more commodities from the site. The economic reason may be that the cost of operating the well, relative to the productive output and spot price of crude oil or fossil gas, is too high for the company to continue operating it. In either case, the licensee will stop the operations through what is known as cased-hole 'abandonment,'[27] where "a bridge plug is put into the well, inside the *casing*, to prevent upward movement of hydrocarbons" (Kenyon et al., 2016, p. E-3, emphasis in original). This temporary form of well abandonment leaves the possibility of returning to the well and resuming production, should conditions change to make it technically and/or economically feasible to resume production.

Following the adoption of 'inactivity,' a well must eventually either resume production or be 'suspended.' A piece becomes suspended once it has been inactive for 6 or 12 months, depending on exactly what commodity it is extracting or transporting. The AER's *Directive 013:*

[27] Again, this is not a stand-in term for 'orphaning' or 'desertion' but is the regulatory term for the first phase of well decommissioning.

Suspension Requirements for Wells outlines the steps for converting an inactive well into a suspended one. Like the inactivity phase, suspension must happen on a prescriptive timeline: "The licensee must complete the initial suspension and reporting requirements for all inactive wells within 12 months from the *Directive 013* active status date" (AER, 2022, p. 2). Despite the strict timelines for pivoting an inactive well into a suspended one, the time a well can remain suspended is an ambiguous subject at the AER. Wells can, and tens of thousands do, remain suspended for an indeterminate amount of time (Muehlenbachs, 2017). While operators are technically required to inspect project sites and infrastructure yearly, they do not need to move towards abandonment on any specific timeline. This is a desirable regulatory mechanism for fossil capitalists, as ARO work has a high price tag and delaying such work into the future makes for better immediate capital accumulation. This has long been a known problem for anyone with an eye on the province's conventional oil patch. As of December 2024, the AER claims that there are around 79,000 inactive wells in the province, according to their 2023 Liability Management Performance Report (AER, 2024f, p. 1).

This report is a product of the province's new liability management framework and December 2021's *Directive 088*, both of which I return to below. It bears repeating that the province's tranche of inactive wells is a longstanding issue that is a principal focus of current management retooling. The fear that stoked the creation of this new framework is that these inactive wells will one day be externalized to the OWA or to the public after their parent companies go bankrupt or decide to end production all together. This leads to a sour, positive feedback loop as the longer that a well remains inactive, the longer the firm can be exposed to poor economic conditions and the possibility of bankruptcy. If a firm does not actively pursue new financing and new reserves, then its existing collection of wells-as-financial-environmental liabilities will grow while its production assets continue to diminish. Unsurprisingly, this life-stage has become an invaluable crutch to operators who do not want to pay for the costly ARO work. Lucija Muehlenbachs' (2015; 2017) unique studies modelling the conditions around inactive well reactivation (as opposed to full abandonment per the AER's guidelines) is prescient here. Muehlenbachs puts it succinctly:

> Only with a drastic, arguably implausible increase in prices and recovery rates will there be a significant increase in the number of reactivated oil and gas wells. This implies that wells are typically left suspended not because of the option to reactivate, but rather to avoid costly environmental obligations, coupled with the fact that there is no penalty for leaving wells suspended indefinitely. (2017, p. 2)

Notwithstanding this political economic conundrum of indefinite suspension/inactivity that the Regulator has allowed itself, a properly cared for well may not end up in this phase for a prolonged period. Wells that are properly overseen will eventually reach the 'abandonment' phase. Rather than the dictionary definition referring to the act of giving up, leaving, or stopping providing support to someone or something, this is the technical term for the appropriate closure practices of a well at its life's end.[28] Abandoned wells will not return to production and are permanently plugged with cement, cut at their heads, and capped with a ventilated topper in order to prevent the release of any fugitive hydrocarbons from the wellbore. This is also known as being 'plugged, cut, and capped' (AER, 2021a). Per *Directive 013*, "a well that has been downhole abandoned, surface abandoned," will have its license status formally changed to 'abandoned' (AER, 2022, p. 19). This phase also broadly includes 'decommissioning,' which involves the permanent dismantling and removal of any other infrastructure on the site.

[28] Nowhere in the industry is the word 'abandonment' used in signifying infrastructure dejected and left behind by operators.

Depending on the complexity and scale of the project site, this can take up to two weeks to complete (OWA, 2024).

Following the decommissioning phase, the site must enter the phases of ‘remediation’ and ‘reclamation.’ A site may need to be environmentally remediated if any contaminants of concern are present in the local environmental media (soil, surface water, groundwater). This is supposed to be determined through environmental site assessment, where soil and water samples from the site are collected and analyzed. If contaminants are found, the site-specific remediation could take months or years. The technologies of remediation depend on both the extent and type of release at the site. The last step of the process once remediation is complete is the actual reclamation of the land and local ecologies. According to the provincial statutes, the land is to be returned to something like its pre-disturbance state. This involves land contouring, addressing stormwater drainage, and re-vegetation. For anyone with a keen ecological eye, this is a notoriously vague part of the process. As ecologist and industry critic Kevin Timoney argues, “the AER’s revegetation criteria are abstruse, but for all intents, there are no requirements to return the land to its previous natural vegetation” (2021, p. 302). Regardless, after this protracted process, the site can be ‘certified reclaimed’ if it meets the conditions of an inspector’s site assessment. But what happens if these conditions are not met by the operator? What happens when the fossil firm does not have adequate cash flow to oversee closure work due to delays in putting capital forward to get the work done? Worst of all, what happens when the firm who owns the infrastructure goes bankrupt?

A “Conventional” (or Mainstream) View of the OWA

The AER explains, regarding fossil firm bankruptcies, that when there is no legally responsible party to look after an asset, they have the authority to designate it as an 'orphan.' This is an important linguistic and legal framing in the phenomenon of mass asset desertion. These orphans are not products of brief, prophylaxis-free romances gone awry. Nor are they now the children of the state because of some fatal tragedy of kin (barring some sort of mass die-off of a firm's C-suite executives and the company closing shop). They are "orphans" because they were deserted by firms and 'disclaimed' by financial institutions who either would not or could not foot the bill for their ARO. Here, the OWA enters the frame. The OWA is an independent, not-for-profit, funded by industry operators, the province of Alberta, and the Canadian federal government (the latter two through interest-free loans which are actively being paid back) which is under the legal purview of the AER. The OWA is the registered trade name of the Alberta Oil and Gas Orphan Abandonment and Reclamation Association, incorporated in 2002 via the *Orphan Fund Delegated Administration Regulation* with a mission to "safely decommission Alberta's orphan oil and gas wells, pipelines and production facilities, and restore the land similar to its original state, all in a cost-efficient manner" (OWA, 2021, p. 1). This history dates to December 1989, when the boards of directors of the principal lobbying groups for the Canadian hydrocarbon industry—the now defunct Canadian Petroleum Association, Independent Petroleum Association, Small Explorers, and Producers Association of Canada—established a joint task force to address unfunded liabilities stemming from insolvencies/bankruptcies in the province. At this time, there were already at least 25,000 inactive wells and 243 deserted wells throughout the province according to the Regulator (Yewchuk et al., 2023). Much happened in those interceding years, but the OWA as such was founded in 2002 in direct response to mass asset desertion. From 1997 to 2002, one of the AER's predecessor, the EUB, had the authority to conduct abandonment, decommission, and reclamation of deserted infrastructure and sites itself through what was known as the Alberta Orphan Program, like the mandate and funding source of the OWA via what is known as the orphan fund levy (OFL) (OWA, 2017).

While the original stated aim of creating the organization was toward the safe restoration of the province's lands through ARO, their mandate continues to evolve according to industry needs, facilitated through the amendment of legislation or the introduction of new regulatory frameworks and mandates. For example, the passage of *The Liabilities Management Status Amendment Act* in 2020 helps fast track their closure processes through amendments to the province's *Oil and Gas Conservation Act* (OGCA) and the *Pipeline Act* (Wivcharuk, 2020). But the organization does not even necessarily have 'its own money,' and does not *necessarily* have institutional perspectives on liability management. The organization is funded through payments by active licensees into the OFL. The AER prescribes and collects this money on behalf of the OWA, according to Part 11 of the OGCA. But the amount they collect depends on "revenue requirements identified by the OWA board and approved by the GoA [Government of Alberta]" (AER, 2021a, p. 15). The ebb and flow of funding—consistently a higher flow these days on account of the extent of inactive and soon to be deserted assets—depends on the scale of work that the organization is tasked with completing in accordance with their inventory size.

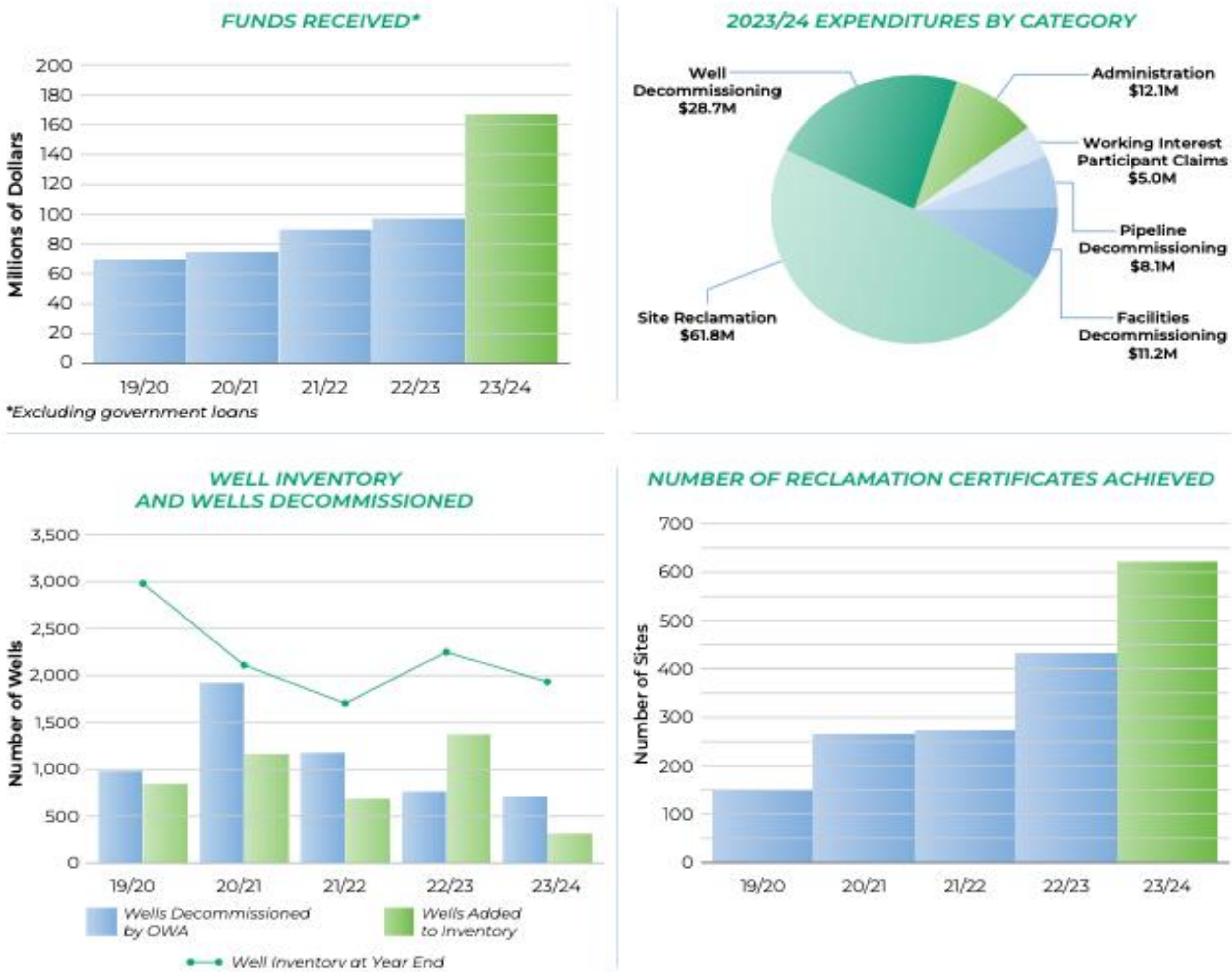
In 2020, the collected levy totaled $60 million,[29] in 2021 it was $65 million, while in 2022 it was $72 million. But, suddenly, in 2023 it nearly doubled to $135 million, and is "expected to remain at this level for the foreseeable future" (OWA, 2024, p. 7). Additionally, the organization collects a Large Facility Levy and generates some novel sums from salvage sales of equipment left behind by bankrupt operators. The Large Facility levy is collected upon the OWA's receipt of new, complex facilities, and funds the Large Facility Liability Management

[29] These figures are in Canadian dollars (CAD) unless otherwise noted.

Program (LFP). Only $6 million was collected for the program in 2022 and, as no new facilities came under their purview in 2023, they collected nothing in the 2023 fiscal year. So-called OWA-run salvage sales (managed currently by the web-based ARMOUREE company) sell used oil field equipment from defunct companies at discounted costs in attempts to repay any secured creditors who were owed money at the time of a fossil firm's bankruptcy (and the sales can also help pad the OWA's own coffers). As such, in a Marxist sense, even in times of bankruptcy this fixed capital, "can then still circulate in the same sense as immovable property generally - as title; but not as use value; it cannot circulate in the physical sense" (Marx, 1973, p. 659). They generated $8.9 million from salvage sales in 2023, down from $11.6 million in the previous fiscal year (OWA, 2024). Of note in their funding streams is a 758% increase in enforcement and security deposit recoveries from the $1.9 million collected in 2022, to $16 million collected in the 2023 fiscal year. This stems from a more aggressive position by the Regulator and OWA to actively recover outstanding security deposits from insolvent firms. These deposits will be discussed more in the following chapter. Below is a tidy collection from the OWA's 2023/2024 annual report showing their accrued funds and the ways in which they have been spending them in recent years.

Figure 1

OWA Funding, Expenditures, Inventory, and Reclamation Certifications



Note. This collection of graphs was published together in the OWA's 2023/2024 annual report. From OWA, 2024, 2023/2024 Annual Report.

As shown in Figure 1, the use of these funds is mostly constrained to decommissioning and site reclamation work (infrastructure AROs), with nominal amounts to administrative costs. Lars DePauw, the president and CEO at the OWA since 2017, said during an interview that, "really, the way that we look at it is we are an agent that does the closure work, but…we do not have our own money. It comes from active companies," and "our job is not to decide how the province manages its liability. We are there to do closure work when sites get designated as orphans" (personal communication, March 8, 2023). This common perception is that since the OWA strictly handles deserted asset closure and remediation from funds collected by the AER via the OFL, there is no great concern for private influence. This is based on the belief that the closure, remediation, and reclamation work does not necessarily interact with private financial returns (although, as we will see, the true indirect influence is an important net positive for the industry on many fronts).

While the OWA does manage public-private coffers, they do not directly handle actual infrastructure ARO work and instead contract third party firms that specialize in environmental consulting and environmental oil field services to take on the physical work. Vertex Resource Group is one such multi-functional 'prime contractor' experienced in well commissioning and removing surface equipment. They are likewise permitted, as a prime contractor, to subcontract work by other firms for ARO services they do not render in-house. Vertex's Vice President of Engineering, Tom Bratrud, told me during an interview that their firm had closed more than 1,600 wells by 2023 through their work contracted by the OWA, this closure number being second only to Canadian Natural Resources Limited's in-house decommissioning program (personal communication, February 23, 2023). Interestingly, Vertex is a publicly traded company on the TSX, much like the producers they service in the patch. They have secured their share of the well closure business by focusing on maximizing the amount of sites they can close in one swoop. They rate their clients' portfolios based on the relative complexity and geography of their project sites, known commonly today as the practice of area-based closure. Beyond deserted assets, they also help solvent firms decommission suspended or inactive wells which will never return to a productive capacity. This is an important part of the equation of *pending* deserted wells as evidenced in the previous discussion on the inactive/suspended well situation. Bratrud said,

> Let's just call it a sheer numbers game. We would say [to a client], "you should focus on removing the wells in this part of the province, because we can do them very effectively, based on our knowledge of the area and our experience…for your spend you will remove more wells than if you were to go into this area. This will then allow you to reduce your liabilities rapidly…" By dealing with the low-hanging fruit first, it will help to reduce, or at least flatline, the number, or value, of wells that are suspended. (personal communication, February 23, 2023)

This group of labourers in the third-party environmental consulting world are important to fossil capital's accumulation. Rather than helping with the offloading of socioecological externalities onto the public, they help grease the wheels of production by using their technical knowledge to decommission extractive assets. Their work of safely closing well sites (as far as is possible with the available technology) can be read as net positive. Likely, their volume of work will grow as inactive infrastructure and sites turn to deserted ones, and the OWA's own portfolio grows accordingly.

The OWA's inventory is assigned based on AER investigations into facilities and infrastructure sites deemed to have no legally responsible or financially viable parties to take care of them. To put it plainly, the OWA absorbs its wards when operators (any fossil capitalist firm with a license to extract in the province) face corporate insolvency and bankruptcy proceedings due to any number of reasons, including executive mismanagement. While the OWA's name might suggest that their scope is limited to oil and gas wells, their purview extends to any piece of infrastructure deserted by insolvent firms with conventional oil and gas licensees including wells, pipelines, processing facilities, and waste facilities. The OWA has flagged the growing diversification of their portfolio and has noted the rise in facilities abandonment, notably taking on the defunct Mazeppa gas plant as their very first 'large facility' in 2021 under the LFP.[30] Firms' assets can become orphaned at any stage in their life cycle whether they are young or old, still profitable, or sunk capital (e.g., a well's recoverable reserves have dried up). While this number is constantly changing, the OWA's January 2024's inventories consist of 2,946 orphan sites requiring decommissioning (2,185 wells and 301 facilities), 2,741 orphan pipeline segments requiring decommissioning, and 5,485 orphan sites ready for reclamation (for which decommissioning has been completed). The spikes in their inventory growth do correlate to energy market downtrends, but there are many more variables that contribute to asset desertion than this alone. These variables can include the depletion of recoverable conventional reserves in an operator's portfolio, mismanagement, poor leadership in the firm, or pre-planned desertion for firms who were never going to conduct their assets' ARO.

This is exemplified in the 2017 and 2018 fiscal years during which the now-infamous firm Lexin Resources was forced into corporate receivership[31] by the AER, and the number of OWA-owned wells increased 76% from 1,778 to 3,128. As will be discussed at length in Chapter 3, industry insiders believe that Lexin never intended to see through their closure obligations and only ever sought to undertake rapid exploitation throughout their tenure. Regardless of the reason(s) behind a firm ending up in receivership, the appointed receiver will attempt to sell whatever pieces of infrastructure they can, while navigating the ARO of the inactive pieces. But

[30] Although DePauw was quick to note that they have decommissioned other large facilities prior to this and the introduction of the LFP.
[31] Meaning that a third party was brought in to take on their AER licenses.

there is often no money left (thus, no legally or financially responsible party) to contract out the necessary ARO work of inactive assets, which leads to the OWA adopting the wells and facilities via license asset transfer. This can be a prolonged legal battle, as the OWA and AER do not really want to become wards of these assets and would rather firms take care of their own messes in the patch. This aligns with the ethos of Alberta's 'polluter pay' principle, stating that whoever made the pollution should be responsible for the bill of cleaning it up. But the provincial law and policy are not aligned in this, and gaps remain in this matter. As legal scholar Jassmine Girgis argues, there is a frustration between federal bankruptcy law and provincial environmental statutes around environmental-financial liabilities which fossil firms have. This might be remedied by amending the existing legislation:

> The goal should be, and fairness dictates, that the debtor always covers the cost, regardless of its solvency, but that requires amending the governing legislation, preferably to give the regulator (in this case, the Alberta Energy Regulator (Regulator), and the equivalent regulators in other provinces) a super priority. (2019, p.1)

I will return to this very important legal frustration in Chapter 5, exemplified by the Supreme Court of Canada's *Redwater* decision. But, in returning to the last phase of asset ARO, only 2,579 sites have been fully closed and reclamation-certified by the OWA since their founding. This is because the reclamation process is a slow and patient process, not unlike a bout of ecological secondary succession following a natural disturbance. It turns out that returning a highly disturbed project site to even near its pre-disturbance state, as is required by provincial law, is difficult and requires much expert involvement. Either way, this is the final certification for a site to be considered 'returned to its original state.' There are 3,400 sites in the OWA's portfolio which are awaiting the revegetation period needed to be reclamation-certified (OWA, 2024).

While the number of wells which need to be decommissioned has been decreasing since 2018, the number of new orphans received from the AER has been slowly increasing. Around $200 million in fresh liabilities are coming their way in 2025 via the bankruptcy of Sequoia Resources, which left behind 2,000 wells alone (Bakx, 2024; OWA, 2024; Yewchuk, 2021). Additionally, the Trident Group's bankruptcy has resulted in more than 4,700 deserted wells and a combined $419 million in unsecured liabilities and outstanding debt, following a legal battle in the Court of King's Bench of Alberta between the OWA and Trident (*OWA v. Trident Exploration Corp*, 2022). There are many individual stories of failing fossil firms which could be told here. But, before any more corporate storytelling, we will look at the leadership of the OWA.

Executive Leadership and The Board of Directors

The corporate governance model of the OWA is distinct from the AER in that the Board is not appointed by an Order in Council but instead is appointed by its constituent members: CAPP, EPAC, and the AER. As such, each organization can designate a certain number of directors, so the six-member board is made up of fossil capitalist elites from different firms, including Paramount Resources, Ember Resources, Cenovus, and CNRL (each of these is a member firm of CAPP). As DePauw explained to me during our interview, the board members are independent fiduciaries, meaning that they are meant to represent the OWA and oversee the organization's operations independent of their private firm or lobbying associations. DePauw explained it like this: “So the way you think about it is that it's almost like a company that has shareholders, and the shareholders vote on the board of directors” (personal communication, March 8, 2023). Four of the six board members work for hydrocarbon firms: Doug Dafoe of Ember Resources (Canada's largest natural gas producer), Logan Popko of Cenovus (Canada's third largest integrated producer), Kyle Pisio of CNRL (Canada's largest heavy crude producer), and D. Blake Reid of Paramount Resources. Interestingly, DePauw is an industry expert with years in private and public positions throughout Alberta's hydrocarbon economies and he told me that he was headhunted to be the first Director of the OWA in 2017. For the 15 years before 2017, the organization was run strictly by its Board. The downturn in hydrocarbon markets created one of the notable inflows of orphans, and the Board realized that creating a leadership position like the Director was necessary. The leadership team which handles the organization's daily operations is made up of four members, including DePauw, who all have extensive experience in the fossil economy.

Conclusion

To fully grasp the scale of the deserted infrastructure crisis, soon to manifest in huge waves of asset desertion in Alberta, it is important to understand the working of the regulatory regime and the way that production happens in the upstream vignette of the industry. As such, this chapter has explained the materiality of conventional hydrocarbons and their production including the geophysical development of hydrocarbons, the politics of reserve designations, issues with petroleum geological language, and the life of a well. To accompany this, above I laid a conventional history of the AER and OWA, mostly as told by Regulator and capitalist-friendly resources. This 'conventional' explanation of both organizations' history, mandates, and governance structures has laid a path for fully understanding the extent and nature of the problem of unfunded, hazardous fossil liabilities. While some critique of these organizations was presented in the chapter, I attempted to hold my tongue to allow the organizations to speak for themselves.

But the devil is in the details, and this conventional history can now be juxtaposed against a different reading of this regulatory apparatus, centering critique of the political power of the fossil capital class. Such analysis below will help in explaining how this problem blossomed, who has long known about it, what regulatory shortcomings allowed it to happen, and why the liability management framework is shifting in the way it is today. The following chapter turns to analyzing the evolution of the liability management regime that allowed the fomenting crisis of unfunded liabilities to unfold and tells a different story about the Regulator and the OWA. In doing so, I attempt to understand how the machinations of fossil capitalism have tried to overcome the structural contradictions of capital accumulation which have been responsible for breeding the province's deserted assets.

Chapter 3: "A Slow-Motion Landslide"; The Failing Liability Management Regime

Introduction

In a 2019 internal memo, AER staff described the coming tide of deserted upstream assets as the product of "a slow-motion landslide of licensee failures" (AER, 2019a, p. 28). They go on to explain that "several mid-sized companies are moving through insolvencies, with the bulk of orphaned volumes expected to fall to the OWA. Smaller companies' inventories are moving directly to OWA care from ceased operations" (AER, 2019a, p. 28). These documents[32] painted a sobering picture of the failures of the regulatory mechanisms in the province, but, as with many of the AER's communications, they do little to explain what, or who allowed the situation to fester as it has. While it is obvious that companies have not been required to pay remotely near the full costs of extraction since the industry's dawn, the role of the dominant factions of capital in the province remains under-examined. In considering the respective roles of fossil and financial capital, it is important to understand the province's regulatory mechanisms used to manage socioenvironmental liabilities surrounding production assets.

In this chapter, I analyze the AER's directives most relevant to corporate insolvency and asset management, including *Directive 006, 011, 075.* Together, these three directives were the bedrock of the AER's liability earlier management program, constituting the Liability Management Rating system (LMR). But 2020 (during the writing of this dissertation) ushered in the Government of Alberta's new Liability Management Framework (LMF), under direction of

[32]This tranche of documents was obtained through FOIP requests during a 2023 investigation by Drew Anderson at The Narwhal in collaboration with CTV National News (Anderson, 2023). The Narwhal is the premier source of in-depth investigative work on Alberta's hydrocarbon economies, and I am indebted to the demanding work that their journalists go through to tell their stories.

the AER and fossil capitalist elite. This shift culminated in *Directive 088*, which has completely reformed the province's approach to liability. Understanding how these mechanisms work is imperative to explaining how the growth of deserted assets has happened, and how it is likely to continue happening, in the conventional sector. Without sufficient knowledge about these mechanisms, the additions to the OWA's inventories are incomprehensible. Further, this step allows the reader to plainly see the number of insolvent firms and soon-to-be deserted assets that there are at any time in the province, expressed in metrics like the monthly LMR reports.

Thus, **the first section** is a thorough discussion of the historic LMR program. I problematize the formulas and ethos that underlie these programs, putting some of my personal communications with Regulatory staff into conversation with other scholars' existing critiques of these programs. I take time to explain the publicly disclosed LMR reports which display the state of fossil insolvency across the province. The **second section** explains the province's recent interjection into liability management through the 2020 Liability Management Framework. The implementation and impact of this new program is still underway, so it would be premature to critique its outcomes. Nonetheless, there are notable problems with it that have been identified by both extra-industry researchers and even the Auditor General of Alberta. The second half of this chapter analyzes what exactly it looks like once a firm is forced into bankruptcy proceedings at the behest of a firm's financial creditor or the Regulator. To explain the real-world steps of insolvency and petitioned bankruptcy, **the third section** turns to the infamous case of the conventional operator Lexin Resources and their 2016 demise. Lexin was licensed to operate some 1,380 wells, 81 facilities, 236 pipeline segments, and 260 non-operated wells at the time of their bankruptcy, many of which became wards of the OWA in 2017 (Tambosso, 2017). This contributed greatly to the 76% increase in the OWA's inventory during the 2017 and 2018 fiscal years, from 1,778 to 3,128. While the calamity with Lexin resources is not paradigmatic of every bankruptcy in the oil patch, this is a good opportunity to discuss the practical steps of asset desertion and the AER investigations into failing firms, along with how the AER's policy and enforcement has failed so tremendously at times. This same dance of insolvency and bankruptcy returns with discussion of the *Redwater* case, in Chapter 5.

What is exposed in this discussion is one facet of the fossil capitalist hegemony controlling policy direction (and influencing the state writ large) through their newfound discretion in insolvency practices (Yewchuk & Fluker, 2024). As will be argued in Chapter 4, these policies and their development have been critical to advancing their accumulation strategies, most obviously through minimizing immediate costs to the industry (for instance, by refusing to pony up securities or bonds upfront) and externalizing yet uncalculated future costs to public coffers.

An Overview of LMR/LLR

From a strictly public policy or regulatory viewpoint, the problem of mass asset desertion appears to stem from Alberta's lackadaisical enforcement over its (already) ineffective approaches to liability management. By 'liability management' I am referring to the economic-environmental practice of balancing fossil capitalist firms' production assets against their liabilities. Assets, in this case, refers to the volume of hydrocarbon commodities that the firm is producing.[33] Liabilities, in this case, refers to the financial costs of ARO work, or the obligatory

[33] The term 'asset' is especially confusing in this context. Up until this point in the dissertation, I have used 'asset' at times to denote the extractive infrastructure of wells, pipelines, facilities, and so on. This is a relatively normal use of the term across fields like finance or political economy. Now, 'asset' will take on this new identity of 'production flows.

end of life care discussed in Chapter 2. The Regulator refers to these figures as 'deemed assets' and 'deemed liabilities.' According to the AER's *Directive 006: Licensee Liability Rating* (*LLR*) *Program*, "the deemed assets"[34] of an eligible producer licensee is the sum of its cash flow derived from oil and gas production…and the cash flow derived from midstream activity from wells or facilities for which it is the licensee" (2021, p. 13).

In general, economic terms, corporate insolvency occurs when a "firm does not have sufficient cash inflows to meet all of its cash outflows" (Lee & Lee, 2006, p. 149). Or, in the more specific words of the AER, the firm's "liabilities are greater than the value of their assets, including oil and gas infrastructure" (2021e). Insolvent firms have a few options including the "do nothing" and hope for the best path; seeking a buyer to take the firm over; negotiating adjustments with creditors outside of the firm; going through legal bankruptcy and reorganization or liquidation; transferring assets to a third party for liquidation; or liquidating the firm themselves (Lee & Lee, 2006). In the case of insolvent fossil capitalist firms in Alberta, the OWA's involvement is a sort of combination of the 'going through legal bankruptcy and liquidation' and the 'transferring assets to a third party for liquidation' routes just outlined. This may be a calculated decision for operators in the province as they weigh how best to accumulate and preserve profit in the face of an evolving, but still patchwork, regulatory framework. Some research suggests that a bankruptcy declaration may be advantageous to smaller firms who cannot easily absorb costs such as those associated with closure and reclamation: "As in many jurisdictions, firms in Alberta can avoid paying for damages through bankruptcy. Given such

[34]From my understanding, the modifier 'deemed' is used throughout the AER's guidelines because it is difficult to precisely calculate production value within the changing crude oil spot marketplace. As such, the liability rating is informed by a three-year provincial average netback that calculates the price per cubic metre oil equivalent along with a shrinkage factor that accounts for volume differences when hydrocarbons are pressurized and transported, per *Directive 011* (AER, 2015).

potential protection, firms may take riskier decisions" (Dachis et al., 2017, p. 5). Increases in corporate insolvencies have never been a mystery or a surprise for AER and OWA, as they have had to soberly calculate firms' potential for ignoring existing liability structures. The OWA's executive leadership's official position on this is to chalk it up to unfavourable economic conditions. Rather than outwardly critique firms that care little for environmental reclamation, and prioritize profit and investor return, the party line is to blame temporary downturns in crude and fossil gas markets: "in a difficult economy for energy producers, we expect to see more insolvencies, with more field work and more receivership management for the OWA" (OWA, 2021, p. 3). This certainly accounts for some firms' rapid insolvencies, but in an industry that is known best for its boom-and-bust cycles, this is far from the only explanation. During our interview, DePauw recognized the limitations of the liability framework, (bearing in mind that the OWA is not part of its creation or implementation): "I think that everyone is keenly aware of aware that what happened in the previous downturn, the tools that they had at the time didn't work very well, and so that's why they put a lot of those other ones in place, and I think they're positive" (personal communication, March 8, 2023).

But the mass desertion of assets has always been coterminous with the global hydrocarbon economy's boom and bust cycles. Extractive firms' asset liability problems as we understand them today date to the 1980s, with a rapid growth of corporate bankruptcies suddenly plaguing the province's maturing conventional hydrocarbon sector (Yewchuk et al., 2023). Decades-old excerpts from the province's then Provincial Coordinator of the EUB read as though they could have been published today:

> Increasing numbers of companies are not meeting our requirements and our customer surveys indicate that most representatives of companies, the public, and other

> government agencies, do not believe our enforcement actions are capable of achieving that compliance. We, and some industry representatives, are very concerned that regulators are not providing a level playing field and enforcing requirements equally (Couchette, 1995, as cited in Yewchuk et al., 2023, p. 266).

Yewchuk et al. (2023) identify three policy shifts in the 21st century that helped form closure liability as it exists today: the elimination of closure requirements for inactive (rather than deserted) wells; legislative amendments to transfer control over the management of the abandonment fund; the use of the liability rating ratios, comparing deemed assets against deemed liabilities.

The first shift is so important because the Regulator did actually try to respond to the nascent problem of inactive wells with more strict abandonment requirements as early as the late 1980's. Prior to 1995, the AER's Suspended Well Subcommittee of the Drilling and Completions Committee had developed guidelines for inactive well reviews to ensure that suspension was conducted, but it did little in the way of reducing the province's growing inactive inventory. In place of this, the EUB crafted a new requirement saying that wells which had not produced for 10 consecutive years either need to be abandoned by the operator or have financial securities posted to cover that eventual abandonment cost (Nichol, 1995, as cited in Yewchuk et al., 2023). This Long-Term Inactive Well Program (LTIWP) was killed by the Surveillance Branch of the EUB's Corporate Compliance Group in 2000, despite their memo to the Board Advisory Committee citing the success of the LTIWP. Overall, the program substantially helped reduce long-term inactive wells through the abandonment of 1200 wells and the collection of financial securities on at least 1500 more in just two years (EUB, 2000). As for the third shift, we can thank the Liability Management Project for introducing the Licensee

Liability Rating program (LLR) and usurping the fledgling LTIWP.

The Liability Management Rating system (LMR) was established in 2002 and encompassed liability calculation for licensees' wells, facilities, and oilfield waste sites. *Directive 006, Directive 024: Large Facility Liability Management Program, and Directive 075: Oilfield Waste Liability* (*OWL*) *Program* together allow the Regulator to track the extent of a licensee's environmental-financial liabilities. At the time, they hoped that the "LLR [would] more accurately assess the asset to liability ratio of each licensee and require financial security deposits from licensees not achieving the specified LLR threshold" (EUB, 2000, as cited in Yewchuk et al., 2023, p. 85). This was in the hopes of protecting the OFL from being overburdened with deserted assets. Naturally, some fossil capitalist elites were resistant to this increase in security as they would have to cough up more money under the new program. The "deep concern," expressed by then-Chairman of CAPP William Friley, was merely about the program cutting into corporate profits, not a matter of program efficacy (Friley, 2001, as cited in Yewchuk et al., 2023; Yewchuk et al, 2023, p. 15). This is a critical part of the Regulator's then-blossoming financial regulation purview. Prior to this, the Regulator was not an organization specializing in financial literacy (nor is it necessarily today). The Regulator was an agency specializing in technical, downhole regulation. This turn-of-the-century shift in responsibilities has led to much amending and alteration of the original directives, as it was obvious that they were seen as either ineffective or making the problem worse. Prior to release of the province's LMF and *Directive 088*, *Directive 006* and *Directive 011*, updated in 2016 and 2015 respectively,[35] guided the LLR/LMR program.

For the time being, explanations of the LMR calculation, and important terminology

[35] The directive numbers do not relate to a chronology of their release date, which can make things confusing.

related to it, primarily live in *Directive 006*. As mentioned above, the LLR is "based on a comparison of assets (production) to liabilities (abandonment and reclamation costs)" and, most importantly, mandates that, "when a company's liabilities outweigh its assets, *the company must provide us with financial security for the difference to help mitigate the risks posed by the company*" (AER, 2025e, emphasis added). These programs are so important to the puzzle of asset desertion in the province because they are what the Regulator uses to determine whether a fossil firm is solvent or insolvent. If a firm is insolvent, this opens them up to being forced into bankruptcy proceedings. Bankruptcy proceedings are when borrowers are forgiven (sort of), and their financial creditors can recuperate money on borrowed debts through the sale of assets which will be handled by a financial firm designated as a 'receiver' or 'trustee.' In the case of oil and gas licensees in the province, the terms are a bit different, but the gist is the same.

In the oil patch, insolvency buds from many stems. As mentioned earlier, spot and future market volatility (and geopolitical manipulation) in the oil and natural gas markets is often harkened to as a leading cause of insolvency (OWA 2021; OWA 2022; Zalik & Osuoka 2020). Equally important is the fact that each well has a limited reserve that can be drawn from it and the capital goods extracted (crude oil, unrefined fossil gas, diluted bitumen) become less over time. Simply put by Altvater, "in a fossil energy regime, the EROEI [Energy Return on Energy Invested] is high in recently developed oilfields and then decreases because in most cases the energy input grows and the energy output decreases, until further exploitation becomes irrational, in terms of both energy and later also economics' (2008, p. 39). Eventually firms will reach a point where the cost-benefit of recovering the last of the down-hole hydrocarbons is not considered financially viable for them. But wells like these (with some viable reserves still within reach) will become important later when the appointed receiver tries to tidy up the mess.

The appointed receiver will host the salvage sales that help recuperate money for the creditors and (hopefully) cover remaining liabilities towards cleanup. Other licensees may buy licenses that have still-active wells, pipelines, and facilities pumping the last bits of viable crude or gas.

Understanding LMR Reports

As of writing this, the Regulator is mandated to conduct monthly LMR assessments (the first Saturday of each month) which tabulate liabilities from the three directives above. Interestingly, the first deserted facility that operationalized *024* and kickstarted the LFP levy on solvent operators was Lexin's defunct Mazeppa Gas Plant, which became an OWA ward after their bankruptcy. But DePauw said "that is a bad description, because we deal with lots of big facilities. This is not our first big facility. It's our first one that's under *Directive 024*" (personal communication, March 8, 2023). Either way, the calculation for the LMR is simply the combination of all deemed assets across the three programs, divided by the combination of all deemed liabilities. Again, these deemed assets are cash flows from developing wells, while the deemed liabilities are the ARO costs associated with suspension, abandonment, remediation, and reclamation (AER, 2025b, p. 13-16).[36] For the sake of example, a firm with $15 million in total deemed production assets from their wells and $10 million in total deemed liabilities would have an LMR calculation of 1.5 and is considered a solvent operator in no immediate danger of

[36] The interested reader can refer to *Directive 011* for the work of explaining parameters and costs associated with both asset calculation (including the industry-wide netback on a barrel of oil, or how much revenue is generated less the costs of transport, rents, and production) and abandonment and reclamation of infrastructure (basic closure cost by region, depth, and download completion scenario). Better yet, the Regulator has posted a YouTube video explaining the cost updates to *Directive 011.* Related to this point, the ALDP has argued that the Regulator's calculation for deemed assets is misleading as it uses outdated commodity prices, does not account for diminishing well production outputs, and fails to implement the rolling three-year netback average outlined in *Directive 011* (ALDP, 2021b, p. 4).

bankruptcy or an inability to afford ARO costs from their own cash reserves. On the other hand, a firm with $10 million in total deemed assets and $15 million in total deemed liabilities would have an LMR of 0.67 and be considered currently insolvent. This insolvency assumes that they do not and will not unless some corporate action is taken like uptaking fresh debt financing to fund new extraction, have active cash flows to ARO costs when the time is nigh.

Figure 2 below is from the Regulator's October 2024 LMR Results Report. It shows that the whole industry's LMR is at 5.43, with the total deemed assets at $161.12 billion and the total deemed liabilities at $29.65 billion. This figure is more than $36 billion and rising, as *Directive 011* was recently updated for the first time since 2015 to account for the increasing costs of well abandonment due to rising labour and materials costs (AER, 2024g). Nonetheless, this is a suitable cross-industry average. There appears to be lots of cash flowing from conventional development (the deemed assets) of the 156,000 active wells in the province. As such, many licensees appear liquid enough to cover end-of-life ARO costs for their infrastructure. In fact, there are 49 licensees with LMR values over 10.00 who collectively have $79 billion in assets against less than $5.0 billion in liabilities. But the devil is in the details and the truth behind the current LMR reports is much grimmer.

Figure 2

AER's October 2024 LMR Summary Report

LMR Summary

Industry LMR:	5.43
Total Number of Licensees Evaluated:	671
Total Number of Licences/Approvals Evaluated:	346,702
Total Deemed Assets:	$161,120,764,926.15
Total Deemed Liabilities:	$29,645,880,497.29
Total Estimated Liabilities*:	$30,296,573,496.29
Total LMR Security Held**:	$327,741,425.59

LMR Range	Number of Licensees	Number of Licences/ Approvals	Total Deemed Assets	Total Deemed Liabilities	LMR Value
0.00	210	11,785	$819,962.18	$1,027,230,906.51	0.00
0.01 - 0.49	31	4,076	$104,653,927.88	$375,888,887.50	0.28
0.50 - 0.99	62	18,860	$1,062,276,143.36	$1,441,643,708.25	0.74
1.00 - 1.49	103	25,329	$2,573,395,940.66	$2,008,660,310.72	1.28
1.50 - 1.99	51	56,710	$6,361,700,263.05	$3,601,539,880.81	1.77
2.00 - 2.99	71	54,668	$9,441,366,520.10	$4,020,822,673.46	2.35
3.00 - 3.99	32	14,435	$4,954,219,609.72	$1,468,922,987.54	3.37
4.00 - 4.99	16	83,464	$26,845,948,917.40	$6,352,002,699.89	4.23
5.00 - 5.99	16	10,117	$8,378,093,183.23	$1,485,635,502.39	5.64
6.00 - 6.99	10	10,190	$8,365,125,594.57	$1,292,408,604.20	6.47
7.00 - 7.99	6	1,761	$1,306,870,313.39	$177,201,472.61	7.38
8.00 - 8.99	9	12,543	$11,220,496,552.31	$1,356,092,920.46	8.27
9.00 - 9.99	7	1,476	$1,754,725,371.07	$181,992,913.35	9.64
10.00 or >	47	41,288	$78,751,072,627.23	$4,855,837,029.60	16.22

*Estimated Liabilities includes liabilities for 'NEW' wells and facilities as defined in Directive 006, which have not yet aged into the liability management programs. Deemed liabilities only account for those wells and facilities that have aged into the liability management programs.

**The AER holds security for other programs and purposes (i.e. Mine Financial Security Program (MFSP), landfills, farm/domestic gas wells, *Coal Conservation Act*, *Mines and Minerals Act* (Part 8), *Environmental Protection and Enhancement Act* and *Public Lands Act*). Only LMR security is included in the scope of this report.

Note. These reports are published monthly and fluctuate according to licensees' changing finances and infrastructural asset ownership. From Alberta Energy Regulator, 2024, Liability Management Rating (LMR) Results Report.

To start, the "Total LMR Security Held" represents the sum of industry-wide payments to the Regulator against outstanding ARO liabilities in accordance with Parts 1.1 and 16.6 of the

Oil and Gas Conservation Rules (a product of the OGCA) and section 11 of the *Geothermal Resource Development Rules* (068). *Directive 006* on this says,

> If a licensee's deemed liabilities in these three programs [LLR, LFP, and OWL] exceed its deemed assets in these programs plus any previously provided security deposits (including facility-specific security deposits), it has a security-adjusted LMR below 1.0 and is required to provide the AER with a security deposit for the difference. (AER, 2021b, p. 4)

Thus, should a licensee have an LMR rating below 1.0, the Regulator should shake them down to securitize against the OFL having to absorb ARO costs of their infrastructure catalogue. Providing such a security deposit would then bring the licensee's LMR score back above 1.0, as the Regulator would have some collateral against the liabilities. Importantly, *Directive 006* explains that these security deposits are *only* collected from firms already within their classification of insolvency (an LMR below 1.0). The obvious problem here is the question of where a functionally insolvent firm is supposed to get this collateral from. Obviously, their lenders are not going to be excited to advance them more capital, fully aware that they lack any assets now that they would use to pay back their loans. As such, these loans to fossil firms are collateralized with the infrastructure of extraction that firms purchase, either new or through salvage sales. Still, as discussed in Chapter 2, the upfront costs associated with the fixed capital of extraction are very high and it can be a risky investment for the creditors. Regardless, this has meant that the Regulator's only other meaningful mechanism to securitize against cleanup liabilities was the OWA and the OFL taxed on the industry. As pointed out during multiple research interviews, this problem has been amplified by the fact that companies with LMR scores well above 1.0 were going into bankruptcy, meaning that this financial calculation is an inaccurate indicator of financial health.

