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Strategies for Oil and Gas Asset Retirement Sustainability in Alberta, Canada

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Ikenna Uhuegbulem

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Walden University
2019

Abstract

Strategies for Oil and Gas Asset Retirement Sustainability in Alberta, Canada

by

Ikenna Uhuegbulem

MBA, Middlesex University, England, 1997

BEng, Federal University of Technology, Nigeria, 1994

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

April 2019

Abstract

Oil and gas companies in Alberta, Canada lose millions of dollars per year due to ineffective management of retired assets. Ineffective management of inactive oil and gas assets in Alberta has led to over 80,000 inactive wells, highlighting the practice of prolonged deferment of asset end-of-life costs. Using the corporate sustainability model and asset management concept model as frameworks, this multiple case study was conducted to explore the strategies that asset managers in small- and medium-sized oil and gas companies used to manage retired assets effectively to increase organizational sustainability. The population for the study included 3 business leaders of small- and medium-sized oil and gas companies in Alberta who implemented effective strategies to manage their retired assets. Data were collected through semistructured interviews with the leaders and review of artifacts including firm documents and websites. Data were compiled, disassembled into fragments, reassembled into a sequence of groups, clarified, and interpreted for meaning. Methodological triangulation and member checking validated the interpretations. Data analysis resulted in 7 themes: responsible leadership commitment, adoption and communication of corporate social responsibility philosophy, regulatory compliance, asset management software tools, dedicated inactive assets and reclamation champion/team, annual budget/long-term planning, and performance measurement/reporting. The findings may contribute to positive social change by providing insights for small- and medium-sized oil and gas business leaders on strategies for managing inactive assets and for fostering an environmental culture among employees that has beneficial impacts on their families and communities.

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Dedication

I dedicate this doctoral study to Almighty God, who provided the strength, motivation, financial resources, and patience to complete this study. I also dedicate this study to my wife, Brenda, and my children, Eliane, Isaiah, and Gabriela, for their prayers, love, and unwavering support during this doctoral journey. I would also like to dedicate this study to my parents, Sir Benedict and Lady Cecilia who inspired me to pursue a doctoral degree.

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I want to thank my chair, Dr. Peter Anthony, and my committee members, Dr. Jorge Gaytan and Dr. Deborah Nattress, for their mentorship, guidance, and excellent support, which significantly contributed to the completion of this study. I want to acknowledge all my instructors and classmates at Walden University for their support, which contributed to my success. Also, I would like to thank my siblings for their continuous words of encouragement during the doctoral journey. I hope this study motivates my children to achieve excellence and positively impact the world. Finally, I would like to thank all the business leaders who contributed their selfless time and knowledge as participants in this study.

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Section 1: Foundation of the Study

Since the 1990s, corporate social responsibility (CSR) has become a salient critical differentiator in the global oil and gas (O&G) industry, with emphasis on safety, community and stakeholder engagement, ethical business conduct, and the environment (Kirat, 2015). However, in the Alberta O&G industry, leaders have neglected the issue of ineffective retired asset management as an element of CSR (Muehlenbachs, 2017). Alberta's lax policies have contributed to an increasing trend of inactive wells, with the number of such sites growing from 25,000 in 1989 to 81,602 in November 2016 (Muehlenbachs, 2017; B. Robinson, 2014). Ineffective retired assets management creates increased environmental risks and has a negative impact on long-term sustainability (Bujok et al., 2015; Soto & Renard, 2015). O&G retired assets incorporate all inactive wells, pipelines, and facilities that are no longer viable in the value chain due to the end of life, obsolescence, and technical or economic reasons and that are no longer in operation.

Background of the Problem

Every Alberta O&G company involved in the exploration and development of oil and natural gas resources is financially responsible for its entire value chain of activities, including the end of life activities for assets (Government of Alberta, 2017a). However, some retired assets in Alberta's O&G companies have remained suspended for more than 10 years, with no effective plan to execute abandonment or disposal operations and return the environment to its natural state (Muehlenbachs, 2017). The Alberta government has a regulatory agency named Alberta Energy Regulator (AER), whose mandate includes

addressing asset retirement obligations (ARO) of O&G companies (Government of Alberta, 2014). Although AER achieved positive strides in promoting and enforcing effective retired asset management, in September 2017, 44% of Alberta's O&G companies failed to meet the industry's retired asset liability threshold (AER, 2017). Further, the disposal of retired assets from Alberta's bankrupt O&G companies falls under the responsibility of the Alberta government, which has compounded the problem (Canadian Association of Petroleum Producers, 2017). Previous research studies and scholarly literature on asset retirement obligations focused on the financial and tax implications of retired assets (Fasci & Willis, 2013; Wright & Johnson, 2003). Several research studies explored the increased environmental hazards and the negative social impact on communities from retired assets (Boothroyd, Almond, Qassim, Worrall, & Davies, 2016; Jackson et al., 2013). However, a gap exists in the literature concerning the increasing negative trend of ineffective retired asset management prevalent in Alberta. I have provided the background to the problem and will now shift the focus to the problem statement.

Problem Statement

Alberta's O&G companies lose millions of dollars per year due to ineffective management of retired assets (AER, 2017). With only $223 million held by AER as security against over $30 billion in liability, 44% of Alberta's O&G companies failed to meet the industry's retired asset liability threshold because of ineffective management of retired assets (Davies et al., 2014). The general business problem is that some O&G asset managers are ineffective at managing their retired O&G assets, which leads to increased

environmental risks and decreased profitability. The specific business problem is that some asset managers in small- and medium-sized O&G companies lack strategies to manage retired O&G assets effectively to increase organizational sustainability.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies that asset managers in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability. The target population for the study was three asset managers of small- and medium-sized O&G companies located in Alberta, Canada, with successful experience in managing their retired assets effectively. The findings of the study may enable O&G asset managers to develop and sustain the efficient management of retired O&G assets by emphasizing the importance of asset lifecycle management. Promoting the value of lifecycle management in the O&G industry develops proenvironmental behaviors with internal and external stakeholders that evolve into an environmentally conscious culture in the industry (McDonald, 2014; Tian & Robertson, 2019; Unsworth, Dmitrieva, & Adriasola, 2013). Positive social change may occur if an environmentally conscious culture within O&G companies spills over into employees' personal lives, leading to improvements in the environment of their local communities (Young et al., 2015).

Nature of the Study

Three research methods used in doctoral studies include qualitative, quantitative, and mixed methods (Leppink, 2017). The qualitative research method was appropriate for this study because, as Eriksson and Kovalainen (2016) claimed, exploring social or

technical phenomena through interactions with a target population justifies the suitability of the qualitative approach. In that I sought to explore how successful O&G companies achieve effective retired assets management through interactions with asset managers, the selection of the qualitative method was justified. The quantitative research method involves statistical analysis and subjective deduction to test hypotheses by analyzing numerical data and drawing inferences from results in relation to a larger population (Bryman & Bell, 2015; McCusker & Gunaydin, 2015). Mixed methods involve combining qualitative and quantitative processes (Molina-Azorin, 2016). Because I did not intend to analyze numerical data, the quantitative and mixed method research methodologies did not fit the purpose of my study.

I considered using the following four qualitative research designs: (a) phenomenological, (b) ethnography, (c) narrative, and (d) case study (Colorafi & Evans, 2016). The phenomenological approach involves the study of individuals' lived experiences of a phenomenon in a business setting (Padilla-Díaz, 2015). Because I did not seek to study participants' lived experiences, I did not select this approach. Ethnography involves conducting research relating to cultural issues in organizations (Eriksson & Kovalainen, 2016). The narrative approach involves studying the lives of individuals over time (McAlpine, 2016). Because this study would not focus on the culture or lives of participants, the narrative and ethnography approaches were not viable for this study. The case study approach was appropriate because it is effective for exploring complex social and technical phenomena in depth (Yin, 2018), which may lead to business improvement.

Research Question

What strategies do asset managers in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability?

Interview Questions

The interviews with O&G asset managers for this qualitative multiple case study included the following questions:

1. What strategies do you use to track, monitor, and manage retired O&G assets effectively?
2. Based upon your experience, what specific features of the strategies contributed to the effective management of retired O&G assets?
3. How is the budget for management of retired O&G assets created to support the strategies?
4. What are the principal internal and external barriers to implementing effective retired O&G asset management strategies?
5. How do you address the internal and external barriers?
6. How do you monitor the effectiveness of your strategies for management of retired O&G assets as compared to competitors?
7. How does improving the management of retired O&G assets enhance the firm's corporate social responsibility?
8. How has your effective management of retired O&G assets ensured organizational sustainability?

9. What additional information can you provide to assist me in understanding the effective management of retired O&G assets to increase organizational sustainability?

Conceptual Framework

In the pursuit of sustainability, intranational factors influence both explicit and implicit CSR elements of organizations (Blindheim, 2015). Hence, the intranational CSR factors influence prevalent ineffective retired asset management practices in Alberta's O&G industry. The corporate sustainability model (CSM) proposed by Epstein in 2008 (Epstein & Buhovac, 2014) and the asset management concept model (AMCM) proposed by the Asset Management Council (2014) were the two conceptual frameworks selected for this study. Epstein and Buhovac (2014) emphasized that a balance between social responsibility, environmental welfare, and economic progress, known as the *triple bottom line*, is critical for successful business practice (Elkington, 1997; Epstein & Buhovac, 2014).

The CSM is a tool that can enable O&G asset managers to integrate green practices into retired asset management by addressing systems, performance measurements, rewards, and structure alignment as part of the CSR function. Retired asset management aligns with the green initiative, which focuses on minimizing organizations' carbon footprint, reducing greenhouse gas (GHG) emissions, and eliminating water pollution and soil contamination (Hwang, 2014; Lampikoski, Westerlund, Rajala, & Möller, 2014). The AMCM is appropriate as a conceptual framework for understanding the foundational elements of asset management to enable

the development and successful implementation of asset management strategies. The AMCM incorporates the lifecycle management of assets toward improving the triple bottom line (Elkington, 1997), which aligns with the management of retired O&G assets.

Operational Definitions

Abandonment: The permanent dismantling of a site in which the O&G well assets are plugged, cut and capped, and left in a safe and secure condition (AER, 2016c).

Asset retirement obligation (ARO): The legal and financial commitment from an organization to manage retired assets and return all lands to their natural state conditions at the end of life of the assets (Afieroho, Patil, Dandekar, Perkins, & Reynolds, 2017).

Corporate social responsibility (CSR): The manner in which leaders of organizations manage their operational and business activities to strive for positive economic, social, and environmental effects on their industry, stakeholders, and the society (Epstein & Buhovac, 2014).

Decommission: The permanent dismantling, decontamination, plugging, disassembly and removal or burial of O&G pipelines and facilities no longer in operation (Kaiser, 2017).

Orphan asset: An O&G asset (well, pipeline, or facility) confirmed by AER to have no legally or financially responsible O&G company that is able to deal with abandonment, remediation or reclamation activities (Muehlenbachs, 2017).

Reclamation: The process of replacing soil and re-establishing vegetation on an O&G location to return the location to its natural state (Government of Alberta, 2017b).

Remediation: The process of cleaning up contaminated soil, water, or groundwater in O&G locations to meet specific soil and groundwater standards (Government of Alberta, 2017b).

Retired O&G assets: All inactive wells, pipelines, and facilities that are no longer viable in the value chain due to the end of life, obsolescence, or other technical or economic reasons and that are no longer in operation (AER, 2016b).

Retired O&G asset management system: The alignment of strategic and sustainability practices within an organization that focus on the abandonment, reclamation and remediation (R&R) of O&G retired assets.

Sustainability: The use of resources for economic, social, and environmental benefits without impeding the sustenance of future generations (Epstein & Buhovac, 2014).

Triple bottom line (TBL): A concept arising from the notion that organizations can achieve success in sustainability by focusing on economic, environmental, and societal goals as integral aspects of conducting business (Elkington, 1994).

Assumptions, Limitations, and Delimitations

Global sustainability awareness has had a positive impact on the Alberta O&G industry, with many leaders of O&G companies communicating sustainability as a core value; however, authenticity and commitment to sustainability practices remain a challenge. The qualitative multiple case study research design used in this study enabled me to focus on the investigation of human experiences from a holistic perspective to explore a complex phenomenon in depth (Stake, 1995), which justified its suitability for

exploring ineffective retired assets management. However, consistent with all qualitative case study research design, there were assumptions, limitations, and delimitations with the study (Denzin & Lincoln, 2018; Hyett, Kenny, & Dickson-Swift, 2014).

Assumptions

In research evaluation, tacit or explicit assumptions based on beliefs, expectations, and considerations are taken for granted and accepted as truths (Nkwake & Morrow, 2016). Articulating and testing such assumptions minimizes the uncertainty and improves the credibility and validity of the research findings (Morrow & Nkwake, 2016). Given the subjective and voluntary nature of organizations engaging in sustainability practices, assumptions included the notion that some leaders in O&G companies fail to recognize retired asset management as part of the CSR function. Another assumption was that the asset managers selected as research participants were capable of providing accurate information on the effective retired assets management of their companies. An inherent assumption was that all research participants were truthful and provided sensitive company information without biased opinions and perceptions. I also assumed that all research participants and their respective companies shared a similar understanding and interpretation of CSR, sustainability, and effective retired assets management. Testing these articulated assumptions to reduce bias included (a) ensuring voluntary participation of research participants, (b) probing each participant's understanding of the subject matter, (c) disclosing the confidentiality of all data and interviews, and (d) using a purposive sampling technique to ensure that the data collected were accurate and relevant to the research question.

Limitations

The multiple case study approach is effective for exploring a complex social and technical phenomenon in depth (Yin, 2018), but it still has limitations that may affect the internal and external validity of the findings (Du-Babcock & Tanaka, 2016; Marshall & Rossman, 2016). Ruzzene (2012) noted the external validity of the case study approach as a limitation if the emphasis does not focus on comparability. The small sample size of the case study approach limits the transferability of the findings to other organizations (Craig-Henderson & Lewis, 2015). I mitigated the limitation by selecting the multiple case study approach with at least three asset managers from different small- and medium-sized O&G companies in Alberta to improve external validity. Excluding the downstream and midstream segments of the O&G industry and organizations with no formal positions dedicated to CSR may limit the depth of understanding of the different strategies used for effective retired assets management in those segments of the industry.

Delimitations

Hyett et al. (2014) explained the importance of delimitations in case study research. The delimitations of a study are the controlled and self-imposed boundaries set by the researcher that outline the scope of the study (Hyett et al., 2014). Defining the contextual boundaries of a study before starting the investigation enables an understanding of the case study as a holistic system (Hazzan & Nutov, 2014). Although the scope of the study focused on the O&G industry in the province of Alberta in Canada, one delimitation was the selection of only O&G upstream companies with no representation from the downstream or midstream companies. The study focused on the

small- and medium-sized O&G companies in Alberta, which were of particular interest due to their limited resources. Another delimitation was the selection of companies with at least 10 years of active O&G exploration and production that possessed heritage assets and were compliant with the AER. The study involved at least three asset managers actively involved in the CSR activities of their companies.

Significance of the Study

The significance of the study is that the results may increase awareness of the value of effective retired asset management as part of the CSR function to improve sustainability. With increasing global sustainability awareness and the fast pace of the business environment, the challenge for business leaders is to address the issue of sustainability while increasing financial performance (Epstein & Buhovac, 2014; Williams, 2014). The future advancement of sustainability depends on business leaders understanding the relationship between sustainability performance and financial performance and developing an organizational culture that focuses the organization on striving for social, environmental, and economic goals (Epstein & Buhovac, 2014). Improving sustainability performance in organizations involves innovations in technology, organization, regulatory, and social (Gebauer, Haldimann, & Saul, 2017; Hwang, 2014).

Contribution to Business Practice

The findings of this study may assist asset managers in the O&G industry in implementing innovative and cost-effective strategies for managing retired O&G assets for sustainability. The findings of this study may be relevant to asset management in

other industries because the need to manage retired assets effectively applies to all industries. O&G companies that are successful in effectively managing their retired assets will receive recognition as socially responsible companies and create a competitive advantage over their peers. With the current O&G commodity price instability, O&G companies employ critical strategies to ensure survival and future profitability, including operational efficiency improvement, cost reduction, and operational optimization. However, some O&G businesses in Alberta may not survive, and their undisposed retired assets could create additional strain on Alberta's Orphan Program, which may compound the retired assets problem. Hence, research into effective retired asset management is of critical importance, and the reversal of the negative trend of ineffective management of retired O&G assets in Alberta's O&G industry should start immediately to prevent future environmental mishaps.

Implications for Social Change

The study may promote positive social change by emphasizing asset lifecycle management in O&G companies and society. Efficient management of retired assets is an important aspect of asset lifecycle management (LCM) and may promote the development of an environmentally conscious culture in the organization with internal and external stakeholders (McDonald, 2014; Tian & Robertson, 2019; Unsworth et al., 2013). In time, the environmentally conscious culture of stakeholders may spill over from work to their personal lives, which could support improvements in society's environmental attitudes and practices (Young et al., 2015). Reversal of the prevalent ineffective management of retired assets in Alberta might lead to organizational culture

change in most O&G businesses, which could have a direct positive impact on stakeholder and community relations (Witkowska, 2016). Effective management of retired assets incorporates green practice in CSR, which leads to environmental improvements and aligns with global environmental awareness on renewable green energy resources.

A Review of the Professional and Academic Literature

The purpose of this qualitative multiple case study was to explore the strategies that asset managers in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability. I used the literature review to establish an academic and theoretical foundation for the development of this doctoral study. Conducting the literature review involved the selection, synthesis, and evaluation of published articles and peer-reviewed journals related to the topic of this study. The purpose of this literature review was to identify significant literature about the role of CSR in business practice, the importance of CSR and sustainability in asset management, and the influence of CSR in the O&G industry.

The literature review included an overview of sustainability, CSR in the O&G industry, strategic integration of CSR, retired asset management, and current trends of ineffective retired asset management in Alberta's O&G industry. The review also included an overview of the issues surrounding self-regulation and new Alberta Government initiatives to address retired asset management. A common theme throughout the literature review was the value and importance of integrating CSR into the

fabric of all business activities to achieve superior triple-bottom-line performance (Epstein & Buhovac, 2014; Williams, 2014).

The literature review organization followed a broad-to-specific approach, providing generic information regarding CSR and sustainability, including the diversity of concepts and the concept of asset management. Following the generic overview of CSR and sustainability, the literature review focused on the CSM and the AMCM related to the specifics of the research topic. The literature review included information on the increasing importance of CSR in the O&G industry and to stakeholders, practitioners, and scholars. This literature review section consists of six subsections, which address (a) CSR and sustainability, (b) CSR standards and evaluation methods, (c) CSM, (d) AMCM, (e) leadership in sustainability, and (f) CSR in the O&G industry.

The compiled information emerged from seminal books, Alberta government agencies, academic peer-reviewed articles, nongovernment organizations, and Walden DBA dissertations, mostly published in 2014 or later. The majority of the peer-reviewed articles came from online databases, namely ABI/INFORM, Academic Search Complete, Business Source Complete, EBSCO, Emerald Insight, ERIC, ProQuest, Sage Journals, and Science Direct. Keywords for this search included the following: *asset management, asset management concept model, asset retirement obligation, corporate social responsibility, corporate sustainability model, CSR evaluation methods, CSR and sustainability, green practices, leadership, O&G environmental risks, qualitative research, sustainability, stakeholders,* and *triple bottom line*. This doctoral study lists 417 references, of which 356 have a publication date between 2015 and 2019, corresponding

to 85% of the total references. The number of references in each source category is as follows: 357 peer-reviewed journal articles, 10 government reports, nine nongovernment organization reports, three dissertations, and 38 books. Table 1 illustrates the classification of the sources reviewed in this literature review.

Table 1

Synopsis of Sources in the Literature Review

Reference type	Number	Less than 5 years	Greater than 5 years
Research-based peer-reviewed journal	357	319	38
Dissertation	3	2	1
Government & nongovernment reports	19	17	2
Book	38	18	20
Total	417	356	61

Corporate Social Responsibility and Sustainability

For over 70 years, the subject of CSR has gained prominence in business practice across many industries and countries. Though the term CSR originated with Clark (1926), who used it to describe the obligations and responsibilities of business to society, scholarly interest in the subject gained momentum following Bowen's (1953) seminal work. Bowen's *Social Responsibilities of the Businessman* recognized CSR as the philanthropic responsibility of business to society. Bowen made the argument that social responsibility should be the foundation of all business and human endeavors. Boulding (1956) expanded on general systems theory and argued that organizations are complex open systems intricately linked to a larger environment. McGuire (1963) emphasized the greater responsibility of business toward society using different CSR approaches. However, a better understanding of CSR developed years later from Carroll's (1979)

seminal paper. Carroll (1979) emphasized that CSR embodies the economic, legal, ethical, and discretionary (philanthropic) elements of business performance. The plethora of definitions and concepts for CSR in the 1980s and 1990s served as drivers for the paradigm shift of CSR from responsible actions toward responsible competitive actions (Hack, Kenyon, & Wood, 2014). Since 1953, several researchers have opposed Bowen's and Clark's CSR interpretation.

With more research and studies conducted on CSR, scholars and business practitioners realized that the adoption of CSR has a competitive component for organizations. Carroll (1999) opined that the expansion of the CSR concept as a competitive tool for organizations and the evolution of CSR since 1926 had led to an increase in the adoption of CSR by organizations. The strategic importance of CSR in business practice is evident from the fact that 95% of the world's 250 largest corporations reported investing in CSR activities in 2011 (Sony, Ferguson, & Beise-Zee, 2015). Additionally, 90% of Fortune 500 companies have explicit CSR initiatives, with more than 50% of the companies involved in CSR reporting, and most have designated CSR senior managers (Kunz, 2016; Raska, Sprott, Joireman, & Spangenberg, 2015). CSR adoption has extended beyond businesses, as government, legislative, and nongovernmental organizations have been adopting CSR values. The growing trend of CSR adoption in organizations and the volume of research studies on the subject support the current relevance of CSR in business practice. The emerging frameworks link CSR with corporate sustainability (CS), but there is no universally accepted definition of CSR

or CS (Carroll, 2015). However, the growing adoption of CSR in firms as a pursuit of CS emphasizes the link between CSR and CS.

Following the definition of sustainable development in the 1987 Brundtland Commission's report (World Commission on Environment and Development, 1987), *sustainability* has referred to the use of resources for economic, social, and environmental benefit without impeding the sustenance of future generations (Epstein & Buhovac, 2014). The European Commission has proposed that CSR refer to actions by firms above and beyond their legal obligations toward society and the environment (Galant & Cadez, 2017). However, sustainability is not a new concept in business practice. Sustainability and sustainable development have been in existence since the conservation and preservation movement in the postindustrialization period of the late 19th century (Hays, 1959; Van Hise, 1927). Three concerns fueled the conservation and preservation movement: the need to protect the wilderness, the impact on the environment of the release of chemical agents from industrial development, and the impact on the ecosystem from population growth and consumption (The National Academies of Sciences, Engineering, and Medicine, 2011). The conservation and preservation movement of the late 19th and early 20th centuries focused primarily on the protection of the environment and ecosystems from the effects of resource exploitation arising from growing industrialization, pollution, and populations (Hays, 1987; Lazarus, 2004). However, the evolution of industry and sustainability prompted the need to focus on issues in addition to the environment.

The focus on only environmental conservation was limited, and the advancement of global sustainability was possible due to the integration of environmental, economic, and social foci. Although the adoption of the concept of sustainable development occurred at the Brundtland Commission in 1987, the foundation of global sustainability occurred at the formal international endorsement at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 (UNCED, 1992). At the UNCED 1992 conference, many countries endorsed a global sustainable development action plan, which incorporated environmental protection and restoration into economic and social pillars of development (UNCED, 1992). The endorsement by various countries at the 1992 UNCED conference started the momentum toward the advancement of global sustainability.

Sustainability has become a prominent focus since the 1950s because industrialization and globalization led to several global issues. These global issues include greenhouse gas (GHG) emissions, climate change, pollution, carbon footprint, poverty, natural resources depletion, health concerns, population growth, and migration (Hart, 1997). The pursuit of economic development, environmental protection, and social change serve as the pillars of sustainability, also known as the *triple bottom line* (Elkington, 1997). Beginning in the 1970s, globalization, pressures from government regulations, nongovernment organizations, stakeholders, and the society fueled the global sustainability awareness, which resulted in more organizations engaging in sustainability initiatives (Hart, 1997; Williams, 2014). Though global sustainability awareness is on the

increase, the integration of sustainability in business practice is prudent to achieve global sustainability.

CSR and sustainability have been gaining popularity in business practice since the 1980s, when extensive research on the topics gained momentum (United Nations Global Compact, 2015). Previously, in the 1970s, CSR was regarded as a futile endeavor because the focus in business was making profits. Friedman (1970) emphasized that businesses existed for the sole, obligatory social purpose of maximizing profits. Supporting the argument, Votaw (1973) shared the profit maximization objective of firms and critiqued CSR as a term that businesses could use to manipulate the public. The critique of organizations using CSR for public manipulation strengthened the argument that CSR was just a guise to cope with government regulations and fawn on the public. However, the notion that business leaders held a duty to the society that superseded the objective of wealth generation started to gain traction in the 1990s and into the 2000s (Carroll, 2015; Jones, 1980). CSR and sustainability now represent a prominent focus at the corporate level in many organizations.

In the 1980s, researchers and business practitioners continued the CSR critique, and Wartick and Cochran (1985) argued against the role of organizations as moral agents, thus questioning the philanthropic responsibility of businesses in addressing social issues. The CSR role of business in selectively addressing social issues clouded the positive CSR impact and gave support to critics who argued that CSR enabled firms to cherry pick social issues while doing very little to benefit society (Hack et al., 2014; Jones, Hillier, & Comfort, 2014). Though scholars and researchers posited several contradictory

perspectives on the purpose of CSR in business practice, there is a consensus that CSR positively impacts sustainability performance (Elkington, 1997; Jeon & Gleiberman, 2017; Pan, Sha, Zhang, & Ke, 2014). However, the debate lingers that integrating CSR initiatives could affect profitability. Successful organizations implement strategies that provide a sustainable competitive advantage, which translates into superior financial performance and value maximization (Galant & Cadez, 2017; Porter & Kramer, 2006). The responsibilities attributed to businesses evolved, and several researchers opined that businesses had the choice in selectively addressing social issues that complemented their business activities.

In the 1970s and 1980s, several researchers made the argument that adopting CSR impacted profitability. Wartick and Cochran (1985) argued that CSR adoption diverted resources to support activities that promoted socially responsible and philanthropic goals stifling the firm's economic responsibility. Advocates for the CSR ideology clarified the four distinct responsibilities of corporations, namely economic, legal, ethical, and discretionary/philanthropic, and emphasized the importance of all responsibilities for sustainable superior financial performance. Further clarification of CSR responsibilities underscored that economic and legal responsibilities are society's requirement of business, while ethical responsibility is an expectation and philanthropic responsibility is a desire. Other scholars have argued that CSR encompasses five responsibilities — responsibilities to shareholders, employees, the environment, the public, and suppliers/consumers (Pan et al., 2014). The evolution of the different CSR ideologies would continue to generate different firm responsibilities.

However, as the CSR concept has continued to evolve, a wider consensus has developed that all CSR responsibilities merge into three dimensions—economic, environmental, and social. Prominent CSR researchers and practitioners support the three facets of CSR responsibilities as profit, planet, people or economic, environmental and social (Epstein & Buhovac, 2014; Hack et al., 2014). However, in the 21st century, most firms are critiqued by stakeholders and society concerning responsibilities not mandated by law, namely ethical and philanthropic responsibilities (Carroll, 2015). The evolution of CSR led scholars and practitioners to develop diverse CSR definitions and concepts based on subjective interests and agendas, which gave some credence to critics' arguments against the concept. Opinions of CSR fall into three categories, namely positive, negative, and neutral (Witkowska, 2016). However, the increase of CSR adoption and CSR reporting in the 21st century has provided evidence that most organizational leaders accept CSR as having a positive impact on their activities.

Despite over five decades of increasing global sustainability awareness, the sustainability movement has been slow, and at the current pace, the pursuit of a future sustainable society looks bleak (Baue & Wood, 2015). The advancement of sustainability for the future requires a radical change that challenges current norms and paradigms of the sustainability movement. A new approach is therefore needed to boost global sustainability for the future while ensuring adaptability to changes in the marketplace, environment, and society (Baue & Wood, 2015; Høgevold & Svensson, 2016). Scholars and researchers agree that leadership is important to engage and drive organizational sustainability success, but to change the current slow pace of global sustainability,

business leaders must engage in integral thinking (Newman-Storen, 2014). Integral thinking develops integral leadership, which provides the capability to discover innovative ways to advance sustainability. The voluntary nature of organizational sustainability has been a drawback, and more government involvement is necessary to enhance laws and provide tax incentives to instigate and motivate more businesses to engage in the sustainability movement.

However, variations in CSR definitions lead to subjective interpretations by organizations, which then influence decisions to engage in certain CSR activities. The subjective interpretation of CSR and ethical standards by individual organizations may result in a façade of CSR initiatives, with no measurement of actual performance achieved (Friedman, 1962, 1970; Gangi & D'Angelo, 2016; Perks, Farache, Shukla, & Berry, 2013). Critics of the sustainability agenda have referred to the hypocritical façade of CSR and the lack of measured performance, thereby justifying some organizations' unwillingness to engage in sustainability initiatives. Furthermore, CSR definitions and understanding are not consistent across national boundaries, and variations exist within the same country (Freeman & Hasnaoui, 2011). Several scholars link the level of education in a geographical area with the level of sustainability awareness and understanding (Lago, Kocak, Crnkovic, & Penzenstadler, 2015; Opp, Osgood, & Rugeley, 2014). When individuals increase their level of education, they gain an improved understanding of sustainability and place more pressure on firms to comply with public policies that benefit society and stakeholders (Opp et al., 2014). Hence, despite the variations in CSR definitions, the focus on improving the level of education in

society should lead to an increase in the number of firms engaged in CSR (Lago et al., 2015; Opp et al., 2014).

CSR is a concept that embodies different meanings and is continually evolving, resulting in the emergence of competing and complementary frameworks. Emerging frameworks include business ethics, corporate citizenship, stakeholder management, and sustainability (Carroll, 2015; Liu, Garcia, & Vredenburg, 2014). The common themes of CSR in recent research studies are the two aspects of protecting and improving. The protection of society implies businesses make decisions and take actions to prevent any negative impacts of its activities on society. The improvement aspect involves enhancing the welfare of stakeholders and society (Carroll, 2015; Fontaine, 2013). Improving CSR requires transparency through appropriate documentation and measurements to fully understand the current state and enables the setting of future improvement targets. The objective of CSR improvement and transparency led to the concept of sustainability reporting.

The concept of sustainability reporting has gained momentum with the advancement of sustainability. However, despite the growing global trend of sustainability reporting, Hashmi, Damanhouri, and Rana (2015) highlighted the lag in sustainability ranking between large corporations in the United States and the rest of the world. In 2013, 93% of the 250 largest corporations in the world (G250) reported on CSR activities, but the global commitment towards sustainability made little progress (Global Reporting Initiative, 2015). Higgins, Milne, & Van Gramberg (2015) opined that organizations involved in CSR activities encounter difficulty with CSR or sustainability

improvement when sustainability reporting is absent. The ongoing issue of sustainability non-report by businesses contributes to the impediment of global sustainability. Bouten & Hoozée (2015) posited that more organizations would become involved in sustainability performance measurement and integrated reporting with the growing global sustainability awareness. The misalignment between the increasing trend of global sustainability awareness and the slow progress of global sustainability reporting highlights a key weakness of the current global sustainability movement.

Sustainability reporting is a communication tool for organizations to highlight their sustainability commitment to stakeholders (Kilian & Hennigs, 2014). Epstein and Buhovac (2014) explained that sustainability reporting involves the evaluation and monitoring of financial and sustainability-related performance indicators, which facilitates continuous improvement in business practice. However, sustainability reporting does not validate the reliability of the report and corporate governance should include a code of ethics and auditor assessment of sustainability reports (Epstein & Buhovac, 2014; Kolk, 2008). The varied interpretations of CSR by organizations (Gangi & D'Angelo, 2016) create the issue of variations in sustainability reporting (Ehnert, Parsa, Roper, Wagner, & Muller-Camen, 2016; Higgins, Stubbs, & Milne, 2018). Moreover, Ehnert et al. (2016) highlighted that the variations in country-specific corporate governance influence company sustainability reporting. Hence, organizations including the Global Reporting Initiative (GRI) have promoted standardization and normalization of sustainability reports.

Global sustainability awareness has underscored several challenges that impede global sustainability advancement. These challenges include resource scarcity, climate change, carbon footprint, global finance systems, human rights, gender equality, poverty, health care, infrastructure investments, and hunger (McKinsey & Company, 2010; United Nations Global Compact, 2015). Addressing these challenges requires the transformation and adoption of a radical change that motivates organizations and countries to enhance the focus on sustainability. Williams (2014) noted organizations need to advance global sustainability to address the challenges of creating a sustainable global society. The emerging factors in fostering radical change are integral leadership and more involvement from country governments in the sustainability movement. Also, the increasing adoption of sustainability reporting in business practice challenges organizations to demonstrate measurable sustainability improvement to stakeholders.

With the current technological advancement, sustainability reports do not only appear in a company's financial reports but on other alternative platforms including company websites and social networks. Social networks have become tools for sustainability communication where companies can share information with stakeholders about their positive social impact from CSR operations (Dovleac, 2015). Globalization led to the interconnectivity of the ecological and business systems with social networks due to the extensive reach of social media (Anderies, 2014), which promotes transparency and trust with stakeholders and enhance a firm's CSR image (Von Scheel, Maamar, & Von Rosing, 2015). The advancement of SR highlights the growing trend of the need for an integrated report that captures strategy, risk, performance, and

sustainability in one document (Birnik, 2013; De Villiers, Rinaldi, & Unerman, 2014). The internet and social networks have led to easier access to information and stakeholders have become more informed. Therefore, firms need to adopt an integrated report format to provide information in one document that satisfies different stakeholders' expectations.

The review of existing literature on CSR and sustainability has highlighted the subjective CSR definition and the adoption of certain aspects of CSR and sustainability in business practice. The subjective CSR adoption emphasizes a gap in the literature and business practice which is evident in the Alberta O&G industry. The prevalent issue of ineffective O&G retired asset management in the Alberta O&G industry suggests that most O&G firms in Alberta have adopted a subjective CSR which minimizes the value of retired asset management. The failure to link retired asset management as an integral component of CSR in the Alberta O&G industry highlights a gap in CSR business practice that justifies the need for this study.

Corporate Social Responsibility Standards and Evaluation Methods

The debate on the relationship between CSR and corporate financial performance (CFP) has lingered as long as the term CSR became a focus of business practice and despite extensive empirical inquiry, the evidence is equivocal (Galant & Cadez, 2017). Establishing normative standards to measure CSR is challenging since CSR has different significance to different corporations and stakeholders, and any form of standardization could negatively impact different interest groups (Hack et al., 2014). Extensive empirical studies on the relationship between CSR and CFP, reveals no clear consensus since

previous studies produced different results (Cheng, Ioannou, & Serafeim, 2014; Pan et al., 2014). The different results of previous extensive studies presented a positive, negative, or neutral relationship between CSR and CFP (Galant & Cadez, 2017), but there is more scholarly acceptance towards a positive correlation. From a global perspective, the increase in firms adopting CSR provided some evidence of the positive correlation between CSR and CFP.