According to the above October 2024 report, the Regulator has collected $327 million in LMR Security against 345,633 evaluated licenses (licenses for individual wells, processing facilities, pipeline segments, and so on). Calculated against the entire batch of licenses in that report, that would mean the Regulator has collected only $898.86 in financial security per each license. But, as just discussed, not all licensees are required to pay towards the LMR security, so that security calculation would only apply to some worst-case scenario where every single license suddenly required OWA-facilitated closure. That means our attention should be on already-insolvent licensees (according to the AER's LMR calculations), of which there are 303 in the October 2024 LMR Results Report. These 303 licensees (individual fossil firms) all have LMR ratings below 1.0 with a collective 34,119 licenses/approvals. That is 34,119 wells, pipeline segments, or processing facilities lingering in the insolvency bardo awaiting either passage into bankruptcy court and court-ordered receivership, or, potentially, to be bought up by bigger fish in the fossil capitalist sea. If we home in on the 210 worst off licensees (those with the lowest LMR, with effectively a 0.00 rating), there are 11,785 licenses and a collective $819,962 of assets against $1.027 billion in liabilities. These fossil firms have at least 1,252 times more liabilities than their assets. Together, the lowest 303 reported insolvent licensees in the October report have $1.168 billion in assets and $2.844 billion in liabilities, a deficit between the two of $1.676 billion which is on track to become the problem of the OWA or the provincial and federal coffers. Again, the Regulator has only collected $327 million in security against all the liability of these operators, hardly 20% of the total cost lying in wait.

Another huge problem for the Regulator is that there is not a uniform cost to ARO work, and the thresholds for this work vary on the location and nature of the infrastructure. If we crudely calculate an average based on the above report, the AER is suggesting that each license is a liability of around $88,000 (there are a total of $30.30 billion in estimated liabilities for 346,702 evaluated licenses). According to researchers from the Alberta Liabilities Disclosure Project (ALDP) who based their study on a 2019 analysis by the AER into cleanup estimates, the average cleanup cost to plug (a well), remediate, and reclaim a project site is more like $219,658, around 250% higher than this average based on the report. Accordingly, the ALDP estimates that actual cleanup for the province's wells alone will cost between $40-70 billion (Boychuk, et al., 2021, p. 11). The ALDP calculations are not far off, evidenced by the Regulator having to increase even their most conservative total liability figure by 20% in updating the *Directive 006* clean up calculations, as discussed above.

Were the AER to institute the practice of automatically shutting down the sub-1.0 LMR firms which are technically insolvent today, every single license that those companies hold *could* become wards of the OWA, should no buyers/new owners be found during salvage sales. Suddenly, a rush of up to 34,119 assets would overtake the OWA, surpassing the total inventory that they have ever reclaimed as an organization. As one anonymous source told me, the Regulator instead chooses to work closely with companies to ensure that they are *not* shut down and are happy to ignore companies with exceptionally low LLRs so long as they officially exist on paper. Again, as noted above, firms have long gone into bankruptcy with LMRs above 1.0, the deemed threshold of insolvency. This all spells an obvious shortcoming in the liability rating metric. My interviewee Mark Dorin noted this as an obvious shortcoming of their security practices and the whole of the LLR program:

> Once you got down to 1, they [the AER] would require you to do certain things to bring your LLR score back up above one. And that could be put up security, abandoning a

> certain number of wells, etcetera. So, this is how they were trying to manage this. But what was happening is that companies that had LLR scores well above 1 were going into bankruptcy. There was no trigger for the AER to realize that this company was approaching bankruptcy, where they could take some action while they still had some loot in their pocket. (personal communication, March 15, 2023)

It is worth noting that the Regulator recognized the failure of the LLR metric and announced as early as 2016, during the *Redwater* saga, its failure. In a short bulletin, they said, “the liability management rating (LMR) of 1.0 is not sufficient to ensure that licensees will be able to address their obligations throughout the life cycle of energy development” (AER, 2016, p. 1). This was a direct response to the lower court rulings in *Redwater*. The Supreme Court of Canada ruling in favour of the OWA and AER’s position three years later negated previous rulings and readied the terrain for the rollout of a novel approach. Thus, the Regulator’s next move was a rapid retooling of the framework to continue ensuring the social cohesion around fossil capital in the province.

The GoA’s 2020 Liability Management Framework

In the summer of 2020, the Government of Alberta announced a revamping of the entire liability management system in cooperation with the AER and industry, known as the liability management framework (LMF). The Office of the Auditor General of Alberta (OAG), in its March 2023 report *Liability Management of (Non-Oil Sands) Oil and Gas Infrastructure* report, clearly outlines the main issues that the Regulator self-identified in its 2019 internal risk analysis vis-a-vis liability management: “Lack of prompt closure of inactive oil and gas sites; unfunded liabilities such as legacy sites where there is no owner or industry funded backstop…inadequate collection of security from operators to ensure they can meet their obligations when projects end" (Auditor General, 2023, p. 1). Unfortunately, the new LMF has thus far failed to minimize the risk of unfunded liabilities as it has not improved transparency, adjusted the enforcement of security collections, or properly re-accounted assets and liabilities, like how the LMR ratings attempted (Auditor General, 2023, p. 7). One of the biggest outcomes has been the late 2021 release of the newly minted *Directive 088: Licensee Life-Cycle Management.*[37] The new data collection and reporting mechanisms of *088* are meant to help the AER to "assess the capabilities of licensees to meet their regulatory and liability obligations throughout the energy development life cycle; administer our liability management programs; and ensure the safe, orderly, and environmentally responsible development of energy resources in Alberta throughout their life cycle" (AER, 2021c, p. 2). This information will create significant changes for licensees in the region and has a specific focus on reducing inactive wells through an 'inventory reduction program.' The LMF has ushered in changes to several directives, and as of October 2024, the full rescinding of *006*, *024*, and *075*. In their place, the AER has elected to establish 'closure quotas' that will force licensees to hit annual spending targets on closure work and subsequently report them to the AER. Should operators fail to meet the AER's closure targets this will trigger a holistic licensee assessment and determine a course of action which can include a security deposit equal to the "licensee's total liabilities, including the costs of providing care and custody and to permanently end operations" (Buckingham 2021). These liabilities even include inactive

[37]It is worth noting that prior to its final publication in December 2021, *088* was released in draft form for feedback from certain stakeholders prior to its publication. These stakeholders included oil and gas operators (Canadian Natural Resources, Obsidian Energy Ltd., Ovinitiv Canada ULC, North River Midstream) financial institutions and crown corporations which fund development (ATB Financial's subsidiary ATB Capital Markets), industry advocacy groups (Canadian Energy Pipeline Association (CAPP), the Explorers and Producers Association of Canada (EPAC)) and municipal district councils (Smokey River No. 140, Reeve Beaver County, County of Barrhead). Thus, like all operations of the AER, operators and industry advocacy groups were the prominent voices in the feedback sessions.

wells and facilities. The AER reports that companies spent $696 million on closure activities in the 2022 fiscal year, and the industry-wide targets are similar for 2023 and 2024, at about $700 million (AER, 2024g).

Overall, this work *should* reduce the number of inactive (potentially deserted) assets in the province. As you may have guessed, though, this is not a useful approach for the hundreds of already insolvent firms who do not have money to put into this work. Rather, this is an effort by fossil capital to manage the conventional sector's waste as they continue their gradual shift into the unconventional sector, namely the tar sands. As the bulk of Alberta's oil and gas in the tar sands remains untapped—an estimated 400 billion barrels of recoverable reserves of the 2 trillion barrels within the various reservoirs—the negotiation of social license is industry money well spent. And as has been the trend over the decades, enforcement and transparency problems remain the Regulator's evergreen headline: "persisting high levels of secrecy, discretion, and nearly exclusive industry influence put the frameworks' goals in doubt" (Yewchuk et al., 2023, p. 1). The system issues in the framework include the Regulator's unwillingness to "disclose financial information on licensees or even the general state of the oil and gas industry," and "still relies heavily on AER discretion to trigger closure obligations and fails to legislate timelines or quotas for closure work" (Yewchuk et al., 2023, p. 1). They also acknowledge the existing gaps in their liability estimates as they preclude pipelines, pipeline installations, single well batteries, and waste management components (AER, 2024e).

The ongoing implementation of the LMF means that the constituent programs are likely to change over the coming years. The Regulator has finally decided to develop a new security framework as part of the package, meant to directly replace the LMR. It is interesting to see a return to this approach, as the industry has long refused and organized against security collection, discussed below in Chapter 4. Their implementation comes at the advice of the provincial government and the AGO, an expression of the state's choice to finally discipline delinquent operators. Either way, it is beyond this dissertation's scope and timeframe to discuss and analyze the impacts of the unfolding LMF program. Instead, we shall turn back the clock a few years to the curious case of Lexin resources to explain the generalized process that crumbling fossil firms face in their end times.

The Lexin Group, Making Orphans, and a Japanese Cat

"They could not put a human face to one name on the list of the Board of Directors and, so, the scuttlebutt is that it was one of the other Board member's pet cat. So, yeah."

- Mark Taylor, personal communication, March 12, 2023

According to former AER Vice President of Closure and Liability at the AER, Mark Taylor, the Lexin Group's now-infamous stint of delinquency was planned from the start of their licensing. The corporate history of Lexin is a confusing and shadowy road of shuffled assets and divergent company ventures which, at its lowest moment, included the replacement of a board member with a pet cat. To make sense of the ebbs and flows of the OWA's orphanage, this section describes the steps that a firm and its assets go through in the process of desertion. I use the story of Lexin's demise as it highlights how turbulent this process can be. In many ways, Lexin's story is dramatic and unparalleled, and it served as a deafening wake up call for the industry and Regulator. An onslaught of bad publicity struck the industry, with dozens of publications reopening the question of whether the Regulator is adept enough to manage extraction. While the *Redwater* courtroom drama was unfolding parallel to this, it did not hold a candle to Lexin's catastrophe, as the details of Redwater's bankruptcy were mostly mundane.

Naturally, the steps taken for the OWA to be handed a deserted asset or project site are not necessarily straightforward or uniform. And, as displayed in the last section, processes of desertion have changed as the AER's policy has changed over the past decade. Accordingly, this discussion will cover the main elements of desertion before the Supreme Court of Canada's ruling in *Redwater*. As I expand upon in Chapter 5, the process of desertion today has limited finance capital's ability to recuperate unpaid loans to defunct operators via their extractive collateral. But the general steps remain the same today as they did in 2017. The gist of the process is as follows 1) due to matters like a lack of cash flows against ARO liabilities from depleting reserves or the mismanagement of the licensed sites, an operator will be read as insolvent according to their LMR number. At this point, the operator may slow or effectively stop operations, at which point the AER prefers to be contacted to indicate that they are doing so. They can attempt to work with their financial lender to restructure or recapitalize now; 2) the company can declare bankruptcy itself, or a lender, secured creditor, or the AER (and now the OWA) can petition them into this bankruptcy process; 3) during the bankruptcy proceedings, a receiver or trustee is assigned to oversee the assets, facilitating sales of any still-producing assets to pay back creditors while overseeing any ARO. These receivers or trustees are financial management firms who specialize in this sort of work; 4) lastly, whatever pieces of infrastructure are left can be 'disclaimed' or transferred to the care of the OWA as deserted infrastructure. Prior to 2019, it was widespread practice for lenders to abrogate responsibility of unproductive assets onto the province, despite existing environmental statutes saying otherwise. Mark Taylor put it pointedly: "they would sell the really good stuff, clean off the bats, and then junk the rest of it onto the OWA" (personal communication, March 12, 2023).

Step One: Insolvency

In every case, the process of desertion begins with a fossil firm becoming insolvent. Recall that "when a company cannot meet its obligations or its liabilities exceed the value of its assets, including oil and gas infrastructure, it is insolvent" (AER, 2024f). Remember that the assets of a fossil firm here are the cash flows derived from the point of production or midstream activity. The infrastructural assets themselves—wells, pipelines, processing facilities—are only as valuable as the hydrocarbons that they can pull, process, and distribute from the subsurface. Thus, when the market bottoms out, a firm's deemed assets will drop with it, sometimes dramatically.[38] The AER does not have the mandate to "control or prevent insolvencies," but instead, according to an anonymous interviewee, will work closely with companies to ensure they are not shut down and are happy to ignore companies with low LMRs so long as their creditors are not petitioning them into bankruptcy. The AER encourages firms to contact them before shutting down operations, as they want to be aware of pending insolvency proceedings and any sites of particular concern the licensee holds, but they will not provide counsel to the firm on what they should do.

Consider now Lexin Resources Ltd. et al. (known collectively as Lexin Group), a mid-sized firm with licenses primarily in natural gas patches of Southern Alberta. Their story really begins in the 1990's, with Compton Petroleum Corporation, "once among Calgary's largest intermediate oil and gas producers" (Southwick, 2017, p. 3). Compton began selling off its

[38] Although the AER calculates assets against a three-year provincial average netback that calculates the price per cubic metre oil equivalent to prevent a constant recalculation in a turbulent, boom and bust market.

assets[39] in the 2000s as it exited the patch and was ready to pad its investors' coffers. Lexin, then known as MFC Energy,[40] had originally acquired a collection of wells and facilities from Compton in 2012 for $33 million. Energy prices were breaking down in 2016, with prices below $30 a barrel for the first time since 2003 but ultimately rebounded back to above $50 by year's end. Presumably, Lexin's operation of these assets were successful for some years. But it is not clear exactly how long operations were running smoothly, as they only entered the limelight once they failed to repay creditors (as early as 2015) and stopped complying with AER orders to address spills, close wells, and pay into the OFL.

Presumably, Lexin's LMR rating was falling quickly throughout this time, as reserves from their purchased licenses dwindled and they were not actively prospecting for more. Regrettably, the AER stopped making individual licensee's LMR scores publicly available online, so this specific information can be hard to come by. That said, they seem to have a loose policy on providing these individualized LMR ratings. I was able to secure what is known as the Historical Liability Management Detailed Report for the firm Redwater, but not for Lexin. These reports can be thousands of lines long, outlining the asset values against the liabilities values for each license which a firm has. Further, while the deemed assets of a well can be easier to quantify due to the seismic prospecting prior to production, the deemed liability costs are only ever estimated due to the difference between each site's infrastructure and environmental landscape, necessitating different processes and time horizons for reclamation (and remediation

[39] Compton's formula is the best business strategy for this boom-and-bust sector. Caura Woods describes it perfectly:

> Raise big capital from institutions; deploy big spending on focused inventories of subterranean prospects for selective exploration and extraction; build infrastructure to separate emulsion (i.e. undifferentiated hydrocarbon fluid); liquidate the corporation by having left enough 'upside' in the ground to attract a buyer; return bigger capital to shareholders, which most often includes themselves as managers, their circle of close business associates, and friends and family. (2019, p. 77)

[40] The corporate structure of Lexin is shadowy and difficult to discern but up until 2016 they were known as MFC Energy. Their parent company was variously named MFC Industrial and MFC Bancorp Ltd. (Southwick, 2017).

if necessary). Still, the combination of Lexin not seeking further licenses, not decommissioning their inactive project sites, and not ponying up liability securities to the AER would mean that their LMR rating could only go down.

It is usually not in a firm's interest to fail, as investors and shareholders[41] take losses and must petition the failed company for some severance. Firms can always restructure or recapitalize with their financial lenders to change the debt and equity structure they hold, which includes "cost cutting and asset optimization" (Woods, 2019, p. 74). Caura Woods, a corporate anthropologist with experience in corporate governance in the province, outlines how one operator navigated insolvency circa 2014's drop in oil prices:

> Challenger [a fossil firm] employees were given pay cuts and offered shorter work weeks. Supply-chain contracts were renegotiated to reduce the rates paid to supply-chain service labour. Spare equipment that had piled up in 'bone yards' was sold off, as were any undrilled and 'unproven' lands. Smaller amounts were spent on wellbore and reservoir optimization measures that were often overlooked when capital was plentiful. (2019, p. 74)

Even if the company has not yet defaulted on their loans, which can easily occur given that there are monthly repayments with debt financing, their lender can still freeze their credit line and force them to restructure. It is important to note that throughout this process, the licensee of the infrastructure remains responsible for the AROs.[42] The licensee can and will change, but at this point it remains the operator's responsibility as they still hold the licenses. If the firm's creditors are not happy, and the debt restructuring and recapitalization plan are not successful, the firm can

[41] Worst yet if they are a publicly traded firm.
[42] The AER has the new *Manual 023* (which is continually being updated, with the newest version as of December 2024) which outlines the responsibilities that the firm should continue to hold during the sundowning of operations.

be forced into bankruptcy.

In the case of Lexin, interviewee Mark Taylor firmly believed that the firm's fate was neither incidental nor accidental: "The general consensus in the industry is that Lexin had a well-thought out plan to basically take financial resources from the assets in Alberta and get them out of the reach of the government and regulators" (personal communication, March 12, 2023). Taylor held multiple roles during his tenure at the AER, including Senior Vice President of Climate Policy Assurance, Vice President of the Closure & Liability Branch, and Vice President of the Industry Operations Branch. Incidentally, Taylor was the stand-in VP of the Closure & Liability team in early 2017 when the AER suspended Lexin's licenses and forced the company into receivership. This directly conflicts with the OWA's, meaning Lars DePauw's, explanation for Lexin's collapse. In the OWA's 2018 Annual Report, they appear to claim that the bearish sentiment in global oil and gas spot and future markets were to blame for Lexin's forced receivership: "The impact of industry economics was certainly seen in the last year with the high-profile collapse of Lexin Resources, when we saw a surge in our inventory" (2018, p. 4). While DePauw is right that the market has been volatile, this alone is not a sufficient or accurate explanation for Lexin's retreat. At the time of its 2017 bankruptcy, Lexin had around "323,000 barrels of oil, 100 Bcf [billion cubic feet] of natural gas and 1.7 million barrels of natural gas liquids (18.7 million barrels of oil equivalent), with an estimated net present value of $66.8 million" (Tambosso, 2017).

Step Two: Borrower Bankruptcy

Depending how things play out with the financial lenders, the firm may sink or swim. If one of the empowered parties decides that it is time for their end, the firm will be legally petitioned into bankruptcy. This step broadly includes “bankruptcy proceedings, receivership, notice of intention to make a proposal under the *Bankruptcy and Insolvency Act* [BIA], proceedings under *Companies Creditors Arrangement Act* [CCAA]” (AER, 2024f, p. 7). The two most common proceedings for upstream producers under the BIA & CCAA are receiverships and restructuring proceedings. These plans, like the geophysical operations of producers, can be extraordinarily complex and their details are beyond the scope of this dissertation. The bottom line is this: the CCAA proceedings allow the debtor to remain in operation of their assets, potentially maximizing fossil capital value creation for the stakeholders. Receivership, on the other hand, means that another entity becomes the licensee of the assets and takes legal custody and possession of a firm’s portfolio (Simard et al., 2022).

It was only five years after Lexin’s purchase of its portfolio of assets that it was petitioned into bankruptcy and receivership by the AER, something that the company went on to fight in court. Lexin continued to operate throughout its insolvency and failures to pay everyone it owed money to. Finally, their operational days ended late in March of 2017. The anecdotes about Lexin’s end-of-days operations are frightening. Employees and business partners of the firm cited their negligence in ignoring hundreds of past due bills culminating in workers shutting down integral equipment due to waning maintenance (Southwick, 2017). Incredibly, they neglected to pay every single person and entity who they owed money to. One executive claimed that the company stopped repaying its creditor, Alberta Treasury Branches, as early as 2015. They were already a particularly high-profile fossil firm as they held the license to the decades-old Mazeppa sour gas plant in the village of Mazeppa.

Garbage piled up around the extremely dangerous Mazeppa sour gas plant while office employees stopped answering the phones and field technicians began to quit or were fired. Sour gas is an extremely dangerous fossil gas full of the highly toxic hydrogen sulfide, which gives it its trademark sour smell, that can cause irreversible fluid accumulation in the lungs, unconsciousness, and death at a concentration as low as 0.1% of ambient air. In short, Lexin "failed to comply with multiple orders, lacked enough staff to manage its more than 1,600 sites" (Vijayaraghavan & Lou, 2017). According to the federal government's Bankruptcy and Insolvency Records dated October 25, 2017, they owed just north of $77 million to their unsecured creditors, principally the AER.[43] It appeared they also owed some nominal amounts to consulting firms (Deloitte) and municipal districts where they had failed to pay ground rents (Foothills and Vulcan County in Southern Alberta) (GTL, 2017a). But this was not the full liability picture, due to the variety of strange and shadowy corporate partnerships which constituted the Lexin Group. The Lexin Group was made up of Lexin Resources Ltd., 0989 Resource Partnership, 1051393 BC Ltd., LR Processing Ltd., and the LR Processing Partnership. The 0989 Resource Partnership had an additional $162 million in total liabilities alone, which included $19 million owed to secured creditors. The list of creditors owed was a 30-page dossier of dozens of fellow fossil firms with working interests in the wells, oilfield service businesses, individual landowners, IT and telecom companies, and even past employees claiming unpaid wages (GTL, 2017b). Unsurprisingly, many people wanted to see Lexin come to an end and have their assets safely handed over to someone else.

Step Three: Receivership and Salvage Sales

A receiver is a financial firm who is appointed, traditionally by the court or by the secured

[43] Mostly as security deposits they were expected to post against their ARO liabilities.

creditor, to “recover amounts owed under a secured loan agreement. The receiver may take control and possession, operate, manage, sell, or liquidate a company’s assets” (AER, 2024d). The receivers have the authority to oversee and unload as many viable assets as possible, and they also have the authority to operate the business to repay the creditors if viable (Simard et al., 2022). Receivers are financial firms specializing in debt relief, often staffed with Licensed Insolvency Trustees or other savvy finance hawks. In Alberta, the list of receivers includes Grant Thornton Limited (both Lexin’s and Redwater’s receiver), Alvarez & Marsal, BDO Canada Limited, Hardie & Kelly Inc., and FTI Consulting Canada, MNP Ltd. The receiver firms are responsible for trying to untangle a bankrupt fossil firm’s financial history to try to recuperate the financier’s unpaid loan. Likewise, when things have really gone off the rails, they end up “chasing who was on the board [of directors]” (Taylor, personal communication, March 12, 2023).

In extreme cases, the AER also has the authority to force companies into receivership. Such was the case with Lexin. The AER brought an application to have a receiver appointed to care for Lexin’s assets in 2017, thankfully forcing Lexin out of any lingering control over their operations. The move to shutdown Lexin’s operation was unprecedented and noteworthy due to the number of licenses and scale of facilities involved, including the Mazeppa sour gas plant[44] which would go on to be the first facility decommissioned via the OWA’s LFP. Grant Thornton Limited (GTL) was assigned as the corporate receiver for Lexin. It was here, amidst the untangling of Lexin’s corporate financials and personnel, GTL discovered that one of Lexin’s

[44] The plant originally refined sales gas and condensate from reserves of sour gas through the extraction of the deadly hydrogen sulfide from the raw sour gas. Hydrogen sulfide is fatal at a concentration of just 0.1%. According to former staff engineer of Canadian Occidental Petroleum (now Nexen), the estimated kill radius from a single sour gas well failure at Mazeppa was 15 kilometres, equating to 600,000 fatalities in the Calgary Metropolitan Region (MacRae, 2023).

board members could not be accounted for. According to Taylor, “they could not put a human face to one name on the list of the board of directors” (personal communication, March 12, 2023). Although it was not proven during the bankruptcy proceedings, it was the belief of some Regulator staff that things had gone so haywire within Lexin’s leadership that when one board member resigned, they were replaced by another board member's pet cat.

It is not surprising, then, that the AER decided to take the ‘extreme’ move of forcing Lexin to shut down. What is unusual here was that the AER decided to task the OWA with care and custody of the assets until the salvage sales were through, as much of the infrastructure was still operational at this point. The OWA took on the responsibility of looking after the allotment of wells and their associated gear, some 1,380 wells, 81 facilities, 236 pipelines, and 260 non-operated wells that their 50 oilfield partners oversaw (Tambosso, 2017). This came to the tune of $100,000 CAD a month for the OWA. The costs ended up swelling to more than $2 million total, stemming from “hiring contract staff to complete well inspections, replace Lexin signs with OWA signs, talking to landowners and performing routine maintenance” (Healing, 2017). This was new terrain for the OWA, as before this case they were only ever responsible for deserted infrastructure.

Step Four: Creating New Wards

As this dance played out before the Supreme Court’s ruling in *Redwater*, the risk for the OWA to absorb much of Lexin’s inventory was much higher. The shift in the receivership landscape after 2019 will be discussed in Chapter 5, but for now we can consider what has traditionally happened. The short of it is that the remaining unsold assets (i.e., the undesirable infrastructure that has little value left for our capitalist class to valorize) revert to the OWA’s portfolio as deserted infrastructure once the salvage sales conclude. This is the proverbial “cleaning off the bats” and 'disclaiming' of assets as mentioned above from my interview with Mark Taylor. This legal step of disclaiming assets onto the OWA is the bedrock step of asset desertion. It is one of the fossil firm’s final declarations where it legally renounces responsibility over infrastructure AROs.

It is the legal responsibility of the AER to designate a site and any associated infrastructure as deserted, once a firm has legally disclaimed it. To emphasize, this is important, because the AER can choose to *not* designate a site as deserted despite the firm who is licensed to operate it being insolvent and functionally non-existent (like the sub-1.0 LMR licensees discussed in the previous section). This is precisely why there is such a high number of sub-1.0 LMR licensees published on the monthly reports in the previous section of this chapter. The choice is a political and/or tactical one by the AER as they know that petitioning the firm into bankruptcy and receivership proceedings would lead to a rapid growth in the OWA inventory, dwarfing their current inventory numbers. But this choice also carries with it negative repercussions in that perpetually inactive wells can have negative consequences for the health of the surrounding people and ecologies.

But should the AER deem a piece of infrastructure deserted, the licenses of the assets can be transferred to the OWA, and they can begin to close the site. The OWA functionally becomes the operator of the infrastructure and project sites. The difference for the OWA is their focus is not on production of the well. Indeed, the OWA is not staffed with a medley of upstream technicians or petroleum engineers like a fossil firm but instead is made up of bureaucrats who handle contracting out this work (as discussed in Chapter 2). They become responsible for things that the defunct fossil firm was failing to do in its final days such as communicating with the landowner(s) whose property the site sits upon or ensuring that project sites are being actively remediated if any hydrocarbons were being released into the local environment.

The OWA is also tasked with navigating the complex ownership structures of any wells or sites that have multiple individual or corporate owners, otherwise known as a working interest participant/partner[45] (WIP). WIPs are important as they too are responsible for chipping in on ARO costs:

> A person or entity owning a beneficial or legal undivided interest in a well or facility under agreements for the ownership of that well or facility. WIPs may be required to provide reasonable care and measures (suspend, abandon, remediate, and reclaim) for a well or facility in which they have a working interest and are required to pay their share of costs for reasonable care and measures (suspension, abandonment, remediation, and reclamation). (AER, 2024f)

That said, the world of corporate ownership via WIPs is complicated and beyond the scope of this discussion, as it could merit its own chapter within a dissertation like this. Suffice it to say, any partial owners of wells are still required to pony up funds for AROs on wells that they co-own with a bankrupt firm.

In the Lexin situation, Sayer Energy Advisors were engaged to help GTL with the salvage sales, given that they had almost 2,000 properties to deal with. Most of the wells had already been shut-in by a few noble employees (who stayed their final day to do so without pay) and by the OWA at the behest of the Regulator. But a third-party consulting firm, GLF Petroleum Consultants, oversaw a reserves evaluation for GTL and Sayer reporting that Lexin still had tens of millions of dollars' worth of reserves below their wells. Naturally, many assumed

[45] Both 'participant' and 'partner' are used in the AER and OWA's official documents.

this would pique some operator's appetite in the sales. The problem was that it did not. The appetite for these cursed assets was pacified due to extended legal delays in the sales process, intersecting the time of *Redwater* playing out. As the Regulator put it:

> The Lexin sales process demonstrates the deteriorated market for assets. In Fall 2017, there were offers for ~25% of the assets. Court delays postponed action by more than 15 months. By January 2019, only 5% of the most productive assets were sold, leaving the remainder orphaned. (AER, 2019a, p. 29)

The OWA officially ended up permanently absorbing 1,033 of Lexin's wells[46] after the unsuccessful salvage sales. They have been working on decommissioning the lot over the last several years, including the Mazeppa gas plant facility. It is unclear exactly how much they have spent on closure work at the plant thus far, but they spent $2.4 million alone in the 2021 to 2022 fiscal year on Mazeppa (OWA, 2022).

So, what exactly were the conditions that led to Lexin's unusual and extreme end? Mark Taylor was unwavering on his view of them:

> Lexin was definitely… an outlier. Their intent was not to follow the regulations. Their intent was to thumb their nose at every legal document including surface agreements with landowners and just keep going until they figured, well, we're about to get totally kiboshed here so let's leave. (personal communication, March 12, 2023)

Unfortunately, the interview I conducted with Lars DePauw proved unfruitful in explaining this phenomenon outside of the official positions found in OWA reporting. As much as I appreciated DePauw taking the time to speak to me, he was tight-lipped and unavailable for any speculation of Lexin's decay, or much of any other matter in Alberta's puzzle of asset desertion. DePauw's

[46] As they were already in limbo in the OWA's care per the Regulator's request, they just made the final switch in identity "from 'suspension only' to 'orphan,' so that they now require decommissioning" (OWA, 2019, p. 8).

simplistic explanation obfuscated one truth: Lexin played the AER's weak, fossil-fueled regulations like a fiddle through a scheme of corporate irresponsibility, profit maximization, and premeditated delinquency on payments. But Lexin was able to do this through the exploitation of existing loopholes in the weak regulatory regime which the fossil capitalist elite crafted to ensure high profitability in the exploitation of reserves. The Regulator & OWA's outward explanation of Lexin's insolvency absolves themselves of any responsibility, chalking it up to what they call "corporate failure" (OWA, 2018, p. 5). Yes, this was an intentional corporatist scheme on Lexin's behalf and, yes, this was an immense state oversight thanks to fossil capitalist hegemony in the regulatory regime. The political and policy practices that make up this fossil capitalist hegemony are the subject of the following chapter.

Conclusion

This chapter has situated the AER's gloomy outlook about the 'slow motion landslide of licensee failures.' Through analyzing the province's early 21st century liability management regime and the steps that precede the hatching of new OWA 'orphans,' I have shown how the costs of extraction have been able to shift away from the fossil firms who profited from production. Although this has been a laborious task, the failings of the modern liability management regime have been made clearer. The firsthand narratives from past regulatory staff offer a unique contribution to the literature on asset desertion. This is because most accounts of Lexin's disassembly have come from tight-lipped bureaucrats who must toe the Regulator's party line to not disturb the power of the fossil bloc or put their own organization under additional scrutiny. Understanding the bureaucratic dance steps in managing these socioenvironmental liabilities now opens us to examination of the *why* and *who* in the forthcoming tides of desertion and asset management. It is therefore time to examine the finer details of the fossil power bloc, including how they have successfully organized the Regulator through their political hegemony.

Chapter 4: Fossil at the Wheel; Capitalist Class Hegemony and the Regulator

The root problem we have in Alberta is, and I want to be really clear: the Alberta Energy Regulator.

- Mark Dorin, Polluter Pay Federation, personal communication, March 15, 2023

Introduction

The second half of this dissertation–the following two chapters–takes a slight analytical turn from the first half of the dissertation. These chapters employ Marxian critique of capitalist statecraft and bureaucracy alongside political economic analyses to understand the AER and OWA's policy decisions and actions surrounding hydrocarbon liability. Herein I examine the development and use of capital's political power in the region to help explain how the province ended up in the current situation of mass desertion. This is to argue three interrelated points: 1) The AER's 21st-century metamorphosis into the province's single-window resource regulator is a product of fossil capitalist hegemony, both within and outside of the broader provincial capitalist power bloc (Bernauer, 2020; Carroll, 2021). I argue that the anemic environmental regulation of the province's resources (Carter, 2020) is a product of strong class hegemony rather than a result of some variant of regulatory and/or corporate capture, which is often touted as an explanation of their backward policy decisions and weak enforcement regimes; 2) That the OWA was founded as a socioecological/regulatory fix to the brewing crisis of mass asset desertion in the province's conventional oil and gas sector. Importantly, this growing crisis of desertion is one manifestation of the second contradiction of capitalism. As I will argue through analysis of internal and external policy documents, the OWA has worked to ensure the industry's access to the region despite the growth of socioecological externalities of production which are hazardous to the people, local ecologies, and the province's coffers. 3) Despite the attempts of the fossil capitalist elite to manage the growing crisis of asset desertion, the province's liability management framework and enforcement is too weak to stymie the coming waves of desertion. As the province's own data reveal, defunct operators have billions of dollars of outstanding liabilities which will become the responsibility of the province. This outcome emerges from decades of fossil capitalist statecraft deferring the work of decommissioning and reclamation, thus privileging private investor return over environmental stewardship. 4) The OWA's growing autonomy also consolidates the power of the fossil capitalist faction over the powerful and growing financial bloc. Despite the financialization of extraction and (everything else), productive fossil capital remains in control of the region and continues to hold mechanisms in the state that discipline other factions of capital when necessary.

As described in my literature review in Chapter 1, claims of 'regulatory capture' are a common refrain among critics of advanced capitalist regulatory regimes and Alberta's energy governance is no exception. I argue that the Regulator was not created to be hardened watchdogs of the industry, and was never a 'free' regulator, but to successfully facilitate extraction and capital's reproduction. This is due in part to the location of the capitalist state within the production of fossil commodities. Returning to Mandel, I argue that this apparatus is subject to strong fossil hegemony but it must also serve "the interests of the protection, consolidation and expansion of the capitalist mode of production as a whole, over and against the conflicting interests of the 'real total capitalist' that is composed of 'many capitals' in the actual world" (Mandel, 1975, p. 479). Fossil hegemony has allowed a professional subclass of Canadian fossil capitalists to maintain leadership positions governing the regulatory regime. As such, there is a less pronounced contingent of financial capital's own intellectuals represented in the leadership of this apparatus of the state, but this has shifted over the decades. Both factions have much more representation in the regulatory apparatuses than the working class. Working class public servants, average citizens, or technical experts in sciences other than petroleum engineering are all but missing from any leadership roles in the state.

To advance my arguments over the next two chapters, I keep Mandel and Poulantzas' theories of bureaucracy and capitalist statecraft close to heart to analyze public reports and conduct the thematic analysis of my interview data. These Marxian theories of the state were important in reorienting my initial views and thoughts about the Regulator. I turned toward viewing the formation of the province's regulatory bureaucracy, and Alberta's fossil state writ large, as being representative of, 1) the relations of force between the fossil capitalist class leading the hegemonic power bloc and the working class and, 2) the inter-factional competition and cooperation between fossil and finance capital within this regional hegemonic bloc. While there have been counter-hegemonic movements and contests for power against the fossil bloc, these movements have not unseated its power. Instead, they have generated a novel amount of financial or socioecological concessions from industry, exacted by the state, which views these as necessary for securing the long-term conditions of capitalist reproduction for the bloc as a whole.

To make sense of my various research interviews, I relied on using thematic analysis. As I interviewed former AER staff, landowner advocates, independent ecological and toxicological scientists, and anonymous participants, the interviewees had quite different perspectives. Using elements of the thematic analysis approach, I sought out recurring themes across these interviews' texts. The thematics analysis approach is used in "identifying, analyzing and reporting patterns (themes) within data" (Braun & Clarke, 2006, p. 79). Ryan and Bernard (2003) identify several ways to identify themes through multiple readings of the interview transcriptions including looking for repetitions, typologies or categories, metaphors and analogies, transitions, similarities and differences, linguistic connectors, missing data, and theory-related material. This approach helped me to compare the experiences of my interviewees who helped develop the liability management regime against the Regulator's public facing explanations and rationale (Braun & Clarke, 2022).

This chapter particularly addresses my arguments regarding fossil hegemony in the policy decisions of the AER. As the AER is the 'parent' of the OWA[47], I start here to locate the ideological and material control which the fossil capitalist elite has in provincial regulation. Before diving into the AER specifically, **the first section** explains the fundamental differences between fossil capital and finance capital in the province. I show the formula of each factions' circulation and use both internal corporate and extra-industry reporting to show how production is financed and by who. This is important as interest-bearing capital (i.e, finance) has proliferated in the 21st century and the oil patch is no exemption. Global hydrocarbon industries rely on their financiers to continue and expand production due to the capital-intensive nature of extraction. It is here that I explain which firms are the main financial players in the desertion equation. **The second section** then analyzes the AER in a different light from the normative history presented in the previous chapter and I present a section of my own counter-history. As such, I focus on my interviewees' broad beliefs about regulatory capture[48] and the ineffective nature of the Regulator over the proceeding decades.

There is excellent scholarship on the different shortcomings of the AER, but there is less

[47] In harkening to the language of orphaning at the centre of this story.
[48] Several interviewees (one anonymous, Dorin, Olsgard, and Timoney) referred directly to the concept of a 'captured' regulator. I do not directly quote these segments of the interviews at length, to focus on more interesting excerpts.

in the way of comprehensive counter-histories of the organization written from critical outsider perspectives. Different fragmented historical accounts of the organization have come from environmental legal experts (Yewchuk et al., 2023), policy experts and political scientists (Adkin, 2016; Carter 2016; Carter, 2020; Carter et al., 2017), energy economists (MacFadyen & Watkins, 2014), and landowner advocates (ALDP, 2021). Rather than attempting to write an entire counter-history herein, this section contextualizes some of the decisions which preceded the Regulator's shift to single-window authority, along with some of the outcomes (as far as they relate to the conventional hydrocarbon sector). I argue that this shift was a modern manifestation of fossil hegemony, which has been solidified in the 21st century, part and parcel of the province's neoliberal resource management regime (Bakker, 2008; Carter, 2020; Carter et al., 2017; Castree 2008). I attempt to account for drivers beyond only the economic or financial goals of the fossil capitalist class.[49] While it may be immediately obvious that the industry wants to continue producing healthy returns to its investors, it can be less obvious what tactics they have used to maintain this provincial and federal hegemony, along with other modalities of control like operational power, strategic power, or allocative power in its relationships to finance capital in the province (Carroll, 2010, 2020).

Fossil vs. Finance; Dimensions of Competition Between Factions of Capital

Chapter 1 outlined my general synthesis and use of the term 'fossil capital/capitalism,' but it did not explain what I consider the main differences between 'fossil' capital and 'finance' capital,

[49] Here I am following Bakker's call to analyze capitalism's fixes to crises with a broader view that will "take a more structured approach to our conceptual frameworks through articulating the relationship between tactics of neoliberalization and an expanded set of targets" (2009, p. 1786)

nor the firms who constitute either faction in 21st century Alberta. For the sake of elaborating this point, I will briefly turn to Marx's formula of the circuit of capital followed by Malm's imagination of the formula under fossil capitalism.

In *Fossil Capital,* Malm outlines his reformation of Marx's general formula of the circuit of capital or, "the form in which it appears directly in the sphere of circulation" (Marx, 1976, p. 257). Marx's general formula is M - C - M', or Money - Commodity - Money prime (prime meaning more). In *Capital I* & *II*, he outlines three distinct phases of the circuit. The first phase is the capitalist's purchase of Commodities (C) with Money (M), represented as M - C. The capitalist appears on the marketplace in the first instance as a buyer of commodities. These commodities are not specific (or qualitatively important) insofar as they are destined alone for use in the following productive phase of the circuit, not for the capitalist's personal, immediate consumption. Marx on this says, "Both the money and the commodity function only as different modes of existence of value itself, the money as its general mode of existence, the commodity as its particular or, so to speak, disguised mode" (Marx, 1976, p. 255). They could be any commodity consumed by people (like, say, an apple which may be used in the industrial production of applesauce), or the machinery used in the production of commodities in the expanded formula of the circuit, but ultimately their destiny is in industrial commodity production.

As discussed already, the energizing of capitalist production with hydrocarbon fuels has allowed for an extreme acceleration of profiteering and production. Thus, the general formula of fossil capital has the same elements as Marx's formula but adds Fossil Fuels (F) to the mix. Contemporary capitalist economies rely on hydrocarbons to produce and circulate commodities, so fossil fuels are attached to the productive phase, necessary for the function of the machinery that in-part makes up the Means of Production.[50] The extended formula of fossil capital takes into account the *unavoidable* production of carbon dioxide in the combustion of hydrocarbons.[51] Most important to my analysis in this dissertation is a formula of the circuit of fossil capital that explains fossil firms' relationship to hydrocarbons and their markets: "Here the fossil fuels are not accessories consumed in the production of something else, but *that which is produced* as use-values commanding exchange-value in holding the promise of profit" (Malm, 2016, p. 291, emphasis in original). As discussed in Chapter 2, many firms specialize only in the extraction and sale of raw, largely unrefined hydrocarbons. Some, on the other hand, are integrated across the multiple streams of production and may extract, refine and upgrade, ship and/or distribute, and take to general consumer markets various hydrocarbon commodities. While this is a labourious academic exercise, these distinctions help in understanding the fossil capitalist oligopoly's accumulation strategies and hegemonic power in the countries with advanced fossil economies which attract hundreds of billions of dollars of investment capital.

Financing the Patch

The ability for fossil firms to produce profit is contingent on their acquisition and maintenance of credit lines from financial lenders. This is because extraction, upgrading, and circulation of hydrocarbon commodities requires quite a bit of machinery (the very assets of the heart of this dissertation) and energy. Financiers make their money in this scenario through the interest-bearing capital that they lend operators as debt financing. Likewise, finance capitalists will invest in private equity or common shares and other financial derivatives of companies, often referred

[50] This formula reads as such: M - C (L + MP (F))…P…C' - M'
[51] The extended formula reads as such: M - C (L + MP (F))…PCO2…C' - M'

to as fictitious capital. The Bank of Nova Scotia's $97 billion portfolio, for example, includes shares in multiple domestic and transnational extractive firms including Enbridge, TC Energy, CNRL, Suncor, Pembina Pipeline, Cenovus, and more (Fintel, 2025). Most salient to this dissertation is the contest and cooperation between fossil and financial firms spurned by their credit relations. Fossil firms also have investment portfolios, very much a product of global financialization today. Yet, fossil firms are still distinct from financial firms in that they still rely on the creation of profit from productive capital operating in the oil patch. Still, both types of firms generate surplus value from interest-bearing capital (IBC) as such:

> Money is advanced as capital and can be understood as a special type of commodity because it provides the use value of self expansion for both lender via interest and borrower via profit simultaneously. The borrower appropriates profit after the payment of interest has been deducted from the surplus value produced. Interest emerges, therefore as a fraction of profit. This unique commodity is called IBC, and interest expresses the valorization of IBC and is the price that the lender is paid. (Alves, 2022, p. 400)

According to the third volume of *Capital*, the movement of interest-bearing capital is thus:

$$M\text{-}M\text{-}C\text{-}M'\text{-}M'$$

The money lent is a type of capital, expended in the first instance as the loan to the borrower and in the second instance as productive capital in the purchase of commodities (or in the trade). This produces the money prime (M') for both the borrower and the lender, hence its double appearance in the formula. In the lender's case, their realized capital is interest, received through monthly repayments from the borrower (represented as $M + \Delta M$) (Marx, 1991). Often referred to as debt financing, this money capital lending is distinct from, say, a person borrowing money to buy a car. If the car is not purchased as a commodity to be put on sale on the marketplace, or as productive capital in the creation of other commodities, then the person who bought the car is not generating money prime (as outlined in Fine, 2013). Subsequently, "money as money, or simple credit, and money as capital coexist and mingle alongside one another, and that the dynamics of accumulation of fictitious and real capital have the potential to diverge from one another" (Fine, 2013, p. 50-51).

But the mass expansion of finance, like IBC, into the social reproductive spheres of our lives is one of the bases of modern financial capitalism. In short, Brett Christophers (2013) identifies three streams of thought as to what the basis of the 'financialization' of late capitalism is. The first, is a more strictly economic view: "a claim that the balance of the capitalist economy has changed, becoming more weighted to financial as opposed to nonfinancial activities and income sources" (2013, p. 233). The second is in the cultural sense, a sort of discursive colonization of the non-economic parts of our lives by the finance sector. The third, is the influence on corporate governance which shareholder value has grasped. The latter was in focus in Chapter 2 during discussion of reserve prospecting and valuation, particularly inspired by Mazen Labban's research (2008; 2013). He argues that "the ascendancy of financial capital has since increasingly subsumed capital accumulation under the logic of finance, channeling larger shares of corporate profits to the financial sector and making the activities and profits of non-financial corporations increasingly financial in nature" (2013, p. 477). Evidently, "paper oil," fictitious capital as the trade in oil futures contracts on global stock exchanges, has had a significant impact on the price of physical reserves for decades (Altvater, 2007; Zalik, 2006, 2010). Labban argues that financialization of fossil economies has completely rearranged accumulation strategies for producers:

> The availability of physical supplies has no direct bearing on the price of oil and that a high market price does not automatically induce investment in exploration and production capacity the relations between price, investment and production have been transformed by the financialization of trade and investment in oil: more oil is traded in financial markets than in spot markets, while major oil companies have increasingly turned towards financial markets for shorter term returns on their investments. (2010, p. 542).

In the modern oil patches of the capitalist core, like virtually all industries, this transformation in the logic of accumulation under neoliberalism and financialization is palpable. There is no doubt that "shareholders exercise power over accumulation as the absentee owners of capital who command the accumulation process by virtue of their property" (Labban, 2013, p. 479). Take, as an illustration, the *first sentence* of CNRL's 2023 annual report, ensuring readers that the firm is "maximizing value for our shareholders" largely through Board approved increases to stock dividends (2023, p. 1). On Cenovus's respective annual report, the reader must make it to page 4 before finding "more cash to shareholders," through a $2.8 billion stock and warrant buybacks and dividend payouts (2023, p. 4-6). Clearly, financialization and 'paper oil' has had a profound impact on the industry, but how has this impacted class composition and the determination of social class?

Who Constitutes Finance?

In Poulantzas's view, "a social class is defined by its *place* in the ensemble of social practices, i.e. by its place in the ensemble of the division of labour which includes political and ideological relations" (1973, p. 27, emphasis in original). Economic criteria, beyond just how much money one makes or has, is an obvious component of social class formation within capitalism. The economic ownership of the means of commodity production allows the capitalist class to exploit the working class for surplus value. But political and ideological relations are also important in class determination and reproduction within the social division of labour. Some of these political and ideological relations of fossil capital will be discussed later in this chapter and in chapter 5. For now, discussing the class composition and character of finance and fossil capital, the economic style of capital accumulation takes pride of place.

Understanding these firm's financial decisions and relationships is important, as, "the 60 biggest banks globally committed 705 B USD" in 2023 alone to the world's fossil economies (Rainforest Action Network, 2024, p. 6). As a short exercise in following the money capital of financial firms in its circulation through the fossil world, I consider the portfolios and lending practices of some major players in the country, both Canadian *investors* and Canadian *lenders*. 'Investors' are firms with significant ownership of private equity (some stake in a private equity fund or as non-voting common shareholders) and publicly traded assets (common or preferred stock shares, often). 'Lenders' are firms who advance interest-bearing capital to fossil firms for their fixed capital costs, as discussed in the previous section. For the purposes of this dissertation, I am particularly interested in the lenders who must be active in monitoring the financial health of fossil borrowers, and who must be active in the case of fossil insolvency and bankruptcy. While high-stakes investors should also be wary of failing corporate health, they do not have an active role in bankruptcy and are typically last in line to receive any compensation for shares they are holding when a company goes bankrupt, far behind the failing firm's creditors.[52] There are many lenders across Alberta's extractive frontier, but I will examine the Alberta Investment Management Corporation (AIMCo) first and the Alberta Treasury Branches

[52] And even further behind whichever contractor is being paid to oversee any deserted infrastructures' ARO.

(ATB), to a lesser extent, as both have been wrapped up in recent high-profile bankruptcies. On the investor side, beginning with the Canadian Pension Plan Investment Board (CPPIB) is as good a place as any.

CPPIB is a Crown corporation overseeing more than $700 billion CAD[53] in assets that stem from country-wide payments made to the national Canada Pension Plan (CPP). Their last reported 2024 quarter was one of the single largest dollar for dollar growths in the fund to date. In fact, their assets have almost doubled since 2018, when the pool was around $368 billion. Of course, this is not from the roughly 22 million Canadian contributors and beneficiaries of the fund (with only $1.5 billion in outflows to CPP recipients annually), but rather from their investment teams aggressive moves "in most asset classes, particularly investments in private equity and credit" (CPPIB, 2025a). They are one of the world's premier private equity investors, and they have interest in all the FIRE sectors (finance, insurance, and real estate). They have a sprawling array of publicly traded equities—spanning more than 1,500 different companies outside of Canada totaling over $172 billion in investments—with sizeable holdings in multiple upstream, midstream, and integrated firms in Canada including CNRL, Enbridge, Pembina Pipeline, Suncor, TC Energy, and Teck Resources (CCPIB, 2025b). They are both one of the largest real asset owners on the globe (Christophers, 2023) and a happy investor of the largest fossil producers in Canada.[54] As of the end of 2024, they held 6.5 million shares of Cenovus worth $98 million, 6.3 million shares of Suncor worth $227 million, just shy of 7 million in Enbridge worth $289 million, 37,000 shares of Imperial for $2.3 million, and 37 million shares

[53] All following monetary amounts in this section are in Canadian dollars.
[54] They do have a diverse energy portfolio in which, besides just the Big Five producers' starring, they hold a growing share of the global renewable energy market. They clearly document their understanding of the changing tides of energy production and the need for the fund to invest in climate capitalist firms and assets.

of CNRL worth $1.14 billion. Worthy of mention are their 14.7 million of TC Energy worth $686 million and nearly 3 million in Exxon Mobil worth $322 million (Fintel, 2025).

While Canadian finance does not outrank U.S. finance capital's unhinged lending to fossil firms, it still ranks considerably. Worst of all, their appetite for hydrocarbon investment continues to grow year-over-year. The five largest chartered banks—The Royal Bank of Canada (RBC), Canadian Imperial Bank of Commerce (CIBC), Scotiabank, Toronto Dominion (TD), and the Bank of Montreal (BMO)—together lent as much as $508 billion between 2016 to 2019 (Hudson & Bowness, 2021). But as of 2023, the five respectively now have invested $256.4 billion, $134.8 billion, $192.7 billion, $178.4 billion, and $148.6 billion for a collective $910.9 billion of investment in various fossil projects (Rainforest Action Network, 2024). For a quick example, we can examine the household Canadian brand Scotiabank. In 2023, some 2.33% of Scotiabank's total assets were wrapped up in fossil financing. This appears like a relatively small number, but it ranks them second globally by percentage of their total portfolio (Rainforest Action Network, 2024 p. 13). Of their more than vested $192 billion, $14.8 billion is going towards companies *actively expanding* operations in 2023. These big banks are central players in the growth of tar sands exploitation, and in controversial projects like the twinning of the Trans Mountain Pipeline (where they are the only listed financiers), and TC Energy's Coastal GasLink pipeline project (all five chartered Canadian banks make the project's top 8 funders' list).

In zooming in on the province's conventional sector, we find some of the less well-known names as the 'secured creditors' who advance IBC to the successful and failing companies alike. In Alberta's fossil economy, a secured creditor is a fossil firm's lender which has a legal claim on their borrower's assets. This means that the loans which fossil firms are reliant on for their fixed and variable capital expenses are collateralized with the infrastructure of extraction and the production flows from reserves, the latter being the ‘deemed assets’ discussed in Chapter 3. Financial firms’ exposure to borrowers is put on display during insolvency and receivership proceedings, as corporate receivers publicly disclose reports on the fossil firms that they continually compile for bankruptcy court judges. AIMCo, for example, is one such lender who is found on the list of secured creditors for Trident Exploration, a bankrupt operator mentioned earlier who made headlines due to the huge volume of their portfolio at the time that they ceased operations.

AIMCo is another Canadian Crown corporation[55] that manages provincial pensions and retirement money of some 375,000 Albertans. They are an asset manager with $168 billion of assets under management, making them one of Canada’s largest. They have had some recent time in the spotlight during both Sequoia Resources and Trident Exploration’s bankruptcies. In 2019, the “OWA took the unusual step of applying to the Court [the Court of King’s Bench of Alberta] for an order appointing a Receiver” (*OWA v Trident Exploration Corp*, 2022). AIMCo was a secured creditor to the firm, having provided Trident $60 million in debt financing with warrants according to their receiver, PricewaterhouseCoopers (PwC, 2019; Storrie et al., 2020). Likewise, they provided $49.5 million to the now-defunct Perpetual Energy. Perpetual was a particularly nefarious operator, becoming Sequoia Resources Corporation in 2017 in a bid to evade at least $200 million in outstanding AROs of its assets, shortly before assigning itself into receivership and bankruptcy. Importantly here, according to extra-industry research, Perpetual “lost 99 percent of its value since AIMCo’s investment” (Storrie et al., 2020, p. 3). Evidently, AIMCo has not always had the safest investment practices throughout the oil patch, despite being responsible for the retirement money of many Albertans.

[55] Like CPPIB, suggesting an obvious pattern of state-owned enterprises financially propping up extraction. This is not novel to Alberta or Canada but is an obvious interlock between the state and private capital.

The receiver, PwC, was not happy with the mischievous offloading of assets by Sequoia and they ended up in a protracted legal battle over whose responsibility the AROs were. While their courtroom dilemma is beyond the immediate scope of this dissertation, it points to an important conflict between fossil firms and receivers. Receivers, as discussed in Chapter 3, are the financial firms appointed by a court or secured creditor to take on a failing fossil firms' operation licenses at the time of their bankruptcy. They are an important part of both the province's financial-ecological liabilities fabric and within the region's capitalist bloc, constituting their own unique faction during times of corporate crisis and insolvency. This is because the financial lenders themselves do not oversee the disassembly and disclaiming of borrower firms' infrastructure/asset portfolios, so they rely on the receivers. Thus, receivers are the necessary vultures acting in their own interests, and on behalf of finance capital's extended family who are trying to make good on a failing firm's end-of-life. Financiers need the receivers, and vice-versa, so it appears that their relationships tend to be less strained than the fossil versus finance relations. Receivers, like financial lenders, have fragile interfactional alliances with fossil producers, especially in the modern era of ARO liability when receivers are ending up with less capital to return to the lenders. *Do you blame a vulture for perching over a carcass?*[56] This type of competition and inter-capitalist frustration is not a new tradition, especially within our era of financialization. of As Labban says,

> In times of crisis especially, capitalists have resorted to accumulation by swindling each other, and since thieving from the propertied classes is the form of theft most visible to the law, such mechanisms of accumulation have engendered rounds of accumulation by

[56] From Chinua Achebe's *Arrow of God.*

litigation: multimillion dollar lawsuits and settlements that redistribute value among corporations, accountants and lawyers. (2014, p. 478)

As will be discussed in Chapter 5, the OWA was opposite of *both* the financial receiver and the secured lender, GTL and Alberta Treasury Branches (ATB) respectively, in the Supreme Court of Canada's *Redwater* case. In this case, domestic fossil capital channeling through the OWA faced off against domestic finance capital and one of its transnational goons. ATB is a well-known quantity in energy lending, and GTL has enjoyed numerous receiverships in the province; they are experts in fossil firm disassembly. As of 2024, ATB has around $6.5 billion in loans to oil and gas operators (ATB, 2024, p. 65), proudly identifying as one of the biggest energy lending teams in Canada. GTL has held pride of place in receiverships over the years likely due to its size and locations throughout main veins of the oil patch, including Calgary, Edmonton, Fort McMurray, and Medicine Hat.[57] Again, this underlines how many hands of finance reaching into the fossil honey pot may be considered their own unique factions of capital, finding themselves in inter-capitalist contests and cooperation at sensitive times. Now that I have outlined some of the financial members of the capitalist bloc in the province, I will turn to some major fossil names in the bloc. But whereas I approached the lenders with broad strokes and did not identify individual people, below I start homing in on the C-suite executives and a few organic fossil intellectuals who are trying to steer the chaotic hegemonic bloc. Individual actions of fossil elites and intellectuals become particularly important in understanding the broader decisions of the province's environmental bureaucracies in control of liability management.

[57] While I do not have the evidence to empirically verify this, I would not be surprised if the *only* reason that they have offices in these locations was to prey on ailing firms in the fossil economy.

Who Constitutes Fossil?

Since these two chapters pay special attention to the industry lobby groups who founded the OWA, it follows to consider the largest and most active lobby group members' corporate leadership. As discussed in Chapter 2, the OWA six-member board is largely made up of executives from fossil firms: Paramount Resources (Board Chair D. Blake Reid), CAPP (Richard Wong), Ember Resources (Doug Dafoe), Cenovus (Logan Popko), the AER (David Hardie), and CNRL (Kyle Pisio). Ember, Cenovus, and CNRL are all member firms of the lobby group CAPP, while Paramount is a member of EPAC.[58] Thus, CAPP and EPAC compose the entire Board of Directors except for the single position which the AER's liability management team representative occupies. The leaders of the Big Five tar sands producers referenced in Chapter 1—Cenovus Energy, Suncor Energy, Imperial Oil, Enbridge Inc., and CNRL—partially overlap this list. The ones who do not directly overlap in OWA board control (Suncor, Imperial, and Enbridge) are or have been members of CAPP and the Canadian Energy Pipeline Association (CEPA). This is a politically and economically powerful collection of fossil firms. Research by the Corporate Mapping Project—a partnership between academic and community researchers who investigate power in the fossil economies of Canada—identifies a number of these firms as part of their 'Fossil-Power Top 50.' Cenovus and CNRL are among the greatest emitters, CAPP and EPAC are in the leading 'legitimators,' and the AER is in the 'enabler' camp (Corporate Mapping Project, 2024).

In short, "Paramount is an independent, publicly traded, liquids-rich natural gas focused Canadian energy company that explores for and develops both conventional and unconventional petroleum and natural gas" (Paramount, 2025, p. 6). The firm's focus is on conventional and

[58] Canadian Association of Petroleum Producers and the Explorers and Producers Association of Canada, respectively.

unconventional gas development across plays in the province's Montney Formation and the Duvernay. At present, they appear only involved in tar sands/heavy oil production through their ownership of Cavalier Energy. Ember Resources has a singular focus on shallow gas, with over 11,000 of the province's wells strictly dedicated to this. Cenovus is a significant producer of unconventional fossil gas and fossil gas liquids across the Elmworth-Wapiti, Kaybob-Edison, Clearwater, and Rainbow Lake play basins. That said, their tar sands productive capacity far outweighs their conventional and unconventional fossil gas and conventional crude production. They produced 593,400 barrels of crude daily in 2023 from their tar sands operations but only 119,900 BOE daily from their conventional operations (Cenovus, 2024, p. 25-26). According to the firm, their conventional holdings mostly fuel the energy-intensive extraction of the more extreme oil production that they pursue in the tar sands: "these assets provide short-cycle development opportunities with high-return potential that complement our long-term oil sands development and serve as an economic hedge for the natural gas we use at our oil sands and refining operations" (Cenovus, 2024). Finally, and in a similar vein, CNRL has both onshore and offshore production throughout the world. They have active operations onshore in western Canada's productive regions, and offshore operations in the North Sea and off Côte d'Ivoire and the coast of South Africa. In Canada, they extract fossil gas, fossil gas liquids, light crude oil, heavy crude oil, and tar sands bitumen. For the former three categories, they have substantial leases in the Montney and Deep Basin plays, which extend from northwest Alberta into B.C. (CNRL, 2025). Fossil gas accounted for 27% of the firm's total production in 2023, a record number.

These firms are easy to identify, like their financiers, but their corporate interlocks and shadowy portfolios of shuffled oil and gas assets and investments in private equity take much more concentration. Due to this mosaic of ownership connections, some scholars argue that these firms are virtually inseparable from financial firms due to “financial liberalization, the shareholder value revolution, and the unification of capital markets” (Hudson & Bowness, 2022, p. 386). In the Poulantzian sense, some argue that financial managers are now leading the hegemonic power bloc in other geographies, especially the U.S. This is especially pertinent as climate capitalist financial opportunities have started to fill out many firms’ portfolios. What is most important to this dissertation’s research agenda is that in these credit relationships, “the bank credit and loans are important in order to keep the oil flowing, they are not structurally vital to TD, RBC, or the other chartered, Canadian banks” (Hudson & Bowness, 2022, p. 387). Financial firms who extend IBC to producers in the patch could still thrive by turning their attention to other real and financial assets outside of the global hydrocarbon circuits (although they might not generate as much profit as fast). Most fossil firms, on the other hand, might not be able to survive without the lending and investment from their financiers. This is a very generalized statement, and financing is very geographically and firm specific. But it is a mutually reinforcing and dialectical relationship because financial firms and their other borrowers rely on the massive sources of energy from hydrocarbons (a central tenet to the heuristic of fossil capitalist political economy), as does global trade more generally. Sudden mass divestment from the fossil economy without substantive alternative energy sources to replace hydrocarbons would make little sense to lenders as it would drastically impact their portfolios beyond just the fossil firms they invest in. This fossil firm dependency on IBC is what makes fossil firms financiers such an important target for anti-extractive social movements: decapitate the funding source and much of the industry will struggle to continue extracting and acquiring new leases (see Young, 2024).

I will return to the contention between borrower and lenders in Chapter 5 as it requires emphasis in considering the OWA and CAPP's focus on the *Redwater* case saga. The aggressive positions of the oil majors in securing top spot in this base of accumulation is so important not least because it is *their* geophysical reserve[59] from which they produce value, but also because these fossil firms do not have the diversity of sectors to accumulate from as their financiers do. Yes, large fossil firms have their own investment portfolios and vertical or horizontal ownership of firms in the extractive web. But they qualitatively and quantitatively pale in comparison to the major asset managers or ruling lenders in the finance world.

The AER and Fossil Capitalism

> *A central political development of late capitalist society has been an increase in the tendency to view the state as capable of solving problems that lie outside of its competence. As the ascription of ability and magical powers to the state fails to solve these problems, advocates of statization press their claim for ever stronger potions, producing a cycle in which impotence results in calls for greater potency, which bring about higher levels of impotence. The more the state fails, the more it is worshipped, and the more it is worshipped, the greater will be its failure. (Wolfe, 1993, p. 292)*

In many ways, Alan Wolfe's arguments about the reification of the capitalist state lie at the heart of the arguments which unfold below. The AER, for instance, has been held up by industry advocates and bureaucrats of the government of Alberta as an expert organization, infilled with

[59] Obviously financial firms at present do not internally have the capacity to extract, upgrade, and circulate hydrocarbons. Hence the obvious distinction between their status as non-productive capital outlined above.

the best-in-class of highly trained and skilled techno-managerial class, constantly developing a regime dedicated to an assumed public interest of environmental protection while maximizing social welfare from industry's economic trickle down. But it is hard to believe in this fairytale of the Regulator as a Promethean shepherd. One only needs to look at its inadequate policy enforcement, the mismanagement and coverup of failing liability frameworks, and an onslaught of negative press about corruption or industry collusion. When put under the microscope, we see layers of institutional and bureaucratic calcification, organized by an ensemble of characters fixated on advancing capital accumulation, simultaneously trying to figure out how to resolve or delay structural contradictions of capital. Instead of pursuing the transparent and honest work necessary to address the root of this polycrisis, the province's regulatory apparatus further concentrates its power and authority, continually rotating inward, away from public view, ever-more reliant on the expertise of precisely the professional class which led it to the crisis of mass asset desertion. This is no surprise to the interviewees who reject the Regulator's party line and who volunteered their expertise to this research.

Several broad themes emerged from the qualitative interviews I conducted regarding the AER and its modern manifestation. The most salient were: 1) while the AER began as an exclusively downhole, technical regulator, sharing responsibilities with a diffuse network of other regulatory agencies, their transition in 2013 to a holistic licensee manager was a last step in consolidating fossil capitalist power. The Regulator has an incredibly complex and broad mandate, which many are sympathetic to, but nowhere in the previous mandates of the organization had advanced financial literacy been part of the Regulatory staff's skill set. Yet, singular oversight for provincial energy projects, from cradle–to-grave, was handed to them. What followed "has come under criticism as further restricting public participation… because it provides no additional transparency with regard to the decision-making process on energy projects in the province or on processes for appeals or decision reviews" (Carter, 2016, p. 162); 2) subsequently, the Regulator has moved towards minimizing input from scientific experts of ecology, environmental health, and toxicology, instead prioritizing the knowledge and regulatory approaches of organic intellectuals of the fossil capitalist class, namely geotechnical or petroleum engineering experts; 3) this has meant that the Regulator has been systematically reducing oversight of its project application process and has focused on streamlining approvals under the auspices of reduced bureaucracy and improved efficiency. They have sidelined any ecological, environmental scientific, or toxicological professionals concerned about socioenvironments and fighting to build in robust environmental performance criteria[60]; 4) at present, any remaining people within the AER and provincial government who want to see change to liability and closure practices do not have the political or economic bargaining power necessary to enact corrective change.

During an interview with Albertan ecologist and author Kevin Timoney, he argued that the advancing consolidation of the Regulator towards becoming the AER has had a negative impact on enforcement and monitoring over the 20th century:

> Now, what has happened, in my understanding, of the situation, as it went from the Petroleum and Natural Gas Board, to the Energy Utilities Board to the Energy Resources Conservation Board, and finally to the AER, is that it's become more and more captured, more sophisticated in terms of how much power the Regulator now holds, especially since the passage of REDA in 2014, and the founding of the AER. So, they basically now have become the complete, single-stop agency for the *Water Act*, the *Environmental*

[60] Something commented upon multiple times during my interview with Mandy Olsgard.

> *Protection Act*, any sort of act having to do with the environment is now under the AER, which is an absolute shameful prospect because they have no confidence, and they have no desire to uphold those acts. (personal communication, May 12, 2024)

Although I am interested in understanding the shifting terrain of this aging capitalist bureaucracy, such a project is beyond the scope and scale of this dissertation. The entire counter-history since the days of the Petroleum and Natural Gas Board in the middle of the 20th century would be a distinct project. I turn, rather, to major movements in liability management from the 1980's EUB onwards to understand the position and work of fossil capital over the last decades.

Liability In the Days of the EUB and ERCB

Unlike social classes, Poulantzas develops the concept of 'social categories' to identify the location of government bureaucrats in capitalist superstructures. A social category in part "designates an ensemble of agents whose principal role is its functioning in *the state apparatuses and in ideology*. This is the case, for example, with the administrative *bureaucracy* which is composed in part of groups of state functionaries (civil servants)" (1973, p. 40, emphasis in original). These social categories still have distinct class compositions and are not necessarily uniform within any administrative apparatus. Thus, there can be civil servants within a state agency who are variously bourgeois, petty bourgeois, or working class, performing in unison towards the state's objectives. This unity is not dissimilar from the unity of the capitalist power bloc which employs its political power to gain favourable ground towards the long-term interests of capital in general. This collective unity in the state bureaucracies allows them to have the relative autonomy from their personal varying social class. But this unity is also like the capitalist bloc's in that it is full of contradictions and can be fragile as different members' class alliances cause ruptures. Different social classes (especially between bourgeois and petty bourgeois, Poulantzas argues) and different factions of capital clash within a unified state apparatus. These social categories have important ideological and political work under capital. Consider Jessop here on the various social origins of state bureaucrats:

> Its capacity to act as a unified force depends on shared commitments to the dominant juridico-political ideology, which justifies its activities with a discourse of public service, general interest, and the maintenance of national unity and social order. State personnel need not share a common class affiliation by virtue of shared social origins. (2021, p. 167)

The regulatory apparatus's position within the mode of production has been paramount to fulfilling the basic long-term goal of fossil capital: preserving access to its geophysical base of accumulation and the associated profit streams that come from it. Luckily for the industry, it has always been able to help materially and ideologically guide the development of liability management in the province, given the relative youth of the nation of Canada and, by virtue, the Albertan state. *The British North America Act* (BNA) was codified in 1867, confederating the disparate provinces of Canada (what are known today as Ontario and Quebec), Nova Scotia, and New Brunswick into the fledgling Canadian state, known then as the Dominion of Canada. The BNA is important to the matter of hydrocarbon exploitation as it began granting provincial authority over the administration of the nation's natural resources. Decades later, the 1905 *Alberta Act* created the province of Alberta as it is recognized by the federal settler state today. Recall, it was only then in 1930 that the NRTA gave the prairie provinces oversight of their hydrocarbon reserves, with the caveat that the Crown still held the rights (King & Pasternak, 2019) and it was not until 1947 that Alberta was put on the map as a major hydrocarbon source when Imperial successfully hit the Leduc-Woodbend field.

In this sense, it is not surprising that the slow-motion liability landslide only began materializing in the 1980's. The fixed capital of extractive industries can have a long shelf life. Some wells can produce for a half-century if the conditions and size of the reserve is right. Others can peter out in as little as a decade. Some wells, as discussed in Chapter 2, are revived by the industry's present-day defibrillator: hydraulic fracturing. Nonetheless, it was as early as 1970 that one of the first attempts at securitizing against the financial costs of deserted assets appeared with an amendment to the province's 1938 *OGCA*. The act stipulated that the EUB had authority to make regulations "requiring the placing by licensees of deposits with the Provincial Treasurer to guarantee the proper drilling, control, completion, suspension, or abandonment of wells and prescribing the form of such deposits" (*Oil and Gas Conservation Act*, R.S.A. 1970, c. 267, s. 22 (2)).

While this early legal approach to security kicked off in 1970, it was not until 1986 that the Regulator turned toward the creation of an orphan fund for the first time when they believed there would be "few instances where a licensee cannot be found or is unable to carry out proper operations" (ERCB, 1986). They were almost immediately wrong in their confident forecast of vigilant producers following guidelines for shutting-in equipment. 1986 was a particularly difficult year for fossil firms as an international quota war led to a flash price collapse amidst a global production glut. Quickly, "it became apparent that more companies than initially expected were likely not going to properly abandon and reclaim their active sites" (Yewchuk et al., 2023, p. 3). This meant that without proper regulation and earnest enforcement, or a new and novel plan devised by the leaders of the hegemonic bloc, the tens of thousands of already inactive wells in the province would be on their way into the Regulator's portfolio.

Interviewee Mark Dorin argued that John Nichol, head of the EUB in the late 80's, was forced to reverse course on developing such "serious rules for deposits to cover closure costs," like those envisioned in the *OCGA*, after industry push-back and threats of capital flight should such posted deposits be too high. Unfortunately, the Regulator had no mechanism for accurately calculating individual firms' closure costs at this time (nor do they now), so blanket security deposits did not appear to make sense. Nichol wrote two pieces, in 1989 and 1991 respectively, in advance of the OFL being codified into law as an amendment to the *OGCA*. The December 1989 ERCB "position paper" led to a cooperative task force between the Regulator, the Albertan state, and the Canadian Petroleum Association, Independent Petroleum Association, and the Small Explorers and Producers Association of Canada (CPA, IPAC, & SEPAC 1990 in Yewchuk et al., 2023, 113). These industry lobby groups are the predecessors to the modern-day CAPP and EPAC, with the former two merging to become CAPP in 1992 and SEPAC simply dropping their 'Small' qualifier. Thus, this powerful political lobbying alliance between CAPP and EPAC has been ideologically informing policy practices for at least the last four decades. Obviously, fossil capital has not *always* had economic dominance in the province, with other 'staples' (Innis, 1930; Watkins, 1963) capital occupying the lion share of the country's export-based economies for years before the Leduc-Woodbend breakthrough. The colonial exploitation of fish, furs, and timber–along with the exploitation of Indigenous knowledge and labour which allowed these industries to gain footing–long held pride of place throughout the country. This is important to note as the additive nature of the global energy transition may start to curate a strong political hegemony of a different faction while the fossil faction continues to produce high amounts of value. As Poulantzas says, "it is possible for a fraction of the bourgeoisie to have the dominant role in the economy without thereby having political hegemony" (Poulantzas, 1973, p.

44).

In any event, both the rejection of a strong deposit system by the industry—rather than the increase in required deposits which probably would have been successful in staving off the worst of deserters—and the creation of the industry task force are some of the first hints of the industry's large appetite to determine the Regulator's direction on modern liability management, orchestrating the flow of deserted assets. Despite being a professional engineer embedded in the province's fossil economies, Nichol's seemed a sensible career bureaucrat, not wanting to raze the very earth of his province for the sake of production flows. In many ways, he represents the autonomization of state power which both Poulantzas (2000) and Mandel (1992) theorized in their own ways. He does not appear to be part of the bourgeois class, based on the limited available biographical information on him (although, his class *origin* may have been bourgeois via his family, something Poulantzas talks about).

For Poulantzas, the state has a relative autonomy from class interests, represented in superstructural apparatuses like the juridical system, in order that it may be a unified, although fragile and contradictory, capitalist type of state. This relative autonomy is the necessary lubrication to the society's social cohesion. For Mandel, there was a question of the limits of the capitalist state's relative autonomy. In his later work, Mandel argued that the many connections between the bureaucratic social formation and the bourgeois class–their "interests, values, mentalities, ideologies and prejudices" (1992, p. 187)–meant that the former would be corrupted by their power. This means that "all top bureaucrats, even if they rebel in spirit, sooner or later go the way of all flesh, attempting to translate their power into private capital accumulation" (1992, p. 187). Which route would a somewhat idealist career bureaucrat like Nichol take in this difficult environment of political power? Would he continue to push through the difficult political assembly of industry lobby groups to preserve the socioecological conditions of the province at stake or would he ideologically bend towards the industry?

He had been with the Regulator for 24 years preceding the development of his task force, so he understood the terrain of that time well. His suggestions included corporate surveillance, new well licensing fees directed to an abandonment fund, ARO security deposits for already-drilled, aging wells, and even a financial and technical means test that reads like the predecessor to the LLR calculations that were adopted years later. Nichol's papers also contemplated new rules for well license transfer, to preclude the shuffling of similarly inactive/sunken assets in the province, including "shifting to a policy of scrutinizing well license transfer applications and imposing closure obligations on previous licensees where an existing licensee was defunct" (Yewchuk et al., 2023, p. 3). In concert, these different components seem like they could be successful in preventing fossil firm delinquency and desertion, but they would ultimately fizzle out, as evidenced by the liability history.

The fossil bloc wanted continued access to their accumulation base, which they were already being guaranteed by the province, but they also wanted to resolve industry failures themselves. Rather than adopt Nichol's early measures, the fossil bloc (represented by the lobby groups), put forward a panoply of its own policy recommendations. Consider Mark Dorin here:

> According to Mr. Nichol, the industry said, "look, if you do this to us, it'll affect investment in the industry." So, the industry offered and said, "we will pay to close the wells of failed companies in our industry." So that's how the Orphan Fund came to be… But I submit that the Orphan Fund is a better system in lots of ways because for example if you take security deposit you have to estimate, and there's no way to estimate how much it's going to cost to plug well. There's no way to estimate from which well there

will be released substances which need remediation, and from which site there will be no release of substances that need remediation. There's no way to put up a bond or security or a letter of credit for every well site that actually covers what the real cost will be. (Mark Dorin, 2023, personal communication)

As discussed in Chapter 3, the AER's Suspended Well Subcommittee of the Drilling and Completions Committee had guidelines for inactive well reviews in an attempt to ensure that suspension and ARO was conducted. Nichol continued his struggle to securitize against inactive wells, namely through the EUB's requirement saying that wells which had not produced for 10 consecutive years either be abandoned by the operator or have securities posted to cover that eventual abandonment cost (Nichol/EUB, 1995). Ultimately, the LMR program led to the demise of the Long-Term Inactive Well Program discussed in Chapter 3 which had successfully reduced the population of inactive wells and collected $24 million in security deposits against 1500 of those wells. As the LMR program design and calculations were covered at length in Chapter 3, I will not return to it here. But something hidden beneath said explanation was CAPP and EPAC's hesitancy around the parameters of the LMR and their interjection into the turn of the century liability management plan. In a 2001 missive to the EUB, CAPP's Chairman William Friley focuses on 'deep concern' that Nichol's expansion of the early orphan program presents to the industry fund (the predecessor to the OFL). The EUB had organized a Fund Advisory Committee made up of senior bureaucrats from the Regulator and other provincial agencies (Alberta Environment, Alberta Agriculture, Food and Rural Development) and, of course, CAPP and EPAC representatives. As prominent 'stakeholders,' the industry had significant influence on the design of the ineffective system. For the most part, the elite of the fossil bloc just did not want to be responsible for the delinquency of companies deserting infrastructure. At the time, the LMR was ultimately viewed as a "good news story for government, industry and landowners" when it was implemented in 2002. As would be reckoned with decades later, the LMR project was an ineffective tool in determining a licensee's financial health and ability to fulfill its AROs, leading to the province's 2020 LMF. It got so bad toward the end of the LMR program that the AER stopped publishing individual LLR calculations of firms, instead opting to aggregate the data in the form of monthly reports as shown and discussed in Chapter 3. This was for fear that it was impacting lending decisions across the sector, as financiers could see individual firms' weak financial positions in relation to their large liabilities, creating hesitancy in future lending.

This shift in practice also set the stage for the tensions between members of the fossil faction and financial factions. Operators (firms of the fossil bloc) sought low posted deposits and the ability to handle asset AROs at their discretion. Members of the finance bloc wanted to maintain the ability to maximize profit from the disclaiming of collateralized fossil assets after borrower bankruptcy. Ultimately, these competing desires could not coexist, as the OWA, and by virtue the member firms who pay into the OFL, became responsible for the unwanted assets. The growth of the OWA inventories eats further and further at specifically fossil profits as levies on industry grow, even if posted securities do not. This is further demonstrated in chapter 5, through discussion of the Redwater cases and the change in lending practices which followed the decision.

Discussion On the Formation of the Bloc

What is important to observe from Nichol's efforts (surely among many other lesser named and lower ranking staff) is the location of both the Albertan bureaucracy and the fossil bloc in deliberations over the hot potato of asset liability. Thinking through a Poulantzian lens of the state, we observe how fossil power was being reshaped and, at times, how contradictions and compromises manifested through its class-specific lobbying groups' relationship to the state and its legal formations. Nichol, for his part, never seemed to give up his struggle to create a regulatory program that would preserve the physical conditions of production in the province and ensure there was no mass delinquency in the province's oil patch. Unfortunately for him, no good deed goes unpunished, and his idealistic outlook and hard work were crushed under the political power of the fossil bloc. It is through such situations that we can recognize how the Albertan capitalist state "was always already at work in forging and reproducing class power" (Khachaturian, 2021, p. 177).

Throughout the tumult of crafting liability management, the Regulator routinely took cues from CAPP and EPAC's on how to discipline and organize lesser firms (including the lobby groups' own members), rather than at some point being an entity that was designed to reproach the industry as a whole for its delinquency. The idea that regulators are political organizations meant to severely punish private capitalist enterprises appears to be a widespread misattribution to the role of state regulation in advanced capitalist countries. Their relative autonomy from economic production does not mean that they are wardens of some cruel panopticon for private capitals. It means that it can operate most effectively as Engel's and Mandel's 'ideal total capitalist,' ensuring long term maintenance of capital as a whole through its superstructural components. This is evocative of Karl Kautsky's oft quoted axiom: "the capitalist class rules, but it does not govern. It is content to give orders to the government" (quoted in Mandel, 1975, p. 479).

Here, especially in putting my interviewees' views in discussion with these Marxian theories, criticism of the Poulantzian theories of the capitalist type of state become pronounced. But rather than argue that this structural Marxist turn renders capitalist states as excessively malleable, I argue that this theory can actually help in explaining the shortcomings of social democratic reformism. This school of thought, stemming from Louis Althusser's work revisioning of Marx's oeuvre through a structuralist framework, is sometimes accused as being a reproduction of the mainstream sociological theory of structural functionalism. Critic Simon Clarke argues that this work of bourgeois sociology (Clarke, 1991), emerging from Emile Durkheim's work, is "unable to grasp the limits of state interventionism inherent in the character of the state as a capitalist state" (1991, p. 72, emphasis in original). This is because such an instrumentalist view of political power ignores the specific and complex nature of social class relations in capitalist society and necessarily in relation to capitalist states. Clarke believes Poulantzas falls into the bourgeois instrumentalist trappings of mainstream sociologists. But there is much evidence that Poulantzas is not an instrumentalist despite his theoretical commitment to developing a structuralism through Althusser or Étienne Balibar's frameworks (perhaps Althusser's most prominent disciple).

In taking up Poulantzas's theory of the relative autonomy which capitalist states maintain from economic production in Canadian political economy, Albo and Jenson (1989) give a more positive assessment:

> Poulantzas granted a critical role to politics, but also made visible the structural constraints of reform within capitalist society. The concept of relative autonomy thus became a forceful explanation of both the gains made by social democratic reformers as

> they expanded social policy and the equally evident failure of such reformers to overturn the political and economic inequalities produced by social relations. (p. 182)

This capitalist state did not, and necessarily *could not*, have a phase of intensive financial or socioecological regulatory enforcement. Such a phase would undermine the viability of capital production in the oil patch such that the mode of production and accumulation would altogether falter. This would effectively realize O'Connor's argument that the structural contradictions of capital foment the state invention that could lead to the socialization of production. h Indeed O'Connor's argument is that *ecological conditions* of production are the starting place for the second road to socialism via the project of state socialization. Obviously, such a progression has not happened in Canada and Alberta's regulatory apparatus has never been this supposed adversary to the industry.

Interestingly, in the ongoing consolidation of the fossil bloc, there is no obvious inter-factional competition between fossil and finance capital in the AER's publicly available documents. That is not to say that finance capital had no interest in the early days of extraction here, as finance was seen swooping in as early as the discovery of Turner Valley in 1914, with "more than 350 brokers and 500 sales agents…peddl[ing] shares in more than 490 companies, most of them new" (Jaremko, 2013, p. 29). But their lesser position is merely a product of the times, as the phenomenon of financialization would not begin strangling global life for another six decades or so. Finance capital's story within the bloc was yet to come, still getting its bearing in lending and ownership across the regional sector.[61] Likewise, the Regulator's documents do not highlight meaningful recorded history of landowner or environmentalist advocacy or

[61] Or there is an untold history about the forging of this section of the hegemonic bloc waiting to be unwound.

activism or anti-colonial struggle[62] around the problems of liability and socioecological contradiction. Of course, anti-colonial and broadly environmentalist struggles did exist and have been recorded elsewhere, although detailing them is not the focus of this dissertation.[63] Popular documentation and support of these struggles has ballooned in recent years throughout the province and nation, evidenced in Indigenous national resistances like the Idle No More movement or the #ShutDownCanada movement, so we can understand the provincial silence on older histories of resistance as a product of the fossil bloc's strong class hegemony. Even today these counter-hegemonic positions are still minoritarian in the province, as many regular citizens and politicians alike constantly reaffirm their ideological desire for the industry to operate with as little opposition as possible.

In homing in further on the ways that the hegemonic bloc was organizing itself around provincial law and policy we can consider CAPP's evolution. In Poulantzas' theories, law is a critical component of self-realization for capitalist classes. As Rafael Khachaturian says, the

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[62] Jaremko's 2013 hagiography *Steward: 75 Years of Alberta Energy Regulation* mentions the term 'activist' once in passing, for example.

[63] Anti-colonial resistance manifested quickly in the settler state's occupation of the lands that are now Alberta. Turning the clock back 150 years to the days before Treaties 6, 7, and 8 were penned are important histories of Indigenous organizers like Louis Riel frustrating early provisional governments. Colonial Alberta's origin is within the early Canadian state's purchase of Rupert's Land in 1869 to the tune of 300,000 English sterling, following the English parliament's passage of the Rupert's Land Act in 1868 (Ishiguro, 2017). The federal government was now prepared to begin moving westward in negotiating treaty relations. This was a significant step for the Dominion and a new phase of the settler project as the 'expansionist spirit' gripped political leaders and citizens throughout the English Canadian society (Owram, 1992). But, the Red River Resistance, organized in-part by Metis leader Louis Riel, almost immediately interrupted this plan. Métis people of the Red River Colony were not consulted about the transfer of land to the Dominion and they refused then-governor William McDougall access to the territory and "declared a provisional government and pursued negotiation for the establishment of a new Canadian province on terms favourable to Métis residents rather than as a colonial extension of English-Canadian settlement" (Ishiguro, 2017, p. 128).

We can see an extractive throughline in the *longue durée* of the prairie provinces' colonization. The collaborative work of fossil capitalists and Canadian geosciences is unavoidable in even pre-confederation history. Natural resource exploitation bred the dual work of settler capitalist accumulation and dispossession of Indigenous land and lifeways through private property enclosure and the extinguishing of Indigenous title right. Unsurprisingly, this expanding regime of extraction would "significantly limit the exercise of inherent Indigenous jurisdiction on their territories" (King & Pasternak, 2019, p. 17). Riel and the Red River Resistance is just one story among the history of anti-colonialism on Turtle Island.

‘juridico-political structures’ act as “a central element in the organisation of hegemony and as a technique for the creation of cohesion and consensus, both within the power bloc and between the power bloc and the dominated classes” (2021, p. 181). While early environmental governance in the province did include industry stakeholders and geotechnical expertise in policy production, the continuous creep of the oil majors’ lobby groups into the fold grew over the 20th century. CAPP was founded in 1927 as the Alberta Oil Operator’s Association following the discovery of the Turner Valley field, but Canada was not even on the map of major producers in that decade (remember, it was not until 1947 that Imperial hit the Leduc-Woodbend reserve). Their formation and unity continued over the decades, opening an office in Ottawa in the late 1950s. By the middle of the 1960s, they had established themselves as the main game in town, representing 97% of all producers in the country (CAPP, 2012). CAPP’s autobiographical sketch of this evolution paints the picture well:

> After a period of modest growth in the 1960s, the Canadian oil and gas industry underwent rapid expansion in the 1970s becoming an important economic force. As oil and gas policy assumed a higher political profile, the CPA [Canadian Petroleum Association, their name at the time] grew in influence and power. During this period, the CPA’s structure and personnel underwent several changes in an effort to make the association more effective and responsive to the current needs of its members and key audiences. In 1978 the numerous committees of the CPA were replaced by general committees, each with several specialized committees organized along functional lines. (CAPP, 2012)

The early leagues of regional petroleum geologists and prospectors who trained at provincial institutions like the University of Alberta throughout the middle of the 20th century appeared mostly interested in the geophysical aspects of production, perhaps harbouring some sort of nationalist-capitalist-realism about the province's resources. George Govier, a renowned petroleum geologist and head of the ERCB from 1962-1978, was one such fossil capitalist intellectual-cum-bureaucrat. Like many professionally trained geoscientists (Nichol included) he was quick to acknowledge and show concern for the hazardous externalities of production like sour gas, chemical leachate from tar sands production, tailings waste. At the same time, he was ardent that "we cannot frustrate the development and use of our energy resources" (quoted in Jaremko, 2013, p. 15). The point being that while fossil capitalists and the capitalist-friendly geotechnical intellectuals were embedded in the regulatory regime, the broader hegemonic bloc did not have apparent signs of *consolidation* until the 1980s.