Though recent studies since the 1990s suggest a positive correlation between CSR and CFP, in the 1970s and 1980s several studies highlighted a negative correlation. Supporters of Friedman's theory of CSR's negative impact on business profits conducted studies that emphasized a negative correlation between CSR and CFP. The study by Vance (1975) found that firms with good CSR performance had mediocre performance in the stock market and established a negative relationship between CSR and return on equity. Further, a study of 329 listed companies in the United States, Europe, and the Asia-Pacific region from 2009-2010, Hirigoyen and Poulain-Rehm (2015) identified that CSR and CFP had a negative correlation. However, Mackey, Mackey, and Barney (2007) identified in their study of CSR and FP that engagement in CSR activities does not maximize future cash flow but maximizes market value. Other studies found that the pursuit of CSR diverted resources to those interests and had a negative impact on financial performance (Pan et al., 2014). The assessment and measurement of CSR have become an important predictor of CFP and managers need to pay attention to CSR evaluation methods and disclosure (Ferrell, Liang, & Renneboog, 2016). Maintaining a healthy CFP comes from tracking, monitoring and managing CSR activities.

Clarkson (1995) conducted a 10-year study that underscored the fundamental problem of inconsistency between different CSR evaluation methods. Evaluating a firm's CSR or corporate social performance (CSP) is challenging because there are no definitions that provide a framework or model for systematic data collection and analysis of corporate data. Further complicating the formulations of CSR evaluation standards are the different mental modes corporate managers use to evaluate CSP. Hockerts (2015) proposed a cognitive perspective that revealed managers use different mental modes in evaluating CSR as a competitive tool. Managers in firms with excellent CSP relied on the frameworks of risk, efficiency, brand building, and new markets, while managers in firms with low CSP relied solely on risk and efficiency (Hockerts, 2015). A commonly accepted reason for the variety of empirical results when evaluating CSR and CFP relates to the measurement methods (Galant & Cadez, 2017). Measurement of CFP data are relatively standardized from financial statements, but the lack of consensus on CSR constructs introduces variability in CSR measurements. The non-financial CSR data lacks reporting standardization and the subjective disclosure of CSR activities by firms creates further complexity (Tschopp & Nastanski, 2014). The complexity of evaluating different firm's non-financial CSR data introduces stakeholder and society skepticism towards CSR.

As a result of the subjective variations of CSR adopted in business practice, some organizations engaged in CSR activities only cater to a small number of stakeholders. From a global viewpoint, different standard-setting organizations have created several CSP standards, but many standards consider the interests of a small number of

stakeholders (Zhu, Liu, & Lai, 2016). The process of setting CSP standards is a key assurance practice and the creation of some voluntary standards by professional or industry-led associations in which the members of the association drive the standards-setting process (Castka & Corbett, 2014). Implementing CSP standards that consider multiple stakeholder interests was the driver that led the International Organization for Standardization (ISO) to develop ISO 26000 in 2010. The ISO 26000 is a voluntary international standard for social responsibility. The standard includes multi-stakeholder considerations namely (a) industry; (b) government; (c) consumers; (d) labor; (e) nongovernmental organizations; and (f) service, support, research and others (Balzarova & Castka, 2012; Zhu et al., 2016). However, there are still limitations to the number of stakeholders included in international CSP standards.

In the O&G industry, the absence of CSR evaluation standards contributed to the ongoing problem with retired assets management. Muehlenbachs (2017) underscored the issue of ineffective retired asset management in Alberta's O&G industry as a result of ineffective CSR standards. The inconsistent evaluation methods by various O&G firms prompted the AER to implement new policies and standards to tackle the retired assets problem. Concerning social responsibility, Bowler, Castka, and Balzarova (2017) identified industry as the dominant stakeholder to influence corporations, but in Alberta, the O&G industry has been unsuccessful as the dominant stakeholder in curtailing the ineffective retired assets practice. Rather coercive pressures from government, nongovernmental agencies and society pushed O&G corporations to incorporate wider sustainability practices for operational sustainability by ensuring compliance with laws

and regulations (George, Siti-Nabiha, Jalaludin, & Abdalla, 2016). The evidence of the retired assets problem in Alberta's O&G industry highlights the weakness of industry in self-regulating good business practices without the coercive pressures from the government.

A recent 2014 US study highlighted the rising expenditure in O&G firms concerning sustainability activities; however, the increased spending does not translate to higher CSP because firms focus on different CSP metrics (George et al., 2016). Despite advancement in CSP standards, O&G firms still focus predominately on economic value. The priority focus on economic value in the O&G industry leads to investment in operations that adversely impact the environment and social welfare (George et al., 2016; Van Der Linden & Freeman, 2017). However, the number of corporations integrating CSR activities is on the rise even though there is a lack of an accepted method measuring CSP because existing methods lack consistency (Epstein & Buhovac, 2014). Though existing CSP measurement methods lack consistency, the growth in CSR rating agencies has helped to provide some level of consistency in measuring CSP.

Since 1990, there has been a pronounced growth in CSR rating agencies that assess firms based on their environmental and social performance (Scalet & Kelly, 2010). CSR rating agencies provide rating services, corporate research, compliance and consulting services for a broad range of stakeholders (Avestisyan & Hockerts, 2017). Most of the growth and development of ratings occurred through the $3 trillion community of socially responsible investors (SRI), including several social indices MSCI (formerly Kinder, Lydenburg, and Domini or KLD), Calvert Social Index and the Dow

Jones Social Index (Montiel & Delgado-Ceballos, 2014). The growth in CSR rating agencies offers a strong indication of the permanence of the CSR movement. However, these agencies vary widely depending on the end user of their data and the criteria used to assess CSP (Scalet & Kelly, 2010). The KLD dataset is the most comprehensive and frequently used source for stakeholder and CSP evaluations and the dataset measures more than 35 dimensions of a firm's socially responsible behavior grouped into seven indicators (Alakent & Ozer, 2014). The seven indicators include (a) corporate governance, (b) diversity, (c) community, (d) environment, (e) employee relations, (f) human rights, and (g) product (Vracheva & Mason, 2015). The comprehensive set of evaluation indicators enables adequate firm comparison to satisfy the self-interests of multiple stakeholders.

Essential stakeholders including employees, investors, consumers, communities, activists, and the public use the data from CSP performance ratings. As Dillenburg, Greene, and Erekson (2003) emphasized "what gets measured gets managed," and the goal of ranking firms by their CSP was to influence corporate behavior towards improvement in environment and social performance. However, Scalet and Kelly (2010) concluded from their study that CSP rankings had little impact on influencing corporate behavior towards improvement in environment and social performance. The difficulty of comparing results across CSR rating agencies due to the variability in standards, assessment and weighting criteria undercuts the stakeholders' ability to discriminate among reliable ratings and enables firms to cherry pick ratings that present their firms in a positive CSP. Furthermore, the lack of transparency in the CSP rankings due to the

proprietary nature of the ratings minimizes the gravity impact on firms and supports the firm's "cherry picking" practice. Hence, regardless of the positive or negative CSP ranking by the rating agencies, firms continue to publish and focus on their positive CSR activities which attempt to avoid the pressures from stakeholders to improve their CSP performance.

The variability in CSR rating agencies prompted other stakeholders to engage in developing CSR evaluation criteria. These stakeholders including government, industry associations, and corporations developed reliable CSR evaluation criteria (Elbasha & Avetisyan, 2017). Scholars and practitioners have also developed several CSR measurement and assessment models including the Sustainability Balanced Scorecard (SBSC) which enables firms to support sustainability strategies (Journeault, 2016). The SBSC integrates the three pillars of sustainability into a single performance measurement system. Kocmanova, Docekalova, and Simanaviciene (2017) developed the Sustainable Environmental, Social, Governance and Economic model (SEESG Model) which can be used to formulate a composite indicator capable of measuring and assessing sustainability. Evaluation methods similar to the composite indicator from the SEESG model incorporate financial and non-financial performance indicators provide consistent benchmarking in evaluating different firm's CSP and corporate decision making (Kocmanova et al., 2017; Kocmanova & Simberova, 2014). However, the different CSR evaluation criteria may reflect a bias focused on self-interests.

An effective CSR rating system enables the society and other stakeholders to adequately compare different organizations and their commitment to CSP, which in turn

challenges organizations to strive for a better CSP. CSR rating systems enable better strategic decisions and ethical decisions for creating a better society (Elbasha & Avetisyan, 2017). However, most firms' management tends to focus on CSR activities that lead to higher economic returns which influence their adoption of CSR evaluation methods instead of value creation through stakeholder synergy (Tantalo & Priem, 2014). Essential stakeholder groups across the economic spectrum are now looking beyond a firm's financial performance towards the CSP as an indicator of long-term operational sustainability (Montiel & Delgado-Ceballos, 2014). Value creation has a different meaning for different stakeholders. However, a firm's value creation is the sum of all the valuation made by essential stakeholder groups for the utilities received from the firm rather than value captured by shareholders. CSR managers should focus on the diversity and sensitivity of stakeholder demands and stakeholder scrutiny to improve CSP performance (Bridoux & Stoelhorst, 2014; Tantalo & Priem, 2014). The benefits of managing stakeholders include greater potential for value creation, competitive advantage, improved trust and commitment from essential stakeholder groups and superior CSP.

Despite the awareness in business practice of the benefits of superior CSP performance, many organizations still do not engage in CSR activities. Journeault (2016) noted that many firms had not developed strategies incorporating CSP metrics. In the Alberta O&G industry, despite the prevalent ineffective retired assets management, the sustainability practices and CSR evaluation methods adopted by many O&G firms still present a positive CSP. Therefore, Montiel and Delgado-Ceballos (2014) emphasized the

need for more uniformity and standardization of CSR measurement constructs from CSR rating agencies, stakeholders, and researchers. The variability and ineffectiveness of CSR evaluation methods adopted in Alberta's O&G industry prompted the government agency AER to develop a monthly CSR evaluation criterion. The Liability Management Rating (LMR) is the monthly CSR criterion developed to specifically address the retired assets issue (AER, 2017; Muehlenbachs, 2017). The LMR incorporates an asset management standard and ranks every O&G firm in Alberta against the standard to highlight noncompliance and draw stakeholder attention to those noncompliant firms. Noncompliant O&G firms are flagged and put on notice to rectify noncompliance within a time frame or incur possible fines and the increased risk of operational sustainability.

Corporate Sustainability Model

Scholars and practitioners have frequently interchanged the terms CSR and CS, but a common definition of CS is still lacking. Though the origin of the CS concept relates to the definition of sustainable development in the Brundtland report (WCED, 1987), Gladwin, Kennelly, and Krause (1995) integrated the CS concept into the management literature. Gladwin et al.'s (1995) definition of sustainable development as a process of achieving human development in an inclusive, connected, equitable, prudent, and secure manner brought attention to the value of CS in business practice (Montiel, 2008; Montiel, & Delgado-Ceballos, 2014). Since the 1980s, CS in the business world is a strategic imperative receiving significant attention from governments, consumers, scholars, and practitioners.

Despite the widespread embrace of CS, organizations are still failing at implementing successful sustainability practices (Baue & Wood, 2015). The difficulty of integrating sustainability into organizational strategies is a major reason why organizations fail at implementing successful sustainability practices (Avota, McFadzean, & Peiseniece, 2015). Hence, researchers, scholars, and practitioners have focused on developing a CSM as a practical guide that enables organizational leaders to succeed in achieving CS. However, other scholars posited that organizational values and sustainability control systems (SCS) that promote organizational sustainability must support the CSM to be successful (Joshi & Li, 2016; Wijethilake, 2017). The success of implementing a CSM depends on the support of leadership in establishing the organizational structure and systems required for that CSM.

Researchers agree that a model for CS adds value and increase organizational competitiveness. However, the limitations imposed by economic, social, and environmental systems impact the value creation and organizational competitiveness (Baumgartner, 2014; Lloret, 2016). Since the 1990s, researchers and scholars developed a different CSM using different perspectives with the goal of sustainable value creation, competitive advantage, and long-term triple bottom performance. Most CSMs incorporate an environmental dimension, social dimension, and economic dimension including corporate governance, human capital management, and CSR (Strand, Freeman, & Hockerts, 2015; Pryshlakivsky & Searcy, 2017). Successful CSR firms develop and measure metrics in the economic, environmental, and social dimension to facilitate continuous sustainability improvement (Avota et al., 2015; Shaker & Zubalsky, 2015).

The economic dimension addresses fair price, cost reduction, balanced shareholder value, investor relationship, and long-term financial performance. The environmental dimension addresses protection of the natural environment, biodiversity, responsible use of resources, and cost-efficient environmental management. The social dimension addresses the protection of human health, sustaining societal values, personal development and education, equality, diversity, and solidarity.

In addition to the profit, planet, people (3P) concept of sustainability, some researchers proposed a 4P model (Schaltegger & Burritt, 2015; van Marrewijk & Were, 2003). The 4P model included principle as the fourth dimension which involved internal drivers and motivators, criteria for decision making, external drivers, the role of government, and organization-stakeholder-society relationship. The differing CSM perspectives include the institutional-based view and stakeholder management, market-based view, resource-based view, responsible leadership, environmental performance, and financial performance (Lloret, 2016). The institutional-based view embodies the influence of societal expectations for firm behavior because firms are subject to regional, national, international, and self-regulatory mechanisms that guide conduct. The market-based view focuses on cost leadership and differentiation, while the resource-based view focuses on the strategic exploitation of resources and capacities. Epstein and Buhovac (2014) developed a CSM that incorporates all the elements of the differing perspectives for practical implementation to achieve superior sustainability performance.

Several researchers defined CS in the same three-dimensional constructs as CSR, but the progression of CS constructs has incorporated Valente (2012) “sustaincentric”

orientation of the firm. Similar to CSR, CS presents the logical concept of taking care of the present and future as a concern for profits, planet, and the people. Carroll (2015) posited that CS is a complementing framework of CSR but has the added advantage of stressing the long-term perspective by incorporating the concern for future generations. The progression of CS in business practice has been the transparency component which transformed firms into the publishing of sustainability reports disclosing their performance in social, economic, and environment realms (Carroll, 2015; Epstein & Buhovac, 2014). Through their study of extensive CS literature, Montiel and Delgado-Ceballos (2014) emphasized the need for a paradigm shift in the current thinking of CS constructs. The current thinking of CS should evolve beyond long-term environmental sustainability but should incorporate the long-term sustainability of a firm's value chain operations.

The general CS notion that economic development and environment sustainability have a positive correlation is misleading without a CS framework to measure performance. In a study of Alberta's oil sand extraction, Busato and Maccari (2016) confirmed that Alberta ranked last in air quality compared to the USA, Saudi Arabia, Venezuela, and the rest of Canada. Alberta's O&G industry has the third largest oil reserves in the world behind Saudi Arabia and Venezuela, which highlights the significance of poor air quality to global environmental sustainability. Several research studies have confirmed that O&G activities impact air and water toxicity, ecosystem, human health, and generate significant greenhouse gas (GHG) emissions (Fernando,

2017; Reams, Harding, Subra, Lam, & O'Connell, 2017). Hence, economic development does not translate to environmental sustainability unless CS performance is measured.

The CS performance incorporates the challenges of improving social, economic, and financial performance simultaneously through the proactive pursuit of sustainability. Successful CS firms proactively engage in sustainability instead of adaptation to sustainability as a result of regulatory enforcement, reaction to competitor's initiatives, demands from the marketplace, or pressure from nongovernmental organizations (NGOs). The 2010 British Petroleum's environmental disaster emphasized the need for formal and informal systems to achieve long-term sustainability. The formal systems refer to the processes, performance measurement, and reward systems, while the informal systems refer to the leadership, culture, and people. The challenges of implementing sustainability in business stem from setting unclear and immeasurable goals, financial incentive pressures, and stakeholder reactions.

Epstein developed the CSM in 2008 and the CSM highlighted the role of various drivers in sustainability, relationships between various inputs and processes, CS actions, the stakeholder reactions to corporate actions, and potential impact on financial performance. Epstein and Buhovac (2014) posited the core of the CSM as the leadership function, which drives management commitment to sustainability as a core value within the organization. The inputs to the CSM include external context, internal context, business context, and human and financial resources. The external context refers to the government, regulatory, and geographical influences and the internal context refers to company mission, strategy, structure, and systems. The business context relates to the

industry sector, customers, products, and services, while the human and financial resources refer to the allocation of human resources and budgets for sustainability purposes. CSM encourages business leaders to develop metrics to measure and manage sustainability performance.

Scholars' studies on corporate sustainability model. Epstein's CSM (Epstein & Buhovac, 2014) is a well-established conceptual framework for CS studies and several scholars have used Epstein's CSM in the business field (Camacho, 2012; Kuei & Lu, 2013; Stuart, 2013; Ting Ho Yan, 2017). Ting Ho Yan (2017) used Epstein's CSM to study the strategies for implementing a sustainable energy program in Hong Kong's public hospitals. Using the CSM five strategies were identified as essential for implementing a sustainable energy program namely internal and external driving forces, leadership, governance, building a sustainable culture, and performance measurement. Stuart (2013) used Epstein's CSM to study the importance of leadership with the development and maintenance of CS branding. Using the CSM enabled the identification of the brand-specific transformational leadership as the type of leadership required in an organization for CS branding. Camacho (2012) used Epstein's CSM in exploring how to improve the environmental effects of business practice toward CSR and suggested the provision of incentives, education, and partnerships were essential to curb environmental effects of business practice.

Kuei and Lu (2013) used Epstein's CSM as a framework to explore the implementation of sustainability management using quality management principles and suggested a quality management conceptual framework consisting of sustainability

design, transformation, assessment and learning elements were essential. Rodas, Gómez, Castanho, and Cabezas (2018) used the CSM in the development of a land valuation sustainable model for urban planning and established a functional model and methodology capable of calculating land valuation from different urbanization stages. Bin, Roslen, Ibrahim, Yee, and Theam, (2017) used elements of the CSM in evaluating the green bonds issuance towards a sustainable future and identified that reputational benefits, legislation, stakeholder pressure, internal legitimacy and personal motives are essential drivers that should guide the strategy to achieve sustainability performance. Sroufe and Gopalakrishna-Remani (2018) used elements of the CSM in exploring the relationship between sustainability management, reputation, and financial performance and noted that firms that adopted sustainability practices enhanced reputation and social responsibility, but social responsibility did not guarantee enhanced reputation or financial performance. Wiesner, Chadee, and Best (2018) used elements of the CSM in developing an environmental sustainability change management model. The versatility of the CSM enables scholars and researchers to utilize the CSM as a conceptual framework for evaluating sustainability issues in different fields of study.

Using the CSM enables managers to understand the influences of the inputs on sustainability, which is useful in developing effective sustainability strategies that take account of an organization's available human and financial resources, structures and systems (Epstein & Buhovac, 2014). Bocken, Short, Rana, and Evans (2014) suggested that elements of a CSM should incorporate the objective to maximize material, energy efficiency, value creation from waste, renewables, and environmental and societal

benefits. Performance measurement in sustainability implementation includes costing and capital investment decision making, risk management systems, performance evaluations and reward systems, measurement systems, feedback systems, and reporting and verification systems (Journeault, 2016). The CSM emphasizes the importance of developing an organizational culture that promotes sustainable decision-making and behavior in establishing long-term sustainability (Macagno, 2014). Having a sustainability strategy does not lead to effective sustainability implementation unless the organization has the appropriate organizational structure, systems, measurements, reporting, and effective leadership committed to sustainability (Eisenbeiss, Van Knippenberg, & Fahrbach, 2015). Corporate and stakeholder buy-ins are also important to successfully implement a CSM. Panwar, Nybakk, Pinkse, and Hansen (2015) noted that during an economic downturn the firms engaged in sustainability initiatives had a decline in sustainability initiatives. However, CSM adoption should help business leaders in identifying and managing essential sustainability initiatives for long-term financial performance (Epstein & Buhovac, 2014).

Though scholars and researchers have advocated for the integration of a CSM in the business strategy for long-term financial performance (Epstein & Buhovac, 2014), other scholars have proposed the drivers to facilitate CSM integration. Saebi, Lien, and Foss (2017) identified that past strategic orientations of a firm created dependencies that influenced the propensity of the firm to adopt a CSM. Ritala, Huotari, Bocken, Albareda, and Puumalainen (2018) conducted a study of S&P 500 firms and identified large firms had the propensity to adopt a CSM towards an environmental orientation than a societal

or organizational orientation. However, the perception of external threats rather than opportunities prompted firms to adopt a CSM (Saebi et al., 2017). Wirtz, Pistoia, Ullrich, and Göttel (2016) conducted a study on business models and posited that firms are more receptive to the adoption of a CSM under conditions of challenging quest for competitive advantage. Supporting this perspective that external threats facilitate a CSM adoption, Bakos and Dumitrascu (2017) proposed that a CSM developed as a crisis management model led to sustainable corporate behavior. However, other scholars highlighted that innovation was also a driver for CSM adoption. Bocken and Short (2016) identified innovation as a driver for the adoption of a CSM and Pedersen, Gwozdz, and Hvass (2018) posited the positive relationship between innovation and CSM adoption.

Epstein and Buhovac (2014) enhanced the CSM in 2014 that provided the paradigm shift in evaluating CS constructs. The CSM is a framework that could enable O&G asset managers to integrate green practices into retired asset management by addressing systems, performance measurements, rewards, and structure alignment, as part of the CSR function. The CSM incorporates nine sustainability principles namely governance, ethics, transparency, business relationship, financial return, community involvement/economic development, the value of product/service, employment practices, and protection of the environment (Epstein & Buhovac, 2014). Using the CSM as a conceptual framework for exploring the management of retired O&G assets provided the evaluation of retired assets using the nine principles.

Ethics. At the core of the CSR or CS movement is the expectation that businesses should strive to establish ethical standards and practices across the value chain of

resource exploitation to achieve superior social, economic, and environmental performance (Epstein & Buhovac, 2014). From the advancement of the CSR movement in the 1950s, businesses have struggled with establishing, monitoring, and maintaining ethical standards and business practices with all stakeholders (Carroll, 2015). Since the dawn of industrialization in the 18th century, concerns about business ethics is an ongoing problem. Business ethics is rooted in moral duty and obligations and illicit activities of businesses and business leaders that negatively impacted stakeholders exposed their CSR failures. Although some scholars argued that business ethics differs from CSR because business ethics addressed the behaviors of specific corporate leaders compared to CSR which referred to the company, other scholars and practitioners agree that the concept of business ethics is integral to the CSR concept.

The scandals from unethical business practices especially from firms engaged in CSR activities have generated negative perceptions of CSR. Pearce and Stahl (2016) highlighted examples of unethical business practices across the globe to demonstrate the extent of the global crisis of dishonesty, greed, and leadership ethics, business ethics, and CSR. Furthermore, employees' perception of their organization's commitment to CSR impacts job performance and influences customer orientation (Korschun, Bhattacharya, & Swain, 2014). As a result of the worldwide unethical business practice epidemic, public trust has eroded with evidence from the 2013 Edelman trust barometer confirming that less than 20% of the general population believes that business leaders are trustworthy (Pearce & Stahl, 2016). The lack of trust in business leaders leads to cynicism,

disengagement, and resignation, which create obstacles for long-term sustainable operations.

Recent business scandals since the early 2000s prompted the need for responsible leadership, and new demands in the global marketplace including increased stakeholder engagement and public scrutiny have challenged firms to create a more sustainable, responsible world. The ever-growing socio-political and environmental challenges around the world are creating more pressure on firms to be actively involved in sustainable development and sustainable responsibility. The increasing global trend of CSR has driven more companies to participate in the United Nations Global Compact and increased CSR awareness among business leaders, however, there is still a disconnect with implementing CSR practices (United Nations Global Compact, 2015). Many firms claim the CSR mantra but lack substance in action and implementation (Jones et al., 2014). Responsible leadership should be present at all levels of the organization and executive leaders must incorporate CSR initiatives in strategic planning and business performance goals to ensure sustainability (Eisenbeiss et al., 2015).

Ethical companies create a code of conducts and ethics programs that adhere to local laws and its ethical practices meet or exceed industry or regulatory standards. However, in Alberta's O&G industry the prevalent problem of ineffective management of retired assets highlights an underlying unethical practice of deferring end of life costs for assets (Muehlenbachs, 2017). Scholars and practitioners agree that firms should adopt practices that strengthen the triple bottom line but incorporate codes, standards, and policies toward ethical responsibility (Quarshie, Salmi, & Leuschner, 2016). Ethical CSR

principles focus on doing the right thing to achieve a good society, which includes normative stakeholder interests.

Governance. The role of governance is important in ensuring organizations remain responsible and sustainable. The CS performance of a corporation is dependent on corporate governance which aims to minimize the conflicts of interests among diverse stakeholders with direct or indirect influence on the corporation (Jo, Song, & Tsang, 2015; Wang & Sarkis, 2017). The governance principle for business leaders is the commitment to manage all resources effectively while balancing the interests of all stakeholders. Carroll (2015) posited that the business justification for engaging in CSR include (a) strengthen reputation, (b) minimize costs and risks, (c) improve competitive advantage, and (d) value creation for stakeholders. However, achieving the benefits of CSR requires effective governance, which involves the formulation and implementation of policies into business practices that ensure every facet of business activity complies with CSR values. Alavi, Habek, and Cierna, (2016) emphasized firms should consider CSR as a regulatory issue concerning economics, politics, society, and environment, however effective CSR governance is the key driver that facilitates the process of institutionalizing CSR in firms.

In business practice, corporate governance influences the formulation and implementation of organizational strategy. Cartwright and Craig (2006) highlighted that corporate governance and strategic business management serves as a major obstacle to global sustainability. The role and responsibility of business leaders and boards of directors in establishing and maintaining effective corporate governance have been under

intense scrutiny since the ethical scandals of the early 2000s. The ethical scandals that led to the collapse of large corporations including Enron, WorldCom, Adelphia, Tyco, Peregrine Systems, and Global Crossing emphasize the importance of effective corporate governance to sustainability. Also, effective corporate governance requires business leaders to conduct continuous evaluation and improvement of policies and business practices to address the ever-changing business environment and stakeholder interests.

Despite the passage of the Sarbanes-Oxley Act of 2002 in the United States, designed to curtail unethical business practices and improve corporate governance, the stock market collapse in 2008 revealed that corporate governance remains an ongoing obstacle to sustainability (Carroll, 2015). The continuous evolution of the industry is a constant challenge for corporate governance and unfortunately, firms with ineffective leadership and a lack of vision will experience lapses in governance with negative consequences. Business leaders in firms with successful CSR performance incorporate sustainable leadership for long-term sustainability performance. Kalkavan (2015) noted the misconception between sustainability and sustainable leadership and the need for business leaders to develop sustainable leadership for long-term success. The seven features of sustainable leadership include profundity, span, extent, fairness, multiplicity, productivity, and preservation.

Profundity refers to leaders promoting in-depth learnings and best practices within the organization, while span refers to succession planning and every leader should focus on developing future leaders for every level of the organization (Kalkavan, 2015). Extent refers to decentralization and delegation of leadership, which enables appropriate

leadership dissemination throughout the organization. Fairness refers to a leader's care for the environment, employees, and stakeholders. Multiplicity refers to the promotion and implementation of diversity within an organization, which increases learning, flexibility, and strength in adaptability to environmental changes (Kalkavan, 2015). Productivity refers to the effective management of financial and human resources to achieve company goals and preservation refers to learning from past experiences to guide the future of the organization. Business leaders should understand the importance of sustainable leadership and focus on promoting elements of sustainable leadership to ensure the long-term success of the triple bottom line.

Researchers and scholars have explored the characteristics of sustainable leadership. Fistis, Rozman, Riel, & Messnarz, (2014) proposed seven characteristics of a sustainable leader. The characteristics include (a) systemic thinking, (b) emotional intelligence, (c) values orientation, (d) compelling vision, (e) inclusive style, (f) innovative approach, and (g) long-term focus. Business leaders should fully understand the trade-offs regarding short-term operational goals and long-term sustainability and develop organizational design processes that drive decision making toward sustainable effectiveness. Economic needs, political pressures, and stakeholder expectations demand firms to address global and local issues by developing a transnational CSR strategy. The transnational CSR strategy should provide decision-making guidance to all managers on the firm's CSR activities and ensure consistency throughout the organization while providing managers with the flexibility to adapt to local needs and challenges. Responsible and effective leadership at all levels of the organization is the key to

ensuring that global policies and codes of conducts adapt to local cultures and stakeholder demands without deviating from the firm's vision and its societal, economic, and environmental goals.

Responsible leadership involves the process of interaction with stakeholders based on values and principles of ethics in the pursuit of achieving organizational goals (Shi & Ye, 2016). Recent scandals of large corporations including Enron and Worldcom establish the importance of responsible leadership and its role in sustainable operations. The growing concerns of irresponsible leadership have forced countries to implement new laws to ensure companies are responsible and accountable. Firms are now compelled to comply with environmental and legal laws that challenge companies to make a cultural change in business performance and long-term sustainability. Due to the easy access to information and the increasing global environmental awareness, business leaders can no longer ignore sustainable development, environment protection, stakeholder engagement, and activities for local communities.

Responsible leadership encompasses ethical value-based leadership in the pursuit of economic, societal progress, and sustainable development (Shi & Ye, 2016). Internal dimensions of responsible leaders refer to the relationship between a leader and employees, while the external dimensions refer to the relationship between the leader and external stakeholders. Several studies have highlighted the need for more effective regulations and increased stakeholder pressure to promote further sustainability in the O&G industry (Kirat, 2015; Kairouz, El Hokayem, & El Hage, 2016). Wan Ahmad, Rezaei, de Brito, and Tavasszy (2016) evaluated six external factors capable of

influencing an O&G firm's sustainability performance namely political stability, economic stability, stakeholder pressure, competition, energy transition, and regulations. Wan Ahmad et al. (2016) identified stakeholder pressure and economic stability as the two most influential factors that promote the need for responsible leadership. Stakeholder pressure is a constant threat that must be managed by a firm's leadership to ensure long-term stability.

Lozano (2015) emphasized that business leaders need to pay attention to the most influential internal and external CS drivers to implement effective corporate governance. The internal drivers include (a) leadership, and (b) superior triple bottom line performance, while the external drivers include (a) reputation, (b) stakeholder demands and expectations, and (c) regulations and legislation. Cartwright and Craig (2006) proposed a governance model that emphasized seven pathways for effective governance. The seven pathways include (a) government policy and regulation, (b) government leadership, (c) ethical investors, (d) stakeholder awareness, (e) stakeholder responsible demands, (f) NGO influence, and (g) business leadership CSR commitment. A common theme with effective corporate governance is leadership and firms should focus on continuously developing the next generation of leaders capable of addressing future challenges.

Transparency. The demand for business transparency has garnered more momentum since the 1980s' as globalization and information technology advancement led to easier access to information. Leading companies in the sustainability movement have incorporated the concept of transparency in their sustainability activities (Navarro-

Galera, Ruiz-Lozano, Tirado-Valencia, & de los Ríos Berjillos, 2017). In today's globalized economy, outsourcing business operations do not exempt the risks and responsibilities for the outsourcing firm but rather the firm is involved in the lifecycle management of its products and services (United Nations Global Compact and BSR, 2015). Transparency demonstrates the quality of CSR in a firm and enhances the relationship between stakeholders and the firm (Fernandez-Feijoo, Romero, & Ruiz, 2014; Kashmanian, 2017). According to the European Commission, transparency is the right of citizens to access government information (European Union Commission, 2015) which, could be applied to business as the right of stakeholders to access company information. However, the traditions and cultures of a geographical location influence the practices of transparency (Navarro-Galera, de los Ríos Berjillos, Ruiz-Lozano, & Tirado-Valencia, 2014). Existing CSR literature confirms that transparency is critical in both private or public businesses and governments to advance sustainability.

Hence, the issue of ineffective retired assets management in Alberta should prompt the evaluation of the traditions and cultures of transparency in Alberta's O&G industry. Morioka, Evans, & Monteiro de Carvalho (2016) highlighted the need to incorporate sustainability into the business by integrating a performance measurement framework to identify sustainability innovations. The need for sustainable management of a firm's resources creates a competitive advantage for firms that demonstrate societal progress ties with the firm's success. Timely disclosure of information about products, services, and activities enhances transparency which enables stakeholders to make informed decisions (Epstein & Buhovac, 2014; Navarro-Galera, de los Ríos Berjillos,

Ruiz-Lozano, & Tirado-Valencia, 2015). The congruency between stakeholder values, CSR activities and ethical standards serve to facilitate a firm's superior CSR performance (Park, Kim, & Kwon, 2017). Successful CSR firms demonstrate a high degree of transparency which promotes public and stakeholder loyalty.

Business Relationships. The importance of a firm's business relationships goes back to the dawn of industrialization in the 18th century in which interdependence on multiple stakeholders resulted in the production of goods or services. However, the lack of social responsibility of business relationships to society led to the criticism of business as a major cause of social, economic, and environmental problems in the society (Crane, Palazzo, Spence, & Matten, 2014). The concept of CSR from the 1950s demand firms to develop relationships with other firms or stakeholders to promote the social development of the society. The paradigm shift of CSR from a focus solely on the environment to the triple bottom line challenges firms to encourage reciprocity in their business relationships by developing and maintaining long-term stable relationships with stakeholders as partners (Epstein & Buhovac, 2014). Business and society are intertwined and complement each other like two sides of the same coin, and leading firms understand the value of balancing both sides by including social dimensions in business strategies (Mishra & Nigam, 2015). Maintaining long-term stable relationships with stakeholders and society minimizes the stakeholder pressures that threaten the longevity of a business.

Financial Returns to Investors. A common objective of most businesses except not for profit organizations is to create value and generate financial returns for its investors. Friedman (1970) emphasized that businesses existed for the sole social

obligatory purpose of maximizing profits and opponents of the CSR concept have aligned and supported Friedman's ideals of a business. However, the narrow view of business creating value solely through economic terms promotes the strategy of prosperity at the expense of the society, which leads to social, economic, and environmental problems (Crane et al., 2014). The narrow view of business value creation creates a focus on short-term financial performance and blurs the importance of long-term sustainability, which ultimately leads to business failure (Porter & Kramer, 2011). The ethical scandals of the 2000s including Enron and Worldcom highlighted the greed prevalent in the leadership of some large corporations motivated by their view of value creation solely through financial returns for investors. The CSR evolution has emphasized the principle of value creation through "shared value" which involves creating economic value that also creates value for the society (Porter & Kramer, 2011). The shared value concept should help business leaders reflect on the impact on society from their corporate decisions.

Community involvement and economic development. Improving the community, community resources and the lives of the community members positively impacts the long-term sustainability of a firm (Epstein & Buhovac, 2014). The mutually beneficial relationship between an organization and the community builds trust and fosters long-term advocates of the organization. Creation of shared value implies firms should collaborate with the community members to promote high standards of health, safety, education, environment protection, and economic development (Park et al., 2017). With the increasing trend of globalization, the stakes are high for corporations, to develop and maintain the creation of shared value while still continuously improving their

corporate identity (Mishra & Nigam, 2015; Porter & Kramer, 2011). Community involvement and economic development align with the creation of shared value (CSV) concept, which invites corporations to evaluate social and environmental issues in the community as real opportunities and strategic targets in conducting business (Crane et al., 2014). Community engagement and community economic development facilitate community buy-ins which provided firm support and goodwill towards current and future projects as well as during crisis management.

Value of products and services. Firms engaged in CSR must ensure their products, services, or any business activities minimizes any negative impact to their customers (Epstein & Buhovac, 2014). Understanding the needs, desires, and rights of their customers and stakeholders enables corporations to create high levels of products and services values for their customers. However, the value of products and services could contribute to the demise of a corporation if the creation of the products or services has a negative impact on stakeholders. Since the 1950s, the failure of corporation self-regulation prompted the government of countries to introduce and enforce new policies that ensure the protection of the health, safety, and environment of the society from the products and services of businesses (Scheltema, 2014). However, the new government policies cannot guarantee the eradication of future environmental or social violations by firms but rather serve as a deterrent to firms because of the penalties and consequences of any violations.

Employment practices. Achieving superior sustainability performance is dependent on the attraction and maintenance of a skilled, competent workforce and the

implementation of employment practices that promote employee development, diversity, and empowerment (Epstein & Buhovac, 2014). Employees are valued partners in business and firms providing fair labor practices, competitive wages, benefits in a safe, friendly work environment create long-term employee loyalty and performance. Implementing employment practices with a focus on sustainability empowers managers within a firm to create a role dissonance and opt for business decisions that enhance CSR (Benjamin, Nisim, & Segev, 2015). Integration of sustainability values in the organizational culture through organizational commitment creates positive employee and stakeholder perceptions and attitudes of CSR that transcend beyond the workplace (Glavas & Kelley, 2014). Employee perceived organizational support through management practices fosters organizational citizenship behavior necessary for long-term organizational sustainability.