This timeline coincides with the flip to global neoliberalization and the spread of financial capital. What better time for capitalist class interests to consolidate and unify than in a period of state retraction, public sector austerity, and the diffusion of finance into every pore of the globe? This also generally coincides with the slow, rocky beginnings of tar sands extraction in the province by Suncor (founded as the Great Canadian Oil Sands company) and Syncrude, in 1967 and in 1978, respectively. Unconventional extraction was mired in problems during this period. Namely, the sands faced the coalescence of technological recovery problems (and their prohibitive costs) in the sands and ongoing conflict between then Alberta Premier Peter Lougheed and Prime Minister Pierre Trudeau over the latter's stomach for higher oil royalties (Carter, 2020). Due to these problems, conventional extraction still reigned supreme, at least for now.

One of the most notable financial members of the wider bloc worth noting is the

Business Council of Canada.[64] While their specific development and role in advancing finance and fossil capital in the province is beyond the scope of this dissertation, they undoubtedly have left a footprint on public policy. They are considered among the most powerful of Canadian capital's modern lobby groups. Finance capital has long had a complex and nested collection of corporate interlocks through ownership structures and investment with members of the fossil bloc. The Business Council is one important representation of this national collection of different factions of capital. Every sector is represented in the Business Council's diversified troupe of over 170 Canadian (and transnational) firms including asset management, banking, automotive, technology, transportation, communications, and oil and gas. Carroll et al. describe these interlocking business relations:

> In contrast, intersectoral business advocacy groups such as chambers of commerce and business councils represent broader class interests. These are sites where wider strata of business leaders (including, for example, bankers or manufacturers) might rub shoulders with the fossil-capital elite. Such contacts provide opportunities for blending the specific, fractional interests of fossil capital within a broader corporate agenda. Most influential in this regard has been the Business Council of Canada, which since the 1980s has significantly shaped neoliberal policy at the federal level. (2021, p. 174)

Without a doubt, the Business Council has long had an internationalist bent while always maintaining a lockstep position with domestic neoliberal leadership working to advance

[64] The Alberta Heritage Savings Trust Fund was also started by Lougheed in 1976 as a place to collect state revenues from extraction, similar to the oft-cited Alaska Permanent Fund or the Government Pension Fund of Norway (this is a bit of a misnomer they do not actually manage 'pensions'), the latter being one of the world's largest sovereign wealth funds. All three were designed to uptake and manage excess extractive state revenues so they can be deployed on future social provisioning. Alberta's fund stopped taking extractive revenues in 1986. Due to this and 'chronic withdrawals' from it over the decades, the fund has stagnated over the past 40 years. Even the libertarian Fraser Institute has been a critic of its mismanagement, rather than its existence as a public coffer, arguing that there should have been higher contributions to it over the late 20th century (Fraser, 2013).

Canadian interests. Their September 2, 1984, position paper on trade liberalization between the U.S. and Canada was published two days in advance of Prime Minister Brian Mulrooney's successful election bid. In 1985, they helped architect the Western Accord on Energy through their bringing together of fossil firm executives and provincial and federal bureaucrats, disassembling Trudeau's National Energy Policy (Langille, 1987). In the 21st century, they proselytize the power and peace of aggressive hydrocarbon recovery technologies and poorly funded remediation plans across the sands: in vogue steam assisted gravity drainage recovery, CNRL's fine tailings treatment at its Horizon mine, or Shell Canada's Quest carbon capture program (Business Council of Canada, 2017). Founding CEO of the Council from 1981-2010, Thomas d'Aquino, said that former Canadian Prime Minister Brian Mulroney credited the council with helping write his administration's policy playbook. In a 2016 speech to the council Mulroney said:

> I want to single out the historic role the Council played in supporting major economic initiatives of my administration, notably the FTA and NAFTA, the GST, privatisation, deregulation, and our low inflation policy. These were the foundational policies for Canada's subsequent growth. (Quoted in d'Aquino, 2024)

Thus, it is obvious that the bloc saw both the industrial policy and natural resource management landscapes as important (and logical) avenues through which it could unify itself. In the case of Canadian production, this dual process of capitalist class organization and subjugated class disorganization happens continuously throughout time and on multiple scales. Whether within provinces' administrations, in the policy convergence and 'sub-governments' (Carter et al., 2017) that the oil-producing prairie provinces forge, or on a federal register, I argue that it can be empirically observed. In bringing this story up to date, we now must turn to the forging of the

AER in the fires of the fossil and finance bloc of the 21st century.

After *REDA*; The Transition to Holistic Licensee Management

2013 was another hallmark year for the bureaucracies involved in Alberta's environmental governance. The province passed the first components of the *Responsible Energy Development Act* (REDA), and the Regulator's identity once again changed to the Alberta Energy Regulator, though it maintained many of the previous roles and authorities held by the ERCB. What was new was the consolidation of responsibilities of the former Alberta Environment and Sustainable Resource Development and their new 'single window' position, becoming the sole regulator for *all* permitting of environmental and water permits in the province upon the subsequent passage of components of REDA in 2014. This meant a much broader scope for the Regulator, as discussed in Chapter 3. And who would be better to chair the board of this new creation than one of the leaders of the fossil bloc, Gerry Protti, the founder of modern-day CAPP. Protti's appointment was the *pièce de résistance* of the fossil bloc's jostling to make a 21st-century regulator which would maintain the oil patch as they saw best. This was years in the making, with the province's 2010 Regulatory Enhancement Task Force, led by three Albertan Members of the Legislative Assembly, recommending the creation of a single regulator (Carter, 2020). The appointment of Protti is one of the premier representations of the fossil bloc's unification through the state in the 21st century. Together with the founding of the OWA, analyzed in Chapter 5, the transition to the single-window authority of the AER has allowed fossil capital full power to steer the ship of accumulation in the oil patch presently. The fossil bloc had long been asserting this hegemony across other scales of Canada's state apparatuses, ensuring the repression of Indigenous and settler counter-hegemonic resistance alike. Such an appointment, I argue, is why the personnel who make up the administrative bureaucracy is so important. I side with Poulantzas and disagree with some other Marxist schools of thought on this point. Some claim that the specific class relationships of the administrative personnel are unimportant. Instead, an insistence on theorizing the location of the state within the capitalist mode of production is prioritized. But this political hegemony is a partly a product of the installation of these organic intellectuals, and power is "facilitated by its hold over key positions inside the state apparatus, which enables it to exploit the state apparatus unity and sovereign authority" (Jessop, 2021, p. 162).

Protti's appointment, among many other things, seems to lead to a common conclusion cited by my interviewees: that the AER was never developed to strictly enforce the industry but rather was created as a comfortable bedfellow to extractive capital which would maximize extraction, minimize scrutiny, and reinforce a highly cooperative 'nudge-style' regulation. A critical point that one anonymous interviewee brought up was that it was created to imitate a company, an expression of the market-based solutions approaches that neoliberal development had fostered over the decades. This "fantastic disaster," they said, was different from previous iterations of the Regulator, which had actually been made up of administrative boards in the past, rather than C-suite executives. A similar point of view was echoed in my interview with Mark Dorin:

> Okay, we don't have one [an energy regulator]. We have one but they're not even remotely carrying out their mandate and that's the real problem here. With some exceptions, we have really good oil and gas laws. They could be improved here and there but, you know, compared to the rest of the world we have fantastic laws. We're just ignoring most of them and enforcing very few of them. (personal communication, March

15, 2023)

But critical research by Canadian environmental law scholars says otherwise, as far as the quality of domestic legislation goes (Boyd, 2007; MacLean et al., 2015; MacLean, 2016; VanNijnatten & Boardman, 2002; Wood et al., 2010). In some ways, the industry's hegemony over regional policy presents the explanation for the failure of Canadian environmental law to address socioecological crises while allowing the externalization of industry costs. I echo MacLean in arguing that deeper, systemic analysis of the production of capitalist law would lead us away from championing them: "Far too often, we analyze environmental laws and regulations at face value, failing to peer beneath their official forms and surfaces to adequately account for their actual origins" (2016, p. 118). The superstructural law and policy which capitalist states create and subsequently enact through its bureaucracies seem ill suited to reach even the most mundane of emancipatory goals around socioecological protection.

There were some competing claims from my interviewees that were antipodal to Dorin's position on the efficacy and honesty of the modern AER. In one instance, an interviewee held that the industry overall is full of producers who want to do right and that the rules and regulations are slow to come online and be enforced, due to the complexity and scale of the problems (especially regarding unfunded liabilities). In this view, the AER has had recent trouble with enforcement due to their transition into the single-windows, holistic licensee manager responsible for financial and technical oversight of firms' production. In my interview with Mark Taylor, he noted that

> The AER was never intended to be a financial regulator. From the days of the ERCB, this was a downhole, technical regulator to make sure that the resources were developed properly and safely and [to] not hurt the environment. Nowhere in that mandate did it say

> you needed to understand the financial health of the company. (personal communication, March 12, 2023)

Some interviewees, including Dorin, who regularly represents clients affected by deserted assets at administrative AERs commission hearings, were sympathetic to the Regulator's massive workload, though unwilling to cede this as justification for their mismanagement in recent years:

> Let me say just this: I'm super sympathetic, no other administrative body has a mandate like the AER in this country, even remotely as complex or as important. The biggest regulator in the country by far with the most important and broad mandate by far. (Mark Dorin, personal communication, March 15, 2023)

This sentiment was latent across these interviews: the fact that the concentration of authority in the single-window approach ushered in by REDA in 2013 has impacted the capacity of the Regulator. Even more important based on my analysis of historical conditions and documents but, not uniformly said during interviews, was that this accompanied the minimizing of alternative policy input from those dedicated not to maximizing fossil extraction, but to environmental stewardship and health.

Indeed, it was no surprise to anyone tuned in prior to REDA that the AER would be ill-equipped to take on this new role of scrutinizing the financial health of licensees. Their metamorphosis made them responsible for ensuring that licensees save enough capital to see through end-of-life asset obligations. Hints of this neoliberalizing through administrative consolidation can be seen in processes like the EUB's restructuring of the 1990s. A Facilities Division was created in the EUB from five previously separate departments which made for less industry oversight on license transfer through an amalgamation "into one process thereby allowing the industry to make one application to transfer a property" (Nichol, 1995, as cited in

Yewchuk et al., 2023). This change, for example, led to reduced oversight eventually leading to a greater volume of inactive wells being transferred to parties who did not have the capital, or interest, to oversee AROs. Timoney views the situation as a sort of slow, industry deregulation seen in the corrosion of existing regulatory processes, rules, and instruments that restrict private capital in diverse ways. This is beneficial to the industry not because of a reduction in inter-capitalist firm competition but because of the maximization of profits any firm might be able to realize.

One interesting introspection into the Regulator from this period is the 2013 publication by the ERCB, authored by one Gordon Jaremko, named *Steward*. It is one of the Regulator's insider attempts at a historical account of the organization, published on its 75th anniversary, the same year as the passage of REDA. One of my interviewees called it a hagiography as it does nothing to question the efficacy of the policy landscape and informal practices that have landed the province in its unfolding crisis of unfunded liabilities. I would go further and mark it as a piece of the province's public petro-pedagogy which, "promote student [or citizen] subjectivities consistent with neoliberal environmentalism centred on individual actions that insulate fossil fuel industries from criticism" (Eaton & Day, 2020, p. 458). This telling of the Regulator's history has them as a champion of the environment, a 'peacemaker,' a 'mentor,' constantly glorifying industry operators and personnel. It is shot through with self-aggrandizing anecdotes about banal things like field inspectors actually doing their jobs, the supposedly militant monitoring of hydrogen sulfide leaks (spoiler: this is poorly monitored in the province according to easily accessed environmental health data), their position as a 'balanced' and fair adjudicator of community concerns, and a transnational knowledge broker of novel extractive policy and enforcement designs. Anecdotes like this one are found in every chapter:

> Spreading the environmental message is part and parcel of an ERCB inspector's role - even when it takes time. For example, Czibi [an inspector with the Midnapore field centre] set out on a 90-minute drive to follow up on one company's request for a certificate that would cut its cleanup liabilities by declaring a pair of old wells "abandoned" … With help from a precise global positioning system, Czibi located the first of the wells and confirmed that it was indeed abandoned, with not a blade of grass out of place, or a bump on the ground to mark its location. But the second well turned out to be a deserted production site, studded with disused pipes, tanks, and dusty hardware in a weather-beaten metal shack. "No certificate for you today," said Czibi. (2013, p. 80)

The assumption is that this incredible story of a field inspector (of which the AER employees more than 70) doing their quotidian job duty of inspecting reclamation-certified production sites is somehow meant to prove the AER's field omnipresence and strict policies. In reality, the Regulator was caught in a lie about just this in 2020 by an investigative journalist from the Narwhal. A previously unreleased report prepared for Alberta Environment and Parks proved that the Regulator actually field checked less than 3% of the wells for which they issued reclamation certifications (Riley, 2020). This number becomes even lower when including subsurface audits (although such audits are not required at every site). According to The Narwhal's report, "between 2015 and 2017, not a single subsurface audit was conducted, while nearly 6,000 reclamation certificates were approved" (Riley, 2019).

These failures in proper auditing can partly be chalked up to the single-window approach, which abrogated permitting and oversight from multiple provincial agencies and placed it under the AER's control. Unfortunately, the Regulator has proven ill-equipped to inform and execute remediation and reclamation work. The continued devolution is epitomized in the development of the automated license application and authorization program, 'OneStop.' This "One Application, One Review, One Decision"[65] program was intended to create efficiencies and was clearly promoted by neoliberal new public management, where economic rationalism and a growing managerial mood (Hood, 2000) has taken hold of the regulatory regime. This approach prioritizes streamlined extraction, rather than emphasis on the tedium which ecological expertise and stewardship would bring to the table. What this program practically means is that the AER receives a single application for multiple activities, such as all the necessary components of resource exploitation. Following this, staff conduct one single review of the applications, which result in one single decision (AER, 2015a). This makes sense when you consider the threat of administrative bloat and headache that can result from a licensee needing to submit dozens of applications for one project site or wellbore. The unfortunate reality is that this regulatory streamlining was a product of making an overworked regulator "leaner" and "fostering rapid economic growth of extractive industries" (Carter et al., 2017, p. 67). Instead of ensuring that the Regulator had proper financial and staffing resources from appropriately sized industry tariffs and rents to fund permitting, monitoring, and judging in disputes from landowners who were thrown into the process, the focus became speeding up permitting and reducing public access or scrutiny.

Ecological Consequences of REDA and the Streamlining of OneStop

The streamlining of project approvals has had serious ecological consequences. Likewise, the potential ecological consequences of inactive wells and impacted project sites–particularly those

[65] Uncannily close to J.R.R. Tolkien's principal antagonist in the *Lord of the Rings* series, Lord Sauron, and his one ring to rule them all.

that have recorded hydrocarbon releases and need to be remediated to treat the contaminated environmental media–can stack up quickly. To understand these consequences, I interviewed two scientists with an intimate understanding of the province's regulatory and environmental/ecological landscapes: Mandy Olsgard, a previous Senior Environmental Toxicologist with the AER, and Kevin Timoney, an inter-disciplinary ecologist with decades of experience in research and publishing about Alberta's fossil economy, specifically the Peace-Athabasca delta. Both repeated the same discontent towards the Regulator's disregard of ecological-scientific expertise. Both also outlined multiple environmental health and ecological consequences of hydrocarbon production on local communities and ecologies. Additionally, Mark Dorin, although not a specialist in environmental health or ecological sciences, also made comments about the environmentally degrading effects of inactive wells.

Olsgard, as a toxicologist and risk assessment specialist, is particularly interested in preventing environmental health consequences from extractive work. Timoney, as an expert on the ecology of post-disturbance landscapes, has written extensively on misinformation stemming from the Regulator's reclamation program. While both of them have extensive knowledge on the ecology of pre- and post-disturbance landscapes, our conversations ended up being somewhat divided: Olsgard focusing on pre-disturbance risk assessment and Timoney focusing on post-disturbance reclamation. Olsgard worked within the Regulator's Contaminated Sites Group, which was made up of hydrogeologists, soil scientists, toxicologists, and risk assessors. Her team supported the AER on any contaminated sites work, meaning sites that had reported hydrocarbon releases. Within the province's energy development, the AER follows the provincial Contaminated Sites Policy Framework, operationalizing and enforcing the risk assessment, risk management, and remediation outlined in the policy. In Olsgard's work, this meant the application of Alberta's two-tiered environmental assessment system for dealing with soil and groundwater contamination.[66] She has an interesting perspective on the shifting identity and arrangement of the Regulator as she was hired at the end of 2014, shortly after the new AER was forged from the old ERCB. Likewise, she is primarily interested in human ecological risk assessment (and cognate studies), rather than the productivity and health of the oil industry itself. Eventually, she was forced from the Regulator after a "death by a thousand cuts," beginning her own toxicity assessment firm. This was due to the Regulator's move to start tightly controlling diffuse teams within their ranks. This was exemplified in her explanations around the development of the OneStop software and, specifically, the way that her Contaminated Sites Group was approached during its design. Olsgard's team was told that "unless 80% of all applications were approved [through OneStop], it wouldn't be a success" (personal communication, November 9, 2023). This is the norm for the licensing system today and clearly precludes the possibility of building in any environmental risk assessment of projects, as Olsgard asserted. As a product of the necessity of expedited and simple project approval, groups which focused on risk-based assessments of pending projects required coercion to make the software work. Crucially, this meant the silencing of ecological, pedological, and toxicological scientific input in project approval processes. This is a systemic issue, she continued, also evidenced in the lack of environmental or ecological science within the AER's written guidance. The Specified Enactment Directions that guide the operationalization of restoration processes like assessment,

[66] My technical educational background circulated around environmental assessment of this nature. The geologic-environmental science program, which I completed, focused on groundwater monitoring well installation and subsequent monitoring events. Naturally, my first job in the oil patch out of college was as a dual staff, environmental scientist, and field technician at a third-party consulting firm. Around 90% of my job was to collect groundwater samples from contaminated project sites where monitoring wells had already been installed. Day in and day out I would drive around rural Colorado trying to find these poorly marked monitoring wells which were made of perforated one inch PVC. We specifically sampled benzene, toluene, ethyl benzene, and xylenes (BTEX), Methyl tert-butyl ether (MTBE), and total petroleum hydrocarbons (TPH) found in the media. I collected thousands of these groundwater samples during my time at this firm.

remediation, and reclamation outlined in the EPEA even fail to specify *how to actually remediate* contaminated sites, whether conventional or in the tar sands.[67]

In a 2023 report on the AER's approach to conventional liability management, Alberta's Auditor General identified adjacent, critical issues with OneStop's reclamation certifications and how the Regulator "lacks processes to ensure third-party professional declarations meet requirements" (2023, p. 37). They found that 20% of applications did not even include the necessary professional declaration[68] of remediation and reclamation which is the very basis of reclamation certification (OAG, 2023). To their benefit, they state that the lack of inspections which would correct these errors was due to a lack of resources, a product of the thinning of resources to environmental governance. But, as Timoney has long claimed, "industry's promise of reclamation is a bait-and-switch, a falsehood that lies upon disinformation. Reclamation is not, as implied, the return of a healthy negation-soil community. It's the establishment of impaired vegetation on damaged soils" (Timoney, 2021, p. 157). According to the province's Conservation and Reclamation Regulation under EPEA, reclamation should return production site land to an equivalency of what it was prior to development. More specifically, "this may entail addressing contamination, land contouring to ensure drainage and establish topography similar to pre-disturbance, and revegetation" (Timoney, 2021, p. 302). As discussed at the beginning of this dissertation, hydrocarbon development in the province has been linked to multiple contaminants of concern now found in the Athabasca watershed from fugitive emissions

[67] For more on this see the AER's online catalogue of Specified Enactment Directions, such as number 002: Application Submission Requirements and Guidance for Reclamation Certificates for Well Sites and Associated Facilities.

[68] Which must be made by a member in one of six professional provincial associations: Alberta Institute of Agrologists, Alberta Society of Professional Biologists, Association of Professional Engineers and Geoscientists of Alberta, Association of Science and Engineering Technology Professionals of Alberta, Association of the Chemical Profession of Alberta, Association of Alberta Forest Management Professionals (AER, 2025, https://www.aer.ca/regulations-and-compliance-enforcement/site-closure-requirements/reclamation/oil-and-gas-sites/professional-sign).

(Kelly et al., 2009, p. 52), and dissolved methane in drinking water from leaking wellbores (Alboiu & Walker, 2019, p. 5).[69]

In discussing his last book, *Hidden Scourge*, Timoney lamented how the ecological sciences have come to take a backseat to the political desires of the fossil bloc and the state. He said,

> But that's where the politics comes in and you realize that the problem of ecology is overwhelmed by the problems of politics. You could prove that if you do A plus B, you will cure all these ills, and you could lay that out in terms of facts. But if that somehow challenges the power structure, then it doesn't matter what the facts are. The overwhelming reality is that the facts don't matter in so many situations. (personal communication, May 13, 2024)

This has especially been the case in the failure of the Regulator's reclamation process to return production sites to a viable pre-disturbance nature. Timoney said that the reclamation criteria have been so poorly informed that even 40 years after a site had been through 'reclamation,' a trained ecologist could easily identify the differences from the surrounding landscape. This is due to the Regulator failing to even try to reestablish native species on post-production sites for decades. But this is also due to how heavily disturbed project sites are during production. Recently, the Regulator has tried to reestablish native plants, but with little success ultimately:

> In very many cases they will plant, for example, white spruce and the white spruce dies

[69] It is worth noting that much ecological and environmental scientific research today focuses on the environmental health impacts of tar sands production, which is completely different from conventional extraction. Some 1,400 known pollutants are generated from tar sands extraction alone (Weinhold, 2011). What is especially troublesome as far as tar sands reserves are concerned is that about 54% of leases are on wetlands (Volik et al. 2020, 247). Independent ecological assessments have found that the biological integrity of 'reclamation-certified' wetland sites is significantly lower than healthy wetlands, due to the environmental stress of exposure to tailings materials (Rooney and Bayley 2012, 759). Wetlands are incredibly important ecosystems, linked to human health and survival, as incredible pools of biodiversity, for flood control, and even in climate change mitigation.

> within a few years because of the salt that is left in the soil. Or because the mycorrhizae are all dead. The soil is basically no longer a living system. It's basically abiotic. So, some things will grow on it, but most things will not. And those things that do grow are going to be non-native generalists, for the most part, and agricultural species. I have never come across an area that has been reclaimed where I can walk through there and see predominantly native species. Never. (Kevin Timoney, personal communication, May 13, 2024)

The poor reclamation practices that preceded and continued alongside the OneStop transition have left this extractive landscape permanently altered. At the time of writing, reclamation practices do little to mitigate the permanent damage to the ecosystems they are situated within. While there is much legalese surrounding this term and process, it is ecologically unsophisticated and unable to attend to the challenges of remediating and reclaiming post-industrial disturbance of this magnitude. But it is another effective tool used to negotiate the social license to extract for the industry.

Mark Dorin claimed that OneStop had an egregious flaw which went unaddressed by Regulator staff for several years, leading to automated, unchecked approval of site reclamation certificates:

> I proved in the hearing that the electronic system they use to issue reclamation certificates and well licenses was flawed, but a bug in it approved them. In the hearing they admitted it; in the decision they admitted…that they knew about it for years, but they didn't tell anyone. They've issued 60,000 approvals, by the way, on this computer per year, with no hearing. All 60,000 could be flawed, and they didn't tell a soul. (personal communication, March 15, 2023)

This could be one explanation for the fact that the so-called reclaimed sites in the province inspected by Timoney throughout his tenure fail to meet criteria: “every site that I’ve looked at, and I’ve looked at hundreds, and these are so-called reclaimed and certified-reclaimed sites, are an ecological mess” (personal communication, May 13, 2024). More devastating for these damaged landscapes are his arguments about their prospects:

> In terms of any sort of hope of the reclaiming of these industrial landscapes to natural, sort-of pre-disturbance communities, I have zero hope that that's going to happen if it has not happened yet... the soil has been so heavily disturbed, the biota has been mashed, the bootstrapping ability of the mycorrhizal communities and the bacteria, and fungi, and all the macroinvertebrates are all gone once these sites are abandoned. (Kevin Timoney, personal communication, May 13, 2024)

Conclusion

The contested history and modern practices of the AER outlined in this chapter contour a simple argument: that the purpose of Alberta’s regulatory mosaic is to organize the long-term interests of capital accumulation, not to preserve the local ecologies. I have taken this position, contested by some Marxist theorists, in arguing that Alberta’s regulatory regime reflects the hegemony of its maturing regional fossil capitalism, organizing things according to capital’s needs. While I did not have time to pick this up in the body of the chapter, it is worth exploring other segments of the Albertan state’s relationship to extractive capital.[70] Albertan Premier Danielle Smith has

[70] And there is no shortage of excellent scholarship which has analyzed various factions in the federal and provincial state relationship to hydrocarbon production at home and abroad, authors I reference throughout this dissertation (Adkin, 2016, 2021; Carroll, 2020, 2021a; Carter, 2016, 202; Carter & Zalik, 2016; Chastko, 2012; Gordon & Webber, 2016, 2018; Hussey et al., 2021; Huseman & Short, 2012; Preston, 2017; Sandlos & Keeling, 2016).

long been ideologically dedicated to extractive industries, often taking cues on formatting liability regimes from industry. As Yewchuk et al. argue, Smith's provincial United Conservative Party (UCP) remains dedicated to taking "instructions on the direction of energy policy primarily from industry, rather than from the public it serves" (2024, p. 1). While it appears that Premier Smith is acting in good faith in trying to understand and overhaul provincial energy policy and regulation, like in striking her 2023 Advisory Council on Alberta's Energy Future, the reality is that she continues the tradition of shrouding regulatory practices in darkness while filling all ranks with industry executives and proponents alone. This is evidenced foremost by the makeup of the Council, as it was "chaired by David Yager, a former president of the Alberta Wildrose Party and oil industry executive and consultant. The other four members were oil and gas executives and a former director at the AER (Bob Curran)" (Yewchuk et al., 2024, p. 1).

One of the Council's recommendations was that non-regulatory functions such as liability management be moved to the portfolio of Energy and Minerals. This is a worrisome recommendation, given that one of the Premier Smith's stated initiatives for that Ministry is "making recommendations to streamline approvals and align policies with the government's goals of increased natural resource production," (Smith, 2023, p. 2). Strangely, the Premier includes "carbon neutrality by 2050, investment in emissions-reduction technologies" within this same streamlining bullet point in her dispatch. Likely, she is hoping to exploit the ineffective carbon credit regime or amplify the fossil bloc's proposed $16 billion carbon capture and storage network, an emerging green capitalist climate solution to Global Northern emission production from a consortium of the fossil bloc's biggest tar sands producers known as Pathways Alliance. She references upping "liquefied natural gas [LNG] export and *credits* to achieve carbon neutrality in Alberta's energy sector," (Smith, 2023, p. 2, emphasis added). This is clearly a reference to TC Energy's Coastal GasLink pipeline which runs from Alberta to southern B.C. Understanding these dynamics is helpful in interpreting how parts of the state present as a relation of contradictory and antagonistic forces between and within social classes of this capitalist society.

This chapter focused on the political power of the fossil capitalist class in swaying the environmental regulatory apparatuses decisions. The chapter attended to the specific class differences between fossil and financial capital in order to make sense of both economic and class domination in the province's political economy. It also attempted to understand and analyze the social categorization of the province's environmental bureaucracy through which the capitalist power bloc has become politically unified. Through analyzing policy practices and decisions over the past four decades, we can see the importance of the Regulator to the reproduction of fossil capital. The negative ecological consequences of fossil resource exploitation are unfolding daily, and the prospect for improvement of this problem dwindles as the province struggles to securitize against the unfunded liabilities associated with asset desertion.

The following chapter turns to the saga of Redwater Energy, an infamous case in both provincial and national hydrocarbon law and policy today. Through analysis of this set of court cases, I argue that the industry elite continue to consolidate power through the OWA. I also turn to O'Connor's theories on the second contradiction of capitalism. Whereas the first contradiction of capitalism led to the advent of global financialization, and the saturation of fossil economies with the fictitious capital of 'paper oil,' the second contradiction considers capital's auto-destruction of the biophysical world through which it reproduces itself. As evidenced in the concluding section of this chapter on the ecological consequences of the fossil bloc's massaging of the Regulator into the AER, the province's environmental health has been deteriorating. But how have the different factions of capital and the state responded to this matter? We have not arrived at the socialization of the means of production, the proverbial second road to socialism which O'Connor wrote about. Instead, it seems like fossil capital was successfully able to pre-empt the second contradiction of capitalism (Surprise, 2018) through their creation of the OWA. They have worked to internalize all the costly, environmentally damaging results of their strong provincial hegemony, namely in the disclaiming or desertion of assets.

Chapter 5: Fixing Alberta's Orphans; Socioecological Contradiction, Finding the OWA, and *Redwater*

Introduction

There's an old saying that victory has a hundred fathers and defeat is an orphan.

- Former U.S. President John F. Kennedy, 1961

This quote comes from a speech in which JFK was reflecting on his administration's failure in invading Fidel Castro's socialist Cuba at the Bay of Pigs in 1961. JFK's orphan was an attempted CIA-led coup of a small, agrarian country in which the U.S.'s apparent best and brightest in imperial violence were out-maneuvered by Cuban guerrilla soldiers. The invasion was served up to him before he was even properly inaugurated, thanks to previous U.S. president Eisenhower's plotting against the leftists who displaced the corporate capital puppet Fulgencio Batista in Havana two years prior. JFK was no angel (despite what liberal rags of the day might have printed about the Casanova) but in this case, he was indeed handed a disaster-turned-defeat-orphan that permanently scarred his administration. Much like JFK's war orphan, the OWA is steward over many orphans of negligence, thanks to operators who came before, made malicious decisions in the service of reproducing capital, and then left their dirty dishes for someone else to clean up. In both stories, global northern tax dollars are drained to secure the production of cheap, highly desired commodities that fuel the work of North Americans: cane sugar from the plains of Cienfuegos and crude oil from the depths of the Western Canadian Sedimentary Basin. Of course, our 'orphans' are different from JFK's in almost every other way, but this is all to say that deserting one's responsibilities before the deal is done is common across the political spectrums.

Following the analysis of the AER's role and location in the mode of fossil production in chapter 4, this chapter turns to the interlocked location and life of the OWA. I argue that the hazardous externalities of production, principally the swelling volumes of deserted and inactive fossil infrastructure, motivated the power bloc to create its own institution to discipline producers in the patch and clean up the mess around the province. As evidenced in Chapter 4, the fossil bloc's most recent class unification came with the passage of REDA, and the OWA's current position is another important mobilization of the bloc's political power. But, distinct from the previous chapter, I conceptualize the OWA as a socioecological/regulatory fix which was founded in response to the manifest contradictions of conventional fossil extraction. As such, **the first section** of this chapter presents a review of the critical geography and political economy literature that theorizes the distinct types of 'fixes' to capitalist crises - spatial, temporal, socioecological, and regulatory. This literature nestles within theories of the crisis tendencies within capitalism, and especially the crisis theory in O'Connor's ecosocialist theorizing discussed in Chapter 1. **The second section** applies this theory and argues why the OWA can be read as a socioecological fix to the crisis tendencies of fossil capitalism. I argue that the OWA was founded by the fossil elite specifically as a regulatory fix for the mass asset desertion that has been an outcome of the industry's strong class hegemony for the last four decades. Taking this a step further, I argue that the OWA has served as a way for the fossil capitalist elite to 'preempt' the second contradiction of capitalism itself (Surprise, 2018). To end this chapter and the body of the dissertation, **the third section** discusses what is known today as the *Redwater* cases, a series of courtroom battles which rose to the Supreme Court of Canada (SCC). This case– involving a small, conventional operator which went bankrupt–would ultimately result in the reshaping of lending practices and insolvency practices in the oil patch. The judges were made to contemplate which faction of capital is responsible for asset AROs in the case of a licensee's bankruptcy. This case, and its fallout, illustrates the ways in which the fossil bloc has taken a more aggressive and disciplinary position via their OWA, working to constrain finance capital in the province. The case is further illustrative of how the OWA's leadership acted in the interest of the organization itself, even though this interest did not align with the finance capital faction who had benefited from frustrations between the provincial environmental statutes and the federal bankruptcy law. This proved to operators and financial lenders alike that the state was willing to discipline certain factions of capital who were not taking care of the base of accumulation. Thus, it is through *Redwater* where we observe a clear case of inter-factional competition between fossil and finance capital in the regional capitalist bloc.

Capitalism's Fixes: Spatial, Socioecological, and Preemptive

Spatiotemporal Fixes

The concept of capitalism's 'fixes' to its cycling crises stems from David Harvey's now-established work of Marxian economics *The Limits to Capital* (1982). As Harvey is a geographer, his approach is a sort of geographical historical materialism and focuses on the spatial and temporal dimensions of capital accumulation, crisis tendency, and expansion (Jessop, 2006). He focuses on the capitalist cities where industrialization took hold and the subsequent ways in which the relocation, reconfiguration, or expansion of capital within urban geographies or into the Global South proceeds. For Marx, of whom Harvey is a disciple, these crises are not permanent but rather are cyclical; his trademark theoretical interpretation of the tendency for the rate of profit to fall, “suggests that economic crises are inevitable under capitalism.” Hence the oft repeated axiom that capitalism is ‘crisis-ridden’ or that these problems are inherent or structural to the system and relations of production.

The Polanyian-O’Connor theorizations on crisis and fictitious commodities complement this view. As summarized in Chapter 1, the continued degradation of the fictitious capitalist commodities of labour, land or nature, and physical infrastructure breeds the second contradiction of capital. Capital tends to destroy its own physical conditions of production in the continual hunt for cheaper inputs into the process of commodity production. The capitalist state, O’Connor theorized, is forced to mediate in this situation under the pressure of countermovements against capital, or capital must find its own solution to the problem to allow for continued accumulation and profit valorization. Capital’s attempt to overcome these crisis tendencies which are inherent in the system and relations of production is known as a ‘fix.’

In the geographic sense, capital seeks solutions which spatially expand its base of accumulation and/or temporally delay the structural problems within it. These are known as spatial or temporal fixes which are sometimes combined, when appropriate, into the portmanteau ‘spatio-temporal.’ Jessop (2006) identifies the two perspectives of spatial fixes in Harvey’s work. The literal spatial fix is the “fixation of capital” through long-term investment in immobile, fixed capital like in the case of infrastructure development (public infrastructure being one of O’Connor’s fictitious commodities within his category of ‘physical production conditions’). The metaphorical fix refers to the temporary relief from crisis which capital creates for itself through these strategies of reorganization which overcome the spatial barriers to accumulation. According to Harvey’s later writing, fix has many more connotations including an addict’s ‘fix’ that temporarily assuages their cravings or the ‘fixing’ of something that is broken back to a functional state (Harvey, 2001; Ekers & Prudham, 2017). The first two analytical uses of spatial fix combine when considering how capital investments can buy capital more time: "crisis-tendencies can be overcome in the short- to medium-term through investments that absorb *current* surplus capital and increase its *future* productivity and profitability" (Jessop, 2006, p. 147-48, emphasis in original). New configurations within urban geographies delays the movement of capital markets to new frontiers: "through urban restructuring, crises of overaccumulation are geographically and politically 'fixed,' at least temporarily, by the creation of new circuits of accumulation through investment in fixed capital and the circulation of commodities within these circuits" (Nugent, 2015, p. 2465). Nugent here is referring to investment in public infrastructure projects like roads, communication networks, water treatment, which can absorb over-accumulated dormant capital in both the productive process and in financialization mechanisms (lending). Beyond the world of financialization and looking towards a transnational scale, imperialism and settler colonialism are perhaps *the* spatial fix par excellence.

In the case of temporal fix, as Zalik explains, capital has created "future markets, time-extensive exploratory processes, and financialization more broadly, in which capital is invested based on forthcoming returns" (2015a, p. 2451). Modern derivative markets in which financial instruments like futures contracts, stock options, and the over-the-counter market writ large, have become an enormous sink for capital under financialization. A combined spatiotemporal fix means addressing the nascent crises of labour and capital surpluses through

> (a) temporal displacement through investment in long-term capital projects or social expenditures (such as education and research) that defer the re-entry of current excess capital values into circulation well into the future, (b) spatial displacements through

> opening up new markets, new production capacities and new resources, social and labor possibilities elsewhere, or (c) some combination of (a) and (b). (Harvey, 2004, p. 64)

An important point here is that the capitalist state often becomes involved, most obviously in the cases which centre around public infrastructure development and urban reconfiguration: “many of these ‘fixes’ demand direct state involvement: e.g. to reconfigure property relationships, or to coordinate and bear the risks of financing large, long-term, often debt-funded projects” (McCarthy, 2015, p. 2487). These large projects are meant to literally ‘switch’ capital into fixed and more permanent infrastructure which subtends the circulation of capital (Ekers & Prudham. 2017). It is noteworthy that O’Connor’s work on this ran adjacent to Harvey’s since his first theorization on the second contradiction. O’Connor says that at the time of the first *Capitalism, Nature, Socialism* publication Harvey had granted him ‘permission’ to “interpret urban and other forms of space as a ‘production condition’” (1988, p. 17). Several critical geographers following Harvey and these theories continue to grapple with and employ versions of the Polyanian-O’Connor in their interpretations of ecological crisis (Bakker, 2009; Castree, 2009; Cohen & Bakker, 2014; Ekers & Prudham 2017, 2018; Zalik, 2015a).

The Socioecological and Regulatory Fixes

Beyond and alongside this collection of Marxist geography scholarship on spatio-temporal fixes has come debate and theorization on capitalism’s ‘ecological fixes.’ Bakker defines these as “strategies of externalization and internalization of socioenvironmental conditions, in search of profit, both by states and by capitalists” (2009, p. 1782). These stem from attempts to internalize the externalities of capitalist commodity production discussed in the previous section, with considerations of the real costs of extraction being absorbed by local ecologies and communities, or in matters like the unequal exchanges of carbon credit and similar ‘green market’ systems. In short, the fixes do the work of rebranding ecological crises and “turning a potential threat into an opportunity” (Bakker, 2009, p. 1782). Castree (2008) outlines four ‘environmental fixes’ which capital and/or the state adopt to address ecological crisis: (1) ‘free market environmentalism’ under neoliberalism where private firms take on ecological stewardship through privatization and marketization of the nonhuman world; (2) removing all barriers to capitalist accumulation in natural resource development where ultimately “the nonhuman world simply becomes a means to the end of capital accumulation - period” (Castree, 2008, p. 147); (3) extending the right of private firms to use nature however will maximize profits without consideration of environmental consequence, rapidly exacerbating the degradation of the conditions of production theorized in the second contradiction framework; (4) a ‘state-environmental fix’ where either the state abdicates responsibility and allows the private sector and civil society to be responsible for environmental crisis or where states without matured regulatory and administrative regimes never take responsibility in the first place for public provisioning.

While I find these views of state-capital cooperation in creating environmental fixes interesting in some rights, I side with Bakker (2009) in likewise finding them too analytically broad. Bakker’s more narrowed approach to defining ecological fix is more fruitful for this dissertation. Consider her suggested framework delimiting Castree’s four fixes:

> Constrain ecological fixes to those strategies which internalize or externalize environmental degradation (his environmental fixes 1 and 3); expand our appreciation of the drivers for neoliberal strategies beyond the merely economic; and take a more structured approach to our conceptual frameworks through articulating the relationship between tactics of neoliberalization and an expanded set of targets. (Bakker, 2009, p. 1786)

This view of ecological fixes does well to analytically explain the function of Alberta's regulatory regime. The internalization of environmentally hazardous hydrocarbon infrastructure by the fossil capitalist class's OWA, for example, is not driven by economics alone but functions to maintain their hegemony and social license to operate, in line with both Carroll's explanation of the Canadian energy sector's elite (2020) and Bernauer's reading of Poulantzas in his scholarship on extraction (2020).

Ekers and Prudham define socio-ecological fixes as "the ways in which the social relations and material and symbolic conditions of capitalist accumulation are reproduced through investments in landscapes that are simultaneously and always conjoined productions of space and nature" (2017, p. 1371). Their definition adopts the ecological Marxist referent of metabolism made popular by John Bellamy Foster (1999) and his interlocutors.[71] They employ metabolism to overcome the sticky 'nature-society and nature-space dualisms' which plague theories of leftist ecology and geography. They combine elements of social metabolism theory, critical geographer Neil Smith's work on the capitalist production of nature, Gramscian hegemony and, Polyanian-O'Connor political struggle to produce a working definition of socioecological fix. They argue that spatial fixes are

> Metabolic processes involving the production of space but also necessarily the transformation of socionatures, whether in urban or rural settings, and whether such transformations are recognized as socionatural in the ideological registers of everyday life (e.g., hydroelectric or irrigation dam infrastructures) or not (e.g., transportation and telecommunications infrastructure). (2017, p. 1381)

Some scholars have gone as far as to argue that spatial fixes are being subsumed by fixes that are

[71] Though the term was first theorized by Marx in part in *The Economic and Philosophical Manuscripts* and more substantively in *Capital*.

socio-ecological in character (Fearn, 2023). This is so due to the overwhelming need for capital to be redirected towards projects which allow for its continued reproduction. The biggest threat to capital's reproduction at the moment may be climate disaster. Addressing global climate change through such fixes is paramount to capital's reproduction and general survival.

Gareth Fearn argues, perhaps contrary to Harvey, that these fixes need to work socially also (2023, p. 4). These fixes cannot just be limitations in the production and consumption of intrinsically planet warming commodities like hydrocarbons, they must serve as new and novel sinks for capital and labour alike. Current socioecological fixes have manifested as capital redirection into renewable energy infrastructure like wind and solar, geo-engineering approaches like Stratospheric Aerosol Injections (Surprise, 2018), and changes to social reproduction, including the movement of urban organic agriculture. But, for the purpose of this dissertation, Castree's invocation of 'regulatory fixes' is the most analytically powerful in explaining: "the state is a key player in securing a regulatory fix for these crises, be its authority national, subnational, or supranational" (Castree, 2008, p. 145).

These 'regulatory' fixes are a subset of socioecological fixes in which capital relies on state intervention to avoid crises, much like the other versions of fixes. But rather than coming online to facilitate capital switching and redirection as new sinks for over accumulated capital, these 'fix' socioecological contradictions through, for one, the capitalist 'internalization' of negative externalities of production. Unfortunately, there does not appear to be much scholarship theorizing explicitly 'regulatory fixes'[72] but the concept is useful to this dissertation and may have purchase with Poulantzas' theories of the capitalist state. Marissa Bell and Allison Macfarlane (2022) outline a few principles of what they argue constitutes a 'regulatory fix': the

[72] There is a panoply of articles which identify similar ideas such as 'catastrophic fix' (Johnson, 2015), 'eco-scalar fix' (Cohen & Bakker, 2014), or 'sustainability fix' (Macdonald & Keil, 2012; While et al., 2004).

fix fails to provide a solution to the underlying problem; it is a temporary stopgap measure; and it is liable to create unfamiliar problems, including the delay of other legislation. In other words, "as with other fixes, regulatory fixes can be inherently contradictory, and problematic because they may actually 'delay (and perhaps even diminish) the possibility of a more permanent legislative solution[s]'" (Bell & Macfarlane, 2022, p. 3).

Through my research, I have found several regulatory fixes in environmental governance that appear in mature hydrocarbon industries, all helpful in ensuring continued extraction and production. The three interlocking phenomena I have identified are: (1) factions of capital mobilizing state power through strong class hegemony to develop temporary or institutionalized protocol and practice; this would include, for example, third-party environmental consulting which green lights continued extraction, even if at times frustrating some firms and productive processes through regulatory tedium; (2) the state temporarily restraining private capital accumulation through nominal concessions such as fines or administrative penalties, either with or without explicit cooperation from penalized firms. This money can often be used to sustain the work of regulatory state apparatuses; (3) the collaborative founding of unique quasi-state institutions which redirect captured industry profits to internalizing environmental externalities which the industry itself produced.