Protection of the environment. CS performance involves the protection of the environment. In the O&G industry, asset lifecycle management, emissions, spills, and unsafe business practices have resulted in several environmental disasters, which negatively impact the ecosystem. Contaminated lands from O&G activities pose a serious environmental threat including a long-term impact on the soil, water, wildlife, and people. The remediation of contaminated lands has experienced an increased trend in recent years with an estimated 2.5 million sites potentially contaminated in Europe (Bardos et al., 2015). In Alberta, the increasing trend of inactive wells from 25,000 in 1989 to 81,602 in November 2016 pose a serious environmental threat (B. Robinson, 2014; Muehlenbachs, 2017). The vast amount of inactive wells in Alberta will require

significant funds for abandonment, remediation, and reclamation of the lands, and the financial burden could end up as the government's responsibility.

However, the subjectivity and site-specific requirements make it difficult for business leaders to implement the appropriate remediation approach consistently. The Sustainable Remediation Forum in the UK (SuRF-UK) created in 2007 was established to promote more sustainable remediation practice in the UK, which included guiding framing sustainability assessment. Implementing sustainable remediation for contaminated lands incorporates sustainability management and sustainability assessment. In Alberta's O&G industry, the implementation of the Liability Management Rating (LMR) program enables better government monitoring and prompts firms to take a proactive approach to assets lifecycle management.

The limiting factors for sustainability assessment in remediation decision-making include subjectivity, stakeholder engagement and transparency, scope, lifecycle thinking, and costs. However, the benefits of sustainable remediation include effective risk management, optimal solutions for soil and groundwater, identifying and avoiding risks, compliance with government and CS policies, and contribution towards positive CSR. The six principles include protection of human, health and the environment; safe working practices; consistent and evidence-based decision-making; record keeping and transparent reporting; good governance and stakeholder involvement; and sound science. The SuRF-UK has established guidance on good sustainable management practices (SMP) supported by standards, codes of practice and technical guidance from authoritative institutions. The SMP serves as the basic framework which enables the incorporation of

sustainable remediation decision-making for contaminated lands. The SMP included good land procurement, land use planning, risk assessment, options appraisal, and implementation of remediation.

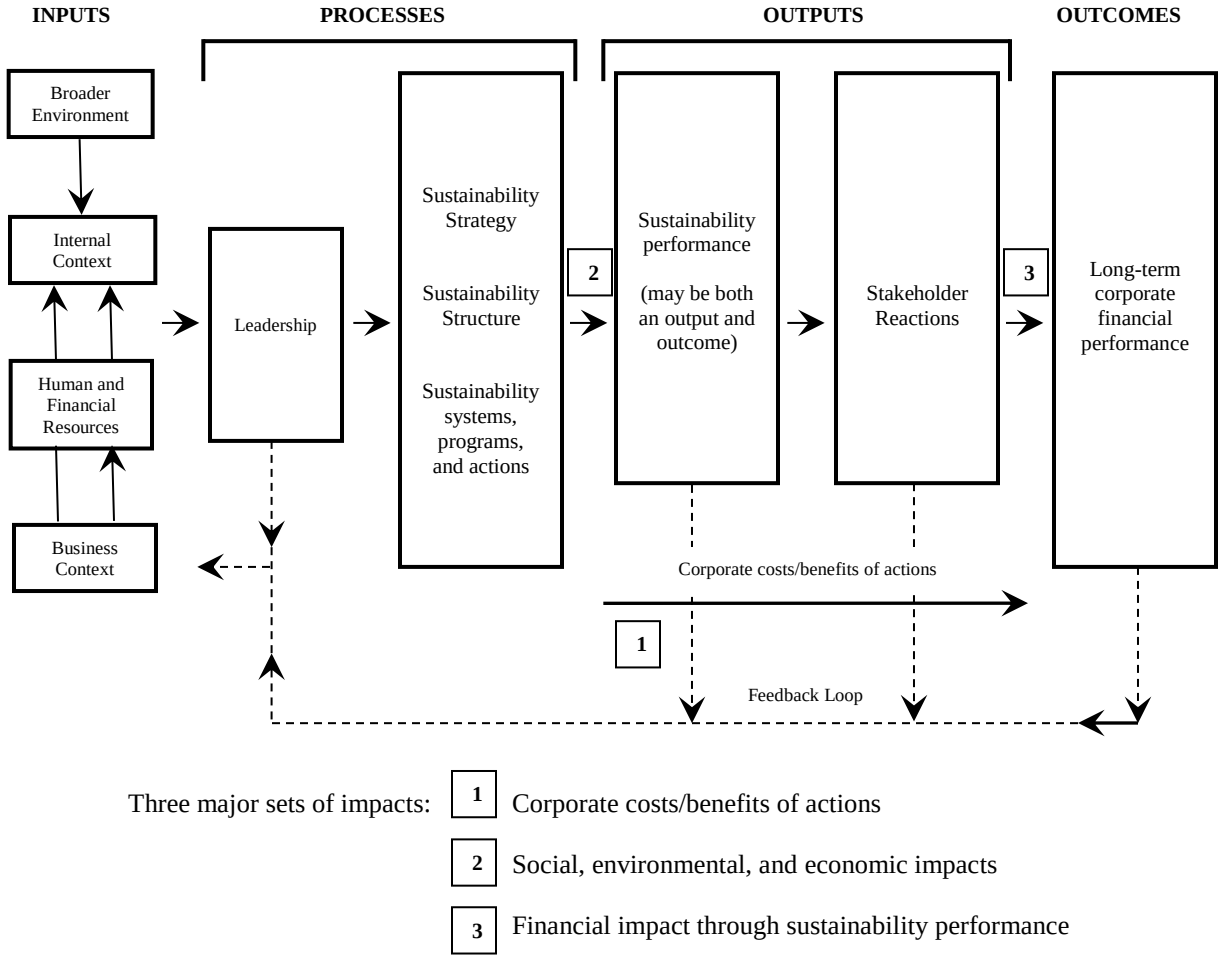

Figure 1. Corporate sustainability model. Adapted from *Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental, and Economic Impacts*, by M. J. Epstein & A. R. Buhovac, 2014, San Francisco, CA: Berrett-Koehler. Copyright 2014 by Greenleaf Publishing Limited.

Epstein's CSM (see Figure 1) challenges business leaders to understand the causal relationships between organizational activities, impact on sustainability performance, stakeholder reactions and impact on financial performance (Epstein & Buhovac, 2014). However, effective implementation and measurement of sustainability success are

challenging for most organizations. Rather than focus on the payoffs of resource allocation (return on investment) for sustainability strategy, the CSM enables business managers to focus on understanding the drivers of sustainability performance and the impacts on various stakeholders for easier integration of sustainability issues in day-to-day operational decisions.

The inputs of the CSM include the broader external context (regulatory, geographical), internal context (mission, vision, strategy, structure, systems), the business context (industry sector, customers, products); and the human and financial resources (Epstein & Buhovac, 2014). The CSM inputs guide the decisions of business leaders on the processes to implement to improve sustainability. The foundation for a successful sustainability performance starts with organizational leaders understanding the inputs of the CSM and taking action to address any deficiencies. In the context of the ineffective retired asset management in Alberta's O&G industry, the business leaders should understand the government regulations and policies impacting the industry. Improving sustainability challenges O&G executives to evaluate the integration of sustainability values in the organizational culture through the firm's mission, vision, strategy, structure, and systems. Resource allocation and talent attraction are critical aspects of the CSM input that contribute to sustainability performance, and business leaders demonstrate a commitment to sustainability by providing appropriate financial resources and human capital.

Evaluating the broader environmental context involves understanding pressures from local and global government regulations which vary by geographic regions.

Business leaders should focus on the intranational factors that influence both explicit and implicit CSR elements of organizations to formulate and implement sustainability actions (Blindheim, 2015). The internal context refers to alignment between organizational goals broken down into asset teams or business units' performance metrics supported by the organizational mission, vision, strategies, structures, and systems. CS performance relies on sustainability control systems (SCS) for continuous improvement and long-term success (Wijethilake, 2017). The business context can be challenging for organizations in industries such as the O&G industry that have a high social and environmental impact. Consumption of resources, lifecycle management of assets, hazardous materials, emissions, health risks, and environmental management in some industries influence how and where organizations focus their sustainability efforts. However, financial resources and human capital are critical for implementing any sustainability initiative.

The processes required to implement sustainability performance include responsible leadership, sustainability strategy, sustainability structure, and sustainability systems, program s and actions. Effective and frequent communication of sustainability initiatives and strategies to all stakeholders demonstrates a commitment from leadership to sustainability. Top business leaders should be knowledgeable about sustainability to motivate the entire organization and stakeholders as well as provide a safe working environment that promotes sustainability. A workplace culture that fosters sustainability encourages corporate citizenship and facilitates the integration of sustainability in daily decision making and operations (Fistis et al., 2014). In addition to developing a sustainability strategy, business leaders should strive to go beyond the local and global

regulations that stipulate a minimum standard of sustainability compliance. The sustainability strategy should evaluate the impact on stakeholders, social investors and the environment. Leading sustainability firms have incorporated sustainability systems including costing and capital investment systems, risk management systems, performance evaluation and reward systems, measurement systems, and feedback systems (Epstein & Buhovac, 2014). In the pursuit of sustainability, an important focus for firms should be a continuous improvement of deliverables which involves performance measurement and taking actions that take into account the industry evolution and external environment changes.

The output of the CSM is the sustainability performance and stakeholder reactions, which contribute towards long-term financial performance. One unique feature of Epstein's CSM is the fact that sustainability performance can be both an intermediate output and an outcome. Some organizations focus solely on the social and environmental dimensions in their sustainability strategies which generate organizational goals and objectives that feed into the sustainability performance as an outcome. However, if long-term financial performance integrates into the sustainability strategies, then the sustainability performance is an intermediate output that feeds into the outcome of the financial performance.

Asset Management Concept Model

The definition of an asset in the international standard on asset management ISO 55000 is an item, thing, or entity that has potential or actual value to an organization but the perception of value defers amongst organizations. The definition of asset management

in ISO 55000 refers to the coordinated activity of an organization to realize value from assets (The Institute of Asset Management, 2015). With the focus on the lifecycle, asset management is the lifecycle management of physical assets to achieve the stated outputs of the enterprise (Asset Management Council, 2014). Asset lifecycle challenges firms to consider the short, medium, and long-term goals of assets including the end of life costs. Asset management is concerned with all aspects of capability from the conception of the need, through its complete operating life, and then disposal. Asset management is not a new concept but has become more prominent since the 1980s in both the public and private sectors when several large-scale disasters involving physical assets highlighted the need for more effective management of assets.

The 1988 Piper Alpha oil platform disaster in the UK that resulted in 167 fatalities and the 1980s oil price crash prompted the O&G industry to seek a radical shift in a more effective asset management system. The paradigm shift for more effective asset management led to the innovation and creation of multi-disciplinary teams managing assets with a full lifecycle view, which many firms have adopted today. Other landmark events that propelled the advancement of asset management included the creation of the 1993 total asset management manual in Australia and New Zealand, and the 1988 report on America's public works in the US (The Institute of Asset Management, 2015). With the advancement of asset management, firms realized that the value of asset management involved more than simply the maintenance of assets.

Asset management is founded on a set of principles that should directly influence an organization's asset management systems and plans. The Asset Management Council

(2014) identifies the four principles as (a) output focus, (b) capabilities, (c) level assurance, and (d) learning organization. The output focus refers to the delivery of output as set out by the firm's objectives in agreed policies, strategies and plans. To achieve the desired output the firm needs capabilities including assets, finance, human resources, information technology, and corporate guidance. The level of assurance refers to the risk that the systems and equipment that comprise assets will deliver the required measurable and testable capabilities. The learning organization is the ability of the firm to measure and analyze performance and incorporate lessons learned in a subsequent action to improve desired output. Effective asset management firms incorporate these four principles to achieve superior sustainable performance.

Since the 1980s, the global recognition of asset management as a discipline has led to a global convergence on asset management thinking and the creation of global asset management standards including the Asset Management landscape in 2011 and the ISO 55000 standards in 2014. The increasing adoption of these global standards by many countries highlights the global acceptance and recognition of the importance of asset management in business practice today. The increasing trend of global environmental awareness contributed to the global convergence of asset management with the evolution of lifecycle management (Cerdas, Thiede, Juraschek, Turetskyy, & Herrmann, 2017). The emphasis on lifecycle management (LCM) of assets emerged during the late 1990s and continues to influence the practice of asset management. However, the evaluation of the lifecycle of assets began in the 1960s when researchers embarked on studies to address concerns of fossil-fuel depletion (Joyce & Paquin, 2016). The focus on the lifecycle of

assets has become prominent in business practice and many firms have leadership positions focused on asset management. Asset retirement is an unavoidable activity in the O&G business practice when assets eventually become unviable in the value chain.

In agreement with the Asset Management Council's set of principles, the ISO 55000 highlighted the four fundamental principles of asset management namely (a) value, (b) alignment, (c) leadership, and (d) assurance. The value of an asset varies from organization to organization, but each organization has to determine what constitutes value in relation to its organizational goals and objectives. Organizations usually use the "value stream" which refers to the lean operations concept and the "value chain" which refers to the strategic concept in assessing value (Porter & Kramer, 2006). Having the right assets in the right place at the right time working together is critical to the value realization of assets and essential for achieving the organization's goals and objectives. The alignment of asset management refers to the link between asset management activities and the firm's strategic plan which should be established to ensure all asset management activities contribute towards the firm's objectives. The asset management policy, strategy, and objectives should be formulated based on organizational objectives. The leadership component refers to visible senior management leadership and commitment to promoting a culture of effective asset management. The assurance component refers to the monitoring, auditing, and continuous improvement of processes and outcomes to ensure assets and systems are operating effectively to deliver the desired outcomes.

The conventional definition of asset management drives the focus in the O&G industry towards maximizing the value realized from assets. However, there exists variability in the value concept in the O&G industry (Fomukong, 2014). Historically, asset value in the O&G industry ties in with the value chain of generating O&G production, reserves, and cash flow (Muehlenbachs, 2017). Retired assets do not contribute to the traditional value chain, which explains why many O&G firms do not focus on retired asset management. O&G retired assets incorporate all inactive wells and facilities that are no longer viable in the value chain due to the end of life or obsolescence and are no longer in operation. Hence the historical O&G industry perception of realizing no value (no production, reserves, or cash flow) from retired assets drives the low priority assigned to retired assets. However, the growing trend of CSR and sustainability in the O&G industry contradicts the old O&G industry perception and O&G firms realize that effective retired asset management adds value to the triple bottom line of an organization. The triple bottom line refers to the economic, social, and environmental performance of an organization (Elkington, 1997) and effective retired assets management also validates the CSR status of an organization.

Deming (1986) posited that employees and organizational leaders could develop a culture of continuous improvement and learning by adopting the Plan, Do, Study, Act (PDSA) Cycle. Walter Shewhart developed the Shewhart cycle in the 1920s and the PDSA cycle also known as the Deming cycle was a modification on the Shewhart cycle. The Shewhart cycle introduced the concept of Plan, Do, See, which was improved upon by Deming into the Plan, Do, Study, Act cycle. The PDSA cycle incorporates the four

phases of management namely (a) Plan phase involves planning for change including analyzing and predicting the results, (b) Do phase is the execution of the plan, (c) Study phase involves checking and studying the results, and (d) Act phase refers to taking action to standardize or improve the process.

The PDSA cycle has a universal approach and its application can provide benefits to business practice including daily routine management, problem-solving process, project management, continuous improvement, process enhancement, and human resources development. The universal approach of the PDSA cycle is evident in the adoption of the PDSA cycle to form the basis of the American Petroleum Institute (API) Model for Improvement. Langley et al. (2009) adopted the PDSA cycle and combined the cycle with three critical questions to form the Model for Improvement. The three questions are (a) what are we trying to accomplish? (b) how will we know that a change is an improvement, and (c) what change can we make that will result in improvement?

Building upon the work of Deming, the Asset Management Council (2014) has applied the concept of the PDSA cycle in the field of asset management to develop the AMCM. The AMCM draws the attention of the asset managers on the importance of developing continuous improvement strategies that satisfy stakeholder interests and improves the asset management competence of the organization. Implementing and maintaining an effective retired assets management program requires continuous improvement and adaptability to stakeholders. The AMCM incorporates the four principles of asset management connected by the Plan, Do, Study, Act processes and encased by a stakeholder circle (see Figure 2).

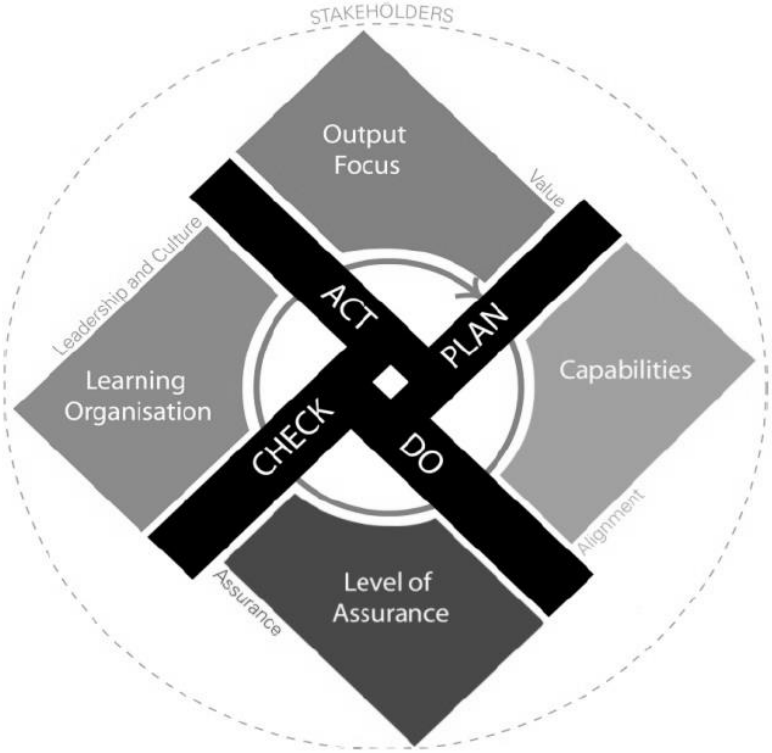

Figure 2. Asset management concept model. Adapted from *Framework for Asset Management*, by Asset Management Council, 2014, Hawthorn, Victoria: AMBoK. Copyright 2014 by Asset Management Council. Reprinted with permission.

The stakeholder circle represents the encompassing and overarching influence of stakeholders in all asset management activities. Stakeholders refer to internal or external individuals or organizations that can affect or be affected by a firm's business decision or activity. As such, stakeholders collectively determine the needs and constraints on business. The four principles within the AMCM enable asset managers to establish clarity on the important components of asset management in their business. Managers need to understand the value or output focus of their business and then provide alignment to achieve the value through the capabilities. The level of assurance challenges managers to manage risk as a key component of asset management. Managers that effectively manage

the “what if” scenarios improve their asset management decision-making that consider the tradeoff between consequences and actions. The learning organization stems from effective leadership and developing an organizational culture of continuous improvement.

The AMCM serves as a conceptual framework that highlights asset management is a process with a start and finish and in between feedback loops to continuously sustain alignment of assets and stakeholders to achieve desired value or output focus. The Plan process involves the output focus or value, the Do process involves using capabilities to execute the plan, the Check process involves managing risk and analyzing results, and the Act process involves incorporating lessons learned from results in continuous improvement. Different industries apply the PDSA cycle or AMCM model in their asset management strategies to achieve sustainability. For example, utility organizations incorporate pipe assessment strategies as part of the sustainability initiative to prevent pipe failures, which impact traffic, water and disrupt service (Matthews, Piratla, & Koo, 2016). The environmental sustainability strategies should focus on five categories namely the quality of life, leadership, resource allocation, the natural world, and climate and risk (Matthews et al., 2016). In the O&G industry, asset management is critical to eliminate environmental risks from operations.

Scholars’ studies on asset management concept model. Several scholars have used the AMCM as an asset management conceptual framework for CS in the business field (Godau, 2008; Hossain & Mitchell, 2008; Kuei & Lu, 2013; Marlow, Beale, & Burn, 2010; Ossai, 2012). Marlow et al. (2010) used the AMCM concept in exploring the integration of sustainability principles in asset management business practices in the

Australian water utility sector and identified funding, value, governance, understanding, and culture as significant barriers to sustainability integration. Kuei and Lu (2013) used the Plan, Do, Check, Act (PDCA) elements of the AMCM concept in exploring the implementation of sustainability management using quality management principles and identified that the PDCA cycle was essential in developing a sustainability management culture in organizations.

Hossain and Mitchell (2008) used elements of the AMCM in a study to develop a successful cross-sector asset management system for a city council in Australia. Hossain and Mitchell's 2008 study suggested that establishing a centralized asset management staffing structure, asset performance measurement, maintenance programs, and lifecycle costs were essential for a cross-sector asset management system. Godau (2008) used the AMCM to justify the importance of transitioning asset management as a corporate function for a city council in Australia and suggested that governance, leadership, planning, analysis, and performance measurement are vital in the transition. Similar to the O&G business environment of this study, Ossai (2012) used the AMCM to explore the advances in asset management techniques relating to corrosion and mitigation strategies of O&G pipelines. Ossai's study identified that advances in inspection and monitoring techniques, as well as a well-defined corrosion management policy and structure, are key elements to combat corrosion issues.

Scholars have used the versatility of the AMCM in conducting studies in a wide variety of business fields. Ghazali and Anuar (2017) used elements of the AMCM in evaluating the implementation of asset lifecycle management in an O&G service

company. Ghazali and Anuar's study identified that the implementation of an AMCM enabled leaders in firms to create value by effectively managing conflicting priorities including asset utilization, short-term performance, long-term sustainability, capital investments, and operating costs. Komljenovic, Abdul-Nour, and Popovic (2015) used elements of the AMCM in evaluating mining organizations as complex adaptive systems and proposed an enhanced strategic asset management decision-making framework that improves long-term planning and performance sustainability. Milanese, Salvador, Decadri, and Ratti (2017) used elements of the AMCM in the development of an asset integrity management system, which business leaders can use to reduce industrial risks that affect safety, environment, and business continuity. Kholif, El Hassan, Khorshid, Elsherpieny, and Olafadehan (2018) used the AMCM framework in the continuous quality improvement in the dairy laboratories and achieved success in the reduction of errors and increasing efficiency and effectiveness.

The AMCM framework is a well-established continuous quality improvement tool used in different industries. Dudin, Frolova, Gryzunova, & Shuvalova (2015) used the AMCM framework in conducting a study in the agricultural sector regarding quality management of business processes and production. Dudin et al. (2015) identified that business leaders in the agriculture sector should utilize the AMCM framework in the implementation of quality management principles to attain sufficiency and safety of food products. Dudin, Smirnova, Vysotskaya, Frolova, & Vilkova (2017) proposed the AMCM framework as an innovative quality management tool for the agricultural sector

in developing countries to resolve food deficiency and low availability of good quality food supplies.

Taylor et al. (2014) used the elements of the AMCM framework to evaluate the improvement of quality management in healthcare and identified five principles for successful implementation of the AMCM in the complex healthcare environment. The principles include iterative learnings, initial small-scale testing, prediction-based testing of change, use of data over time, and documentation (Taylor et al., 2014). Prybutok (2018) conducted a case study using the elements of the AMCM framework as a quality improvement tool in a healthcare organization to improve extended patient wait times and patient care delivery. Curatolo, Gutermann, Devaquet, Roy, and Rieutord (2015) used the PDCA elements of the AMCM framework to conduct a study on French hospitals regarding patient medications and highlighted the reduction of medication errors at admission with the implementation of the AMCM framework. Other scholars have also used the AMCM framework as a methodology or concept in conducting studies in the healthcare sector to improve quality management of patient care (Knudsen, Laursen, Ehlers, & Mainz, 2017; Laverentz & Kumm, 2017; Perry, Bell, Shaw, Fitzpatrick, & Sampson, 2014).

Wang, Liu, and Liu (2018) utilized the elements of the AMCM framework in the management of oil pipeline projects and underscored the identification of the critical management processes to improve the efficiency of pipelines and ensure sustainable development. Ilori (2015) used the AMCM framework as a continuous improvement process in evaluating engineering asset management in the O&G service industry in

Nigeria and identified the extensive use of the AMCM framework in the areas of asset lifecycle and engineering maintenance strategies. Kusumawardhani, Kumar, and Tore (2016) conducted a study evaluating the asset integrity management practices in the offshore O&G industry using the AMCM framework and highlighted that firms need to establish a continuous improvement and documentation culture to manage the asset integrity and lifecycle of offshore facilities effectively. Ren, Ling, Wei, and Fan (2015) utilized the AMCM framework as a dynamic control principle in engineering construction project management and identified the improvement of project quality, cost reduction, and schedule effectiveness.

Senge, Smith, Kruschwitz, Laur, and Schley (2008a) posited the need for organizations to evaluate and learn their assets lifecycle to enable effective management of retired assets. The objective of assets lifecycle analysis is to identify advantage areas within the organizational system where synergy and improvements could create a competitive advantage and positively affect organizational financial performance (Stacey, 2011). In the Alberta O&G industry, the management of retired assets is an avenue for O&G companies to improve their CSR image, create a sustainable competitive advantage, and increase profitability through operational efficiency. Creating sustainable competitive advantage requires a focus on human capital, efficiency, environment, and innovation (Mahsud, Yukl, & Prussia, 2011). The application of the AMCM in the Alberta O&G industry should provide the framework for effective management of retired assets.

Leadership in Sustainability

Leadership is the process of influencing and motivating people to collaboratively achieve common goals (Northouse, 2016; Vroom & Jago, 2007). Since the 1970s, the definition of leadership has changed from the traditional functions of setting goals and directions to visionary, inspirational, moral values, and intellectual stimulation (Avolio, Walumbwa, & Weber, 2009). Organizational leaders in the pursuit of sustainability focus on the triple bottom line (social, environmental, and economic impacts) of their operations rather than solely on increasing shareholder value. However, Baue and Wood (2015) highlighted the need for a radical mindset paradigm to advance global sustainability. The current sustainability paradigm led to a limiting mindset that plagued the progression and advancement of global sustainability. The mindset paradigm shift to an integral paradigm creates a thriveability mindset that enhances the ability to create systems that promote sustainability and the power to transcend paradigms for sustainability success.

The motivation for businesses to strive for superior sustainability performance starts with the leadership and the pressure from stakeholders because enforcement by government is lacking. Varadarajan (2014) noted that government regulations and enforcement are soft in many countries and businesses find loopholes to take advantage of these soft laws. Moreover, leadership in many organizations fail to implement the necessary governance to ensure credibility and integrity in their sustainability activities. To enhance credibility in sustainability, Steinmeier (2016) emphasized business leaders should focus on deterring fraud in sustainability. The increase in government

sustainability networks and participation in global sustainability initiatives should improve sustainability governance (United Nations Global Compact, 2015; Zeemering, 2014). In the context of sustainability, the future advancement of sustainability in business will depend on the governance of sustainability through transition management (Baumgartner, 2014; Hall, & Vredenburg, 2003). The governance of sustainability starts with the support and commitment from leadership through policies, strategies, resource allocation, and frequent communication.

Although several studies confirm a positive relationship between supervisory ethical leadership and follower performance, the ethical leadership of a firm's CEO and the firm's performance is not guaranteed. CEO's and business leaders that demonstrate responsible leadership and integrate ethical considerations into decision making create ethical values that become enshrined in the organizational culture (Eisenbeiss et al., 2015). However, business leaders are responsible for the implementation of ethical values in business practice through ethics training and policies. Eisenbeiss et al. (2015) posited that the organizational ethical culture developed from established corporate ethics policies is essential for the firm's ethical leadership, which promotes CSR performance. Ultimately business leaders are responsible for developing, implementing and sustaining socially responsible business practices and behaviors that integrate into the organizational culture (Christensen, Mackey, & Whetten, 2014; Kilskar, Ingvaldsen, & Valle, 2018). Though organizational culture develops over time, business leaders can influence culture by deliberately establishing policies, implementing business practices and promoting behaviors that align with CSR values.

Identifying the best-suited leadership style for promoting sustainability in a particular organization would influence the training and development of their responsible leadership programs. Blake and Mouton (1985) stipulated that individuals have a dominant leadership style used in most situations and the dominant leadership style is either task directed or people directed. Hahn, Preuss, Pinkse, and Figge (2015) proposed two different cognitive frames, which impede managerial decision-making due to the contradictory tensions between economic, environmental, and social issues but implementing a strategic performance measurement system improves managerial decision-making. Different leadership styles could yield positive results in different business environment conditions. Contrary to the notion that full disclosure and transparency in leadership is best in all situations, researchers identified that the opposite might deliver positive results in certain conditions. Cho, Laine, Roberts, and Rodrigue (2015) evaluated the two theories guiding corporate disclosure behavior namely signaling theory and legitimacy theory, and identified that in situations with contradictory stakeholder demands on sustainability reporting, organized hypocrisy, and façades could yield positive social change.

Achieving long-term organizational sustainability requires leadership capable of navigating the paradoxical perspective on CS. Different sustainability objectives create conflicting tensions and sustainability leadership should be capable of utilizing a paradox perspective to delineate the descriptive, instrumental, and normative aspects in decision making (Hahn, Figge, Pinkse, & Preuss, 2018; Ozanne et al., 2016). Also, integrating sustainability goals in an employee's annual objectives and performance evaluation

should motivate engagement in sustainability activities without the expectation of financial return for the organization. Williams (2014) supported the argument that not all activities that create shared value lead to financial returns. Further, Vogel (2005) emphasized the performance measurement of employees and managers should link success with societal improvements to encourage the deliberate and mandatory pursuit of positive social change initiatives. Responsible leadership and sustainable leadership skills play an important role in the advancement of the global sustainability movement (Kalkavan, 2015; Szczepanska-Woszczyna, Dacko-Pikiewicz, & Lis, 2015). Business leaders that promote socially responsible business practices and reward employees that achieve positive social change influence the sustainability outlook of their firms.

Berns et al. (2009) posited the three barriers for business leaders to successfully implement sustainability include the lack of understanding of sustainability and its impact on the business, economic justification, and evidence of previous failed attempts. However, the economic justification argument for not engaging in CSR is becoming just an excuse because recent studies and surveys have highlighted better than average financial returns for organizations engaged in CSR activities. Hardcastle (2016) mentioned firms such as Unilever that have obtained superior financial returns because of their commitment to CSR and sustainability. Organizations use the excuse of failed attempts as a deterrent to engaging in sustainability, however, in many cases, the failed attempts were the result of inadequate infrastructure, resources, leadership commitment, and stakeholder engagement.

Integral leadership challenges business leaders to elevate their understanding of business practice and leadership to achieve superior firm performance. Wilber (2000) noted business leaders should understand leadership styles, behaviors that promote performance, individual values and motivation, organizational and national cultures, stakeholder management, systems thinking, processes, and organizational structures. Kalkavan (2015) mentioned the strategies to improve the sustainable leadership skill set within an organization include executive coaching practices and one-on-one managerial coaching. However, the development of sustainable leadership capability should integrate into the core values and organizational culture of an organization to ensure all stakeholders engage in sustainable leadership at all levels. Baumgartner (2014) underscored responsible leadership should exemplify mature normative management with sustainability incorporated into corporate vision and policy, governance, and culture.

Organizational culture refers to learned beliefs, values, habits, attitudes, behavioral norms, procedures, practices, and expectations that influence how employees work in an organization (Mohelska & Sokolova, 2015; Northouse, 2016). Taylor (2014) defined organizational culture as common practices and assumptions accepted by members of an organization and perceived as laudable business processes. Successful organizations have effective leadership and organizational culture with strong capabilities for change, commitment to innovation, and a high level of trust. Leadership behaviors establish organizational culture over time (Taylor, 2014). Muls et al. (2015) highlighted organizational culture develops over time and is established by the nature of the

leadership style to achieve organizational success. Hence, organizational culture has interdependence on leadership.

Authentic commitment towards sustainability involves the complete integration of sustainability practices in the organizational culture, which transforms the corporate and stakeholder values and behavior. The strategic decision by some leaders of O&G companies to limit the integration of certain sustainability practices impedes the transformation of organizational culture towards sustainability. However, some leaders of O&G companies implement sustainability strategies that exceed the minimum compliance standards, which provide the benefit of superior sustainability (financial, social, and environmental) performance. The positive corporate image from superior sustainability performance attracts investors, joint venture partners, talent, minimizing stakeholder pressures and improving government collaborations.

Corporate Social Responsibility in the O&G Industry

Since 1950, the O&G industry has gone through a significant CSR transformation driven by globalization, pressures from government regulations, stakeholders, nongovernment organizations, and the society (Ekhator, 2014; Fomukong, 2014). Historically, the O&G industry was responsible for some of the highest profile environmental disasters including the Santa Barbara oil spill of 1969, the Piper Alpha disaster of 1988, the Exxon Valdez spill of 1989, and the Deepwater Horizon explosion and spill of 2010 (Spence, 2017). With each O&G environmental disaster from O&G operations raises new questions and skeptical perceptions about business ethics and CSR in the O&G industry. The aftermath of such disasters increased the pressure on the O&G

industry for more transparency, accountability, and stringent government regulations. The transparency, accountability, and regulatory demand on the O&G industry have led to increased CSR integration, CSR spending, and the development of CSR standards and policies in O&G organizations (Berkowitz, Bucheli, & Dumez, 2017). The increased regulatory demand for O&G companies is a consequence of the failure of self-regulation (Scheltema, 2014).

The environmental community has argued the threat of the O&G industry to animal habitats, health risks, oil spills, and climate change; greenhouse emissions outweigh the positive job creation and revenue generation for the government. A report by Clean Energy Canada revealed that in 2013, the green energy sector produced 23,700 direct jobs compared to the oil sands 22,340 jobs (Clean Energy Canada, 2014), which debunks the claim of superior job creation from oil sands development. Hence, most governments in the developed countries are actively investing in greener energy sources, but the ongoing demise predictions of the O&G industry since the 1970s are still unproven (Friedman, 2016). The global O&G industry issues regarding energy security, volatile commodity prices, increased greenhouse gas emissions, sustainable procurement, ethical business practices, improved environmental standards, and stakeholder pressures challenges firms to commit towards sustainability (Fistis et al., 2014). Until the demise of the global O&G industry comes to fruition, increasing the CSR focus in the O&G industry is critical to achieving long-term sustainability.

Alberta has the third-largest oil reserves in the world behind Saudi and Venezuela (Busato & Maccari, 2016), which makes the study of sustainability in Alberta's O&G

industry relevant to global environmental sustainability. However, Alberta has received numerous controversies and negative media coverage due to environmental impacts and greenhouse gas (GHG) emissions from the oil sands operations (Charpentier, Bergerson, & Maclean, 2009; Friedman, 2016). The pursuit of a sustainable global economy drives many organizations and government in the developed economies to promote sustainability, but the reality is the lag between sustainability in the developed, emerging, and survival economies, which results in the slow pace of global sustainability (Hart, 1997). The field of sustainability is multi-faceted, and the topics of integral leadership and government collaboration are emerging as part of a new sustainability approach to advance global sustainability (Baue & Wood, 2015). Over the last three decades, several factors have impeded the advancement of global sustainability including economic justification, lack of understanding, evidence of previous failed attempts, variations in CSR definition, governance, and sustainability reporting (Williams, 2014). However, the increase in global firms adopting CSR initiatives is evidence that global sustainability is still making progress but at a slow pace.