In the first instance, we can consider the wide-spread regulatory institutions of auditing, moderating public legal forums, third-party environmental monitoring and consultation, all manifestations. These, of course, depend on to what degree the state's technical experts deem extractive projects require them, obviously subject to some interpretation of multi-level environmental statutes. This fix has created a wide-spread cottage industry of technical experts whose employment depends on the production of externalities and more advanced regulatory processes. Zalik argues, for instance, that the institution of Environmental Impact Assessments (EIA) is such a phenomenon, providing,

> A venue through which competing responses to ecological/economic crises are offered by capital and its opponents; but it also encloses the affective and mostly unruly elements of such struggles—including active social resistance—within formal procedures shaped by interests of extractive capital/state alliances. (2015a, p. 2453)

Environmental assessment (EA) or impact assessment (IA) is entrenched in regulatory regimes at both the federal and provincial levels. Private capital appears cooperative in these fixes, as they can help neatly overcome multiple obstructions to development. In Canada, they are organized federally under the Impact Assessment Act (2019), a constantly contested component of the advanced Canadian capitalist state's juridical system. This is especially the case in Alberta's environmental governance and different provincial statutes regulate their assessment processes differently in dictating "post-decision impact management activities" (Noble & Birk, 2011, p. 18). They are under attack due to the regulatory burden which they place on private firms' resource development projects.

This may also be where the second instance of regulatory fixing begins to appear, mostly as penalties assessed on the unrestrained output of the hazards of production. In extreme moments of disaster, legal settlements and administrative penalties can cost firms billions, as with infamous cases such as the Deepwater Horizon oil spill, the Bhopal disaster, or the still unfolding 2022 Kearl Mine tailings releases in Alberta. In the everyday, slower moving, destructive tendencies of fossil capitalism, tariffs, rents, royalties, fines, or fees are assessed on firms as tools to financially prop up the environmental regulatory apparatuses overseeing remediation work. Obviously, firms try to avoid any measures which cut into profits and shareholder returns, but should the state not intervene in this way, social unrest may brew into untenable forms. This fix is epitomized in the logic of the 'polluter pays' principle, which was established in Canada through CEPA (Gilbert & Zalik, 2019). One advocacy group, or countermovement we could say, has been founded in Alberta on this principle, reliant on the written word of federal and provincial environmental statutes: The Polluter Pay Federation.[73] Suffice it to say here that their programmatic attempts at better regulatory enforcement are not aimed at changing the system or relations of production, but are aimed at better management of the socioecological byproducts such as deserted assets and environmental waste.

In the last instance of regulatory fixing, we can consider the creation of quasi-state organizations which take on the management of specific production outcomes, or socioecological externalities (not so different from public-private partnership contract arrangements which can be read as spatial fixes depending on the project at hand). These organizations are important tools which extractive firms lean on to obscure their relationships to the hazardous outputs of their production processes. Despite the existing provincial statute mandating polluters to pay for reclamation work in Alberta, the creation of supposedly independent organizations makes the industry appear writ large as "good neighbours" (OWA, 2018, p. 3). They serve a similar purpose of enhancing social license to extract, much like how philanthropic commitments or community engagement efforts of oil firms operating throughout the Canadian landscape do. These, like EIAs, might, "often target specific community stakeholders, with a view to managing grievances and/or reinforcing industry perspectives" (Eaton & Enoch, 2021, p. 318). I argue that these are peculiar organizations under neoliberalism as they point to the failures of governance in environmental and asset stewardship and mark a return to capital requiring state intervention.

[73] My interviewee Mark Dorin was active with the Federation at the time of our research interview.

The OWA as Failing Socioecological and Regulatory Fix for Fossil Capital

I organize my argument in this section around two central points. First, that the OWA was founded as a an attempted socioecological and/or regulatory fix by members of the hydrocarbon industry to ensure fossil capital's continued reproduction in the face of its quantifiable destruction of the physical conditions of production, an expression of the second contradiction of capitalism (O'Connor, 1998). The degradation of the socioenvironments surrounding extraction, and inactive and deserted infrastructure which lays dormant, is supported by numerous studies in the ecological scientific and environmental health scholarship about Alberta and was discussed in Chapter 4. Likewise, I employ multiple sources of data to demonstrate how industry's hegemony in the province allowed for this deleterious manifestation of the second contradiction of fossil capital, including industry and regulatory grey literature, private and public policy documents (like comments from internal communications acquired through FOIP requests), and interviewee knowledge. Second, that the OWA was founded early enough to serve, in principle, as a pre-emptive fix to the second contradiction (Surprise, 2018). The OWA was not founded amidst the peak of the crisis of deserted assets which is still approaching, but rather much earlier when the industry and Regulator recognized the forthcoming 'slow motion landslide' of liability crises now maturing in the 21st century. This can also be observed in internal and external missives made by regulatory authorities which predicted the rise in deserted assets stemming from corporate mismanagement. As I show below, the meteoric rise of this asset class has been brewing since the 1980s. This is evident through the industry elites' ability to conceal this from prying eyes, play down the necessity of proactive posting of high deposits, and ensure minimal scrutiny of operators. This can be observed through communications between the fossil capitalist elite's main lobby groups (CAPP and EPAC) and those at the Regulator responsible for asset decommissioning and reclamation.[74]

The Writing on the Wall

The leaders of Alberta's 20th-century fossil capitalism saw the writing on the wall, recognizing that inventories of state-owned deserted assets would only grow as the province's industry matured, recoverable reserves diminished, and neoliberal resource management regimes became the norm. They wanted no crisis-induced restructuring of an industry that had proved itself lucrative for the province and firms alike in Alberta. It seems that they also sensed, to use O'Connor's framing, that the industry was not only prone to a realization crisis in the over-production of fossil capital—as discussed above in the matter with oil gluts resulting in international oil cartel throttling production to fix prices (see Labban, 2010; Mitchell, 2011)—but also to a liquidity crisis from the under-production of fossil capital, stemming from "the rising costs of reproducing the conditions of production" (O'Connor, 1988, p. 26). Alongside this, they were aware of the brewing discontent from landowners whose properties were atop reserves and were forced into agreements with fossil firms which would later go bankrupt and abdicate responsibility for project clean up. The Joint Industry Task Force (discussed in Chapter 4) was attentive to public risks that inactive and orphan wells posed to fossil hegemony. Curbing the rise of inactive and subsequently deserted infrastructure and project sites was clearly important to continued maintenance of the social license to operate, but it was equally important to internally manage and discipline any delinquent operators, rather than transfer this

[74] This argument is supported through analysis of a tranche of documents acquired through multiple FOIP requests made by public policy researchers at the University of Calgary.

responsibility to any administration or organization hostile to the industry.

Past Provincial Coordinator of the EUB Leo Couchette, who worked alongside John Nichol, understood the potential for mass insolvency. In one 1995 internal report where his concerns are being aired, he stated:

> We, and some industry representatives, are very concerned that regulators are not providing a level playing field and enforcing requirements equally. If this continues, the intense competition for investment will create an unnatural selection process which will favour those companies with substandard operations. (Touchette, 1995, as cited in Yewchuk et al., 2023)

Late 20th century neoliberal financialization seems to have impacted the organizational and administrative capacity of state institutions and fossil capitalist firms. Consider Touchette's worries again:

> The companies our organization dealt with in the seventies had comparatively large incomes, many support staff, and entrenched bureaucracies. The companies of today have responded to lower oil and gas prices and intense competition for investment capital by becoming ever more streamlined. These companies have limited funds, a few support staff, and live with an uncertain future due to potential takeovers, etc. (Touchette, 1995, as cited in Yewchuk et al., 2023)

So how would the province's resource management regime deal with these slimmer, more delinquent firms? As we saw throughout Chapters 3 and 4, the attempts at securitizing against mass inactivity and eventual abandonment were routinely frustrated by negative industry input and redirection to different, less effective programs. This is in part due to the fossil bloc realizing its power through the state, of course with some help of finance capitalists.

The Perception of the OWA as Ambivalent Organization

As with the AER, interviewees voiced varied sentiment about the OWA and its location within the province's production scheme. The OWA is regarded as a promising, largely apolitical route for the province to address desertion in a mostly apolitical manner. Mark Dorin, for example, was emphatic that the OWA was not itself a problem, though their direction over the OFL may be suspect:

> I've got no issue with the OWA itself, except that they more or less dictate what the Orphan Fund Levy should be. But I don't really think that's their fault. Let's be clear: The Orphan Well Association does an incredibly good job of actually getting rid of these sites and doing its job of closure. So, I've got no issues there. (personal communication, March 15, 2023)

While I agree with the view that the OWA has been effective in its closure work, I argue that the OWA is not an ambivalent or apolitical institution. Instead, the organization works to maintain the fossil bloc's hegemony (both within the power bloc and through the oil patch) through management of the externalities of production. The fossil capitalist class founded a vehicle to internalize environmentally hazardous infrastructure, but not for the sake of economics alone. The OWA is the industry's own socioecological/regulatory fix which helps maintain the unwanted messiness of fossil capitalism's geophysical bases of accumulation.

According to the party line, the OWA was created in 2002 as merely another stakeholder of the AER. It is framed as being strictly dedicated to maximizing the closure and reclamation work it can do with the funds it is given via the OFL. Lars de Pauw reiterated this several times across our interview when I probed about the location of industry leaders across the board and executive leadership. The OWA functions as an *ambivalent organization*, crafted by industry to address issues which have been created by industry as a product of its rapacious production schemes and fealty to shareholders. He explained how the board members from CAPP and EPAC serve as independent fiduciaries, meaning that they are legally and ethically obligated to advise the organization on the best use of the resources they have, namely the OFL money. As such, according to DePauw the organization would not have any special relationship to policy making:

> Our job is not to decide how the province manages its liability. We're there to do closure work when sites get designated as orphans…So when they [the AER or province] make rules around, say, well abandonment requirements, they consult with absolutely everybody. So that's industry, that's other stakeholders, it's people who are working in the service sector, and we're just considered one of those stakeholders. But outside of that we don't have any direct input, or our voice isn't taken any differently than anyone else's input. (personal communication, March 8, 2023)

But later in our interview, DePauw suddenly escalated the status of companies legally required to pay into the OFL according to the OGCA: "It [the OFL] comes from active companies. So, really, it is the active companies that should be providing input to the Regulator and the legislature and bureaucrats about what that liability management should look like. Because, you know, they're going to pay for it" (personal communication, March 8, 2023). This is an interesting perspective but is seldom how capitalist firms function today (and even less so in liberal capitalist democracies). The OFL is supposed to function like a safety net for the province and industry, a type of socialized insurance policy all operators must pay into. Most average insurance policy holders—barring the odd insurer which is not publicly traded—*are not* *stakeholders* who have specific influence over how plans should be designed. Just because I pay a legally obligated monthly premium to a car insurance company does not mean that I have influence over how premiums, deductibles, policy limits, or claims should be organized. Rather, *the top shareholders*[75] are allotted decision-making authority over the actions of the firm strictly according to the size of their investment in the firm.

Alongside of this view, De Pauw also views the organization as something like a publicly traded company in that he believes CAPP and EPAC's member firms are somehow merited status as shareholders by virtue of their legally required payments into the OFL. As De Pauw put it, "so the way you think about it, that it's almost like a company that has shareholders, and the shareholders vote on the board of directors" (Lars DePauw, personal communication, March 8, 2023). Thus, at once De Pauw is arguing that the OWA both does and does not mimic a private corporation, rather than a quasi-regulatory body. By virtue of operators' legal responsibility to pay towards the OFL they *should* have a say in crafting the provincial liability management frameworks. According to his contradictory position that fossil capitalist firms are stakeholders via their political lobby organizations as OWA Board members and industry, they deserve doubly the say on liability management outcomes. We can consider *Directive 088*'s drafting to further draw out this situation.

Before its final publication in December 2021, *088* was released in draft form for feedback from certain stakeholders. These stakeholders included operators (CNRL, Obsidian Energy Ltd., Ovinitiv Canada ULC, North River Midstream), financial institutions and crown corporations which fund development (ATB Financial's subsidiary ATB Capital Markets),[76] the

[75] Who themselves are typically institutional investors—BlackRock, Capital Group, Vanguard Group—who are managing other institutions' portfolios (see Christophers, 2023).
[76] As discussed earlier, ATB's Corporate Financial Services is the only financial institution a member of EPAC.

industry lobby groups (CAPP, EPAC, Canadian Energy Pipeline Association), municipal district councils (Smokey River No. 140, Reeve Beaver County, County of Barrhead), landowner advocates (the Farmers' Advocate Office), and the OWA (AER, 2021d). Thus, fossil firms had multiple avenues for their individual and broader hegemonic bloc goals to surface through their multiple stakeholder positions. Rather than ambivalence, we can see their active participation in swaying the design and implementation of liability frameworks. But why does it matter whether the OWA is an autonomous organization, rather than just an ambivalent one? Because it has had the authority to help fossil capital overcome the structural contradictions that arise from its continuous pursuit of more exploitation and higher profits. And, as will be shown, it has taken on a highly active role since the AER's dawn in 2013, both via its legal battles with operators and receivers and in new strategies of accumulation for the province's fossil firms that involve the provisioning of the OFL.[77] While these are the most recent activities of the OWA, which fall outside of its stated purview, the origin of the institution was directly focused on closure work.

Pre-Empting the Second Contradiction and Counter-Hegemony

The above argument can be advanced a step further, as industry elites knew about this problem far before the glare of bad publicity entered it into independent research and numerous mainstream media investigations. The attempt by industry to resolve this dilemma of public risk and ecological contradiction came *preemptively*. Long have fossil elites wanted to avoid underwriting deserted project AROs left behind by more junior or reckless producers. These

[77] As will be explained in the final section of this chapter, the provisioning of the OFL may prove to be an important strategy of accumulation *for the fossil firms who pay into it*. Discretion over the OFL used to be at the discretion of the AER, but now it has been taken over the OWA which is chaired, again, by CAPP and EPAC member firms' executives.

industry impresarios sought an approach to stall the tide of desertion and preempt the emergence of any counter-hegemonic political rise (like landowner advocates against the expansion of the industry or regional environmentalist groups) involving more strict state intervention between capital and their geophysical bases of accumulation. This 'preemption of the secondary contradiction' is a useful framework for my study, one I adopt from Kevin Surprise's (2018) work on the emergence of stratospheric aerosol injection (SAI) as a solar geoengineering mitigation and adaptation tool for atmospheric change. The atmosphere which subtends all organic life on earth is an example of the Polyanian-O'Connor concept of the conditions of production *par excellence*. In Surprise's framework, SAI injections serve as a spatiotemporal fix for the contradictions of capital exhausting the atmosphere of earth in its accelerating rates of exploitation. The emergent strategies of green/climate capitalism like this work to resist any change in capitalist production and class domination (2018, p. 1230-1233).

In the case of maturing Albertan fossil capital, the contradictions that piled up early on were socioecological and financial concerns (though they are nearly impossible to separate in the case of capitalist political economy). Negative industry relations with landowners and local governments if fossil firms fail to deliver ground rent and/or royalty payments. Likewise, landowners' frustration with long inactive or deserted infrastructure on their properties creates resentment towards industry. The voluntaristic creation of the OWA as an independent, non-profit organization helped to obscure industry's historic unwillingness to commit to practical preemptive measures, including the bonding requirements that John Nichol attempted to advance in the 1980s, ever-so briefly adopted and then canned. While it is unclear at this point in my research[78] whether asset desertion could lead to an actual crisis of underproduction as theorized

[78] Though this would be hard to quantify in Alberta's conventional sector, the enormous environmental liability monster of global tailings production from surface mining projects offers an equally important case study. In Alberta

by O'Connor, it certainly has presented moments where counter-hegemonic threats to extractive industry develop. We can interpret this 1995 statement from long time EUB employee Leo Touchette as a hint of this:

> Increasing numbers of companies are not meeting our requirements, and our customer surveys indicate that most representatives of companies, the public, and other government agencies, do not believe our enforcement actions are capable of achieving that compliance. We, and some industry representatives, are very concerned that regulators are not providing a level playing field and enforcing requirements equally. (1995, as cited in Yewchuk et al., 2023)

Asset desertion throughout the 20^{th} century had already garnered attention from several bureaucrats, across time and space, attempting to intervene in the short-term accumulation of capital (even if weakly) through prioritizing new enforcement regimes. The hegemonic bloc's failures are increasingly visible to people impacted by development. This visibility creates windows for counter-hegemonic movements, allowing groups to "advance their critiques of the system and to propose alternative ways of organizing production and government" (Adkin, 2022, p. 221). Although no movement has yet upended Albertan fossil capital's control in the province, many have been formed and many struggle daily against the fossil bloc. Unfortunately, an extended analysis of these movements is beyond the scope of this dissertation. Further research

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alone there are nearly two trillion litres of production effluent in ponds today. Olsgard believes that the best estimate of tar sands liability today is north of $260 billion, a figure leaked from a 2018 meeting at the AER involving her Contaminated Sites Group (personal communication, 2023). O'Connor, ever precocious on this matter, predicted the immense cost of socioenvironmental liability. As it appears impossible to calculate the global cost of even hydrocarbon production, upgrading, and distribution, this quote stands the test of time:

> No one has estimated the total revenues required to compensate for impaired or lost production conditions and/or to restore these conditions and develop substitutes. It is conceivable that total revenues allocated to protecting or restoring production conditions may amount to one-half or more of the total social product—all unproductive expenses from the standpoint of self-expanding capital. (O'Connor, 1988, p. 26)

would be perfectly set up to analyze the non-state organizations in the province who struggle against this problem, like the Polluter Pay Federation, the Alberta Liabilities Disclosure Project, the Alberta Conservation Association, the Grassroots Alberta Landowners Association, the Keepers of the Water, and so on. For now, I will end this section by pointing to one industry success that could also still lend to a high-level counter-hegemonic project. Despite capital's success in organizing the OWA, provincial statutes do allow for the appointment of another, independent organization to handle issues related to deserted assets. Dorin pointed this out during our interview:

> What I do have issues with is that we only have one outfit like the Orphan Well Association, where the law contemplates multiple designates to deal with the problem…the law contemplates other bodies besides the AER handling orphan well issues, including naming orphans, and deciding the Orphan Fund Levy. It doesn't have to be the AER. The Provincial Cabinet can appoint another independent body because these are matters of law, and they can all be appealed to the courts, and could be done properly instead of non-transparently. So, here's our solution. (personal communication, March 15, 2023)

This could prompt an interesting challenge to industry. Stripping fossil capital from control of the OFL through the appointment of a different body, would mean that they could no longer rely on their tactic of political control through the OWA. Likewise, as will be discussed in the next section, this would also interrupt their new strategy of accumulation through the OFL.

The OWA's Autonomy in *Redwater*

Since I have been theorizing the ideological and political power of the fossil bloc via the OWA, it is high time to discuss how exactly this power has mobilized. Adherence to the "code of law" is incredibly important to maintaining the private property relations inherent to capitalism. These juridico-politico structures maintain all the key components of capitalist political economy, including the labour exchange process itself and rules around competition (Poulantzas, 1975b). Jessop synthesizes Poulantzas's criterion for a capitalist state in relation to these legal structures well:

> Commitment to the rule of law, which, as the 'code of organized public violence', serves, among other things, to sanction capitalist relations of production and exploitation through their juridical representation as rights attached to private property, organises the sphere of circulation through contract and commercial law, and regulates the state's economic interventions. (2021, p. 165)

This is one reason, among others, as to why I consider legal cases and the law writ large in my treatment of the OWA. The OWA has taken to competing with Canadian and transnational financial capital through these juridico-politico structures, both to support both the longevity of itself as an organization and the long-term goals of capital accumulation in the oil patch. Recently, this has been expressed in frustration between the Canadian state's federal bankruptcy law and Alberta's provincial statute which dictates the order of repayments in the case of a fossil firm going bankrupt and leaving behind unreclaimed assets. This arose within a series of legal cases colloquially known as *Redwater*. These cases pitted the factions of capital against each other, revealing one side of their competition-versus-cooperation relationship.

To make this argument I offer a reading of the judgements collectively known *Redwater*:

Honourable Chief Justice Neil Wittmann's 2016 decision in Alberta's Court of Queen's Bench[79] *Redwater Energy Corporation* (2016 ABEQ 278) and the SCC's overturning of the lower courts' decisions in their 2019 ruling in *Orphan Well Association v. Grant Thornton Ltd.*[80] This case centred on the legal obligations that appointed receivers and financial lenders have towards infrastructure care after the bankruptcy of a fossil capitalist firm. Does the corporate receiver (GTL, in this particular case) have a responsibility to close and reclaim the bankrupt firm's inactive infrastructure and project sites in compliance with provincial statutory obligations—rather than simply disclaiming them to the OWA—before being able to sell the still-marketable assets to pay back outstanding loans? The SCC ruled in favour of the Regulator, stating that they have the regulatory authority to require a trustee or receiver to ensure that the ARO of any infrastructure is fully funded prior to any financial creditors being repaid through asset salvage sales. This was a blow to financial lenders in the patch but was one new wall of security for the leaders of the hegemonic bloc in the OWA. As there are hundreds of already insolvent fossil firms in Alberta waiting to enter bankruptcy, with large portfolios of inactive and suspended assets, this will (at least temporarily) stave off the coming landslide of assets. Instead of finance capital continuing to externalize the costs of closure and reclamation onto the OFL, they now must navigate these environmental obligations and have been required to amend lending practices accordingly.

As evidenced by this dissertation, the Albertan oil patch has long featured the juggling of liabilities. As early as the 1986 joint task force, there are glimpses of the forthcoming dance

[79] This trial court's title shifts depending on the gender of the Commonwealth's monarch. During Queen Elizabeth II's reign, it was the Queen's Bench, while as of writing this, under King Charles III's rule, it is known as the King's Bench.
[80] While the case was heard by the Alberta Court of Appeal before ascending to the SCC, they sided with the position of Whitman C.J. 's, meaning nothing changed until it reached the SCC. As such, I will not spend time analyzing their decision.

between creditors and the OWA's elite:

> The Task Force is supportive of amendments to the Bankruptcy Act to ensure that trustees in bankruptcy are charged with the responsibility for contributing towards a bankrupt party's share of abandonment costs. There are compelling arguments for changes to the existing insolvency legislation to ensure that public safety takes precedence over the rights of creditors" (CPA, IPAC & EPAC, 1990, as cited in Yewchuk et al., 2023, p. 53).

Were the vultures of finance capital allowed to continue externalizing defunct assets over the coming years, the hegemony of fossil capitalism could be threatened via the overwhelm of the OWA, which has been successfully serving as a socioecological fix for the contradiction presented by the patterned accumulation in the province. Thus, the AER and OWA putting their force into this court saga can be read as a strategic long-term move (a successful one) to secure the reproduction of fossil capital through this disciplining of finance capital. In doing so, the Regulator continues the necessary maintenance of the messy geophysical base of accumulation.

Redwater Energy Background

This story begins with Redwater Energy Corporation's first oil and gas exploration licenses approved by the AER in 2009, with 127 issued to the firm over the subsequent years. In 2013 Alberta Treasury Branches (ATB[81]) first funded Redwater with secured credit for upcoming capital acquisitions and new drilling projects. As is the case with most secured loans in the industry, the collateral offered as security against the loan was the firm's fossil assets - wells,

[81] It is worth noting that in 2016, the year the courtroom saga really took off, ATB had around $46 billion in assets and $1.52 billion in revenue (ATB, 2017, p. 35).

pipelines, processing, and/or waste facilities. In 2014, coinciding with a downturn in crude spot and futures markets, Redwater began floundering financially due to a failure to secure the acquisitions and start the drilling initiatives (*Redwater Energy Corporation*, 2016, at para 11). Redwater agreed to sell off some of its assets to cover the secured loan, and temporarily defer interest payments, as they were short $5.1 million to ATB. By this point, only a few dozen of their assets were actually producing or transporting crude and there was no appetite in the rest of the industry to purchase their scraps (via asset sales/license transfers), funds they needed to make up the $5.1 million they owed (*Orphan Well Association v. Grant Thornton Ltd.*, 2019, at para 46). Come 2015, ATB, the same creditor who just a year prior had given the firm fresh capital, sought a bankruptcy order for Redwater from the courts, and petitioned them into receivership.

The Alberta Court of Queen's Bench appointed Grant Thornton Limited (GTL) as trustee and receiver of Redwater's estate of wells and infrastructure. The millions in unsecured liabilities that Redwater had at the time of the bankruptcy were of no interest to their lender, ATB. GTL intended to proceed with asset sales of the viable infrastructure and 'disclaim' the rest to the OWA. Disclaiming, as mentioned in Chapter 3, is a longstanding industry practice of sloughing off non-productive assets onto the province, so that they eventually become wards of the OWA. GTL's position, as was argued to be industry standard at that time, was that paying back the secured loan to ATB should be financially *ahead* of dealing with the obligatory environmental liabilities, according to the priority scheme in the federal *Bankruptcy and Insolvency Act* (BIA). This externalization of liabilities by the bankrupt extractive firm, the lender, and the receiver was always a best-case scenario for finance capitals' bottom line and a worst-case scenario for OWA's coffers (or public coffers, should they have to be used). The AER and OWA were not pleased with GTL's plan and issued GTL orders to first deal with the inactive assets' end-of-life

AROs before using any money from the sale of the marketable assets to repay the ATB loan. The AER maintained GTL's regulatory obligations to shut-in the infrastructure as trustee of the estate based on their interpretation of the term 'licensee' in the relevant provincial law. This is summarized in the Court's outlining of events of the bankruptcy:

> Upon being advised of the receivership, the Regulator sent GTL a letter dated May 14, 2015, setting out its position. The Regulator noted that the OGCA and the *Pipeline Act* included both receivers and trustees in the definition of "licensee". The Regulator stated that it was not a creditor of Redwater and that it was not asserting a "provable claim in the receivership". Accordingly, notwithstanding the receivership, Redwater remained obligated to comply with all regulatory requirements, including abandonment obligations for all licensed assets. The Regulator stated that GTL was legally obligated to fulfill these obligations prior to distributing any funds or finalizing any proposal to creditors. It warned that it would not approve the transfer of any of Redwater's licenses unless it was satisfied that both the transferee and the transferor would be in a position to fulfill all regulatory obligations. It requested confirmation that GTL had taken possession of Redwater's licensed properties and that it was taking steps to comply with all of Redwater's regulatory obligations. (*Orphan Well Association v. Grant Thornton Ltd*., 2019, at para 47)

While Redwater only had around 100 wells, pipelines, and facilities at the time of its petitioned bankruptcy, their relationship with their secured creditor and appointed receiver is paradigmatic of finance capitalist firms' long history of avoiding responsibility for AROs of collateralized assets. *Redwater* was exemplary of the insolvency and lending practices that financial capital relied on in the province to freely lend without consequence, regardless of their borrowers' financial prospects. Thus, the growth of unsecured liabilities in the province is in part a product of lender and receiver disregard for public safety and the health of socio-environments, with these firms instead prioritizing financial returns.

Then Chief Justice Neil Wittmann of the Court of Queen's Bench did not (strictly speaking) disagree with the AER's position vis-a-vis the provincial oil and gas statutes. More importantly, he boiled it down to a question of competing provincial and federal law:

> This case raises the issue of whether the Trustee has the ability to disclaim property that is non-producing; in other words, whether it can pick and choose realizable property. It also raises the issue of whether the AER, a provincial regulator, can effectively create a priority for abandonment and environmental liabilities in bankruptcy by approving the transfer of licenses subject to conditions, which are detrimental to some creditors, and if so, whether this creation or recording of priority is contrary to the BIA (*Redwater Energy Corporation*, 2016, at para 6).

So, the frustration between the provincial environmental regulations and the federal BIA was at the core of the dispute, and the federal law of Canada took precedence according to Wittmann CJ. Trustees can disclaim assets according to the BIA, even if the provincial OGCA, the *Pipeline Act*, and the AER's *Directive 006* all say otherwise. Specifically, the BIA states that a "trustee may abandon or renounce any interest in any real property of a bankrupt firm and (subject to some restrictions) not be liable for any costs associated with such an abandonment" (Spizzirri & Title, 2018, p. 55). But a critical component of the licensee-trustee-receiver nexus is that a ""Licensee" is defined in both the *Oil and Gas Conservation Act* (OGGA) and *Pipeline Act* (PA) to include a trustee or receiver-manager of the property of a license" (*Redwater Energy Corporation*, 2016, at para 36). This is especially important for not only the AER's courtroom argument, but also for all other parties who could go on to bear responsibility for "disclaimed" assets. The AER's competing definition of 'licensee' is a slim barrier that prevents the externalization of obligations and liabilities and even makes extraction/production of lower risk for the people and local ecologies impacted by development.

As discussed in Chapter 4, the AER and fossil capitalists have implemented few meaningful tools to prevent or securitize against a runaway increase in deserted assets. Things like the security deposits that operators with LMRs under 1.0 were required to post, as outlined in the now-phased-out *Directive 006*, were always too little too late. The rise of disclaimed assets has meant that existing solvent operators must pony up higher and higher tariffs via the OFL and federal and provincial coffers are eyed to pay for inactive and suspended well abandonment. But Wittmann's CJ's short commentary displayed that he was on the side of finance capital: "Considering the current uncertainty of the economy of this province, the law needs to be clarified regarding the protection of trustees and receivers where environmental concerns arise" (*Redwater Energy Corporation*, 2016, at para 1). Rather than focusing on the protection of everyone impacted by "environmental concerns," such as hydrogen sulfide, methane, and other volatile organics leaking from deserted wells that are not properly reclaimed, Wittmann centres trustees' and receivers' futures. While this position would be celebrated by various industry sycophants and then parroted by the Alberta Appeal Court in 2017, it would go on to be usurped by a SCC majority in 2019.

Moving to the SCC

After the lower court decisions, some energy insiders were happy to know the taps of financial capital would remain running. Although it may never be fully understood as such, this interdecision period was very impactful on the OFL and could have truly begun the negative runaway effect of desertion that still lies ahead. According to the AER:

> From the May 2016 *Redwater* decision until January 30, 2019, receivers and trustees involved in 28 insolvencies renounced their interest in more than 10,000 AER-licensed sites (wells, facilities, and pipelines) with deemed liabilities of almost $335 million. In that same period, the OWA's inventory of wells increased more than 300% from 768 to 3100. (AER, 2019b)

According to their 2023 annual report, the OWA spent $183.6 million in their 2022-2023 fiscal year meaning that they gained two years of work alone from the period between these two *Redwater* decisions. It was a short-lived jubilee for creditors and trustees who were happy to abdicate themselves and their borrowers of responsibility. Had the SCC ruled otherwise on the appeal, this could have led to a sudden windfall increase in OWA wards and the consequences could have accelerated this contradiction of production that fossil capital has created for itself. Some energy giants in the province thanked the lower courts for protecting their creditors. One industry spokesperson, Kathleen Shannon, who is now a lawyer for Enbridge, was quoted in a CBC interview saying, "lenders will still feel secure in their creditor positions, so they're likely to continue lending to the oil and gas industry. If the decision had been reversed, there would have been more hesitancy from financial institutions" (Johnson, 2017). But not all industry insiders or advocates celebrated like Enbridge, understanding that this was not productive for the long-term maintenance of production.

Licking its wounds and knowing it was on the right side of the provincial law, the AER announced that it was seeking leave to appeal to the SCC in April 2017. The SCC agreed to hear the Regulator's appeal on November 9, 2017, and the court subsequently heard the appeal on

February 15, 2018, as *Orphan Well Association v. Grant Thornton Ltd.* Like the lower courts before, the SCC boiled the case down to more or less one question: "what happens to these [cradle-to-grave reclamation] obligations when a company is bankrupt and a trustee in bankruptcy is charged with distributing its assets among various creditors according to the rules in the *Bankruptcy and Insolvency Act*" (*Orphan Well Association v. Grant Thornton Ltd.*, 2019)? The Supreme Court of Canada sided directly opposite of the Court of Queen's Bench decision (presided over by Wittman CJ's). In a 5:2 decision announced in January of 2019, the SCC ruled that in the case of a licensee going bankrupt, the AER *has the right to require ARO's be overseen from a debtor's estate, prior to any secured creditors being repaid*. Put another way, "the *Redwater* decision concluded that a trustee for a bankrupt oil and gas company had to use the bankrupt estate's assets to pay for the ARO of non-producing wells and could not "disclaim" them" (Yewchuk, 2021, p. 1). This huge verdict sent ripples through the industry.

The Fixing Power of *Redwater*

The SCC's decision had a twofold consequence benefiting fossil capitalist elites: i) the necessary maintenance of the industry's collective geophysical accumulation base (which had been made messy by certain producers, lenders, and receivers with a long practice of disclaiming assets into the province's care) and, ii) the elimination of lesser fossil competition which was unwilling to play by the rules of the province's hydrocarbon economies, a product of inter-capitalist competition. The latter is in line with the tendency of the hydrocarbon industry towards increasing centralization of production to the hands of just a few major producers (Labban, 2008). Thus, rather than the *Redwater* decision being a negative outcome for the industry writ large, it has been welcomed by its long-standing mavericks in CAPP. But the sacrifice of some creditor returns through prioritizing environmental clean-up was lamented by select junior producers. Why would the largest upstream oil and gas lobby group in the country champion a court ruling that might scare off finance capital and hold lesser firms' feet to the fire? Immediately following the ruling, CAPP released an enthusiastic statement:

> CAPP has argued on behalf of industry that when a company declares bankruptcy, the value of any assets should go to abandonment and reclamation costs first. The Orphan Well Association, which is funded by industry, should be a last resort and only used after all other sources of funding are exhausted. CAPP believes that this judgment restores the balance between environmental obligations and creditor interests to that which existed for many years before this case. (EnergyNow Media, 2019)

This statement is not surprising if we remember that CAPP is an independent fiduciary of, and one of the fathers to, the OWA. Their member firms are some of the largest contributors to its coffers via the OFL. On the surface, this statement suggests CAPP's support just because it would be *inappropriate* for the OFL to have to internalize all the deserted externalities produced from an existing bankruptcy priority scheme that places ARO work last. But through zooming out and assessing the political economic motivations behind this, we can see *Redwater* as another fix for the contradictions that have manifested in this maturing industry, including the tensions around maintaining political power in the face of the continually failing liability management regime.

Recall, Fearn (2023) argues that these fixes must work *socially*, not just economically. While the OFL certainly will have trouble keeping up with the growing portfolio of deserted assets, CAPP and EPAC mobilized behind the OWA to pursue legal action in *Redwater* to maintain the position of fossil capital over finance capital. The OWA's leadership (including

Lars DePauw who came onboard in 2017) were acting in the best interest of the organization itself, even though this interest was at odds with the finance capital faction who had benefited from frustrations between the provincial environmental statutes and the federal BIA. This proved to inattentive industry operators and financial lenders that the state was willing to discipline certain factions of capital.

With this decision, finance capital had to reposition itself and its lending practices in the province. Consider former AER staff Mark Taylor here:

> So, if you put a company into receivership that had a bunch of wells that needed to be cleaned up, in theory, all of the money that the receiver was going to collect was going to come to the AER or the OWA in order to clean up those wells, and the banks would be left with zero cents on the dollar. They were no longer first in line to get their money back. (personal communication, March 12, 2023)

Suddenly, our ne'er-do-well financial firms were not so keen on freely lending to industry borrowers. Nor were industry receivers excited about court appointments, as they would be paid out last according to the ruling, and they were to start acting in a regulatory capacity, not as another creditor asserting a monetary claim on the bankrupt fossil firm's estate. Boardroom attitudes towards asset AROs quickly changed in the province. Here's Mark Taylor again on this:

> We faced a bit of a problem in that, for the most part, banks and receivers suddenly lost any appetite in pushing any company into insolvency…I heard this from a number of bankers directly, they were not happy with us. In fact, they were irate. And I was told a number of times that I had single-handedly caused the demise of all lending in the oil and gas sector, because now the AER was first in line. (personal communication, March 12, 2023)

But Taylor said that the lenders actually started pressuring fossil firms to see through AROs, lest they lose their credit lines. He said that,

> Every time they [lenders] went to discuss the line of credit, the first question they started asking the oil and gas company executive was, "how many wells did you abandon last year?" and "what is your plan for your asset retirement obligation?" And the number of abandonments in the province started going up significantly. (personal communication, March 12, 2023)

Redwater did not force the creation of new legislation or rules in the province, but it did stimulate the provincial government, Regulator, and fossil capitalist elite to rethink liability management while they could.

The preceding years after 2016 led to the creation of the province's 2020 Liability Management Framework, discussed in Chapter 3, as everyone reckoned with the reality that the coming tide of mass desertion could have been at the province's door. This shifted the attitude of the Regulatory regime to be more aggressive in liability management. But what is the explanation for this aggressive positioning of the province and Regulator while conventional production is slowly sundowning? The answer, I argue, is that it is critical to maintaining fossil hegemony in the province as the ramping up of unconventional assets in the tar sands proceeds. CAPP represents a broad constituent of upstream producers, including the major producers in the tar sands like CNRL, Cenovus, ConocoPhillips, Shell, and Suncor. Now is the time to tighten the belt on old infrastructure maintenance as the major producers all transition to highly contested and publicly scrutinized unconventional reserves in the tar sands. Here's Taylor again:

> So, all of what we see, or a lot of what we see, in the whole liability management space was created in the last eight years. Right? And a lot of the tools that the AER uses now

> that can be seen publicly, if you read directives, or not seen publicly because they're memorandums of understanding with other government agencies and regulators, came out of the *Redwater* decision. So, one of the things we found when we started to look at what the history had been with *Redwater* is that there were a lot of warning flags that different government organizations or regulators knew that there were some problems with Redwater but none of us had the legal paperwork behind us to be able to compare notes. (personal communication, March 12, 2023)

A New Strategy of Accumulation?

One of the lesser discussed and undesirable outcomes for finance capital from the *Redwater* saga was that the OWA has gained *the ability to appoint a receiver of their choice.* This new OWA control of insolvency practices in the province appears as a new strategy of accumulation. This is a substantial change in the insolvency practices throughout the patch, as the AER has been the government organization responsible for conducting investigations and determining if an operator needs to be put into receivership (like the case with Lexin Resources discussed at length in Chapter 3). Now, the OWA, which is not legally a government organization, will also have this enforcement authority. Through this new power they can securitize the industry-funded OFL from growing any further and prevent eating into their member firms' profits. The OFL has grown almost five-fold over the last 8 years, from $30 million in 2016 to over $130 million in 2024 (OWA, 2024). While this is a small number compared to the $200 billion in revenues that CAPP member firms alone generated in 2024, they know that the "slow motion landslide" of asset desertion is on the horizon. This is a new and improved strategy for disciplining fossil firms and various fossil financiers who do not want to properly retire infrastructural assets.

The AER long was the only state organization able to petition firms into bankruptcy (less common and called for in extreme circumstances) and appointing bankruptcy receivers (much more common). Most of the time, a firm's lenders were the ones who had to initiate the process and go through the arduous court proceedings. Now, a new, problematic point of these insolvency operations is that the OWA can decide at what point there should be a receiver appointed to sell the failing (or already failed) licensee's assets. As discussed in Chapter 3, there are hundreds of firms with sub-1.0 LMR ratings in the province which are categorically insolvent. Most of these firms only exist on paper, but the AER has been happy to leave them be even if their assets are idling and leaking carcinogenic fumes in someone's backyard.

With the SCC's *Redwater* decision in hand, the OWA can force failed firms' creditors and receivers to adopt the ARO of their borrowers' assets. Since finance firms originally collateralized their borrowers' loans with the infrastructural assets, due to the *Redwater* appeal decision they can no longer avoid being saddled with these responsibilities. Financial lenders of defunct fossil firms can only hope that the OWA will not pick their racehorse (their borrower) when assessing who needs to move from insolvency to bankruptcy court. Finance capital has been left with few ways to extract more from their lenders following the constraint on them that *Redwater* affirmed. But this also means that the fossil capitalist behind CAPP and EPAC have even more power today than previously. The OWA is being mobilized as the main adjudicator over which firms are petitioned into bankruptcy, and *which are not*. Will the board members of the OWA decide democratically which firms to petition? Will they be motivated by the corporate interlocks that they personally have with the financial capitalist firms in the patch? As Yewchuk argues

This is obstructing the efficient handling of defunct oil and gas licensees and their assets,

> as the OWA's board has an economic interest in preventing oil and gas infrastructure from being sent to the OWA's inventory and, by extension, preventing increases in the orphan fund levy paid by industry. (2024, p. 1).

This may prove to be an important accumulation strategy for the industry writ large, but more specifically for the largest operators in the conventional sector including Cenovus, Imperial, CNRL, Paramount, and Ember Resources. No one has a crystal ball so we cannot know how the OWA will continue to handle these insolvency practices for now.

Conclusion

Both the creation of the OWA and the aggressive position of the organization in *Redwater* are keystone moments in the industry's recent history. This chapter has discussed how the organization and its actions since 2017 may be read as a further accumulation of political power and as an expression of its broader political project (securing the long-term goal of capital accumulation in the oil patch). It examined how the socioecological contradictions that have arisen from production have been met with industry-led solutions that appear to temporarily stave off the problem, rather than addressing the root of the issue via permanent solutions. I have argued above that the OWA was founded as a socioecological/regulatory fix to the waves of asset desertion in the oil patch, recognized as a brewing problem decades ago by Regulator staff and industry elites. The chapter further analyzed the political economic dimensions of the founding of the OWA, a tool that tried to pre-empt the second contradiction of capitalism and to oversee maintenance of the oil patch itself. Through analyzing the *Redwater* legal decisions, the chapter also considered the evolving trajectory of the OWA and the fossil elite who control the organization. The SCC's *Redwater* decision, I assert, had a 'fixing' power, providing the OWA new political power to oversee insolvency practices and potentially provide a new strategy of accumulation for the CAPP and EPAC member firms who pay into the OFL.

Despite the age of the conventional sector in the province, its infrastructure and processes are always being organized anew. Key figures in the regulatory tapestry have both underestimated and overestimated fossil capital's malleability and its complexity. As Touchette attested, "we, as regulators, once worked under the assumption that one company would drill wells, construct facilities, and produce and abandon these wells and facilities" (1995, as cited in Yewchuk et al., 2023, p. 266). But as Michael Watts put eloquently, "oil frontiers have no simple, linear life cycle; they are dynamic and unstable, discovered, and rediscovered, opened and reopened. There is no clear line of discovery, depletion, or closure. In the case of oil and gas it is as if there is a permanent extractive frontier" (2015, p. 219).

Chapter 6: Conclusion and Final Ruminations

Dreary compulsion has at its command only lifeless drill, which smothers vital initiative at its birth and can bring forth only subjects, not free men.

- Rudolf Rocker, *Anarcho-Syndicalism*, 1938

As we approach the slow sundowning of conventional hydrocarbon development across the WCSB, many unfortunate consequences will likely appear which threaten the well-being of human and non-human communities. Fossil capital must eat at its near and distant socioenvironments in its process of valorization. Finance capital, too, feeds endlessly through its sprawling array of real and financial asset management and investment funds, weaving itself into every strand of our waking lives via housing, land, public infrastructure, telecommunications, water, and energy. I agree with Brett Christophers in that these two factions' constant feeding represent "the purest manifestation of a world in which money talks" (Christophers, 2023, p. 296). Yet the point of this dissertation is not only to assess these sectors' responsibilities for the crises we face, nor do I seek to blame individual people who are involved in the fossil world.[82] Rather, the point is to examine both *fossil capital and the capitalist state as social relations*. Quoting Malm:

> By its very definition, it is the circulatory, spiral-like process of valourization or self-expanding value; but it is also–by its very definition–the relation between capitalist and workers, for capital exists 'only by sucking in living labour as its soul, vampire-like'; but if labour is its soul, extra-human nature is its utterly corporeal body. (Malm, 2016, p. 286)

[82] Although some certainly harbour misanthropic, violent tendencies towards life on earth.