CSR has become a strategic and systematic aspect of conducting O&G business; however, the debate still lingers on the competitive advantage versus the economic viability of CSR. The seminal work by Porter and Kramer (2006) highlighted the four tenets of CSR (moral obligation, sustainability, license to operate, and reputation) which contribute to competitive advantage for organizations. Aspelund, Fjell, and Rodland, (2017) supported the argument that implementation of CSR strategies delivered competitive advantage. Further, Jeon and Gleiberman (2017) confirmed in their study

that the implementation of green strategies and sustainability reporting positively impacted the firm's profitability. However, sustainability reporting does not guarantee positive financial returns. In a study of Fortune 500 firms from 1997 to 2006, Shabana, Buchholtz, and Carroll (2016) identified that businesses engaged in three types of sustainability reporting namely defensive reporting, proactive reporting, and imitative diffusion. Depending on the maturity and success of a firm's CSR performance, the type of sustainability reporting may positively or negatively impact financial returns.

However, Perks et al. (2013) noted that the O&G industry received criticism since the 1980s due to its lack of sustainable CSR practices. Buldybayeva (2014) posited the argument that the perception of CSR as a marketing tool with no definite deliverables and the variations in CSR understanding plagued CSR advancement in the O&G industry. From a global perspective, the different cultures and societal values influence the subjective interpretation of CSR (Buldybayeva, 2014; Hofstede, 2001), which explains the lag between CSR practices in developing and developed countries (Spence, 2017). The different cultures and societal values in different countries impact the local O&G industry and CSR adoption, and implementation differs across different geographical boundaries. Multi-national O&G firms play a significant role in establishing high CSR standards across all global operations, which in turn positively influences the local O&G industry, governments, and regulatory bodies to elevate the local CSR standards (Berkowitz et al., 2017).

The O&G industry is a global industry with several dominant large multinational corporations operating in a wide variety of societies, political systems, cultural values,

economic and social development, which increases the complexity of CSR advancement (Berkowitz et al., 2017; Kim, Lee, & Yang, 2015). Researchers on CSR have reiterated the benefit for O&G companies of integrating CSR initiatives include an improved corporate image which attracts investments and talent. Other benefits include improved operational efficiency resulting from the timely government and regulatory approvals of applications as well as reduction of objections from stakeholders and other operators, which should result in higher profitability.

In the fast-paced business environment, organizations need to engage in sustainable operations while striving to increase profitability. Lynch-Wood, Williamson, and Jenkins (2009) underscored the need for companies to invest in CSR initiatives. The Alberta O&G industry has many O&G firms engaged in CSR initiatives, but the level of CSR engagement is dependent to a large extent on commodity prices. Furthermore, the priority focus on lifecycle assessment involving retired asset management is lacking. The North American "shale gas revolution" led to an oversupply of natural gas that led to depressed commodity gas prices (Wang, Chen, Jha, & Rogers, 2014). The current low commodity price environment challenges growth sustainability and stakeholder value creation in the industry.

The International Energy Agency (2015) highlighted the energy sector accounts for approximately 40% of global CO2 emissions, and with Canada's withdrawal from the Kyoto protocol in 2011 (United Nations Framework Convention on Climate Change, 2014) there is an urgent need to focus on sustainability efforts in the energy sector. Alberta has the third-largest oil reserves in the world behind Saudi and Venezuela

(Busato & Maccari, 2016), which makes the study of sustainability in Alberta's O&G industry relevant to global environmental sustainability. The global energy sector should focus on improving energy efficiency, low carbon energy infrastructure, lowering greenhouse gas emissions, and innovative new technologies to strive for an environmentally sustainable energy sector (Foster & Bedrosyan, 2014). However, Alberta ranked last in air quality compared to the US, Saudi, Venezuela, and the rest of Canada, which underscored that Alberta does not benefit from a sustainable balance of economic development and air quality (Busato & Maccari, 2016). Although significant CSR initiatives exist in Alberta's O&G industry, the increasing O&G activities increase the risk of environmental damage through spills, water pollution, and greenhouse gas (GHG) emissions affecting air quality.

Businesses have embraced an active role in the preservation of resources for future generations. The study by Wan Ahmad et al. (2016) focused on examining the external factors influencing sustainability goals in the O&G industry. Wan Ahmad et al. found that stakeholder pressure and economic stability were the two most influential external factors that impacted O&G organizations striving for sustainability. The findings by Wan Ahmad et al. (2016) emphasized the collective influence external and internal stakeholders have on an organization's sustainability performance. However, the study by Jones et al. (2014) identified that the variations in sustainability definitions play an important role in promoting commitment towards sustainability. The level of trust between an organization and stakeholders determines the influence of stakeholder pressure on an organization. Stakeholder trust is critical to the success of a firm, and CSR

determines the reputation of an organization which impacts the level of trust with stakeholders (Park, Lee, & Kim, 2014). Organizations need to develop trust with stakeholders to be effective at creating sustainable positive social impact in the communities (Hung-Baesecke, Chen, & Boyd, 2016). Understanding the interests and expectations of different stakeholders and implementing strategies that satisfy those interests without jeopardizing the firm's long-term business goals facilitates stakeholder trust.

The reality of the current economic downturn in the Alberta O&G industry has resulted in organizations declaring bankruptcy, divesting assets, mergers, or acquisitions, which contribute to the challenge of effective retired asset management. Historically, the reduction or elimination of ARO budgets is a common practice or strategy executed by Alberta's O&G companies during an economic recession or in a low O&G price environment. The conventional notion justifies the practice that disposing of retired assets realize no value (production, O&G reserves, or cash flow) and capital allocation focuses on projects and initiatives that provide the economic value to stakeholders. As a result of the uncertainty and risk in achieving sustainable growth with O&G production from conventional reservoirs, the O&G industry evolved to exploit the high growth shale business. With the focus on the shale gas or shale oil business, Alberta's O&G companies have been ineffective in the decommissioning and disposal of retired assets from non-producing conventional operations.

Volatile O&G commodity prices adversely impact the priority placed on retired asset management in the value chain. Optimizing the intra-link effectiveness and

governance of operations, production, transportation, marketing, and asset retirement should enhance profitability (Kaplinsky, 2000). According to the International Energy Agency (IEA), the 2015/2016 drop in O&G commodity prices will only recover in 5 years under favorable conditions (IEA, 2016). The low commodity price environment challenges growth sustainability and stakeholder value creation in the O&G industry. As O&G companies in the industry struggle for survivability, the pressure for shareholder value creation becomes the main focus, and commitment towards sustainability becomes a low priority.

The competitiveness of the Canadian O&G industry impacts access to suppliers, third-party transportation capacities for getting products to market, new land acreages, talent recruitment, and services for drilling, completion, production, and equipment. The delivery of cost-effective quality services from third-party suppliers and service providers in the larger value system impacts a firm's ability to implement sustainable CSR practices. Berkowitz et al. (2017) identified the importance of meta-organizations (MO) in implementing CSR practices in the O&G industry. Alberta's O&G companies with a poor history of addressing retirement of assets (inactive wells and facilities) at the end of the lifecycle (Robinson, 2015), risk significant financial liabilities, environmental impact, public safety, and social ramifications (B. Robinson, 2014). Environmental, public safety, and social implications include soil, groundwater and surface water contamination, wildlife impact, land usage, health risks, and negative community well-being (Unger, 2013). Alberta's ineffective retired asset management demonstrates a failure of corporate socially responsible O&G practices and regulatory enforcement.

According to AER, the negative upward trend of ineffective asset retirement in the O&G industry reveals inactive wells increased from 25,000 wells in 1989 to 81,602 wells in 2016 (AER, 2016d; Muehlenbachs, 2017). The volatility of the O&G commodity prices has further complicated the issue of asset retirement as more O&G companies struggle to address the challenges of survivability, growth sustainability, and stakeholder value creation with no strategy on asset retirement. The concepts of sustainability and strategic thinking are critical to developing a sustainable solution for improving its CSR image and creating long-term profitability and stakeholder value (Senge, Smith, Kruschwitz, Laur, & Schley, 2008b). A sustainable solution for small and medium-sized businesses serves as a framework for other O&G companies on how to implement strategies to address asset retirement and create long-term stakeholder value.

The pace of the shale gas revolution coupled with the O&G activities over the last 50 years has led to a consistent trend of increased O&G activities in North America, which is expected to continue in the future. Jackson et al. (2013) identified that the distance of gas wells to drinking water wells was the dominant factor in the increasing trend of hydrocarbon contamination in drinking water. Concerns about groundwater contamination include the toxicity and radioactivity of produced fluids from O&G wells, potential explosion and asphyxiation of natural gas, and the health hazards to people and animals. Hydrocarbon contamination in drinking water which has adverse effects on the health of the people, wildlife, and community may continue to be an issue for the future as the O&G industry continues to evolve and develop new technologies to access unconventional reservoirs.

The continuous growth and development in societies have led to community expansion into areas that contain heritage retired assets which creates increased environmental risks (Boothroyd et al., 2016). Historically, the low quality of O&G asset integrity, coupled with ineffective document/records management and poor regulatory governance presents a situation where the heritage retired assets could potentially have a negative impact on the environment in proximity to communities. Examples of new buildings (residential or commercial) built near heritage retired assets that have experienced some level of hydrocarbon leaks, which led to soil and water contamination will become routine if all O&G companies do not practice effective retired asset management.

The North American "shale gas revolution" led to an oversupply of natural gas that led to depressed commodity gas prices (Wang et al., 2014). The current low commodity price environment challenges growth sustainability and stakeholder value creation in the industry, which impacts the level of CSR initiatives to be executed. The findings of previous studies highlighted the gap between awareness and practice of social responsibility and the need for the government to increase its involvement in developing CSR policies and enforcement. The results from previous CSR studies confirm the importance of CSR to the economy, environment, and social change (Epstein & Buhovac, 2014). However, some O&G companies failed to recognize retired asset management as an integral function of CSR. Kirat (2015) made the argument that the difficulty of attaining widespread CSR improvement is in part due to the variations in CSR definitions, which enables subjective interpretations by organizations. However, the

increase in government regulatory demands should encourage firms to strive for CSR improvement.

Kirat (2015) highlighted the lack of CSR research in assessing stakeholder and societal CSR needs, the absence of CSR strategies, poor stakeholder engagement in CSR activities, no defined CSR budget, poor evaluation of CSR performance, and bias of company benefits impact the selection of CSR activities. The results of the study confirm that the practice of CSR in the O&G industry needs significant improvement to develop a sustainable CSR culture. Implementing sustainability initiatives has multistakeholder impacts and understanding Porter's five forces framework, and the impact of the initiatives on the value chain (Millar & Porter, 1985) fosters dialogue between all stakeholders to support the initiative for success. Jones et al. (2014) underscored the need for business leaders to identify the appropriate sustainability initiative for their firm, dedicate resources to the initiative, and incorporate the initiative as part of the economic growth planning to achieve long-term success.

Transition

In Section 1, I provided the background and specify the research foundation of the study, which aims to understand the strategies that asset managers in O&G companies implement to manage retired assets effectively. In Alberta's O&G industry, the vast amount of inactive wells, which in November 2016 was 81,602, poses a serious environmental threat and financial burden to the government if not addressed immediately. Though many Alberta O&G companies have established CSR programs, the prevalent issue of ineffective management of retired assets suggests that many O&G

companies do not consider effective management of retired assets as part of the CSR function. From the existing literature, I reviewed the concepts of CSR, sustainability and asset management, and I identified several themes in literature that have the potential to influence the asset managers' decision-making regarding management of retired assets.

In Section 2, I provided information on the research procedure with a detailed explanation of the role of the researcher, the participants, sampling strategy, the research method and design, data collection instruments and techniques, and assurance of reliability and validity. Section 3 included the presentation of the findings from the study, application of findings to business practice, implications for social change, recommendations for future research, reflections, and the conclusions.

Section 2: The Project

In this section, I focus on providing more information on the different aspects of conducting the research study. In my role as the researcher, I determined the research design and data collection methods that were best suited to answer the research question of the study. In this section, I describe the approach I took to explore the strategies that O&G business leaders implement to ensure asset retirement sustainability. The major topics I discuss in Section 2 include my role as the researcher, the research method, the research design, the participants, population and sampling, ethical considerations in research, data collection instruments, data collection, data organization, data analysis, and reliability and validity.

Purpose Statement

The purpose of this qualitative multiple case study was to explore the strategies that asset managers in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability. The target population for the study was three asset managers of small- and medium-sized O&G companies, located in Alberta, Canada, with experience in managing their retired assets effectively. The findings of the study may enable O&G asset managers to develop and sustain the efficient management of retired O&G assets by emphasizing the importance of asset lifecycle management. Promoting the value of lifecycle management in the O&G industry may assist the development of proenvironmental behaviors with internal and external stakeholders that evolve into an environmentally conscious culture in the industry (McDonald, 2014; Tian & Robertson, 2019; Unsworth et al., 2013). Positive

social change may occur if the environmentally conscious culture of O&G companies' employees spills over from work into their personal lives, leading them to improve the environment of their local communities (Young et al., 2015).

Role of the Researcher

In qualitative research, the researcher is the primary instrument for data collection (Hancock & Algozzine, 2016). The role of the researcher is critical in a qualitative case study that involves in-depth interviews with participants (Yin, 2018). Haines (2017) highlighted the importance of ethical considerations in conducting qualitative research, and Dasgupta (2015) noted the researcher's role in the selection of the research design, as well as procedures for participant recruitment, data collection, data analysis, and data interpretation. As the researcher in this case study, I selected an appropriate research methodology and design, recruited research participants, and collected and analyzed data from the research participants in an ethical manner.

Although I am currently working in the Alberta O&G industry, I did not have any business relationship with the organizations and the research participants, which ensured the objectivity of the research study. Collins and Cooper (2014) noted that a researcher's position external to an organization can ensure the objectivity of research; however, the researcher should have personal and social competence to conduct the study. My work experiences in the O&G industry provided personal competence (self-awareness, self-regulation, and motivation) and social competence (empathy and social skills), which validated my competence to conduct the study.

The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1979) summarized ethical principles and guidelines for the protection of humans in the Belmont Report. Wessels and Visagie (2015) highlighted that full compliance with the Belmont Report's ethical principles ensures that a researcher conducts a study ethically. Rowley (2012) underscored that the role of the researcher includes understanding the processes, attitudes, behaviors, and experiences of the participants about a specific topic. The researcher should ensure the presentation of varying views and perspectives that emerge from the study (Kavoura & Bitsani, 2014). As the primary data collection instrument, I protected the identity of the research participants as well as their organizations. Lancaster (2017) noted that researchers have an obligation to maintain the confidentiality and anonymity of research participants. In my role as the researcher, I protected the research participants by ensuring the confidentiality of their responses. In my pursuit of compliance, I completed the NIH web-based training course Protecting Human Research Participants (certification number 2074996) from the National Institutes of Health (NIH) Office of Extramural Research. Connelly (2014) emphasized that the researcher should be competent to conduct the research study. In conducting this case study, I ensured that my role as the researcher complied with the Belmont Report protocol regarding the three basic ethical principles, namely (a) respect for persons, (b) beneficence, and (c) justice. The respect for persons principle ensures that the researcher protects all research participants and treats all participants as autonomous agents (Wessels & Visagie, 2015). The beneficence principle involves the researcher's obligations to secure the well-being of the research participants.

The justice principle refers to the distribution of benefits and burdens of the research. The researcher should make efforts to ensure that there exists fairness in the distribution of benefits and burdens from the research.

Marshall and Rossman (2016) noted that an unbiased researcher perspective is essential to enhance research quality. To maintain a neutral perspective, it is necessary to avoid researcher bias by maintaining an awareness of personal biases and potential ethical issues (Marshall & Rossman, 2016). Hancock and Algozzine (2016) mentioned that semistructured interviews are a suitable data collection method in a case study. Castillo-Montoya (2016) emphasized that the use of an interview protocol can provide rich and detailed qualitative data for research. I used an interview protocol with open-ended interview questions for one-on-one, face-to-face interviews. An interview protocol ensures that a researcher is consistent in asking the same interview questions and procedures with all research participants, which helps to reduce bias (Yin, 2018). Hancock and Algozzine emphasized that all interviews should be audiotaped and fully transcribed for analysis to ensure interview accuracy and minimize bias. I audiotaped all of my interviews to ensure interview accuracy and reduce bias. Du-Babcock and Tanaka (2016) noted the bias of qualitative research studies based on the interpretive nature of the qualitative analysis. The tendency of the researcher to ignore other evidence based on interpretive analysis introduces bias, which affects the validity and reliability of the findings (Collins & Cooper, 2014). Du-Babcock and Tanaka (2016) underscored the importance of member checking, data triangulation, and data saturation to limit researcher bias. Member checking is a validation technique that involves participant

review of data to ensure the credibility of the results (Birt, Scott, Cavers, Campbell, & Walter, 2016; Harvey, 2015). Data triangulation is the use of different data sources to strengthen the reliability of the findings (Graue, 2015; Mayer, 2015), and data saturation refers to the stage in the data collection process when the researcher can no longer identify any new data or new themes from further data collection (Fusch & Ness, 2015; Morse, 2015b). I used member checking, data saturation, and data triangulation from different sources to mitigate researcher bias.

Researcher bias can negatively influence the outcome of research if left unchecked (Cruz & Monteiro, 2017; Ioannidis et al., 2014). Researchers should use reflexivity to increase awareness of their bias by gathering their thoughts, assumptions, expectations, and emotions (Greene, 2014). Understanding their own potential bias in the research process through the use of reflexivity enables researchers to mitigate the impact of bias on their studies (Darawsheh, 2014). However, reflexivity is not foolproof, and Probst (2015) mentioned several reflexivity challenges based on the individual researcher, including personal challenges, time constraints, and credibility concerns. *Epoché* or bracketing is a technique used to reduce the researcher's bias by helping the researcher to evaluate any preconceptions, feelings, and previous experiences with the phenomenon in the study (Kidd, Davis, & Larke, 2016). I mitigated researcher bias by bracketing my worldview to enhance the objectivity of the study, and I adhered to the interview protocol to ensure uniformity of the interviews.