I designed and conducted this research agenda as a former geotechnical labourer-cum-ecosocialist activist and researcher who has had contact with multiple parts of the extractive economies of Turtle Island. Given my experience in both the environmental monitoring complex surrounding these economies, and several social movements resisting further development, I hold a unique view of some components of extraction. This has helped me to offer, to my knowledge, one of the first accounts of the phenomenon of deserted conventional hydrocarbon infrastructure informed by a combination of geoscientific ideas, political ecology, and a critique of fossil capitalist political economy and statecraft. I drew on seven key informant interviews conducted with a fairly diverse group of professionals circling the industry: an OWA executive, a former AER liability management leader, a former AER toxicologist, an OWA prime contractor, an Albertan ecologist, a landowner advocate, and an anonymous source. Along with this, I poured over provincial government policies and reports, news media, extra-industry studies, and legal scholars' commentary to create an account of the complex, confusing, and sometimes contradictory movement of fossil capitalist assets and processes of desertion. While I did not really know where this long road would take me, I found myself returning to the exact point where I began my Master's research years ago: contemplating and trying to understand the hegemony of modern capital in its slovenly consumption of the biosphere, wondering where the biggest cracks in the facade for anti-capitalist struggle sit. John Holloway comes to mind when I take a step back, trying to see the long view, remembering that *we* are the crisis of capital:

> Each day we create a world of horrors, of misery and violence and injustice. We take an active part in constructing the domination that oppresses us, the obscenity that horrifies us. We create surplus value, we respect money, we accept and impose unreasonable authority,

> we live by the clock, we close our eyes to the starving. We make capitalism. And now we must stop making it. (2019, p. 210-211)

In the following sections, I review what I consider the key findings and contributions from each chapter. Following this, I assess the implications of this research for those who I consider the main audiences for this story: fellow scholars, regulatory policymakers, and members of social countermovements. Subsequently, I end the dissertation with a discussion of the limitations of my research design, and ultimately where future research agendas could pick up on this analysis. The 'Postscript' discusses the recent attempts by the province's fossil majors to secure public funds and rapid regulatory approval for carbon capture technology in the tar sands.

Key Findings and Contributions

In Chapter 2, *The AER, the OWA, and the Materiality of Alberta's Hydrocarbons*, I walked the reader through the types of hydrocarbon reserves in Alberta, their associated production processes, the design of the Regulator responsible for overseeing them in life, and the design of the OWA responsible for overseeing them in death (should they be deserted). The point of this is to understand what assets constitute the 'orphan class' and to begin explaining why they are such a technically difficult and costly problem. In advance of doing so, I introduced the framework that I call critical physical geology. Although the creation and refinement of this theory was not a focus of the dissertation, I argue that it is an important beginning to future research that synthesizes scholars' knowledge from disconnected geoscientific and social scientific fields surrounding extraction. This framework helped organize the discussion about the materiality of hydrocarbons. I explained that fleshing out these geophysical production processes and points of the hydrocarbon supply chains is useful in comprehending four pieces of the fossil web: the companies involved, the specific points for anti-extractivist contestation along these circuits, the specific and regulation and rationale for different AROs, and simply understanding some of the most central geotechnical aspects of advanced fossil capital. I believe that it is important to understand these different pieces of the puzzle in part because they are often *not* explicitly examined in ecosocialist literature.

This framework is part and parcel of the dissertation's broader theoretical underpinnings especially political ecology, and critiques of fossil capitalist political economy. Likewise, this critical geologic view ties back to my use of O'Connor's second contradiction of capitalism and the capitalist 'fixes' to the structural contradictions of accumulation. In relation to theories of fossil capitalist political economy and ecology, this work helps infill scholarly lacuna around the critique of the geophysics of conventional production regimes. While dissecting and explaining the technical and bureaucratic world of an advanced capitalist state's fossil production is tedious, it helps avoid confusion and misattribution of the origin of problems like unfunded liabilities and the role of the capitalist state. This is especially so when trying to understand and analyze fossil firms' cash flows, their assets, or their socioecological-financial liabilities. Within this dissertation, teasing out details of this production allowed the reader to understand what I referred to in saying that the OWA only deals with *deserted conventional assets from upstream and integrated producers*.

Further, I argued that having this theoretical and empirical understanding of these commodity circuits and processes is necessary for social transformation in the transition away from this mode of production and consumption (even a condition of possibility for getting onto the ecosocialist 'second road to socialism'). In other words, this explanatory work sets the stage for demonstrating the conditions under which the state and factions of capital end up confronting the second contradiction of capital. The state and capital alike must reckon with the degradation of the conditions of production which allow capital to reproduce. As will be commented on below, the industry and state are looking towards the regional unconventional sector as the new base of accumulation. Yet, the struggle against the industry's deleterious externalities is forcing a reckoning in their full transition to the unconventional sector. The necessity of evolving liability management in recent years (if only into a new facade) has been a product of class antagonism and the work of countermovements. The state's intervention currently does not appear to be extreme enough to foster any serious exercise of control over the industry in "production, investment, markets, and so on" (O'Connor, 1998, p. 164).

The second half of this chapter concerned the institutional makeup of the Regulator over the last 70 years. The Regulator has undergone many name changes and facelifts over its *durée*, which have accompanied shifts in its leadership, mandate, and relationship to industry. The subsumption of many different provincial environmental governance mandates as a product of REDA's passage in 2013 is one of the most important shifts in conversation today. I explained this broadened mandate and gave a 'conventional,' that is more 'mainstream', view of its corporate governance. Following this, through the example of a conventional oil/gas well, I explained the many stages that infrastructure passes through during its life. I ended the chapter with a conventional history of the OWA, including how it came to be, how it gets its money for ARO work, and who makes up its executive leadership and board. These contributions to the study of the geophysics and process flows of the deserted assets, set the table for the rest of the dissertation - which offers contributions to understanding complex processes of socioenvironmental liability policy making and enforcement under Alberta's advanced capitalist state.

The purpose of Chapter 3, "*A Slow-Motion Landslide"; The Failing Liability Management Regime*, is to review and critique the Regulator's 21st century approaches to calculating financial liability: the LMR program and the LMF programs. These are critical pieces of the history of liability management in the province, and the LMR program's weaknesses has precipitated a coming tide of deserted upstream assets, which Regulator staff have called "a slow-motion landslide of licensee failures." Like chapter 2 preceding it, I read this landslide of desertion as a manifestation of structural contradictions in fossil capitalism, the core of the dissertation's broader theoretical framework. I argued that these policies and their enforcement stem from fossil capital's strong hegemony in the region. I argue–through the analysis of tranches of public records–that the fossil capitalist class (and to a lesser degree, finance capital) realized its' political unity within and through the Albertan bureaucracies that are charged with environmental governance; ultimately this lead an environmental governance model that precipitated these failures of ARO regulation. The long-term use of this complicated, failing liability management regime has damaged the local ecologies and communities in the province, as deserted assets sit fallow and rack up closure costs which will ultimately be subsidized by taxpayers. This context also has compromised the fossil capitalist class who have to pay higher and higher levies to the OWA to fund cleanup. This failure to manage deserted infrastructures costs is just one extension of the global damage which fossil fuel dependence has caused. As Kevin Young puts it: "what is puzzling about this status quo is not that it harms the vast majority of humanity–capitalism has always done that–but that it harms most of the ruling class" (2024, p. 56).

Highlighting and analyzing the liability programs also allows anybody to see the sheer volume of operators lingering in insolvency, not yet bankrupt and disassembled, but also not actually operational. Explaining these inadequacies also prepares the reader for understanding why Alberta Premier Danielle Smith's government intervened in 2020 to re-tool the whole liability management regime under the LMF.

The second half of chapter 3 was dedicated to playing out the process of corporate insolvency and proceeding bankruptcy via the curious story of Lexin resources. By most accounts, this fossil firm has become the most infamous in the province's petro-history due to its' shadowy corporate organization, lawless command of dangerous assets like the Mazeppa gas plant, and a final act of a massive disclaiming of assets onto the OWA. Lexin's name came up at almost every interview I conducted given that their story unfolded a few years after the passage of REDA in 2013 and amid the *Redwater* courtroom saga. The Lexin saga fresh hell was truly a test of faith of the newly minted AER and its liability management team. Further, it was the beginning of a new era for the AER and OWA, as the fossil elite in control of these apparatuses began making more aggressive moves against delinquent operators playing in their sandbox. The first evidence of this is the AER assigning the OWA responsibility over Lexin's assets while the bankruptcy proceedings and salvage sales moved along.

Most importantly, this chapter made a unique contribution to scholarship on Albertan fossil capitalism through documenting firsthand accounts from regulatory staff about how severe regulatory mismanagement fomented the Lexin catastrophe. This is a unique treatment of Lexin in the scholarship as most of the Regulator's accounts of the firm's demise blame either the company alone, or the falling value of hydrocarbons in spot and futures market. Instead, my analysis focuses on the fossil bureaucracy in the AER, which was also very much to blame, as it was another product of industry, that is fossil/hydrocarbon capital, exercising political power through the Regulator. The AER attempted to officially distance itself from the failings of Lexin by pointing fingers at Lexin's leadership and highlighting how the OWA did such a fantastic job responding to the catastrophe during the receivership. Hence, this chapter also advanced the dissertation's core argument through critical analysis of the work of the province's capitalist environmental bureaucracy. Rather than seeing capitalist state regulation and enforcement as a tool for interrupting the steady flow of fossil capital's economic, social, and environmental externalities, I showed how the regulatory bureaucracy is perpetuating the long-term core political and economic objectives of the fossil bloc: exploitation of both technical labour and the earth to realize maximum profit. Slowly, some contradictions of production are being faced, but obviously there is a strong refusal to resolve them, as this could functionally spell the end of this very lucrative and powerful industry. Instead, protracted, and haphazard management of these socioenvironmental costs continues as the landslide of unfunded liabilities looms on the horizon.

Chapter 4, *Fossil at the Wheel; Capitalist Class Hegemony and the Regulator*, marked the beginning of the second half of the dissertation. This chapter focused on (a) distinguishing between the competing factions of capital (fossil/hydrocarbon and financial) which were discussed in chapter 5 and (b) showcasing the political relationships between the fossil capital elite and the Regulator. This argument contests the often-invoked argument that the AER or OWA are merely 'captured' institutions, awaiting release from the talons of industry. In fact, the chapter reveals that the province's regulatory bureaucracies have long been directed by the fossil capital elite, via their lobbying organizations CAPP and EPAC, an elite that has held provincial hegemony for the last several decades. My analysis here is informed by a Marxian critique of capitalist statecraft and bureaucracy, specifically some elements of Ernest Mandel's theory of capitalist bureaucracy and Nicos Poulantzas theories on the formation of capitalist type states. These theories nestle within and complement the dissertation's larger theoretical frameworks, specifically a critique of fossil capital's political economy and statecraft. I have woven together elements of these different theorists to make sense of this state regulatory apparatus.

Through this mode of analysis, I presented my own 'unconventional' counter-history of the Regulator as it has shifted over the 20th and 21st centuries. I tried to make sense of and argue that the liability and regulatory enforcement regime has always been a response to the need of fossil capital in particular, and the needs of capital as a whole, as it resists political power against it. I worked on analyzing the ways that financialization has impacted fossil economies, while also attempting to name and differentiate the distinct players in both financial and fossil capital. In trying to fully understand the driving force behind each faction's actions, it is necessary to understand what divides them and who the main firms involved are. As evidenced by the data and my related arguments, fossil capital has pride of place in decision making within the province.

Chapter 4's central empirical and analytical contributions arise from putting into conversation many different interviewees' viewpoints on this matter. Hearing the disparate stories of interviewees from vastly different professional backgrounds offered unique insight into what was not previously explored in the literature. Interviewing professionals with expertise in ecology, toxicology, upstream oil and gas, and landowner advocacy, allowed me to construct a co-constitutive account of how fossil hegemony has manifested in the province's bureaucracies. This exploration of the socioecological impacts of the Regulator's poor policy and enforcement relates the chapter to the broader theoretical framework of the dissertation.

Chapter 5, *Fixing Alberta's Orphans; Socioecological Contradiction, Finding the OWA, and* Redwater, acts as the final body chapter of the dissertation. It begins by presenting a synthesis of the literature that theorizes the many types of 'fixes' employed to overcome capitalism's structural contradictions. These theories are complementary to the work of O'Connor (and his many predecessors) concerning the two kinds of crisis described in ecosocialist theory, summarized in Chapter 1. Following this, I argued for a new historical interpretation of the OWA, explaining why this institution should be read as a socioecological fix to the inherent crises of fossil capitalist accumulation. Deepening this argument, I advanced a reading of the OWA as a mode of the fossil capitalist elite attempting to 'preempt' the second contradiction of capitalism itself (Surprise, 2018). As such this chapter, and the dissertation, offers a new contribution to the extant literature on 'fixes' as there is scant critical literature which offers in depth empirical analysis of regulatory fixes - in this case, how the fossil bloc realized its political power and came together to create its own quasi-state institution. The OWA has proven to be an autonomous organization, one that takes an aggressive position within the province's regulatory apparatus.

The second half of this chapter analyzed the OWA's role in the *Redwater* case, to date one of the most important SCC cases on environmental liability. This dissertation is the first attempt at a critical analysis of the result of *Redwater* within the critical political ecology and economy literature(s). The SCC's decision had major consequences for the inter-capitalist competition which is continually unfolding within the hegemonic bloc. Fossil capitalist elites benefited as the Court mandated that financial capital was also responsible for maintaining the industry's geophysical accumulation base, one that has become increasingly messy due to delinquent licensees, lenders, and receivers disclaiming and deserting assets into the fossil bloc (and, by virtue, the province's) care. Additionally, it helped ensure the elimination of lesser fossil competition in the province, also a manifestation of inter-capitalist competition rather than cooperation, in line with the tendency towards increasing centralization of production in the hands of a few oil majors (Labban, 2008).

Ultimately, chapter 5 contributed to the dissertation's core argument regarding the hidden function of the OWA as an attempted fix for fossil capital's contradictions and messiness in the region. This chapter showcased the successful political work of the leaders of the fossil capital bloc by critiquing the commonplace view of the OWA as an ambivalent organization. The fossil bloc, largely via its lobby group CAPP and its predecessors, was able to create and control this quasi-judicial organization to discipline other members of the hegemonic bloc as necessary. This, like the previous chapter, connects the theoretical backdrop of the dissertation with the empirical data derived from the sociolegal terrain of *Redwater* and its fallout.

Implications for Scholars, Social Movement Organizers, and Policymakers

For Scholars

The above findings and contributions have implications, in particular, for three groups: 1) scholars of Canadian fossil capital, 2) social or political movement organizers struggling against fossil capital's hegemony and deleterious wasting practices, and 3) policymakers and agents of state regulatory enforcement. With regard to fellow scholars, critical researchers, and policy analysts, my research findings contribute to understanding the role of the Canadian oil majors in the mass desertion of productive assets. As discussed in the dissertation, there is a large body of scholarship on environmental/climate governance across Canada, with special attention to the provinces with sizable upstream and downstream extractive economies, including Alberta, British Columbia, Saskatchewan, and Newfoundland and Labrador. Alberta's fossilized political economy (Carter, 2020) has invited a great deal of this scholarship and critique. The research on this governance in Alberta vis-a-vis liability management is largely found within legal studies on the liability framework (Yewchuk et al., 2023), corporate anthropology (Woods, 2019), interprovincial and regional sociolegal studies of regulatory capture and policy commentary (Boychuk et al., 2021; MacLean, 2017), and predominantly ecological studies with minor political commentary (Timoney, 2015, 2021, 2025). While all of these studies have contributed to my understanding and analysis, this dissertation is the first assessment of these practices of wasting through a critical political ecology lens. Simply put, this study is political ecological because it "takes the viewpoint of both environmental history and Marxist political economy" (Davis, 2017, p. 16).

The academic and popular scholarship on the political ecologies of extraction, continue to require exploration of fossil capital's hegemony and unification within and through late capitalist states. To interrupt the global violence of the oil majors and minors, the field needs more developed critique which does not rely on 'freeing' capitalist bureaucracies from industry capture. This work needs to agitate with a mind toward the withering away of the capitalist state - a key site where fossil capital's political power is organized. While the abolition of fossil fuels can potentially be achieved through the capitalist state in the slow transition to climate capitalism, our collective liberation cannot. Nevertheless, I do realize that agitating fossil capitalist states towards more progressive reforms, whether in more serious regulation of destructive extractive industries or in more robust social provisioning from captured royalties and taxes, can be immediately beneficial to people and broader ecologies.

For Social Movement Organizers

It goes without saying again that this dissertation has focused on the power of the fossil capitalist elite within the broader regional hegemonic bloc. But this elite is not the only viable target of focus for anti-extractive social movements. I empathize with fossil fuel abolitionists like Kevin Young who argue that the targets of campaigns should be the expanding financier faction:

> An alternative approach would involve applying direct pressure on the elites who control energy-related investments. Priority targets would include the capitalists and state officials with the real power: polluters of course, but more importantly the banks, insurers, asset managers, pension funds, employers, regulators, and judges who are crucial to the polluters' ability to do business– all the elite decision-makers who enable climate destruction by financing, ensuring, authorizing, and purchasing fossil fuel products. (Young, 2024, p. 15)

Because my research herein has contributed to an understanding of the contradictory and antagonistic relationships between the fossil and financial elite, I believe it can be useful to organizers. It offers insight into how to target the different factions of the fossil bloc in the province and elsewhere.

In the first instance, the research can be used by regional social movement organizations such as landowner advocacy groups, environmental advocacy groups, and anti-colonial and/or Indigenous-led groups in the province. The dissertation outlines how the capitalist state has been under the sway of the fossil fuel industry and how regulation has continued to deteriorate according to these capitalist firm needs. In order to address the specific problem of unfunded liabilities in the province, the role of industry lobby groups in liability management must be understood. The research has shown the problematic role that CAPP and EPAC have played in the OWA, something which needs to be addressed in the process of the world's transition to low-carbon energy sources.

Following Young's quote above, this dissertation research adds to the growing body of work that can be mobilized by social movement activism focusing on financial lenders, not just the fossil firms. There are already substantial, multi-organization publications that focus on fossil lending such as Rainforest Action Network's annual *Banking on Climate Chaos.* That said, this dissertation has outlined some of the specific, interlocking relationships between financiers and borrowers in the Alberta fossil economy. The collected empirical data and arguments could be used for developing campaigns and identifying how political opponents (i.e., members of the fossil bloc) are mobilizing their power. Likewise, it shows that there are fragile relationships between members of the power, especially between financial lenders and fossil borrowers.

Recommendations for Policymakers

The idea of advancing policy recommendations towards a capitalist state bureaucracy which I have just argued is organized according to a power bloc which I am at odds with feels strange. While I maintain hesitancy that improving existing enforcement practices or even restructuring agencies has the power to disrupt the control of the Canadian fossil capitalist class, I was still inspired to include this section directed at policymakers. As Maclean says: "academics are at once ideally positioned and ethically obligated to assist in countering capture by generating socially and politically transformative regulatory alternatives capable of attracting broad popular appeal" (Maclean, 2019, p. 482). I do maintain the Poulantzian position that the state is a condensation of social relations, neither an instrument, nor something that stands above a society, and certainly not a natural or neutral arena. Because of this, ecosocialist and anti-capitalist struggles cannot simply assume the reins of state apparatuses and expect egalitarian outcomes. As Peter Gelderloos, a longtime anarchist author and social movement organizer, says in a simple and honest way,

> Our survival depends on escaping the dead-end cataclysm of the official response. But we can't enact solutions we're unable to imagine — so let's start imagining a real solution. It won't be an easy exercise: We'll have to jettison the entire institutional complex that has caused and is managing the problem. We'll also have to envision change occurring through a completely different paradigm than the one we're brought up believing in. (2025, Intro)

But, because of the state's form as a condensation of these contradictory and fragile class relations, there is opportunity for division to be sown within the power bloc, expanding and deepening the cracks and contradictions already alive within it. I can only hope to help expand such fissures, remaining committed to alternative life ways and social organization, around an ecological socialism which rejects the value form of commodities, and seeks the socialization of production. Such organization would mean many, almost unimaginable changes in human and more-than-human relations. Although I might not agree with all of Mandel's arguments, his view of socialization is simple and elegant:

> (1) abolition of commodity production and the gradual disappearance of money ('the power of the relation of supply and demand dissolved into nothing'); (2) volition of trade in consumer goods, at least within the commune; (3) controlled by the freely associated producers over the product of their labor, and over their working conditions, including access to consumer goods; (4) controlled by the people over 'the mode of their mutual relation', which rules out a repressive apparatus separate from society. (1975, p. 20-21)

But in grounding myself in the world of policy and enforcement, which was a major focus of this project, I wish to present some practical recommendations directed at the provincial state, the AER, and the OWA.

There have been many sensible policy ideas which the province at large has refused to enact which might curtail the crises explored in this dissertation. These recommendations have come from both within and without the Regulator over the decades. Public-facing environmental justice organizations and landowner advocacy groups impacted by development have worked hard to organize themselves and have their voices heard, but often they are stunted by the power of the fossil bloc. Researchers at the Canadian environmentalist organization Environmental Defence published a report in 2023 attempting to tabulate the total cost of environmental cleanup associated with the nation's hydrocarbon extraction and production. According to the report,

> The report authors compare the expected revenues from remaining production to the current and mounting cost of environmental liabilities. Under the "Economically Efficient" scenario, at least 37 per cent of industry profits must go to paying for the cleanup of the oil and gas sector's environmental liabilities. Even with longer phaseout timelines in the "'Business as Usual' scenario", nearly 20 per cent of profits must go to environmental cleanup. (Levin, 2023, p. 5)

Thus, the fossil bloc could *afford* to cover the outstanding liabilities. Ultimately, it is also the responsibility of the financial capitalist faction who lend, underwrite, and invest in fossil firms to cover some liability costs. In the end, the report recommends that solvent fossil firms pay for the $123 billions of country-wide decommissioning, remediation, and reclamation efforts.

The Alberta Liabilities Disclosure Project (ADLP) published a 2021 report with a similar recommendation, although with more focus on the potential to create a 'jobs boom' in Alberta from the asset ARO work. One of the most important analytical contributions from this report was their calculation of the true average cost of well and project site cleanup. Whereas the OWA stated that the average cost of shutting in wells from their inventory to be less than $20,000 on average, the ALDP found the average cost to be over 10 times that number (Boychuk et al., 2021, p. 12). They estimated–given that this was published in 2021 before any real impacts from the AER's new LMF and *Directive 088* could be realized–that this ARO work would generate more than 10,000 full-time jobs and almost $2 billion in contributions to Alberta's gross domestic product.

The way I have thought through this phenomenon and its solutions are informed by the positions found in researching and reporting like this. But my recommendations are also informed by my direct experiences with the fossil industry and are more concentrated on breaking the political power of the fossil bloc. While ensuring that 'polluters pay' according to federal Canadian law, this is unlikely to unseat the power of the fossil and finance capital. This is problematic because these same factions of capital have already shifted their focus to expanding tar sands investment and production and to other climate capitalist ventures (discussed below). Without challenging the fossil bloc's hegemony, there is little hope that much will improve on a permanent basis. While my initial instinct is to nationalize the province's industry, there are several steps that could be enacted prior to and alongside this process. Below is a list of five policy recommendations which I drafted that have not been explicitly published by organizations and individuals. Depending on the nature of the recommendation, they could be realized immediately or phased in over time.

1. **Return the AER to the ERCB so that it once again resembles a board**

- Since the Regulator was reorganized as the AER in 2013 following the passage of REDA, it has been shaped in the image of a private corporation. Prior to becoming the AER, for example, the ERCB and EUB both were directed by boards of directors and conducted their regulatory investigations alongside the provincial ministry Alberta Environment. Now, the CEO of the AER leads daily operations, and the organization has sole regulatory authority meaning that no other provincial ministries are involved in the inspection and enforcement of regulation
- As such, the AER should return to the form of the ERCB. This would necessitate either repealing the entirety of the province's REDA, or the relevant sections related to the establishment, governance, and enforcement of the AER, including Parts 1 and 5.
- Along with this, amend REDA or legislation which will take its place that will create a moratorium on the inclusion of fossil-professionals on the AER board. This would include any individual who has been employed in the last 10 years for any fossil lobby groups (CAPP, EPAC, Pipeline Contractors Association of Canada) or by any fossil firm.

2. **Disband the OWA in order to create a new, independent organization: The Deserted Fossil Infrastructure Board (DFIB)**
    - The OWA is a delegated authority pursuant to Part 11 of the province's OGCA's, as outlined in the *Orphan Fund Delegated Administration Regulation*. But, as discussed in Chapter 5 through conversation with Mark Dorin, the Provincial

Cabinet has the power to disband the OWA and create a new, independent organization which is still funded by the OFL, as collected by the AER.

- Accordingly, the Cabinet should disband the OWA and institute a new delegated authority, like the Deserted Fossil Infrastructure Board (DFIB). The AER would still have the legal authority to prescribe the OFL amount according to their investigations into insolvent operators and subsequent growth of the organization's deserted inventories. The new organization would not have an Executive team but instead be organized as a Board and guided by directors.
- Like the above suggestion regarding the ERCB, a moratorium should be established on the inclusion of fossil professionals, including lobby associations like CAPP or EPAC or the Canadian Energy Pipeline Association, on the new board of directors. The DFIB would not include industry-appointed board members, as the OWA currently does, but instead would have membership from oil field service contractors, professional ecologists, and environmental health experts - professionals who oversee the work of decommissioning assets, performing site assessments, and implementing remediation and reclamation strategies.

3. **Increase hydrocarbon royalty and tax rates to a flat 50%, with an incremental increase of 2.5% annually**
   - Currently, the province has a 'sliding scale' royalty rate for tar sands development. In short, "the government has designed royalty rates to change based on the price of oil, so the risk and reward is shared between industry and

government. When prices are high, the royalty rates are higher, and when prices are low, the royalty rates are lower" (Government of Alberta, 2025).

- This sliding scale rate should be replaced with a flat tax rate of 50% on all operations, with an incremental increase of 2.5% annually until 2050. The incremental increases coincide with the federal government's 2050 net-zero carbon commitments. Through these incremental 2.5% increases, by 2030 the effective royalty rate will be 60%, in 2040 the effective royalty rate will be 75%, and in 2050 there will be an effective 100% royalty rate on hydrocarbon extraction and production in the upstream sector.
- In this scenario, the industry will effectively be nationalized, as all production assets and revenues will have been paid directly to the province. In this scenario, all unfunded industry liabilities can be subsidized by this royalty regime on solvent upstream operators.

4. **Petition all sub-1.0 LMR fossil firms into bankruptcy to accelerate clean up**

    - According to an anonymous interviewee, the provincial government has long been implicitly told that it is too late to try and recover money to cover unfunded liability costs. As such, the Government of Alberta announced the new LMF framework in July 2020. This ushered in *Directive 088*, its associated operational Manual 023, and the Licensee Capability Assessment (LCA). The new LCA program is quite complicated, but it has effectively eliminated the need to petition sub-1.0 LMR firms into bankruptcy. This is because the other option for the Regulator and province was to amend the LMR program due to longstanding under-estimation of ARO costs and over-estimation of fossil firms' revenue streams. According to the same interviewee, an LMR score of between 2.5-3.0 is actually representative of a safely solvent firm (meaning that the firm has three times the amount of assets that it does liabilities). While the new LMF will aid in reducing the inactive well inventory, it will not take care of the orphan inventory lying in wait from already-insolvent firms.

- This mass bankruptcy petitioning process will principally impact financial lenders and corporate receivers, as this set of fossil borrowers (currently at least 303 different licensee firms according to the AER's LMR reporting) do not have the liquidity to cover liability costs. As such, the financial lenders will be responsible for taking care of the collateralized fossil assets as part of their lending agreements.

5. **Prioritize the hiring of both regional Indigenous nations' traditional knowledge holders and ecologists from across Treaties 6, 7, and 8 and ecological economists, biophysical ecologists, and environmental health specialists for a new, specialized division in the AER to retool project land reclamation programs**

   - The reformed ERCB should create a new division which focuses on the ecological economics and environmental health of impacted communities and local ecologies. It would have a similar function as the AER's Contaminated Sites Group and would be informed by Alberta's Tier 1 Soil and Groundwater Remediation Guidelines. But this group would begin by conducting both desktop studies and in-person research projects to reassess best practices for remediation and reclamation of project sites. This is because there are many issues with seemingly banal contaminants from production which are not properly addressed in the AER's litany of manuals and directives. Take, for example, the issue of soil salinity (the concentration of soluble salts) in post-disturbance sites. Timoney argues that this omnipresent issue is improperly addressed due to the widespread use of non-native species in the province's reclamation:

> As with the petroleum guidelines, the use of existing "acceptable" levels of salinity and conductivity may not be protective of natural ecosystems. Levels of salinity, sodicity, pH, and conductivity considered "acceptable" are largely based upon responses of species commonly used in reclamation (e.g., Howat 2000). The focus on reclamation species means that there is little information available for the majority of native species. Levels of salinity that permit reclamation species to survive are irrelevant to most native species. (Timoney, 2021, p. 45)

- Thus, this recommendation is in response to complaints made by interviewees Mandy Olsgard and Timoney about the lack of remediation guidelines in the Regulator's reclamation certifications. According to Olsgard, within the province's guiding Specified Enactment Directives (SEDs) "it's very hard to find a reference to the requirement to remediate or decontaminate a site before you just reclaim it by putting like a cap of soil on it" (personal communication, November 9, 2023).

Limitations of Research and Future Horizons of Inquiry

While this dissertation explored one worrisome phenomenon of Alberta's fossil economy, my research scope was limited due to many factors. I chose the specific perspective and subject of deserted infrastructure because there is a dearth of political, ecological and economic research which takes up the sprawling complex of liability management. The main limitations of this research were: the limited geographic scope; the narrow view of strictly conventional resource liabilities; and the limited distribution of interviews.

Limited Geography

First, I limited the geography of the study to only one province within one advanced industrial core country in the network of global oil trade. I recognize that the lack of interprovincial and global context leaves some large gaps in the story. Understanding Canada's location in the broader world-ecology (à la Jason Moore, 2015) and attending to the *international* world-system and political economy (following Wallerstein) would have aided in explaining both capitalist and financial firms' production and financing decisions alongside regulatory policy choices. While this is an important critique to recognize, I believe that this dissertation research has set the stage for in-depth comparative analysis with other domestic and international hydrocarbon economies' liability regimes. I see interesting direction for further research that expands the geographic scope of this empirical fossil policy study, like that already begun by scholars in Canada, not least including Angela Carter's critical work in *Fossilized* (2020) or the Corporate Mapping Project's numerous outputs (Brooks et al., 2023; Carroll, 2021). A study of the impact of the Canadian fossil bloc on determining the historical policy direction of other provinces would complement this research well.

Similarly, the phenomenon of extractive/productive asset desertion is not new, and it is not contained to Canadian provinces. Some estimates put the number of inactive wells in the United States alone at 3 million (Ho et al., 2016). These wells, whether in Canada or in the

United States, pose significant threats due to their pervasive releases of greenhouse warming gasses like methane (Klotz et al., 2025). It is difficult to estimate exactly how many of these wells are categorically deserted given that states do not report this data consistently. But this goes to show that there is ripe ground for a comparative political economic analysis of how different jurisdictions handle deserted infrastructure.

One of the damning, international situations that has plagued the Regulator over recent years has been investigations into their estranged child, the International Centre of Regulator Excellence, known as ICORE. According to the AER's telling, ICORE was founded in 2017 in partnership with the Government of Mexico, product of the AER's 2014 Regulatory Excellence initiative, which accompanied their subsumption of the various regulatory systems into the single-window approach. At this time, certain staff at the AER (including the former, now-disgraced CEO) were proud of their regulatory work and sought international audiences to which they could export the AER's fragmented and ineffective regulatory design and practices. Particularly, the AER's then-CEO, Jim Ellis, Executive Vice-President of Stakeholder Engagement, Jennifer Steber, their VP of National and International Relations, Zeeshan Syed, and Chief of Staff, Martin Krezalek, saw this as a potentially lucrative opportunity for the Regulator and themselves. In short, ICORE was "designed and built primarily to generate money from international jurisdictions through training of foreign regulators and by providing regulatory services" (Auditor General, 2019, p. 7). Put another way, ICORE manifested as an attempt by fossil capitalist intellectuals within the Regulator to export the anemic regulatory regime of Alberta to countries with emergent and developed hydrocarbon extractive sectors through contracted work as educators and advisors. In the AER's 2017 annual report, they believed ICORE would "enable regulators to exchange best practices, advance their collective body of knowledge, and train both emerging and established regulators from around the world. The AER is a regulator, not a trainer, therefore the creation of ICORE can address work that's beyond our mandate" (AER, 2017, p. 26).

What happened in reality was a hodgepodge of fund mismanagement, gross negligence by the Regulator's senior leadership who were developing the program, and a subsequent slew of staff resignations. The Auditor General of Alberta, the provincial Public Interest Commissioner, and Ethics Commissioner all undertook investigations into the ICORE program. They found that public money was wasted by the leadership on luxury travel, controls on personnel conflicts of interest were completely useless, the Board did nothing to intervene, and its Chair was implicated in the activities, and the biddings of the group were able to be hidden from the public's view (Auditor General, 2023). In their words, the Auditor General found that "the AER Board did not have all the skills, nor did they contract the required skillset, to conduct proper oversight" (Auditor General, 2019, p. 32). This is an unfortunately recurrent theme across the Regulator's collection of responsibilities, but it was unique as ICORE was a transnational project. Despite the widespread issues with regulation and enforcement of industry at home, they were geared up to export these to other resource-bearing countries, starting with Mexico. All of this is to say that the AER is implicated in international political economy through situations like ICORE, but I did not focus energy and research on this component of the organization.

Limited Scope of Liabilities

Second, this project only investigated one subject of Alberta's liability management regime: deserted conventional infrastructure. Originally, I had intended to combine this study with analysis of tar sands waste, specifically the socioenvironments and liability matters of Alberta's mushrooming tailings ponds. The Alberta tar sands megaprojects—the Athabasca, Cold Lake, and Peace River project sites—are surrounded by almost 2 trillion litres of "water, sand, silt and petrochemical waste products" (EDC & NRDC, 2017, 1). This "oil sands process-affected water" is the effluent of industrial tar sands production (or the by-product of the tar sands water-based separation process specifically), the decades-long amalgam of waste from Alberta's now-premier source of fossil and financial capitalist accumulation. I realized that a comparative analysis between the two cases would mean doubling the length (and timeline) of the dissertation. This is due to the extent of difference in geophysics, technologies of extraction of unconventional reserves, the sheer size of the problem, the ecological impact of the waste sites, and the unique nature of the factions of capital involved.

This expanded view of liabilities in the tar sands was meant to be informed by the multi-disciplinary research of the critical discard studies. It is another subfield which can complement the political ecology framework. Well its core objects of analysis are waste and wasting it is united by a critical framework that questions premises of what seems normal or given, and analyzes the wider role of society and culture, including social norms, economic systems, forms of labor, ideology, infrastructure, and power in definitions of, attitudes toward, behaviours around, and materialities of waste (Discard Studies, n.d.). It is sometimes interchangeably associated with 'waste studies,' of which it has many overlapping premises and objects of analysis. Like critical political ecology, the field invites interdisciplinary scholars and approaches and works towards a radical analysis that decanter traditional understandings of the social categories waste and purity (i.e., cleanup). It hosts scholars focusing on e-waste, psychoanalytic geographers, environmental remediation specialists, conservation biologists, and material engineers to name a few. It is in the business of reconceptualizing and defamiliarizing (Liboiron & Lepawsky, 2022) common assumptions, truisms, or experiences about waste and wasting. While the research in this dissertation could contribute to this field, I ultimately decided to not engage this body of literature yet.

As was reiterated in several of my interviews, the accumulating liability attached to remediation and reclamation of tar sands mine sites dwarfs the socioenvironmental and liability costs of the conventional sector. This is due to the immense scale of tar sands process waste known as tailings fluid, discussed briefly in a number of sections in the body of this dissertation. My rationale for homing in on the conventional sector instead of the tar sands, as I explained at the outset of the dissertation, is that a great deal of political-ecological and economic scholarship has been focused on the tar sands reserves. On the other hand, much less focuses explicitly on the sundowning conventional sector. Luckily, this research has illuminated a path towards an agenda investigating the socioenvironmental risks of the Regulator's unconventional liability management regime, along with the influence of the fossil and financial capital classes' work in organizing the Albertan state in response to this phenomenon. Both the worlds and the province's tar sands extraction is still ramping up today, meaning that it is not too late to undertake such research! Many of the same methodological approaches used in this project could be employed in a future project about tailings management.

Similarly, in 'studying up,' I limited the focus of my study to the decisions of capitalist class elites and bureaucrats. In doing so, I did not have the time to focus on the role of diverse types of labour in the valorization of surplus value in the oil patch. Labban makes a fair point regarding why labour is still a particularly good object of analysis, even given the organic composition of fossil capitalist production in the patch:

> The focus on labour in the oil industry may seem anomalous given its apparent capital-intensive character, but this appearance is precisely what renders the oil industry an appropriate object of the critique of labour under nance. …the financialization of the oil corporation has rendered the industry more labour intensive, and this requires thinking labour intensiveness in terms other than the number of workers and the cost of labour relative to the cost of capital for the corporation. (2013, p. 478)

That said, I did attempt to interview members from Iron & Earth, a worker-led organization of tar sands labourers who are "committed to incorporating more renewable energy projects into our work scope" (Iron & Earth, n.d.). This was intended to gain both an understanding of their views on liability management and their organizational involvement as a partner of the RenuWell Project. The RenuWell Project is attempting to convert deserted well sites into solar energy development sites through the reuse of existing access roads and powerlines, combined with a focus on long-term bioremediation of the land (Hildebrand, 2020). These projects have started to come online and are a novel shift in the evolving terrain of Albertan climate capitalism. They were awarded by the Alberta Emerald Foundation in 2024 as "RenuWell Project partners have successfully deployed two pilots within the MD of Taber, with a combined installed capacity of 1.45 MW, equivalent to powering 300 homes or 90 quarter-section pivot irrigation systems" (Alberta Emerald Foundation, 2025). All this to say that it was a notable gap in the research, one which could have helped identify how and which fossil firms are addressing (or not addressing) their liabilities. I know that connecting with this group of workers would have been fruitful, given our shared backgrounds in upstream energy work and interest in decarbonized energy production.

Limited Theoretical Scope and Unresolved Contradictions in Thinking

Finally, despite attempting to include a variegated theoretical framework across the spectrums of political ecology, Marxian critiques of political economy and statecraft, the geosciences, and human geography, this dissertation often relied on what some might label a type of economic determinism, prioritizing class relations above other points of analysis. By this I mean that I began much of my analysis with the economic base of production in Alberta to subsequently understand superstructural components of Albertan society, such as its legal, political, and ideological makeup. This is because I am compelled by the historical materialist argument which believes that shifts in the mode and relations of production will subsequently lead to dramatic changes in the superstructural elements of a society. As Marx explains in the preface of *A Critique of Political Economy*:

> In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness. At a certain stage of development, the material productive forces of society come into conflict with the existing relations of production or – this merely expresses the same thing in legal terms – with the property relations within the framework of which they have operated hitherto. From forms of development of the

> productive forces these relations turn into their fetters. Then begins an era of social revolution. The changes in the economic foundation lead sooner or later to the transformation of the whole immense superstructure. (2000, p. 425)

Thinking in this manner makes sense when considering the pride of place which fossil capital commands in the province of Alberta. Fossil capital has a unique omnipresence that has been described in detail across the scholarship that informs my thinking and research. Whatever position one may argue on this, Marx and Engels themselves rejected any tie to an 'economic determinism' in their work. As Ralph Miliband argues, they were dismissive of any 'rigid and mechanistic notion' which located the economic base as the only determinate factor in society. He says, "it is much more apposite and meaningful to treat the 'economic base' as a *starting-point,* as a matter of the *first instance*" (1977, p. 8, emphasis in original). This is in part what led me to focus on subsequent interventions from Marxist theorists like Gramsci, Poulantzas, and Mandel, to narrate the ideological and political dimensions of capitalist production in the province. Gramsci is sometimes cited as a key figure in post-structuralism and other anti-Marxist academic currents, though this is not the way I read his theories. Rather than trouble myself with their location in modern academic camps, I employed his work as well as Poulantzas subsequent theories on hegemony and the capitalist ruling bloc to understand political movements and ideological currents.

Still, there are many other modes of analysis and points of departure that can be used to understand both the driving forces and negative, diffuse impacts of fossil capitalist accumulation. Not least of all, focusing on the conditions of Alberta's colonial relations and imperialism, systemic racism, and gender dynamics. There have been profound implications in Alberta (and Canada writ large) that are a product of its deep settler colonial history. This is especially so when considering the country's extractive economies, hydrocarbons, and other factors. This dissertation could have been improved through a more fulsome engagement with dynamics of Canadian settler colonialism and the ways in which capitalism and colonialism conjointly shape practices of wasting in the province. Similarly, it would have benefited from including histories and successes of specifically Indigenous-led anti-extractive social movements targeting the industry.

I believe that there is an opportunity to expand on this analysis of asset desertion with specific attention to settler colonialism. This could start from the point of identifying the relationship between Canadian state treaty making and asset desertion. For example, this could look like identifying how treaty relations with First Nations and Metis nations across the territories of Treaties 6, 7, and 8 alter a firm's ability (or decision) to desert assets. This analysis could also assess to what extent anti-colonial movements are targeting these wasting practices, including such as organizations like Indigenous Climate Action[83] or the Keepers of the Water Society.

This is all to say that while the conventional hydrocarbon sector in Alberta is slowly winding down and its many contradictions continue to see daylight, the fossil bloc continues to seek ways to maintain its political power and course of extraction. Of course, the tar sands will remain the focus of the major producers in the region, and any low-carbon energy sources will be additive, and the change will be slow, but their political projects will attempt to extend beyond that extractive frontier as well. If the destructive political power of fossil capital is to be broken in the transition to low-carbon energy futures, we need a robust understanding of its trajectory and evolution. Likewise, we need to be collectively forward thinking about counterhegemonic

[83] This was an organization I intended to reach out to with an interview request prior to my ethics rejection.

projects, much like the fossil bloc itself does. This future is not written, and I refuse to believe that capital is too big to break today. This dissertation has been one modest contribution to understanding how this political power has manifested through the late capitalist state and where we might look for cracks in its walls.

Postscript: Fossil Capital's Short-Term Future; More Orphans, Carbon Fixes, and Tar

While I cannot guarantee it, signs point to the growth of the deserted conventional hydrocarbon asset class over the coming years. Already, many sizable firms have started to desert their infrastructure in the wake of *Redwater*, as failures to recapitalize or restructure during insolvency have left them no choice. The Trident Group, a consortium of private natural gas producers which operated in the province, deserted more than 4,700 wells across 4,440 AER-licensed sites equating to around \$329 million in unsecured liabilities and \$90 million in outstanding debt to their secured lenders in 2019. According to a court affidavit sworn by Lars Depauw, the AER issued an order to Trident on April 29 of the same year stating they must "address end-of-life obligations associated with 4,400 energy licensed sites, either by decommissioning those sites, posting financial security or transferring the sites to responsible energy companies," per the OGCA (Court of Queen's Bench Alberta, 2019, p. 3). In a seeming fit of rage, Trident's executives fired all employees, most of the board resigned, and the leadership left 1,500 wells active with no operator to oversee their production. In a press release from April 30, the following day, Trident hid behind, among other things, low natural gas spot prices and inflated surface lease and property tax payments as the reason for their shutdown. Trident leadership went on to claim that, "ultimately, the recent Redwater decision, regulatory uncertainty and a lack of egress has created a treacherous environment for energy investors that dare to risk their capital in Canada" (Court of Queen's Bench Alberta, 2019, p. 6). Further in their officially released temper tantrum they say, "as many have speculated and we have unfortunately proven, the *Redwater* decision has had the unintended consequence of intensifying Trident's financial distress and accelerating unfunded well obligations" (Court of Queen's Bench Alberta, 2019, p. 6).

In another incredible display of complicated and shadowy corporate asset shuffling, Sequoia resources, briefly discussed in Chapter 4, disclaimed 2,500 assets onto the OWA at the beginning of 2025. Sequoia has been in bankruptcy proceedings since 2018, with PWC appointed as their receiver, but the process was slowed down due to litigation between PWC and Sequoia where the OWA appeared as an intervenor along with several of the province's Big Five producers (Yewchuck, 2021). Either way, the OWA is absorbing 90 pages of fresh assets from Sequoia that will entirely consume the latest $235 million loan from the province meant to help speed up outstanding remediations. This will nearly double the OWA's current inventory, which stood at just under 3,000 wells awaiting the first stages of abandonment prior to Sequoia's mass desertion.

Trident and Sequoia's bankruptcies were both exemplary of the new aggressive position that the OWA has adopted over recent years, as briefly explained in Chapter 4. Unfortunately for the Big Five, they cannot be aggressive enough now. They can thank themselves for maintaining control of what is merely a defensive system against desertion, waiting far too long to impose pre-emptive measures like the mandatory closure targets set out in *Directive 088*. But the depletion of their recoverable conventional reserves, and the slow sundowning of the conventional sector writ large, certainly does not mark the end of fossil and finance capitals' marathon of wrestling value from Alberta's colonized lands. As has been alluded to in several moments of this dissertation, the expansion of the tar sands mega projects is a primary focus of the country's monopoly firms. At present, the near-term targets of both capitalist factions are, 1) securing regulatory fast tracking of socioecological fixes to their *carbon problem* and, 2) ensuring the smooth, profitable ramp up of unconventional production. These two objectives are dialectically linked and, arguably, the success of the latter may well depend on the success of the former. Thus, the ongoing mass desertion of assets is not the only worry for the regional oil majors. They also need to attend, biophysically and politically, to the unbelievable scale of pollution that the fossil industries have produced in the country.

The federal government has developed a ‘Carbon Management Strategy’ to attend to its producer firms' all-too-much-carbon problem (Government of Canada, 2025). Perhaps unsurprisingly, the state has taken on the ‘managerial mood’ to its carbon problem, an attitude in line with its other neoliberal resource governance approaches (Hood, 2000). The nation has had to adopt this management regime because it ranks 12th in the world in total emissions and is the second-highest emitter of greenhouse warming gases per capita. This comes to about 17.7 tonnes of CO2 annually per each of the 38 million Canadians alive. Although this is a difficult volume to conceptualize, it would equate to the same amount produced by someone driving around the entire globe twice (Environment and Climate Change Canada, 2024). The province of Alberta’s extractive sector clinches gold in the country’s GHG emissions tally. Oil and gas produced 158.3 megatonnes (Mt) of CO2 in 2022, largely from production, processing, and transmissions (Canada Energy Regulator, 2024). One Mt is equal to one million tonnes or one billion kilograms. Written out in full, this means 158,300,000,000 kilograms of carbon come spewing out of Alberta’s fossil sector each year. As is the tradition of writers to compare inconceivably large masses against the average weight of adult African bush elephants—around 5,896 kilograms for an adult male—we can follow suit: this equates to 26 million elephants. With each Canadian having two-thirds of their own carbon elephant to handle, it is no surprise that the state has taken to strategizing around the collective carbon footprint.

They are doing this in part through a technology known as carbon capture and storage (CCS), or carbon capture storage and utilization (CCUS), depending on the project's nature. It is an energy intensive, expensive, and unproven at scale way to remove carbon dioxide from the atmosphere, with some research suggesting it could cost as much as $200 CAD per tonne of carbon (Cameron & Carter, 2023). Seven commercial-scale projects are already in action across Canada, with five operating in her oil fields. In the case of heavy bitumen extraction, it works through capturing emissions and then liquifying them through intense pressure, much like the natural gas liquification process. A sprawling octopus of pipelines are built into tar sands upgraders' emission points, the plants where the crude oil from strip mined sands is separated out. Once the carbon is captured and liquified, it is stored below ground. In the case of CCUS projects, the carbon can be utilized through its recycle into extractive projects:

> Most commercial-scale CCS projects in Canada use the captured carbon to boost the production of oil and gas through a process called enhanced oil recovery (EOR), injecting carbon dioxide (C02) into declining oil fields to increase production, thereby creating new emissions. (Cameron & Carter, 2023, p. 2)

This poor carbon can be used and abused repeatedly in this recycle-to-extract nexus before it is shoved back to whence it came, as far as two kilometres underground. These projects only have the capacity to capture 0.001% of annual carbon production around the globe, despite the decades of research and development they have won (Levin, 2022).

The networks of capitalist elites, anticipating the death agony of fossil capitalism, are working to usher in these domestic and transnational projects under the new banner of 'climate capitalism.' This new mode of accumulation "designates the neoliberal attempt to mitigate climate change through market measures that turn aspects of nature into new means of accumulation while minimizing end-of-pipe, direct state regulation of greenhouse gas (GHG) emissions" (Sapinski, 2016, p. 268). Carbon markets, where you can simply buy or sell excess carbon emissions (it is that easy!) were one of the first theatres to attempt to work out this new genre. But they have already faced a lot of scrutiny and criticism to date as they rely on land dispossession in the Global South (Sapinski, 2015) and are based on dubious ecological accounting and science (Lohmann, 2008). Carroll (2020) argues that this fomenting climate capitalism fits Gramsci's theory on passive revolution through its technocratic solutions to environmental degradation that do not create too many disruptions for workers and may even offer improved life-stylings for the middle class. This slow passivity is important to capital's reproduction as rapid decarbonization, and socialized transition would result in loads of stranded assets (namely the fixed capital used in hydrocarbon production) and no time for the reorganization of fossil capital elites around a new accumulation base (Carroll, 2018).

The province's latest $16.5 billion proposed CCUS project (briefly mentioned in Chapter 4) comes from the tar sands' best under the title the Pathways Alliance. Pathways is a consortium of the six largest firms in the province who own 95% of the regional surface leases - CNRL, Cenovus, ConocoPhillips Canada, Imperial, MEG Energy, and Suncor. They cling to deformed ideas about the good of free markets in environmental stewardship, sure to organize and stabilize this new network, something the critical geographer Noel Castree warned us about. In 2023, the Alliance's president, Kendall Dilling, began making calls for federal direct injections into the project, which would be situated in the Cold Lake area of the province. Dilling's said to a Fort McMurray crowd, "Once you get that first wave of infrastructure in place, prices will come down, the market will take over, and government won't always have to be a player," (McDermott, 2023). Naturally, our old friends at CAPP (whose member firms are the members of Pathways) mobilized to begin pawing at the province and federal government's Department of Finance, vying to get at least 75% of Pathway's project covered.

As if the industry had not already reabsorbed enough of the public coffers they pay into, Premier Danielle Smith's government penned them just the custom coupon book of CCUS grants and corporate income tax rebates that they wanted. It could cost the province more than $5 billion in lost revenue over the next decade. Always happy to be in lock step, Prime Minister Justin Trudeau's government had already mulled over a federal CCUS Investment Tax Credit in 2022, which they were happy to put into law in 2023. Estimates of how much this will cost the Canadian tax base are contingent on how much firms themselves redirect into the projects. The state has given this variety of investment credits a 25-year shelf life though, so firms are welcome to mosey back in once they grow bored of other investments marked with climate risk or simply those carrying lower returns.

Together, this unholy union between mass carbon deposition into the atmosphere and carbon capture technology, a terrible but seemingly perfect dialectic movement towards dawning climate capitalist accumulation, does a terrible dance. This proposed *carbon fix* is another perverted negation of the negation, internalizing and commodifying the inevitable off-gassing of carbon dioxide that necessarily accompanies the consumption of hydrocarbons. We now get to watch as the producers of the all-too-much carbon dioxide that has long positioned the planet in a climate crisis try to suck the inevitable by-product of their accumulation out of the air and put it back underground or (worse?) rebottle it for more extraction.

APPENDICES

Appendix A: Terminology

There are many similar sounding, industry-specific terms within advanced hydrocarbon economies. Rather than awkwardly cramming the definitions and specific uses of these terms into footnotes, this section outlines how the industry uses these terms and how I use these terms in this dissertation. As one text on tar sands production processes says,

> Definitions are the means by which scientists and engineers communicate the nature of a material to each other and to the world, through either the spoken or the written word. On the other hand, *terminology* is the means by which various subjects are named so that reference can be made in conversations and in written and so that meaning is passed on. (Speight, 2013, p. 2, emphasis in original).

As such, this appendix contains definitions from the industry, the Regulator, parastatal petroleum organizations, and me. My definitions sometimes work against the hegemonic industry definitions. In most cases, these terms are explained in detail in the body of the dissertation, within their relevant context, but this section serves as an explainer and place to return for clarity if necessary.

Abandonment / Abandoned Well

Following the indeterminate period of suspension, a well then reaches the abandonment phase. Rather than referring to the act of giving up, leaving, or stopping providing support to someone or thing, this is the technical term for the appropriate closure practices of a well at its life's end. Per *Directive 013*, "a well that has been downhole abandoned, surface abandoned, and the well license status is “abandoned”” (AER, 2022, p. 19)

AER License

This is the legal means through which oil and gas firms (operators) are granted privilege to extract, process, and transport Alberta’s hydrocarbons. The OCGA gives an unspecific and recursive definition on this: “A license granted pursuant to this Act or any predecessor of this Act or a regulation under any of them or rules under this Act” (Government of Alberta, 2023, p. 10). The act later clarifies that, “no person shall commence to drill a well or undertake any operations preparatory or incidental to the drilling of a well or continue any drilling operators, any producing operators or any injecting operations” without an approved license (Government of Alberta, 2023, p. 25). This likewise applies to licenses for facilities, schemes, processing plants, and pipelines, the latter governed by the PA (Government of Alberta, 2023b, p. 6).

ARO

This is an acronym for ‘abandonment and reclamation obligations.’ This is the obligatory end-of-life care that hydrocarbon assets and production sites in the province are expected to go through according to provincial environmental statutes. This includes all decommissioning, environmental site assessment, remediation, and reclamation.

Conventional Oil and Gas

Hydrocarbon reserves that can be recovered through traditional well drilling and pumping techniques are marked by low viscosity and a liquid state (in the case of crude oil) at atmospheric temperatures and pressures. Conventional crude, for example, “is a liquid mixture of paraffin and other hydrocarbons spanning a wide range of molecular weights and containing varying amounts of Sulphur, nitrogen, and other elements' (MacFadyen & Watkins, 2014, p. 3). The oil or natural gas must be fluid enough to be pumped out of its reserve without new age technologies forcing it out. Natural gas extracted without lateral well drilling and extensive hydraulic fracturing is considered conventional.

Desertion

In contrast to the terminology of 'orphan' formally adopted by the Alberta government and its regulatory bodies, I use the term 'desertion.' I continue to use the term 'orphan' when referring to the OWA and AER's empirical data on their inventory, but my own analysis of this broader phenomenon explicitly avoids it. This is because I argue that the desertion of this infrastructure shapes a crisis in capitalist production as the continued externalization of social and environmental costs is absorbed by Albertan non-profit institutions, solvent operators paying industry tariffs, the province of Alberta and, accordingly, the public. I contest the province's obfuscatory language of 'orphaning' to better illuminate the way that licensees leave behind these assets whenever possible to maximize their profits and leave these environmental costs and hazards to someone else. This is part of my discourse analysis and interrogation into the language employed by the regulator and the industry which serves to shield financial-industrial capital from responsibility wherever possible.

Disclaiming

Once a fossil firm is within bankruptcy proceedings and receiver-led salvage sales have concluded, any remaining unsold assets revert to the OWA's portfolio as deserted infrastructure.

For this to happen, the bankrupt fossil firm must ‘disclaim’ the assets. This is a legal declaration stating that they will not oversee the infrastructure and project site AROs. This legal step of disclaiming assets onto the OWA is the foundation of asset desertion.

Economic Geology

The Encyclopedia Britannica defines this as the

> scientific discipline concerned with the distribution of mineral deposits, the economic considerations involved in their recovery, and an assessment of the reserves available. Economic geology deals with metal ores, fossil fuels (e.g., petroleum, natural gas, and coal), and other materials of commercial value, such as salt, gypsum, and building stone. It applies the principles and methods of various other fields of the geologic sciences, most notably geophysics, structural geology, and stratigraphy (qq.v.). Its chief objective is to guide the exploration for mineral resources and help determine which deposits are economically worthwhile to mine. Specialists in economic geology often assist in the extraction of the mineral commodities as well (n.d.)

Thus, this is one of the unholy scientific practices used in the extraction of hydrocarbons. It is such an important practice in the matter of refreshing and changing recoverable reserve numbers because it combines the matter of practical extraction and political economic conditions that determine extractive patterns.

Energy Return on Energy Invested (EROEI)

This is the economic geologic metric used to calculate returns on extractive projects. Clark here says, “unlike the traditional financial metric, Return on Investment (ROI), EROEI refers to the amount of *energy spent* compared to the amount of *energy extracted*. EROEI is the ratio between energy expended to extract a barrel of oil, versus the energy provided by that barrel of oil" (2005, p. 79). This is important in the case of crude bitumen, and other heavy oils at large, because the EROEI has historically been extremely low (read: bad) for these hydrocarbons.

Externalities/ External Conditions of Production

Externalities, also known as external costs, are the social, biological, or physical costs not included in the actual prices of commodities but still a byproduct of commodity production. They are considered external "because they were seen[84] as being external to markets, and therefore external to the economic system in which those markets operated" (Oreskes & Conway, 2014, p. 56). The external conditions of production, on the other hand, are those things that must be used by the productive powers of capital in commodity production. Marx, in writing on theories of capitalist economic crisis, defined three sections of these: external physical conditions, labourpower of workers, and "communal, general conditions of social production" (Marx quoted in O'Connor, 1998, p. 160). O'Connor outlines the external physical conditions as almost any biospheric level condition (depending on what of his work one reads) which are more than human: "the viability of ecosystems; the adequacy of atmospheric ozone levels; the stability of coastlines"

Hydrocarbon

These are subterranean mineral oils that are hydrogen and carbon molecules. Hydrocarbons are used for fuel, to heat, and as a capital good in the creation of derivative products like plastics,

[84] This quote is from Oreskes & Conway's *The Collapse of Western Civilization; A View from the Future*, and as such is written to appear as if the capitalist economies of today have fallen.

rubbers, and motor oils. Sometimes synthesized hydrocarbons may be included with the naturally occurring category, like in the case of the natural gasification of coal, or other carbonaceous raw hydrocarbons, into natural gas.[85] In some literature, 'petroleum' serves as a catchall for hydrocarbon commodities. While I use 'petroleum systems' in this text, I never use 'petroleum' when explaining extraction, upgrading, and processing, or the political economy surrounding Albertan development.

Inactive Well

Prior to proper ARO procedures described below, many wells in the province collect the title of 'inactive.' This is dependent first upon the type of well and, second, the length of inactivity. Per *Directive 013,* these are "Critical sour wells (perforated or not) that have not reported any type of volumetric activity (production, injection, or disposal for six consecutive months," or "all other wells that have not reported any type of volumetric activity (production, injection, or disposal) for 12 consecutive months" (AER, 2022, p. 19).

Liability

The direct opposite of an asset's liabilities in this regulatory context are the financial obligations (the ARO) calculated or owed towards the asset's ARO. According to the AER's *Directive 006*, this financial obligation is calculated through "an assessment conducted by a licensee to estimate

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[85] In 2015, I spent a month working at the Dakota Gasification Company's Great Plains Synfuels Plant in Beulah, North Dakota. I would describe it as a horrific place, with huge, towering stacks, which reeked of ammonium sulphate (immediately reminiscent of cat urine), one of the commercial byproducts of the gasification process. Subcontractors were required to always wear half-face respirators while on site due to the toxicity of ammonium sulphate and the other byproducts of the process. As mustaches are the only facial hair compatible with a half-face respirator, various crews of mustached men smelling like cat piss would leave the immense facility at odd hours throughout the day and night.

the cost to suspend, abandon, remediate, and reclaim a site" (AER, 2021b, p. 3). This calculation is made in accordance with Appendix 5 of *Directive 006*. This is a highly variable number as the location, nature, and age of the infrastructure makes few pieces the same.

Licensee

These are the firms who hold the AER licenses described above. The province's *Oil and Gas Conservation Act* (*OGGA*), *Pipeline Act* (*PA*), and *Directive 006* similarly define this as "the holder of a license according to the records of the Regulator and includes a receiver, receiver-manager, trustee or liquidator of property of a licensee and, for greater certainty, includes a person who is a licensee for the purposes of this Act under section 3(3)" (Government of Alberta, 2023a, p.9). The frustration between differing definitions of who exactly is a 'licensee' in provincial law and the federal Bankruptcy and Insolvency Act are discussed within the case of Redwater Energy in Chapter 5. I use this term specifically when discussing financial and consulting firms who assume the assets of bankrupt oil and gas operators as trustees and receivers. In Alberta this would include firms like Grant Thornton Limited or Ernst and Young. This is because while operators can also be licensees, these financial firms do not actually ever undertake the material work of extraction, processing, upgrading, or shipping hydrocarbon commodities. They are merely temporary foster parents or stewards of assets which operators brought into this world.

Light/Sweet Synthetic Crude Oil (SCO)

The synthetic output of crude bitumen upgrading is achieved through fractionation and chemical treatment. This is both more valuable and has a cleaner energy output with a price approximating the industry standard West Texas Intermediate (WTI) crude oil. The upgrading process includes, “1. Diluent recovery; 2. H:C [hydrogen to carbon] ratio upgrading through hydrogen addition or carbon rejection; 3. Fractionation or braking of heavy oil into light oil; 4. Impurity removal; 5. Product blending” (Oil Sands Magazine, 2020). Today, Alberta is an exporter of raw or only partially upgraded bitumen, as demand for the cheaper, heavy bitumen is higher than SCO. Importing countries can refine themselves and would rather do it domestically than pay the premium for SCO. I principally use this term in explaining Canada’s lack of hydrocarbon diversification and the theorizing on Canada’s carbon trappings,’ which both developed on and critiqued the work of Mackintosh (1923), Innis’s (1930/1999) and Watkin's (1963) staples theory of economic growth (Fast, 2014; Gunton 2014; Haley 2011; Laxter 2014).

Operator

These are the actual oil and gas firms who have “control of or undertakes the day to day operations and activities at a well or facility” or “keeps records and submits production reports for a well or facility to the Regulator, whether or not that person is also the licensee or approval holder in respect of the well or facility” (Government of Alberta, 2023a, p. 11). These firms do undertake extraction, processing, upgrading, and shipping hydrocarbon commodities. In Alberta, this includes the likes of Canadian Natural Resources Limited (CNRL), Suncor Energy, Census Energy, Imperial Oil, and many others.

Orphan / Orphan Wells

Production sites or pieces of conventional oil and gas infrastructure which no longer have any legal or financial guardians to take care of them in their lives after viable production. These orphans are wards of Alberta's Orphan Well Association (OWA), which operates under the purview of the Alberta Energy Regulator (AER). This can include oil and gas wells, pipelines, processing facilities, or waste facilities. For infrastructure to assume status as an 'orphan' the licensee must become insolvent and enter, or be petitioned, into bankruptcy. The potential profitability of the orphan is immaterial, and assets may become orphans at any time in their life cycle if their licensee goes under. The Orphan Fund bears the cost of their suspension, abandonment, remediations, and reclamation. The fund is a provincial coffer administered by the AER and used by the OWA which accrues through a levy on solvent licensees in the License Liability Rating program (LLR) (AER, 2021b).

Petroleum

The COGEH defines this as "a naturally occurring mixture consisting predominantly of hydrocarbons in the gaseous, liquid, or solid phase" (COGEH, 2022, p. 10). The term is often a colloquialism and modifier for hydrocarbon products (petroleum jelly, also known as petrolatum, or simply 'petrol' in the British use as fuel for cars and other combustion engines) and engineers or scientists in the industry (petroleum engineers or petroleum geologists). I avoid using it except when describing geologic petroleum systems in Alberta.

Receiver

A firm who is appointed by either a lender (the operator who borrowed money) or secured creditor (the financial institution who lent an operator money) to "recover amounts owed under a secured loan agreement. The receiver may take control and possession, operate, manage, sell, or liquidate a company's assets" (AER, 2023). A receiver becomes involved once an operator is within bankruptcy proceedings. The receivers have the authority to oversee and unload as many viable assets as possible, but they seldom operate the assets as they are financial firms specializing in debt relief, staffed with Licensed Insolvency Trustees (LITs) or other finance hawks. In Alberta, the list of receivers includes Grant Thornton Limited (both the Lexin Group and Redwater Energy's receiver), Alvarez & Marsal, BDO Canada Limited, Hardie & Kelly Inc., FTI Consulting Canada, MNP Ltd.,

Remediation

The process of cleaning polluted environmental media at a project site which happens alongside the suspension and decommissioning of the infrastructure there. There are many types of remediation which are called upon based on what environmental media is polluted (i.e., ground water, surface water, soil).

Reclamation

The final step in a project's ARO, which attempts to return the project lands to something resembling a 'pre-disturbance' level. Once a site concludes this multiyear process, the licensee (and the site) is issued a reclamation certificate. This is a legally required conclusion to the production of hydrocarbon infrastructure in the province.

Security

Money which is collected by the Regulator from fossil firms according to provincial directives. This money 'securitizes' the Regulator if a fossil firm goes bankrupt and does not have the necessary funds to pay for their infrastructure's ARO's. Prior to the 2021 retooling of the province's liability management framework, this was long assessed and collected according to *Directive 006*.

Tar Sands

While the industry prefers the term 'oil sands' when referring to Alberta and Saskatchewan project sites, I use tar sands. I use this term in a general sense to refer to Alberta's Athabasca, Peace River, and Cold Lake deposits. I identify the extracted hydrocarbon (which contains a plethora of contaminants) as 'crude bitumen,' defined below. As Nikiforuk says, the state and industry prefer the word 'oil' as "it sounds abundant, accessible, and clean. Oil raises investment cash faster than tar does, and it reassures consumers nervous about the ever-rising price of fossil fuels" (2010, p. 12).

Unconventional Oil and Gas

Unconventional reserves are made up of heavier, less pure, and more difficult to retrieve hydrocarbons. These include bitumen and heavy oil like that found in Alberta's tar sands, and tight/shale gas or coal-bed methane found in the Rocky Mountain foreland of the Alberta basin. Often, 'unconventional' and 'non-conventional' are used interchangeably in the industry. The AER and Alberta Geological Survey use 'unconventional' instead of 'non-conventional,' so for the sake of this project I use it as well. The categorical distinctions of 'conventional' and 'unconventional' are blurry at best and continue to become intertwined as more diverse reserve supplies are tapped to keep up with fossil capital's demands. But the characteristics assessed for distinguishing between the categories are often, "(1) geological aspects of the formation, (2) properties of the deposits, and (3) technical necessities for an ecologically acceptable, economic exploitation, and more appropriately to the method of recovery" (Speight, 2013, p 2). The messy distinction is part of the industry's work of shaping the discursive present and future of pricing and social perception of the industry, for better or worse (Zalik, 2008). This phenomenon is discussed more in Chapter 2. It would not be unbelievable if one day 'unconventional' supplies are considered the convention of the day, as older wells full of more easily tapped hydrocarbons continue to dry out year after year. Rather than shift development capital to renewable energy projects in these instances, more 'extreme' unconventional sources are tracked down and allotted said capital.

Well Suspension / Suspended Well

Following the adoption of 'inactivity,' a well must next either resume production or be suspended. *Directive 013: Suspension Requirements for Wells* outlines the steps for converting an inactive well into a suspended one. Similarly to the inactivity phase, suspension must happen on a prescriptive timeline: "The licensee must complete the initial suspension and reporting requirements for all inactive wells within 12 months from the *Directive 013* active status date" (directive 13, p. 2). Despite the strict timelines for pivoting an inactive well into a suspended one, the time a well can remain suspended is an ambiguous subject at the AER. Wells can, and tens of thousands do, remain suspended for an indeterminate amount of time. While operators are required to inspect project sites and infrastructure yearly, they do not need to move towards abandonment on any timeline.

West Texas Intermediate (WTI)

The most common benchmark for crude oil on the US spot and futures markets (MacFadyen &

Watkins, 2014, p. 127). WTI is also the ticker for trading futures contracts on the New York Mercantile Exchange. I use this term on occasion when comparing spot market prices of hydrocarbons as it is the dominant benchmark in the U.S.

Appendix B: Sample Informed Consent

Note: I used four different consent forms for the four different types of participants: current OWA/AER staff, former OWA/AER staff, OWA prime contractors, and not-for-profit organization members. The content of the consent forms did not vary but the title of the documents did according to the group at hand. Additionally, when I began this research project, I intended to compare the phenomenon of tailings ponds with deserted infrastructure, as evidenced by the 'Purpose of this Research' section. As the project developed, I decided to focus exclusively on deserted infrastructure.

Informed Consent Form

Date: October 14, 2023

Study Name:

A World of Desertion: Fossil Capitalist Liabilities and Contradictions in Alberta's Conventional Hydrocarbon Economy

Researcher:

Principal Investigator Alie Hermanutz, Doctoral Candidate, Department of Politics, 603 South Ross, York University, ahermanu@yorku.ca, 416-736-2100

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Dr. Jakeet Singh (PhD), Assistant Professor, Department of Politics, 672 South Ross, York University, 416-736-2100 x30013

Purpose of the Research:

The purpose of this research is to explore the political ecological/economic conditions around which oil and gas infrastructure is abandoned, and waste produced, in the tar sands. I hope this investigation will open analysis of: 1) the political ecological/economic background that leads to the abandonment of oil & gas infrastructure (wells, pipeline segments, processing facilities) and the waste of oil and production (tailings ponds), 2) the physical/ecological landscapes of the tar sands megaprojects and conventional oil and gas reserve areas, 3) the fate of hundreds of thousands of assets necessary for Canadian oil & gas exploration, along with more than one and a half trillion litres of tailings waste in the province. My research questions will contribute to a gap that exists in the field of critical political ecology of tar sands oil & gas production concerning sunk oil and gas capital (orphans) and waste (tailings ponds). The research methods I will use include document analysis (DA) and corporate mapping, secondary analysis of ecological scientific grey literature, key informant interviews, autoethnography, and historical analysis.

What You Will Be Asked to Do in the Research:

I would like to conduct a one-on-one semi-structured interview/open discussion with you that will last between 60-90 minutes. The discussion will focus on your experiences as a member of a not-for-profit organization involved in tar sands development projects. I am asking for your consent to audio record and transcribe your interview and/or to take notes during our interview. Audio recording and note taking are not mandatory to participate in the interview. Interviews will be conducted by Alie Hermanutz.

Risks and Discomforts:

I do not foresee any major risks or discomfort from your participation in the research. However, your anonymity will be maintained in the research outputs to ensure that your professional career is not impacted by participation in this research.

Benefits of the Research and Benefits to You:

Participation in this research will not benefit you personally or directly. Indirect benefits of the research may include contributions of your knowledge, experience, and unique perspectives to building in impacting future policy on the matter of environmental stewardship and may motivate the province towards creating stronger environmental restoration programs.

Voluntary Participation and Withdrawal:

Your participation in the study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer, to stop participating, or to refuse to answer questions will not influence the nature of the ongoing relationship you may have with the researchers or study staff, or the nature of your relationship with York University either now, or in the future.

In the event you withdraw from the study, all associated data collected will be immediately destroyed wherever possible. Should you wish to withdraw after the study, you will have the option to also withdraw your data up until the analysis is complete.

Confidentiality:

Unless you choose otherwise all information you supply during the interview will be held in confidence and unless you specifically indicate your consent, your name will not appear in any report or publication of the research. Participants names will be separated from identifying information and care will be taken to ensure the identity of participants is never disclosed directly or indirectly. Your interview and transcription data will be safely stored on an encrypted computer hard drive and only I will have access to this information. The data will be stored until September 1, 2026. Once the study is over (September 1, 2026) I will delete all interview data, transcriptions, and field notes from our interview. Confidentiality will be provided to the fullest extent possible by law.

Questions About the Research?

If you have questions about the research in general or about your role in the study, please feel free to contact me, Alie Hermanutz, either by phone (647-909-1844) or by email (ahermanu@yorku.ca). Likewise, you can contact my supervisor, Anna Zalik, either by phone (416-736-2100 x22622) or by email (azalik@yorku.ca).

This research has received ethics review and approval by the Delegated Ethics Review Committee, which is delegated authority to review research ethics protocols by the Human Participants Review Sub-Committee, York University's Ethics Review Board, and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Sr. Manager & Policy Advisor for the Office of Research Ethics, 5th Floor, Kaneff Tower, York University (telephone 416-736-5914 or e-mail ore@yorku.ca).

Legal Rights and Signatures:

I ___________________________, consent to participate in the interview conducted by Alie Hermanutz. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Signature_______________________ **Date**

Participant

Signature_______________________ **Date**

Principal Investigator: Alie Hermanutz

Additional consent (where applicable)

1. Audio recording

I consent to the audio-recording of my interview(s).

2. Note taking

I consent to having notes taken during my interview(s).

3. Consent to waive anonymity

I, ____________________________, consent to the use of my name in the publications arising from this research.

Signature ______________________ **Date**

BIBLIOGRAPHY

Adipah, S. (2018). Remediation of petroleum hydrocarbons contaminated soil by Fentons oxidation. *Journal of Environmental Science and Public Health*, *2*(4), 168-178.

Adkin, L.E. (2016). Ecology and governance in a first world petro-state. In Adkin, L.E. (Ed.), *First world petro-politics: The political ecology and governance of Alberta* (pp. 3-50). University of Toronto Press.

Adkin, L.E. (2021). Petro-universities and the production of knowledge for the post-carbon future. In Carrol, W. (Ed.), *Regime of Obstruction: How corporate power blocks energy democracy* (pp. 273-306). Athabasca University Press.

Adkin, L.E. (2022). Hegemony & counter-hegemony. In, Ballamingie, P., & Szanto, D. (Eds.), *Showing theory to know theory: Understanding social science concepts through illustrative vignettes*. Showing Theory Press.

Adkin, L. E., & Stares, B. J. (2016). Turning up the heat: Hegemonic politics in a first world petro state. In Adkin, L.E. (Ed.), *First world petro-politics: The political ecology and governance of Alberta* (pp. 190-240). University of Toronto Press.

Aguilera, R. F., Eggert, R. G., Gustavo, L. C., & Tilton, J. E. (2009). Depletion and the future availability of petroleum resources. *The Energy Journal*, *30*(1), 141-174.

Alberta Energy Regulator. (2014). *2013/2014 annual report*. https://static.aer.ca/prd/documents/reports/201314_AERAnnualReport.pdf.

Alberta Energy Regulator. (2015a, May). *One application, one review, one decision: A single-window approach to energy development.* https://static.aer.ca/prd/documents/about-us/NALA_brochure.pdf

Alberta Energy Regulator. (2015b). *ST98-2015: Alberta's energy reserves 2014 and* *supply/demand outlook 2015-2024.* Alberta Energy Regulator. https://static.aer.ca/prd/documents/sts/ST98/ST98-2015.pdf.

Alberta Energy Regulator. (2016, July 8). *Bulletin 2016-21: Revision and clarification on Alberta Energy Regulator's measures to limit environmental impacts pending regulatory changes to address the Redwater decision*. https://static.aer.ca/prd/documents/bulletins/Bulletin-2016-21.pdf.

Alberta Energy Regulator. (2019a, September 19). *Liability narrative.* https://thenarwhal.ca/wp-content/uploads/2023/05/AER-liability-narrative.pdf.

Alberta Energy Regulator. (2019b). *Redwater decision.* https://www.aer.ca/applications-and-notices/application-status-and-notices/decisions/redwater-decision.

Alberta Energy Regulator. (2021a). *2020/2021 annual report.* https://static.aer.ca/prd/documents/reports/AER2020-21AnnualReport.pdf

Alberta Energy Regulator. (2021b). *Directive 006: Licensee liability rating program*. https://www.aer.ca/regulations-and-compliance-enforcement/rules-and-regulations/directives/directive-006.

Alberta Energy Regulator. (2021c). *Directive 088: Licensee life-cycle management.* https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-088

Alberta Energy Regulator. (2021d). *Draft directive: Licensee life-cycle management (released June 2021) stakeholder feedback and AER response.* https://www.aer.ca/about-aer/media-centre/bulletins/bulletin-2021-45.

Alberta Energy Regulator. (2021e). *Insolvency.* https://www.aer.ca/regulating-development/project-closure/liability-management-programs-and-processes/insolvency.

Alberta Energy Regulator. (2021f). *Oil and gas liabilities management*.

https://www.alberta.ca/oil-and-gas-liabilities-management.aspx

Alberta Energy Regulator. (2021g). *Suspension and abandonment*. https://www.aer.ca/regulating-development/project-closure/suspension-and-abandonment

Alberta Energy Regulator. (2022). *Directive 013: Suspension requirements for wells.* https://www.aer.ca/regulations-and-compliance-enforcement/rules-and-regulations/directives/directive-013.

Alberta Energy Regulator. (2023a). *Alberta energy outlook; ST98, executive summary*. https://static.aer.ca/prd/documents/sts/ST98/2023/ST98_executive_summary.pdf

Alberta Energy Regulator. (2023b). *2022/2023 annual report.* https://static.aer.ca/prd/documents/reports/AER2022-23-AnnualReport.pdf.

Alberta Energy Regulator. (2023a). In situ recovery. https://www.aer.ca/providing-information/by-topic/oil-sands/in-situ-recovery.

Alberta Energy Regulator. (2023b). Low permeability and shale area assessment. https://www.aer.ca/providing-information/data-and-reports/statistical-reports/st98/reserves/low-permeability-and-shale-area-assessment

Alberta Energy Regulator. (2023c). Reserves. https://www.aer.ca/providing-information/data-and-reports/statistical-reports/st98/reserves

Alberta Energy Regulator. (2023d). Oil sands area assessment. https://www.aer.ca/providing-information/data-and-reports/statistical-reports/st98/reserves/oil-sands-area-assessment

Alberta Energy Regulator. (2024a, October 28). *Application processes*. https://www.aer.ca/applications-and-notices/application-processes.

Alberta Energy Regulator. (2024b). *2023/2024 annual report*. https://static.aer.ca/prd/documents/reports/AER2023-24-AnnualReport.pdf.

Alberta Energy Regulator. (2024c, September). *Corporate governance of the Alberta Energy Regulator*. https://static.aer.ca/prd/documents/about-us/corporate-governance.pdf.

Alberta Energy Regulator. (2024d, March 15). *Directive 067: Eligibility requirements for acquiring and holding energy licenses and approvals.* https://static.aer.ca/prd/documents/directives/Directive067.pdf.

Alberta Energy Regulator. (2024e, June 13). *Estimated liabilities: Ongoing implementation of liability management framework*. https://static.aer.ca/prd/documents/liability/LMR-Session2-Estimated-Liabilities.pdf.

Alberta Energy Regulator. (2024f, November 22). *Insolvency*. https://www.aer.ca/regulations-and-compliance-enforcement/liability-management-programs/insolvency.

Alberta Energy Regulator. (2024g, December 5). *2023 liability management performance report*. https://www.aer.ca/data-and-performance-reports/industry-performance/liability-management-performance-report.

Alberta Energy Regulator. (2025a). *Board of directors.* https://www.aer.ca/about-aer/governance/board-directors.

Alberta Energy Regulator (2025b). *Directive 011: Estimated liability.* https://www.aer.ca/regulations-and-compliance-enforcement/rules-and-regulations/directives/directive-011.

Alberta Energy Regulator. (2025c). *Executives*. https://www.aer.ca/about-aer/governance/executives.

Alberta Energy Regulator. (2025d). Hearing process. https://www.aer.ca/applications-and-notices/hearings/hearing-process.

Alberta Energy Regulator. (2025e). Liability management programs.

https://www.aer.ca/regulations-and-compliance-enforcement/liability-management-programs.

Alberta Geological Survey. (2020). *Conventional oil and gas resources.* https://ags.aer.ca/research-initiatives/conventional-oil-and-gas-resources.

Alberta Government. (2016). Hydraulic fracturing in Alberta; Facts and stats. https://open.alberta.ca/dataset/0d0b5d16-20da-48bb-9f85-dded8356067a/resource/6225d9e3-7d64-4348-b401-2c8a8e841a43/download/fsfracturing.pdf

Albo, G. & Jenson, J. (1989). A contested concept: The relative autonomy of the state. In W. Clement & G. Williams (Eds.). *New Canadian political economy* (pp. 180-211). McGill-Queen's University Press.

Alboiu, V., & Walker, T. R. (2019). Pollution, management, and mitigation of idle and orphaned oil and gas wells in Alberta, Canada. *Environmental Monitoring and Assessment*, *191*, 1-16.

ATB Financial. (2017). *2017 annual report*. https://www.atb.com/siteassets/pdf/ar/atb-annual-report-2017.pdf

ATB Financial. (2024). *2024 annual report.* https://www.atb.com/siteassets/pdf/ar/atb-annual-report-2024.pdf

Altvater, E. (2007). The social and natural environment of fossil capitalism. In L. Panitch & C. Leys (Eds.). *Socialist Register 2007: Coming to terms with nature* (pp. 36-59). Merlin Press.

Alves, C. (2023). Fictitious capital, the credit system, and the particular case of government bonds in Marx. *New Political Economy*, *28*(3), 398-415.

Anfara, V. A., Mertz, N. T. (2015). Setting the stage. In V. A. Anfara & N. T. Mertz (Eds.). *Theoretical frameworks in qualitative research* (pp. 21-69). SAGE Publications.

Angus, I. (2016). *Facing the Anthropocene: Fossil capitalism and the crisis of the earth system.* Monthly Review Press.

Auditor General of Alberta. (2023). *Liability management of (non-oil sands) oil and gas infrastructure: Alberta Energy Regulator*. Office of the Auditor General. https://www.oag.ab.ca/reports/oag-liability-management-of-non-oil-sands-oil-and-gas-infrastructure/.

Appel, H., Mason, A., & Watts, M. (2015). *Subterranean estates; Life worlds of oil and gas.* Cornell University Press.

Atleo, C. (2021). Between a rock and a hard place. In Carrol, W.K. (Ed.), *Regime of Obstruction: How corporate power blocks energy democracy* (pp. 355-376). Athabasca University Press.

Baker, R. (2009). *Family of secrets: The Bush dynasty, America's invisible government, and the hidden history of the last fifty years.* Bloomsbury Press.

Bakker, K. (2009). Neoliberal nature, ecological fixes, and the pitfalls of comparative research. *Environment and Planning A*, *41*(8), 1781-1787.

Bakx, K. (2024, October 1). Number of orphan wells in Alberta will soon double as controversial oilpatch bankruptcy settled. *CBC News*. https://www.cbc.ca/news/canada/calgary/bakx-owa-seqouia-pwc-alberta-orphan-wells-1.7336635.

Bebbington, A. & Bury, J. (2012). Political ecologies of the subsoil. In A. Bebbington & J. Bury (Eds.), *Subterranean struggles; New dynamics of mining, oil, and gas in Latin America* (pp. 1-26). University of Texas Press.

Bell, M. Z., & Macfarlane, A. (2022). “Fixing” the nuclear waste problem? The new political economy of spent fuel management in the United States. *Energy Research & Social Science*, *91*, 102728.

Berlin, A. (Ed.). (2011). *The Oxford dictionary of the Jewish religion*. Oxford University Press.

Bernauer, W. (2020). “Regulatory capture” and “extractive hegemony”: the relevance of Nicos Poulantzas’ theory of the state to contemporary environmental politics in Canada. *Human Geography*, *13*(2), 160–173.

Boutilier, R. G., & Thomson, I. (2011). Modelling and measuring the social license to operate: Fruits of a dialogue between theory and practice. *Social License*, *1*, 1-10.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27-40.

Boychuk, R., Anielski, M., Snow, J., & Stelfox, B. (2021). *The big cleanup: How enforcing the polluter pay principle can unlock Alberta's next great jobs boom.* Alberta Liabilities Disclosure Project. https://549b4da0-c9d6-4a84-b004-d25bccb850b3.filesusr.com/ugd/6ca287_2ffe90ca7c354d3eac43b5f141b6ec8a.pdf.

Boyd, D. R. (2007). *Unnatural law: rethinking Canadian environmental law and policy*. UBC press.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77-101.

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative psychology*, *9*(1), 3.

Bridge, G., McCarthy, J., & Perreault, T. (2015). Editor’s introduction. In Perreault, T., Bridge, G. & McCarthy, J. (Eds.), *The Routledge handbook of political ecology* (pp. 3-18).

Routledge.

Brinkmann, S., & Kvale, S. (2018). *Doing Interviews*. SAGE Publications.

Bryman, A. (2012). *Social research methods.* Oxford University Press.

Burkett, P. (1999). *Marx and nature: A red and green perspective*. Springer.

Burkett, P., & Foster, J. B. (2006). Metabolism, energy, and entropy in Marx's critique of political economy: Beyond the Podolinsky myth. *Theory and Society*, *35*, 109-156.

Business Council of Canada. (2017, February 1). *Canada's oil sands: A vital national asset.* https://www.thebusinesscouncil.ca/report/canadas-oil-sands/.

Cameron, L., & Carter, A. (2023). Why carbon capture and storage is not a net-zero solution for Canada's oil and gas sector. *International Institute for Sustainable Development*, 2023-02.

Canada Energy Regulator. (2024). Provincial and territorial energy profiles - Alberta. https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-alberta.html#:~:text=Alberta%27s%20GHG%20emissions%20from%20the,refining%20and%20natural%20gas%20distribution

Canada Pension Plan Investment Board. (2024, March 31). *Canadian publicly traded equities.* https://www.cppinvestments.com/wp-content/uploads/2024/05/Canadian-Public-Disclosure_ibfs_Q4F24.html.

Canada Pension Plan Investment Board. (2025, February 12). *CPP Investments net assets total $699.6 billion at third quarter fiscal 2025.* https://www.cppinvestments.com/wp-content/uploads/2025/02/Q3-F25-News-Release-Febr-12-2025.pdf.

Canadian Association of Petroleum Producers. (2012). *History of CAPP.*

https://web.archive.org/web/20120705073542/http://www.capp.ca/aboutUs/history/Pages/default.aspx.

Canadian Association of Petroleum Producers. (2023a). *Oil extraction.* https://www.capp.ca/oil/extraction.

Canadian Association of Petroleum Producers. (2023b). *Statistics*. https://www.capp.ca/resources/statistics/.

Canadian Natural Resources Limited. (2024). *2023 annual report*. https://www.cnrl.com/content/uploads/2024/03/2023-Annual-Report.pdf.

Canadian Natural Resources Limited. (2025). Light crude oil and NGLs. https://www.cnrl.com/world-class-assets/natural-gas-light-crude-oil-ngls/light-crude-oil-ngls/.

Carroll, W.K. (2010). *The making of a transnational capitalist class: Corporate power in the 21st century.* Bloomsbury Publishing.

Carroll, W. K. (2018). Rethinking the transnational capitalist class. *Alternate Routes: A Journal of Critical Social Research*, 29, 188-206.

Carroll, W.K. (2020). Fossil capital, imperialism and the global corporate elite. In Satgar, V. (Ed.), *BRICS and the new American imperialism: Global rivalry and resistance* (pp. 30-57). Wits University Press.

Carroll, W.K. (2021a). Canada's fossil-capital elite: A tangled web of corporate power. In Carrol, W.K. (Ed.), *Regime of Obstruction: How corporate power blocks energy democracy* (pp. 143-170). Athabasca University Press.

Carroll, W.K. (2021b). Introduction. In Carroll, W.K. (Ed.), *Regime of Obstruction: How corporate power blocks energy democracy* (pp. 3-34). Athabasca University Press.

Carroll, W. K. (2025). *Refusing ecocide: From fossil capitalism to a liveable world*. Routledge.

Carroll, W. K., & Huijzer, M. J. (2018). *Who owns Canada's fossil-fuel sector? Mapping the network of ownership and control.* Canadian Centre for Policy Alternatives. https://www.policyalternatives.ca/wp-content/uploads/attachments/CCPA_Who%20Owns%20Canada%27s%20FF%20Sector_Summary_final_for_web.pdf.

Carter, A. (2020). *Fossilized: Environmental policy in Canada's petro-provinces.* UBC Press.

Carter, A. V. & Zalik, A. (2016). Fossil capitalism and the rentier state: Towards a political ecology of Alberta's oil economy. In Adkin, L. E. (Ed.), *First world petro-politics: The political ecology and governance of Alberta* (pp. 51-77). University of Toronto Press.

Carter, A. V., Fraser, G. S., & Zalik, A. (2017). Environmental policy convergence in Canada's fossil fuel provinces? Regulatory streamlining, impediments, and drift. *Canadian Public Policy*, *43*(1), 61-76.

Castree, N. (2008). Neoliberalising nature: The logics of deregulation and deregulation. *Environment and Planning A 40*, 131-52.

Cenovus Energy. (2024a). *2023 annual report.* https://mc-95523900-b89e-4513-a7cd-2165-cdn-endpoint.azureedge.net/-/media/Project/WWW/docs/investors/2023/2023-Annual-Report.pdf?rev=40fb87ea8ab94b9fbc462f6904346210&sc_lang=en&hash=322D811378AD401597323DF773BE1A97.

Cenovus Energy. (2024b). Conventional oil and natural gas. https://www.cenovus.com/Our-operations/Conventional-oil-and-natural-gas.

Chastko, P. (2007). *Developing Alberta's oil sands: from Karl Clark to Kyoto*. University of Calgary Press.

Chastko, P. (2012). Anonymity and ambivalence: The Canadian and American oil industries and the emergence of continental oil. *Journal of American History 99*(1), 166-176.

Christophers, B. (2013). *Banking across boundaries: Placing finance in capitalism*. John Wiley & Sons.

Christophers, B. (2023). *Our lives in their portfolios: Why asset managers own the world*. Verso Books.

Cohen, A., & Bakker, K. (2014). The eco-scalar fix: Rescaling environmental governance and the politics of ecological boundaries in Alberta, Canada. *Environment and Planning D: Society and Space*, *32*(1), 128-146.

Corporate Mapping Project. (2019). *Fossil-power top 50.* https://www.corporatemapping.ca/wp-content/uploads/2019/07/Fossil-Power_Top50.pdf

Coronil, F. (2019). *The Fernando Coronil reader: The struggle for life is the matter* (J. Skurski, G. Wilder, L. Dubois, P. Eiss, E. Murphy, M. Coronil, & D. Pedersen, Eds.). Duke University Press.

Court of Queen's Bench Alberta. (2019, May 2). Affidavit of Lars DePauw. Court file number 190-06244. https://www.pwc.com/ca/en/car/trident/assets/trident-003_050319.pdf.

d'Aquino, T. (2024, March 11). Brian Mulroney, Canadian business, and nation building. *Canadian Politics and Public Policy.* https://www.policymagazine.ca/brian-mulroney-canadian-business-and-nation-building/.

Dachis, B., Shaffer, B., & Thivierge, V. (2017). All's well that ends well: Addressing end-of-life liabilities for oil and gas wells (Commentary No. 492). *C.D. Howe Institute.* https://www.cdhowe.org/sites/default/files/attachments/research_papers/mixed/Commentary_%20492_0.pdf.

Davidsen, C. (2016). The Alberta oil/tar sands and 'mainstream' media framings between globalization and polarization. In Adkin, L. E. (Ed.), *First world petro-politics: The political ecology and governance of Alberta* (pp. 241-262). University of Toronto Press.

Davis, M. (2017). *Late Victorian holocausts: El Nino famines and the making of the third world.* Verso.

Deleage, J. P. (1989). Eco-Marxist critique of Political economy. *Capitalism Nature Socialism*, *1*(3), 15-31.

Demirović, A. (2019). The capitalist state, hegemony, and the democratic transformation toward socialism. In Ducange, J. N., & Keucheyan, R. (Eds.), *The end of the democratic state: Nicos Poulantzas, a Marxism for the 21st century* (pp. 43-60). Springer.

Discard Studies. (n.d.). *About.* https://discardstudies.com/about.

Doluweera, G., Kralovic, P., & Millington, D. (2017). *Economic impacts of Canadian oil and gas supply in Canada and the US:(2017-2027)*. Canadian Energy Research Institute.

Eaton, E. M., & Day, N. A. (2020). Petro-pedagogy: Fossil fuel interests and the obstruction of climate justice in public education. *Environmental Education Research*, *26*(4), 457-473.

Eaton, E., & Enoch, S. (2021). The oil industry is us: hegemonic community economic identity in Saskatchewan's oil patch. In Carrol, W. K. (Ed.), *Regime of Obstruction: How corporate power blocks energy democracy* (pp. 307-330). Athabasca University Press.

Egbuhuzor, M., Umunankwe, C., & Ogbobe, P. (2022). Polyethylenes: a vital recyclable polymer. In Achilias, D. S. (Ed.), *Waste Material Recycling in the Circular Economy: Challenges and Developments* (pp. 95-111). IntechOpen.

Egler, M. (2021). *Not Well Spent A review of $1-billion federal funding to clean up Alberta's inactive oil and gas wells.* Parkland Institute. https://coilink.org/20.500.12592/4864f3.

Ekers, M., & Prudham, S. (2017). The metabolism of socioecological fixes: Capital switching, spatial fixes, and the production of nature. *Annals of the American Association of Geographers*, *107*(6), 1370-1388.

Ekers, M., & Prudham, S. (2018). The socioecological fix: Fixed capital, metabolism, and hegemony. *Annals of the American Association of Geographers*, *108*(1), 17-34.

EnergyNow Media. (2019, February 1). CAPP issues statement on Supreme Court of Canada's Redwater decision. *EnergyNow Media.* https://energynow.ca/2019/02/capp-issues-statement-on-supreme-court-of-canadas-redwater-decision/.

Energy Resources Conservation Board. (1986, February 21). *Informational letter 86-1: "Well license deposits"*. https://www.aer.ca/regulations-and-compliance-enforcement/rules-and-regulations/informational-letters?page=1.

Environment and Climate Change Canada. (2024). Canadian environmental sustainability indicators: Global greenhouse gas emissions. www.canada.ca/en/environment-climate-change/services/environmental-indicators/globalgreenhouse-gas-emissions.html.

Environmental Defence and Natural Resources Defense Council. (2017). *One trillion litres of toxic waste and growing: Alberta's tailings ponds.* https://environmentaldefence.ca/report/albertas-tailings-ponds/.

Ellis, C. (2008a). Autoethnography. In Given, L. M. (Ed.), *The SAGE encyclopedia of qualitative research methods*, (pp. 48-51). SAGE Publications.

Ellis, C. (2008b). Systematic sociological introspection. In Given, L. M. (Ed.), *The SAGE encyclopedia of qualitative research methods*, (pp. 854-855). SAGE Publications.

Ellis, C., & Adams, T. E. (2014). The purposes, practices, and principles of autoethnographic research. In Leavy, P. (Ed.), *The Oxford Handbook of Qualitative Research* (pp. 254-

276). Oxford University Press.

Ellis, C., Adams, T. E., & Bochner, A. P. (2011). Autoethnography: An overview. *Historical Social Research/Historische Sozialforschung, 36*(4), 273-290.

Encyclopedia Britannica. (n.d.). *Economic geology*. Britannica Academic. Retrieved September 26, 2023, from https://academic-eb-com.ezproxy.library.yorku.ca/levels/collegiate/article/economic-geology/31931.

Energy Resources Conservation Board. (2013). *ST98-2013: Alberta's energy reserves 2012 and supply/demand outlook 2013-2022.* Alberta Energy Regulator. https://static.aer.ca/prd/documents/sts/ST98/ST98-2013.pdf.

Engel-Di, Mauro, S. (2014). Ecology*, soils, and the left.* Palgrave Macmillan.

Fast, T. (2014). Stapled to the front door: Neoliberal extractivism in Canada. *Studies in Political Economy 94*(1), 31-60.

Fearn, G. (2023). The end of the experiment? The energy crisis, neoliberal energy, and the limits to a socio-ecological fix. *Environment and Planning E: Nature and Space 0*(0)*,* 1-22.

Fintel. (2025a, January 10). Bank of Nova Scotia portfolio holdings. https://fintel.io/i/bank-of-nova-scotia.

Fintel. (2025b, January 11). Canada Pension Plan Investment Board portfolio holdings. https://fintel.io/i/canada-pension-plan-investment-board.

Forsyth, T. (2003). *Critical political ecology: The politics of environmental science.* Routledge.

Foster, J. B. (1999). Marx's theory of metabolic rift: Classical foundations for environmental sociology. *American Journal of Sociology 105*(2), 366-405.

Foster, J. B., & Burkett, P. (2000). The dialectic of organic/inorganic relations: Marx and the Hegelian philosophy of nature. *Organization & environment, 13*(4), 403-425.

Foster, J.B., & Burkett, P. (2008). Classical Marxism and the second law of thermodynamics: Marx/Engels, the heat death of the universe hypothesis, and the origins of ecological economics. *Organization & Environment, 21*(1), 3-37.

Foster, J. B. & Burkett, P. (2016). *Marx and the earth: An anti-critique*. Brill.

Foster, J. B., Clark, B., & York, R. (2011). *The ecological rift: Capitalism's war on the earth*. NYU Press.

Galeano, E. (1997). *The open veins of Latin America*. The Monthly Review Press.

Gilbert, L., & Zalik, A. (2019). The limits of audit culture extractivism: Risk and reinsurance in Canadian oil transport by rail and pipeline. *The Extractive Industries and Society*, *6*(3), 654-664.

Girgis, J. (2019, March 1). *Lessons from Redwater: Discard the AbitibiBowater test and legislate super priority for the Regulator*. ABlawg. http://ablawg.ca/wpcontent/uploads/2019/03/Blog_JG_Discard_AbitibiBowater_Test_Legislate_Super_Prior ity_for_Regulator_Feb2019.pdf

Gordon, T. & Webber, J. *Blood of extraction; Canadian imperialism in Latin America.* Fernwood Publishing.

Gorz, A. *Ecology as politics* (P. Vigderman & J. Cloud, Trans.). South End Press.

Government of Alberta. (2018). *Freehold mineral ownership.* https://open.alberta.ca/dataset/33655143-7b4a-4abb-98a1-a4c285f1c5a6/resource/707db33f-1861-476e-9981-3f5edb3c4726/download/energy-freehold-ownership-fact-sheet.pdf.

Government of Alberta. (2020). *Mineral ownership fact sheet.* https://open.alberta.ca/dataset/93d8715b-30e3-46ad-989a-e220ea5c023d/resource/21c8a6fc-90d8-4e60-87aa-cd123f8ff4fb/download/energy-mineral-ownership-fact-sheet.pdf.

Government of Canada. (2025). Canada's carbon management strategy. Natural Resources Canada. https://natural-resources.canada.ca/energy-sources/carbon-management/canada-s-carbon-management-strategy.

Gramsci, A. (2010). *Selections from the prison notebooks of Antonio Gramsci* (H. Quintin & G. N. Smith, eds.). International Publishers. (Original work published in 1971)

Grant Thornton Limited. (2017a, November 1). In the matter of the bankruptcy of Lexin Resources Ltd. https://doanegrantthornton-docs.webpal.net/document-folder/viewer/docul8LWsxcWho7J/347487947123687986.

Grant Thornton Limited. (2017b, November 1). In the matter of the bankruptcy of 0989 Resource Partnership. https://doanegrantthornton-docs.webpal.net/document-folder/viewer/docul8LWsxcWho7J/161834371715746401?_gl=1*12bzn4c*_ga*MzIzNzY3OTIzLjE3MzY1MjAyNjU.*_ga_JLRBBJ6PTP*MTczNjUyMDI2NS4xLjAuMTczNjUyMDI2Ny42MC4wLjA

Gunton, T. (2014). Staple theory and the new staple boom. In Stanford, J. (Ed.), *The staple theory @ 50; Reflections on the lasting significance of Mel Watkins' "a staple theory of economic growth"* (43-52). Canadian Centre for Policy Alternatives.

Haley, B. (2011). From staples trap to carbon trap: Canada's peculiar form of carbon lock-in. *Studies in Political Economy, 88*(1), 97-132.

Hanieh, A. (2024). *Crude capitalism: Oil, corporate power, and the making of the world market*. Verso Books.

Harvey, D. (1982). *The limits to capital.* Basil Blackwell Publisher Limited.

Harvey, D. (2001). Globalization and the "spatial fix". *Geographische Revue: Zeitschrift für Literatur und Diskussion*, *3*(2), 23-30.

Harvey, D. (2004). The 'new' imperialism: accumulation by dispossession. *Socialist Register, 40*, 63–87.

Healing, D. (2017, November 10). Orphan Well Association spending tops $2 million on care of Lexin assets. *The Canadian Press.* https://www.nationalobserver.com/2017/11/11/news/orphan-well-association-spending-tops-2-million-care-lexin-assets.

Helbig, L. (2014). *Beautiful destruction*. Rocky Mountain Books.

Hildebrand, L. (Aug. 18, 2020). *Project to solve orphan oil well problem with solar energy gets green light*. Iron & Earth. https://www.ironandearth.org/good_news_for_energy_workers_project_to_solve_orphan_oil_well_problem_with_solar_energy_gets_green_light#stream.

Holleman, H. (2015). Method in ecological Marxism: Science and the struggle for change. *Monthly Review*, *67*(5), 1-10.

Holloway, J. (2019). *We are the crisis of capital: A John Holloway reader*. PM Press.

Holloway, J., & Picciotto, S. (1978). Introduction: Toward a materialist theory of the state. In, Holloway, J., Picciotto, S. (Eds.), *State and capital: A Marxist debate* (pp. 1-31). Edward Arnold Publishers.

Hood, C. (2000). Paradoxes of public-sector managerialism, old public management and public service bargains. *International public management journal*, *3*(1), 1-22.

Huber, M. T. (2009). Energizing historical materialism: Fossil fuels, space and the capitalist mode of production. *Geoforum*, *40*(1), 105-115.

Huber, M. T. (2013). *Lifeblood: Oil, freedom, and the forces of capital*. University of Minnesota Press.

Hudson, M. (2021). Finance capitalism versus industrial capitalism: The rentier resurgence and takeover. *Review of Radical Political Economics*, *53*(4), 557-573.

Hudson, M., & Bowness, E. (2021). Finance and fossil capital: A community divided? *The Extractive Industries and Society*, *8*(1), 383-394.

Hunter, R. (2023). The capitalist state as a historically specific social form. In Hunter, R., Khachaturian, R., & Nanopoulos, E. (Eds.), *Marxism and the capitalist state: Towards a new debate* (pp. 253-273). Palgrave Macmillan.

Hussey, I., Pineault, E., Jackson, E., & Cake, S. (2021). Boom, bust, consolidation: Corporate restructuring in the Alberta oil sands. In Carrol, W. K. (Ed.), *Regime of Obstruction: How corporate power blocks energy democracy* (pp. 35-60). Athabasca University Press.

Huseman, J., & Short, D. (2012). 'A slow industrial genocide': Tar sands and the Indigenous peoples of northern Alberta. *The International Journal of Human Rights 16*(1), 216–237.

InfluenceMap. (2019). *Big oil's real agenda on climate change: How the oil majors have spent $1bn since Paris on narrative capture and lobbying on climate.* InfluenceMap. https://influencemap.org/report/How-Big-Oil-Continues-to-Oppose-the-Paris-Agreement-38212275958aa21196dae3b76220bddc.

Innis, H. (1999). *The fur trade in Canada: An introduction to Canadian economic history.* University of Toronto Press. (Original work published 1930).

Iron & Earth. (n.d.) About us. https://www.ironandearth.org/about_us.

Janzwood, A., & Harrison, K. (2023). The political economy of fossil fuel production in the post-Paris era: Critically evaluating nationally determined contributions. *Energy*

Research & Social Science, 102, 1-12.

Janzwood, A., Neville, K. J., & Martin, S. J. (2023). Financing energy futures: the contested assetization of pipelines in Canada. *Review of International Political Economy*, *30*(6), 2333-2356.

Jaremko. G. (2013). *Steward: 75 years of Alberta energy regulation.* Energy Resources Conservation Board. https://static.aer.ca/prd/documents/about-us/Steward_Ebook.pdf.

Jessop, B. (1985). *Nicos Poulantzas: Marxist theory and political strategy.* Macmillian.

Jessop, B. (2006). Spatial fixes, temporal fixes and spatio-temporal fixes. In Castree, N., & Gregory, D. (Eds.), *David Harvey: A critical reader* (pp. 142-166). Wiley-Blackwell Publishing.

Jessop, B. (2021). Poulantzas' changing views on law and the state. In O'Connell, P. & Özsu, U. (Eds.), *Research handbook on law and Marxism* (pp. 156-172). Edward Elgar Publishing.

Jessop, B. (2024). Hegemonic projects and cultural political economy. In Carroll, W. K. (Ed.), *The Elgar companion to Antonio Gramsci*. (pp. 261-278). Edward Elgar Publishing.

Johnson, L. (2015). Catastrophic fixes: Cyclical devaluation and accumulation through climate change impacts. *Environment and Planning A*, *47*(12), 2503-2521.

Johnson, T. (2017, April 24). Creditors over environment: Alberta Court of Appeal upholds Redwater Energy Decision. *CBC News*. https://www.cbc.ca/news/canada/calgary/redwater-energy-appeal-dismissed-alberta-bankruptcy-environment-creditors-1.4083474.

Kelly, E. N., Short, J. W., Schindler, D. W., Hodson, P. V., Ma, M., Kwan, A. K., & Fortin, B. L. (2009). Oil sands development contributes polycyclic aromatic compounds to the Athabasca River and its tributaries. *Proceedings of the National Academy of Sciences*, *106*(52), 22346-22351.

Khachaturian, R. (2021). The state as social relation: Poulantzas on materiality and political strategy. In O'Connell, P. & Özsu, U. (Eds.), *Research handbook on law and Marxism* (pp. 173-188). Edward Elgar Publishing.

King, H., & Pasternak, S. (2019). The spectrum of consent. In Pasternak, S. & King, H. *Land back: A Yellowhead Institute red paper* (pp. 15-22). Yellowhead Institute, Ryerson University.

King James Bible. (2011). Oxford University Press (Original work published 1769)

Kliman, A. (2017). Long-term Dynamics. *Routledge Handbook of Marxian Economics*. In Brennan, D.M., Kristjanson-Gural, D., Mulder, C.P., & Olsen, E.K. *Routledge Handbook of Marxian Economics* (pp. 225-233). Routledge.

Klotz, L. A., Woolley, L., Lamarche, B., Boutot, J., & Kang, M. (2025). Sevenfold underestimation of methane emissions from non-producing oil and gas wells in Canada. *Environmental Science & Technology*, *59*(18), 9008-9016.

Kozinets, R. V. (2010). *Netnography: Doing ethnographic research online.* SAGE Publications.

Kwak, J. (2014). Cultural capture and the financial crisis. In Carpenter, D. & Moss, D. A. (Eds.), *Preventing regulatory capture: Special interest influence and how to limit it* (pp. 71-98). Cambridge University Press.

Labban, M. (2008). *Space, oil and capital*. Routledge.

Labban, M. (2010). Oil in parallax: Scarcity, markets, and the financialization of accumulation. *Geoforum*, *41*(4), 541-552.

Labban, M. (2014). Against value: Accumulation in the oil industry and the biopolitics of labour under finance. *Antipode*, *46*(2), 477-496.

Langille, D. (1987). The Business Council on national issues and the Canadian state. *Studies in Political Economy*, *24*(1), 41-85.

Lave, R. (2012). Neoliberalism and the production of environmental knowledge. *Environment and Society*, *3*(1), 19-38.

Lave, R., Wilson, M. W., Barron, E. S., Biermann, C., Carey, M. A., Duvall, C. S., ... & Van Dyke, C. (2014). Intervention: Critical physical geography. *The Canadian Geographer/Le Géographe Canadien*, *58*(1), 1-10.

Lave, R. (2015). Reassembling the structural: Political ecology and actor-network theory. In Perreault, T., Bridge, G. & McCarthy, J. (Eds.). *The Routledge handbook of political ecology* (pp. 213-223). Routledge.

Lave, R., Biermann, C., & Lane, S. N. (2018). Introducing critical physical geography. In Lave, R., Biermann, C., & Lane, S. N. (Eds.). *The Palgrave handbook of critical physical geography* (pp. 3-22). Palgrave.

Laxter, G. (2014). Alberta's sands, staples and traps, In Stanford, J. (Ed.), *The staple theory @ 50; Reflections on the lasting significance of Mel Watkins' "a staple theory of economic growth",* 5-7. Canadian Centre for Policy Alternatives.

Lee, C.-F. & Lee, A. (Eds.). (2006). *Encyclopedia of finance.* Springer.

Levin, J. (2023). *Past due: Tallying the costs of oil and gas cleanup in Canada*. Environmental Defence.

Levin, J. (2023). *Buyer beware: Fossil fuel subsidies and carbon capture fairy tales in Canada*. Environmental Defence.

Liboiron, M., & Lepawsky, J. (2022). *Discard studies: Wasting, systems, and power*. MIT Press.

Library of Congress. (2024). *Upstream: Production and exploration*. https://guides.loc.gov/oil-and-gas-industry/upstream.

Lohmann, L. (2008). Carbon trading, climate justice and the production of ignorance: ten examples. *Development*, *51*(3), 359-365.

Löwy, M. (2005). What is ecosocialism? *Capitalism Nature Socialism*, *16*(2), 15-24.

Löwy, M. (2007). Eco-socialism and democratic planning. *Socialist Register*, *43*, 294-309.

MacFadyen, A., & Watkins, G. C. (2014). *Petropolitics: petroleum development, markets and regulations, Alberta as an illustrative history*. University of Calgary Press.

Mackintosh, W.A. (1923) Economic factors in Canadian history. *Canadian Historical Review, 4*(1), 12-25.

MacLean, J. (2016). Striking at the Root Problem of Canadian Environmental Law: Identifying and Escaping Regulatory Capture. *Journal of Environmental Law and Practice*, *29*, 111.

MacLean, J. (2019). Regulatory capture and the role of academics in public policymaking: Lessons from Canada's environmental regulatory review process. *UBCL Rev.*, *52*, 479.

MacLean, J., Doelle, M., & Tollefson, C. (2015). The past, present, and future of Canadian environmental law: A critical dialogue. *Lakehead Law Journal*, *1*(1), 79-104.

Malm, A. (2016). *Fossil capital: The rise of steam power and the roots of global warming*. Verso.

Malm, A., & Carton, W. (2024). *Overshoot: How the world surrendered to climate breakdown.* Verso Books.

Mandel, E. (1992). *Power and money: A Marxist theory of bureaucracy.* Verso Books.

Mandel, E. (1975). *Late capitalism.* Verso Books.

Marshall, MN. (1996). The key informant technique. *Family Practice 13*(1), 92-97.

Marx, K. (1976). *Capital volume I: A critique of political economy.* Pelican Books. (Original work published in 1867)

Marx, K. (1992). *Capital: Volume II*. Penguin UK. (Original work published in 1885)

Marx, K. (1993). *Grundrisse: Foundations of the critique of political economy*. Penguin UK. (Original work published in 1939)

McCarthy, J. (2015). A socioecological fix to capitalist crisis and climate change? The possibilities and limits of renewable energy. *Environment and Planning A*, *47*(12), 2485-2502.

McCreary, T. (2022). Crisis in the tar sands: Fossil capitalism and the future of the Alberta hydrocarbon economy. *Historical Materialism*, *30*(1), 31-65.

McDermott, V. (2023, July 5). Pathways president urges federal funds for carbon capture in Fort McMurray visit. *Fort McMurray Today.* https://www.fortmcmurraytoday.com/news/local-news/pathways-president-urges-federal-funds-for-carbon-capture-in-fort-mcmurray-visit

Macdonald, S., & Keil, R. (2012). The Ontario greenbelt: shifting the scales of the sustainability fix? *The Professional Geographer*, *64*(1), 125-145.

McGregor, S.L.T. (2018). Philosophical underpinnings of the transdisciplinary research methodology. *Transdisciplinary Journal of Engineering & Science 9*, 182-198.

Ministry of Energy. (2013). *Energy annual report 2012-2013.* Government of Alberta. https://open.alberta.ca/dataset/cbd7147b-d304-4e3e-af28-78970c71232c/resource/cbf7a50c-f241-458c-95cf-b16d81187071/download/6847119-2012-2013-alberta-energy-annual-report.pdf.

Mitchell, T. (2011). *Carbon democracy: Political power in the age of oil.* Verso Books.

Montgomerie, J. (2017). Reimagining critical methods. In Montgomerie, J. (Ed.), *Critical* *methods in political and cultural economy* (pp. 1-15). Routledge.

Moore, J. W. (2003a). Capitalism as world-ecology. *Organization & Environment 16*(4), 431-458.

Moore, J. W. (2003b). The *modern world-system* as environmental history? Ecology and the rise of capitalism. *Theory and Society 32*, 307-377.

Moore. J. W. (2015). *Capitalism in the web of life: Ecology and the accumulation of capital*. Verso.

Mossop, G.D. & Shetsen, I. (1994). *The atlas of the Western Canada Sedimentary Basin*. Canadian Society of Petroleum Geologists and the Alberta Research Council.

Muehlenbachs, L. (2015). A dynamic model of cleanup: Estimating sunk costs in oil and gas production. *International Economic Review*, *56*(1), 155-185.

Muehlenbachs, L. (2017). 80,000 inactive oil wells: A blessing or a curse? *The School of Public Policy Publications*, *10*.

Noble, B., & Birk, J. (2011). Comfort monitoring? Environmental assessment follow-up under community–industry negotiated environmental agreements. *Environmental Impact Assessment Review*, *31*(1), 17-24.

Nihart, A. J., Garcia, M. A., El Hayek, E., Liu, R., Olewine, M., Kingston, J. D., ... & Campen, M. J. (2025). Bioaccumulation of microplastics in decedent human brains. *Nature Medicine*, 1-6.

Nugent, J. P. (2015). Ontario's infrastructure boom: a socioecological fix for air pollution, congestion, jobs, and profits. *Environment and Planning A*, *47*(12), 2465-2484.

O'Connor, J. (1988). Capitalism, nature, socialism, a theoretical introduction. *Capitalism, Nature, Socialism 1*(1), 11-38.

O'Connor, J. (1998). *Natural causes: Essays in ecological Marxism.* Guilford.

Oil and Gas Conservation Act, RSA 1970, c 267, https://canlii.ca/t/53rt7.

Oil and Gas Conservation Act, RSA 2000, c O-6, https://canlii.ca/t/55427.

O'Leary, Z. (2017). *The essential guide to doing your research project* (3rd edition). SAGE Publications.

Orphan Lifeline International. (2024). *Orphan and child poverty fact sheet.* https://www.orphanslifeline.org/orphan-fact-sheet#:~:text=However%20a%20closer%20study%20of,true%20orphans%20and%20social%20orphans.

Orphan Well Association. (2017). *Annual report 2016/2017.*

Orphan Well Association. (2018). *Annual report 2017/2018.* https://cdn.prod.website-files.com/66a3c445f4f5971ff979146e/66a3c445f4f5971ff97916f7_OWA%20Annual_2018_WEB.pdf

Orphan Well Association. (2020a). *FAQ general*. http://www.orphanwell.ca/faq/

Orphan Well Association. (2020b). *Orphan inventory*. http://www.orphanwell.ca/about/orphan-inventory/

Orphan Well Association. (2021). *Annual report 2020/2021.* https://www.orphanwell.ca/wp-content/uploads/2021/07/OWA-Annual_2020_web3.pdf

Orphan Well Association. (2022). *Annual report 2021/2022.* https://cdn.prod.website-files.com/66a3c445f4f5971ff979146e/66a3c445f4f5971ff97916ee_OWA%20Annual_2021_web.pdf

Orphan Well Association. (2024). *Annual report 2023/2024.* https://cdn.prod.website-files.com/66a3c445f4f5971ff979146e/66a3c445f4f5971ff9791700_OWA%20Annual_20

23-WEB_v2.pdf.

Orphan Well Association v. Grant Thornton Ltd., 2019 SCC 5 (CanLII), [2019] 1 SCR 150, https://canlii.ca/t/hx95f

Orphan Well Association v Trident Exploration Corp, 2022 ABKB 839 (CanLII), https://canlii.ca/t/jtjk3

Paramount Resources. (2025, March 5). *2024 annual results.* https://www.paramountres.com/content/uploads/2025/03/PRL-Q4-2024-Results-FINAL.pdf

Parks Canada. (2024). Leduc-Woodbend oilfield national historic site of Canada. https://www.pc.gc.ca/apps/dfhd/page_nhs_eng.aspx?id=33.

Parlee, B. (2016). Mobilizing to address the impacts of oil sands development: First Nations in environmental governance. In Adkin, L. E. (Ed.), *First world petro-politics: The political ecology and governance of Alberta* (pp. 329-355). University of Toronto Press.

Pasternak, S., & Schabus, N. (2019). Privatizing uncertainty and socializing risk: Indigenous legal and economic leverage in the federal Trans Mountain buy-out. *UNBLJ*, *70*, 207-229.

Pasternak, S., Metallic, N., Numata, Y., Sekharan, A., Galley, J., & Wong, S. (2021). *Cash back: A Yellowhead Institute red paper.* Yellowhead Institute, Ryerson University.

Peet, R. & Watts, M. (2004). Liberating political ecology. In Peet, R. & Watts, M. (Eds.), *Liberation ecologies: Environment, development, social movements* (pp. 3-43, 2nd ed.). Routledge.

Peet, R., Robbins, P. & Watts, M. (2011). Global nature. In Peet, R., Robbins, P. & Watts, M.

(Eds.), *Global political ecology* (pp. 1-48). Routledge.

Perreault, T., Bridge, G. & McCarthy, J. (Eds.), (2015). *The Routledge handbook of political ecology.* Routledge.

Pineault, É. (2018). The capitalist pressure to extract: the ecological and political economy of extreme oil in Canada. *Studies in Political Economy*, *99*(2), 130-150.

Pohl, W. L. (2011). *Economic geology: principles and practice*. John Wiley & Sons.

Polanyi, K. (2001). *The great transformation: The political and economic origins of our time*. Beacon Press. (Original work published in 1944)

Post, C. (1999). Ernest Mandel and the Marxian theory of bureaucracy. In Achcar, G. (Ed.), *The Legacy of Ernest Mandel* (pp. 119-151). Verso Books.

Poulantzas, N. (1975a). *Classes in contemporary capitalism*. New Left Books.

Poulantzas, N. (1975b). *Political power and social classes*. New Left Books.

Poulantzas, N. (2000). *State, power, socialism.* Verso.

Poulantzas, N. (2008). *The Poulantzas reader: Marxism, law and the state* (J. Martin Ed.). Verso.

Preston, J. (2017). Racial extractivism and white settler colonialism: An examination of the Canadian tar sands mega-projects. *Cultural Studies, 31*(2-3), 353–375.

PricewaterhouseCoopers. (2019, May 3). In the matter of the receivership of Trident Exploration Corp. https://www.pwc.com/ca/en/car/trident/assets/trident-006_050919.pdf.

Rainforest Action Network (RAN), BankTrack, Center for Energy, Ecology, and Development, Indigenous Environmental Network (IEN), Oil Change International (OCI), Reclaim Finance, the Sierra Club, and Urgewald. (2024, May 13). *Banking on climate chaos: Fossil fuel finance report 2024*. https://www.bankingonclimatechaos.org/wp-content/uploads/2024/07/BOCC_2024_vF3.pdf.

Rapley, T. (2007). *Doing conversation, discourse and document analysis.* SAGE Publications.

Redwater Energy Corporation (Re), 2016 ABQB 278 (CanLII), https://canlii.ca/t/grvgf.

Responsible Energy Development Act, SA 2012, C R-17.2, https://canlii.ca/t/8r5q.

Riley, S. J. (2019, March 29). Alberta issues 97% of reclamation certificates without ever visiting oil and gas sites. *The Narwhal*. https://thenarwhal.ca/alberta-issues-97-of-reclamation-certificates-without-ever-visiting-oil-and-gas-sites/.

Riley, S. J. (2020, January 23). Report 'buried' by Alberta government reveals 'mounting evidence' that oil and gas wells aren't reclaimed in the long run. *The Narwhal*. https://thenarwhal.ca/report-buried-by-alberta-government-reveals-mounting-evidence-that-oil-and-gas-wells-arent-reclaimed-in-the-long-run/.

Robbins, P. (2012). *Political ecology: A critical introduction* (2nd ed.). Wiley-Blackwell.

Romaniuk, A. (2017). Is there a need for new policies for inactive and orphan wells? *Canadian Energy Research Institute*. https://books.scholarsportal.info/en/read?id=/ebooks/ebooks4/cpdc4/2018-12-11/3/10094847.

Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field methods*, *15*(1), 85-109.

Saito, K. (2020). Marx's theory of metabolism in the age of global ecological crisis. *Historical Materialism*, *28*(2), 3-24.

Sandlos, J., & Keeling, A. (2016). Toxic legacies, slow violence and environmental injustice at Giant Mine, Northwest Territories. *The Northern Review 42*, 7-21.

Sapinski, J. P. (2015). Climate capitalism and the global corporate elite network. *Environmental*

Sociology, *1*(4), 268-279.

Sapinski, J. P. (2016). Constructing climate capitalism: corporate power and the global climate policy-planning network. *Global Networks*, *16*(1), 89-111.

Scott, D. N. (2013). Fossil Capitalism & the implications of the new pipeline proposals for environmental justice in Canada. *Faculty Research Seminar Series. 2.* https://digitalcommons.osgoode.yorku.ca/frss/2.

Simard, C., Iatridis, K., Cameron, K., & Williams, A. (2022). Restructuring and Insolvency Deals in the Oil Patch: Recent Trends and Developments. *Alta. L. Rev.*, *60*, 363.

Simon, G. L. (2020). How the west was spun: The de-politicization of fire in the American West. In Lave, R., Biermann, C., and Lane, S. N. (Eds.), *The Palgrave handbook of critical physical geography (*pp. 153-178). Palgrave Macmillan.

Smith, Danielle. (2023, July 10). *Mandate letter – Energy and Minerals*. Office of the Premier. https://open.alberta.ca/dataset/bf7f9a42-a807-49b3-8ba3-451ae3bc2d2f/resource/c87b60b4-217e-4d60-98be-1bbd2f538353/download/em-mandate-letter-energy-and-minerals.pdf.

Sin, L. T., & Tueen, B. S. (2023). *Plastics and sustainability: Practical approaches*. Elsevier.

Society of Petroleum Evaluation Engineers. (2022). *Canadian oil and gas evaluation handbook*. SPEE Canada.

Southwick, R. (2017, March 30). Behind the scenes: Lexin Resources, the chaos and its clash with regulators. *Calgary Herald*. https://calgaryherald.com/business/energy/inside-months-of-chaos-at-a-shuttered-oil-and-gas-company.

Speight, J. G. (2013). *Shale gas production processes*. Gulf Professional Publishing.

Spence, M. (2000). Capital against nature: James O'Connor's theory of the second contradiction of capitalism. *Capital & Class*, *24*(3), 81-110.

Spizzirri, F. & Title, S. (2018). Redwater Energy: Environmental clean-up costs in Canada. *American Bankruptcy Institute Journal*, *37*(1), 54-85.

Springer, S., Locret-Collet, M., Mateer, J. (2021). Introduction. In, Springer, S., Locret-Collet, M., Mateer, J., Acker, M. (Eds.), *Inhabiting the earth: Anarchist political ecology for alternative urban futures* (pp. 1-18). PM Press.

Steinmo, S. (2008). Historical institutionalism. In Porta, D. D. & Keating, M. (Eds.), *Approaches and methodologies in the social sciences: A pluralist perspective* (pp. 118-138). Cambridge University Press.

Storrie, J., Kinney, D., & Boychuk, R. (2020). Alberta's failed oil and gas bailout. *PressProgress*. https://pressprogress.ca/wp-content/uploads/2020/04/AIMCO-report.pdf.

Surprise, K. (2018). Preempting the second contradiction: Solar geoengineering as spatiotemporal fix. *Annals of the American Association of Geographers*, *108*(5), 1228-1244.

Tambosso, A. (2017, September 5). Receivership sale: Lexin Resources Ltd. and affiliated entities. *BOE Report.* https://boereport.com/2017/09/05/receivership-sale-lexin-resources-ltd-and-affiliated-entities/.

Tienhaara, K., & Walker, J. (2021). Fossil capital, 'unquantifiable risk' and neoliberal nationalizations: The case of the Trans Mountain Pipeline in Canada. *Geoforum*, *124*, 120-131.

Timoney, K. P. (2015). *Impaired wetlands in a damaged landscape: The legacy of bitumen exploitation in Canada*. Springer.

Timoney, K. P. (2021). *Hidden scourge; Exposing the truth about fossil fuel industry spills.*

McGill-Queen's University Press.

Timoney, K. P. (2025). Regulatory failure to monitor and manage the impacts of tailings spills, Alberta, Canada. *Environmental Monitoring and Assessment*, *197*(2), 125.

Touchette, L. (1995). New EUB enforcement approach. FOI 2023-G-0015, 267. In Yewchuk, D., Fluker, S., & Olszynski, M. (2023). A Made-in-Alberta Failure: Unfunded Oil and Gas Closure Liability. *The School of Public Policy Publications*, *16*(1).

Valdivia, G. (2015). Oil frictions and the subterranean geopolitics of energy regionalisms. *Environment and Planning A: Economy and Space*, *47*(7), 1422-1439.

VanNijnatten, D.L. & Lambright, W.H. (2001). Canadian smog policy in a continental context: Looking south for stringency. In VanNijnatten D.L. & Boardman, R. (Eds.), Canadian environmental policy: Context and cases (pp. 253-273). Oxford University Press.

VanNijnatten, D. L., & Boardman, R. (2002). Canadian environmental policy: context and cases (2nd edition). Oxford University Press.

Vayda, A.P. & Walters, B.B. (1999). Against political ecology. *Human Ecology 27*(1), 167-179.

Vijayaraghavan, A. & Lou, E. (2017, June 13). Canada's Lexin to cooperate with receivership; Adjourns suit against regulator. *Reuters*. https://www.reuters.com/article/business/canada-s-lexin-to-cooperate-with-receivership-adjourns-suit-against-regulator-idUSKBN19509X/.

Vromen, A. (2010). Debating methods: Rediscovering qualitative approaches. In D. Marsh & G. Stoker (Eds.), *Theory and methods in political science* (3rd ed., pp. 249-266). Palgrave Macmillan.

Walker, P. (2005). Political ecology: Where is the ecology? *Progress in Human Geography 29*(1), 73-82.

Watkins, M. (1963). A staple theory of economic growth. *Canadian Journal of Economics and Political Science, 29* (2), 141-158.

Watts, M. (1983). *Silent violence: Food, famine, and peasantry in northern Nigeria*. University of California Press.

Watts, M. (2015). Now and then: The origins of political ecology and the rebirth of adaptation as a form of thought. In Perreault, T., Bridge, G. & McCarthy, J. (Eds.), *The Routledge handbook of political ecology* (pp. 19-50). Routledge.

Watts, M., & Zalik, A. (2020). Consistently unreliable: Oil spill data and transparency discourse. *The Extractive Industries and Society*, *7*(3), 790-795.

Weiss, T., Thibault, B., & Miller, B. (2016). Alberta's electricity future. In Adkin, L. E. (Ed.), *First world petro-politics: The political ecology and governance of Alberta* (pp. 385-416). University of Toronto Press.

While, A., Jonas, A. E., & Gibbs, D. (2004). The environment and the entrepreneurial city: Searching for the urban 'sustainability fix' in Manchester and Leeds. *International Journal of Urban and Regional Research*, *28*(3), 549-569.

Wivcharuk, J. (2020, April). *Alberta Government passes Bill 12, Liabilities Management Statutes Amendment Act, 2020 – what you need to know.* McMillan LLP. https://mcmillan.ca/insights/alberta-government-passes-bill-12-liabilities-management-statutes-amendment-act-2020-what-you-need-to-know/.

Wolfe, A. (2019). The Reification of the state. In Olsen, M. E., Marger, M. N., & Fonseca, V. (Eds.), *Power in modern societies* (pp. 286-294). Routledge.

Wood, C. (2019). Orphaned wells, oil assets, and debt: The competing ethics of value creation and care within petrocapitalist projects of return. *Journal of the Royal Anthropological*

Institute (N.S.), 67-90.

Wood, S., Tanner, G., & Richardson, B. J. (2010). Whatever happened to Canadian environmental law. *Ecology LQ*, *37*, 981-1040.

Yellowhead Institute. (2019). *Land back: A Yellowhead Institute red paper.* https://redpaper.yellowheadinstitute.org/wp-content/uploads/2019/10/red-paper-report-final.pdf.

Yewchuk, D. (2021, January 18). The Sequoia bankruptcy part 1: The motion to strike and the interveners. *ABlawg*. http://ablawg.ca/wp content/uploads/2021/01/Blog_DY_Sequoia_Part_1.pdf.

Yewchuk, D., Fluker, S., & Olszynski, M. (2023). A Made-in-Alberta Failure: Unfunded Oil and Gas Closure Liability. *The School of Public Policy Publications*, *16*(1).

Yewchuk, D., Fluker, S., Olszynski, M. & Bankes, N. (2024, May 30). The Premier's review of the AER: A recipe for how industry can have its cake and eat it too. *ABlawg*. http://ablawg.ca/wpcontent/uploads/2024/05/Blog_DYSFMONB_Premier_AER_Review.pdf.

Yewchuk, D. & Fluker, S. (2024, July 9). The problem with industry control of the OWA, and the OWA control of oil and gas insolvency. *ABlawg*. https://ablawg.ca/2024/07/09/the-problem-with-industry-control-of-the-owa-and-owa-control-of-oil-and-gas-insolvency/.

Young, K. A. (2024). *Abolishing fossil fuels: lessons from movements that won*. PM Press.

Zalik, A. (2006). Oil futures: Shell's 'trilemma triangle' and the 'force of community'. *Environmental Politics Colloquium*. Institute for International Studies, University of California at Berkeley.

Zalik, A. (2008). Liquefied natural gas and fossil capitalism. *Monthly Review 60*(6), 41-53.

Zalik, A. (2010). Oil 'futures': Shell's Scenarios and the social constitution of the global oil market. *Geoforum*, *41*(4), 553-564.

Zalik, A. (2015a). Resource sterilization: Reserve replacement, financial risk and environmental review in Canada's tar sands. *Environment and Planning A*, *47*(12), 2446-2464.

Zalik, A. (2015b). Vicious transparency: Contesting Canada's hydrocarbon future. In Appel, H., Mason, A, & Watts, M. (Eds.), *Subterranean estates: Life worlds of oil and gas* (pp. 354-370). Cornell University Press.

Zalik, A. (2016). Duty to consult or license to operate? Corporate social practice and industrial conflict in the Alberta tar sands and the Nigerian Niger Delta. In Adkin, L.E. (Ed.), *First World petro-politics: The political ecology and governance of Alberta*, (pp. 356-384). University of Toronto Press.

Zalik, A. (2022). Whither hydrocarbons? The rescaling of global oil and gas markets amidst COVID-19 and a contested transition. *Environment and Planning A: Economy and Space*, *54*(8), 1641-1668. https://doi.org/10.1177/0308518X221114879

Zalik, A., & Osuoka, I. A. (2020). Beyond transparency: A consideration of extraction's full costs. *The Extractive Industries and Society*, *7*(3), 781-785.