Participants

This multiple case study focused on the Alberta O&G industry in Canada. Because most of the senior business leaders for Alberta O&G firms are in Calgary head offices, the selection of participants focused on O&G senior business leaders in Calgary. Dasgupta (2015) highlighted study participant eligibility criteria involving persons with direct involvement and relevant knowledge on the research topic under investigation and willingness to participate. Lingard, Turner, and Charlesworth (2015) noted that participant eligibility criteria in their study of small- and medium-sized enterprises included employees in firms with fewer than 199 persons and knowledgeable employees who were willing to be interviewed. Lewis (2015) underscored that in a qualitative study, the researcher should select participants with in-depth knowledge of the phenomenon under study. The population for this study consisted of senior business leaders in small- and medium-sized O&G firms with direct involvement in the strategy development and successful implementation of the retirement of O&G assets. According to Innovation, Science, & Economic Development Canada (2013), medium-sized O&G firms have between 100 and 500 employees. Therefore, in order to be included in the study, an individual needed to (a) be a business leader who had managed a successful CSR program for at least 5 years; (b) be with an O&G firm that had invested and established a successful asset retirement program for more than 5 years, (c) be with an O&G firm in the top 10th percentile of firms with successful licensee liability programs, and (d) be with an O&G firm with between 100 and 500 employees.

Kondowe and Booyens (2014) underscored the importance of gaining access to willing participants and maintaining relationships with participants as critical elements of conducting qualitative research. Researchers need to establish respectful, open, and trusting partnerships with participants through open channels of communication such as telephone calls, emails, and face-to-face meetings to gain access to the participants' knowledge and experience (Kondowe & Booyens, 2014). Peticca-Harris, deGama, and Elias (2016) underscored the importance of researchers exhibiting a variety of interpersonal skills and competencies including trust, rapport, sensitivity, knowledge, and experience to gain access to participants. Monahan and Fisher (2015) reiterated that gaining access to participants can be time consuming and stressful, noting that researchers need to allocate sufficient time and effort toward gaining access to participants. To gain access to participants, I used public reports from the AER to identify small and medium-sized O&G firms that had established a successful asset retirement program. Then I used purposeful sampling, starting with my network of senior business leader contacts in the Alberta O&G industry, to target participants in those O&G firms that met the established criteria for the study. Additionally, I used LinkedIn and my contacts at the Association of Professional Engineers and Geoscientists of Alberta (APEGA) to establish contact with other potential participants in those O&G firms where I had no direct contacts.

Marshall and Rossman (2016) noted that establishing trust between the researcher and the participants improves the working relationship and increases the quality of data collection. Providing sufficient details on the study and offering assurance of

confidentiality should help to establish trust between the researcher and participants. I followed up the introductory emails with phone calls to establish a rapport with the participants and to address any concerns they might have, and I provided clarification about the research process. In all telephone and face-to-face communications with the participants, I established rapport and trust by ensuring that I was actively listening, providing honest and transparent responses, maintaining eye contact whenever possible, and adopting a flexible schedule that respected their time and schedules. The response quality from research participants increases when rapport between the researcher and the respondents is facilitated by the researcher's full disclosure to research participants (Guillemin & Heggen, 2009; Hartup, 2016).

Brayda and Boyce (2014) underscored the importance of using purposeful sampling to identify study participants with relevant knowledge to answer research questions. For this study, participant selection criteria were aligned with the research question, which involved the strategies that asset managers in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability. Alshenqeeti (2014) also noted that the objective of conducting interviews is to gather data to answer the research question, which emphasizes the need to select participants who align with the research question. Elo et al. (2014) suggested that researchers should select participants with the expertise needed to answer the research question. Selecting participants with relevant knowledge aligned with the research question is essential to conducting high-quality research (Elo et al., 2014). By applying participant selection criteria, I sought to ensure that the participants aligned with the

research question. Rosenthal (2016) noted the importance of the researcher developing a rapport and working relationship with participants to enhance the richness and quality of the interview responses. I used emails, telephone communications, and face-to-face meetings to establish rapport and develop a working relationship with participants, which facilitated openness and rich quality responses during the interviews.

Research Method and Design

Selecting an appropriate research method and research design is critical in conducting a study. The three research methods are quantitative, qualitative, and mixed methods (Leppink, 2017). After I had evaluated the three main research methods, the research question of the study guided the selection of the qualitative research method using an exploratory, multiple case study design. Marshall and Rossman (2016) highlighted that the research question guides the researcher in the selection of the appropriate research method and design. The qualitative research method and case study design satisfied the requirement for an in-depth exploration of strategies for O&G asset retirement sustainability in the Alberta O&G industry.

Research Method

Qualitative research refers to a research method designed to address questions in the natural world by facilitating knowledge gathering rather than creating knowledge, as well as interpreting knowledge rather than analyzing knowledge (Marshall & Rossman, 2016; Yin, 2018). A qualitative research method enables the researcher to explore, gain insight into, and understand differing participants' experiences and perceptions in detail in their natural settings (Allen, 2015; Birchall, 2014; Hyett et al., 2014). Qualitative

research methods are most commonly applied when phenomena are insufficiently understood and the researcher seeks an in-depth exploration of the phenomena, which enables the identification of thematic patterns and new insights (Dasgupta, 2015; O'Sullivan, 2015; Yilmaz, 2013). I selected qualitative research as the most appropriate methodology for this study because of the exploratory nature of the research question. My interest in exploring how successful O&G companies achieve effective retired assets management through interactions with asset managers justified the suitability of the qualitative method.

The quantitative research method involves statistical analysis and subjective deduction to test hypotheses by analyzing numerical data and making inferences about how the results apply to a larger population (Bryman & Bell, 2015; Mukhopadhyay & Gupta, 2014). Due to the exploratory nature of this study, it was not necessary to examine the relationship or differences between variables. The use of mixed methods involves collecting, analyzing, and interpreting both qualitative and quantitative data in the same study (Makrakis & Kostoulas-Makrakis, 2016; Molina-Azorin, 2016). Because I did not analyze numerical data, the quantitative or mixed method research methodologies were not necessary for addressing my research question.

Research Design

Researchers commonly use the following four qualitative research designs: (a) phenomenological, (b) ethnography, (c) narrative, and (d) case study (Colorafi & Evans, 2016). The phenomenological approach involves the study of individuals' lived experiences of a phenomenon in a business setting (Glover & Philbin, 2017; Padilla-Díaz,

2015; Skea, 2016). Because I did not intend to study participants' lived experiences, I did not select the phenomenological approach. Ethnography involves conducting research relating to cultural issues in organizations (Cappellaro, 2017; Eriksson & Kovalainen, 2016; Ottrey, Long, & Porter, 2018). The narrative approach involves studying the lives of individuals over time (George & Selimos, 2018; Marshall & Rossman, 2016; McAlpine, 2016). Considering that there was no focus on the culture or lives of participants in my study, the narrative and ethnography approaches were not viable for this study. The case study approach was appropriate because it is effective for exploring complex social and technical phenomena in depth (Harland, 2014; Marshall & Rossman, 2016; Yin, 2018), which can lead to business improvement.

After the evaluation of four commonly used qualitative designs, the selection of a multiple case study design was the most appropriate research design to explore and understand the strategies used by O&G firms for asset retirement sustainability in Alberta. Providing an answer to the research question of this study requires an in-depth understanding of the senior business leader's CSR business practices and strategies for implementing successful asset retirement, which creates value for stakeholders. Obtaining an in-depth understanding of the phenomenon under study requires interviewing senior business leaders and analyzing company documents. The phenomenological design may provide an in-depth understanding of the unique lived experience of several individuals by exploring their perspectives and insights on experiencing the particular phenomenon (Gill, 2014; Glover & Philbin, 2017; Skea, 2016). However, the phenomenological design was not appropriate for this study because

the senior business leaders did not experience the same phenomenon under study in the same business setting. Moreover, my intent of gaining in-depth understanding required the analysis of company documents which is not part of a phenomenological design.

The ethnographic design is appropriate for the study that describes and interprets the shared beliefs and behavior within a culture-sharing group (Eriksson & Kovalainen, 2016; Ottrey et al., 2018; Tavakol & Sandars, 2014). Ethnographic research requires the researcher to observe the participants over an extended length of time, which is not the most effective approach to address the research question of this study. The narrative design was also not appropriate for this study because it focuses on the detailed stories or life experiences of one or more events (George & Selimos, 2018; Marshall & Rossman, 2016; McAlpine, 2016), which is not the intent of this study. A qualitative case study design is an empirical research design in which the researcher collects and analyzes data from a variety of data sources in a natural context to explore a particular phenomenon (Cronin, 2014; Dasgupta, 2015; Leppäaho, Plakoyiannaki, & Dimitratos, 2016). The exploratory nature of the current study requires the use of interviews as one of the data sources during the data collection phase. When conducting in-depth interviews, the researcher can redirect questions and ask probing questions that help identify concepts and emerging themes about the phenomenon under study (Rubin & Rubin, 2012).

Generally, the small sample size of the case study design limits the transferability of the findings to other organizations (Craig-Henderson & Lewis, 2015). However, the transferability limitation is mitigated by selecting the multiple case study design and ensuring data saturation. Yin (2018) underscored achieving data saturation is a vital

prerequisite for a valid qualitative study and influences the sample size of participants required in a qualitative study. Data saturation refers to the stage in the data collection process when the researcher can no longer identify any new data or new themes from further data collection (Fusch & Ness, 2015; Morse, 2015b). The selection of the multiple case study design extends data collection across multiple O&G businesses, which enabled the researcher to capture extensive data and reduce bias that might occur in a single case study. A single case study which focuses on a single business would be insufficient to capture the differing business practices and strategies employed in the Alberta O&G industry. Marshall and Rossman (2016) highlighted that the multiple case study enables the capture of high-quality data with external validity. Therefore, I selected the qualitative multiple case study for this study and I ensured that data collection reaches data saturation to improve the robustness and external validity of the data findings.

Population and Sampling

The research population for this qualitative multiple case study comprised of three medium-sized O&G firms in Calgary, Alberta with 100 and 500 employees and an established CSR program with at least 5 years of successful asset retirement implementation. According to ISEDC (2013), a medium-sized O&G firm has between 100 and 500 employees. Jašarević, Miličević, Brdarević, and Lemeš (2017) conducted multiple case research using five case studies to explore the measurement of organizational culture in public administration in Bosnia and Herzegovina. In their study of sampling richness and integrity in qualitative research, Roy, Zvonkovic, Goldberg, Sharp, and LaRossa (2015) recommended three to five cases in a multiple case study to

achieve data saturation. Therefore, I selected a sample size of three business leaders from the sample population to achieve data saturation. In my pursuit of rich information, I purposively selected my sample source, which included one senior business leader from each O&G firm that had managed CSR responsibilities for at least 5 years.

Sampling is a major consideration in all research, but the requirements and challenges differ depending on the research method. In qualitative research, participants are chosen not to represent others but for their likelihood of having information on the phenomenon under study which is different from statistical sampling, where the objective is an inference to a population (McCrae & Purssell, 2016). The possibilities of the sampling unit in qualitative research are diverse, flexible, rarely limited to people, and are comprised of multiple and varying data sources (Gentles & Vilches, 2017). In qualitative research, the sampling involves the selection of specific data sources for data collection to address the research question. Rosenthal (2016) noted the importance of determining appropriate sample size in a qualitative case study, and O. Robinson (2014) highlighted the appropriate sample size for a qualitative case study is dependent on both practical and theoretical deliberations. The sampling depends on the diversity of the data, and the number of respondents required has to be sufficient to achieve data saturation on answering the research question (Fusch & Ness, 2015; Gentles, Charles, Nicholas, Ploeg, & McKibbon, 2016).

As the depth of inquiry is important in qualitative research, the sample size needs to be large enough to capture a wide perspective of the phenomenon until the researcher achieves data saturation (Morse, 2015b). Researchers rely on precedents for determining

the number of participants in qualitative studies (Palinkas et al., 2015; Rosenthal, 2016). However, there is no optimal sample size because it depends on the research question, research design, the purpose of the study, heterogeneity of the participants, and achieving data saturation (Fusch & Ness, 2015; Gentles, Charles, Ploeg, & McKibbon, 2015). Fusch and Ness (2015) identified researchers achieve data saturation when no new data, no new themes, and no new coding emerge as well as when the replication of the study is possible by asking the same questions to the same participants in the same timeframe. Roy et al. (2015) recommended three to five cases in a multiple case study to achieve data saturation. To achieve data saturation, I conducted three semistructured interviews with the business leaders of three O&G firms and the data analysis revealed no new identification of data, themes, or codes. Further, O. Robinson (2014) highlighted four important components of sampling in an interview-based qualitative study namely (a) setting the sample universe, (b) selecting a sample size, (c) devising the sampling strategy, and (d) sample sourcing.

Researchers have underscored the merits of the different sampling methods namely theoretical sampling, purposeful sampling and snowball sampling (Gentles & Vilches, 2017; McCrae & Purssell, 2016), but Palinkas et al. (2015) suggested that combining sampling strategies may be more effective in implementation research. However, Palinkas et al. (2015) noted that the mixed methods design is preferable in implementation research which is not relevant to the current qualitative study. Kılınç and Firat (2017) noted purposeful sampling is a preferred expedient sampling method in qualitative research that enables the researcher to target participants that meet the

established criteria. Based on the qualitative research design of the current study, I determined the use of purposeful sampling was the most appropriate sampling technique for the study.

Purposeful sampling is a technique widely used in qualitative research for the identification and selection of information-rich data sources for the most effective use of limited resources (Patton, 2015; Yin, 2018). For the current study, this sampling strategy involves identifying and selecting senior business leaders knowledgeable and experienced in the CSR practices of asset retirement sustainability in Alberta, Canada. Palinkas et al. (2015) emphasized that purposeful sampling also involves the availability and willingness of the target population to participate, and the ability to communicate experiences and opinions in an articulate, expressive, and reflective manner. Quantitative methods place primary emphasis on generalization, but qualitative methods place primary emphasis on data saturation (Patton, 2015; Walker, 2012). Achieving data saturation by continuing to sample until no new substantive information on the phenomenon under study is identified increases the richness of data to help answer the research question (Houghton, Casey, Shaw, & Murphy, 2013; Morse, 2015b).

Upon receiving IRB approval, I identified potential participants that met the established criteria to determine eligibility for inclusion in the current study. Successful interview data collection involved ensuring participants met established criteria, and I provided an informed consent form to participants, utilized an interview protocol, selected an ideal interview location, recorded the interview, and adhered to legal and ethical requirements (Hancock & Algozzine, 2016; Rosenthal, 2016). Also, Jacob and

Furgerson (2012) highlighted the importance of avoiding long interviews and keeping the interview between 60-90 minutes with six to 10 well-written questions for effective interview data collection. The interview locations for the current study were quiet office locations in downtown Calgary with minimal disruptions for the participants and minimal noise to improve audio recording quality.

Ethical Research

The IRB procedures stipulate that research participation is voluntary, and the researcher should ensure the protection of the participants (Connelly, 2014; Haines, 2017). Tuckett (2004) emphasized that researchers should inform participants of their right to withdraw from the research at any time. Meho (2006) emphasized that the consent form should contain the information on the participant's right to withdraw from the study at any time. To ensure voluntary participation of the participants, I distributed an informed consent form to all potential participants with the explanation that participation is voluntary, and withdrawal can occur at any time before or during the interview. The informed consent form provided sufficient information about the purpose of the study and contained the researcher's contact information and Walden University's IRB contact information in case the participants require any further clarifications. Maintaining the confidentiality of the participants, I used acronyms and numbering the participants in the order of the interviews to protect the personal identities of the participants. For the interview data collection with the three senior business leaders, the first participant was PA1, the second participant PA2 and the third participant PA3. A password-protected media stored all the data collected, which will reside in a safe

location for 5 years to safeguard the rights of participants and, after 5 years, I will destroy the research data by shredding or electronic erasure.

Data collection did not commence until the approval from Walden University's Institutional Review Board (IRB). Walden University's IRB has the oversight of ethical research practices and approves research involving human participants to ensure compliance with the guidelines for ethical research and U.S. federal regulations (Walden University, 2015). Completing the Walden University's IRB process requires full disclosure of the plans and strategies for conducting ethical research. The disclosures included (a) description of the procedures, (b) identification of potential risks and benefits for participants, (c) data integrity and confidentiality, (d) identification of community stakeholders, (e) potential conflicts of interest, (f) data collection tools, (g) obtaining informed consent, and (h) description of the research participants (Walden University, 2015).

Before engaging with the participants, each participant received a mandatory informed consent letter via email as well as a brief explanation of the research to capture their interest and help to establish trust between the researcher and participant. The introductory email with a brief explanation of the study included a description of the nature and importance of the study to the O&G business practice. In this email, I provided details of the research, including the voluntary nature of the participation, the withdrawal policy that allowed the participant to withdraw from the study at any time, the expected length of time for the interviews, and the assurance of confidentiality. Robinson (2014) underscored the importance of transparency and full disclosure of the purpose of

the study with research participants to facilitate trust and enhance the quality and integrity of the study. Obtaining informed consent from participants adheres to the voluntary participation of participants and eliminates any doubt of coercion (Goodell, Stage, & Cooke, 2016). Before conducting the research study, it is the responsibility of the researcher to obtain approval from the university's IRB to ensure appropriate procedures and processes are in place to protect the participants by considering the potential risks and benefits to the participants (Goodell et al., 2016; Haines, 2017). Polit and Beck (2014) emphasized that researchers should avoid providing excessive incentives to participants because such incentives could constitute a form of coercion, which could negatively impact the credibility of the study. Offering participant incentives or compensation could coerce or motivate participants to provide misleading data (Aluwihare-Samaranayake, 2012; O. Robinson, 2014). The participants in the current study received no compensation or incentives for their voluntary participation in the study; however, every participant received a two-three page summary of the study findings.

In conducting a study with human participants, the protection of the participants is vital in ensuring that the researcher conducts the study in an ethical manner that complies with the Belmont Report protocol (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1979; Wessels & Visagie, 2015). The obligation to protect the research participants included ensuring the confidentiality of their responses, protecting the identity of the research participants as well as their organizations (Lancaster, 2017). I conducted this research study following high ethical

standards. In my pursuit of compliance, I completed all the ethical requirements of my university's institutional review board (IRB) and obtained the IRB approval for this study (approval number 11-21-18-0640672).

Data Collection Instruments

In conducting qualitative research, the researcher is the primary instrument for data collection (Hancock & Algozzine, 2016). As the primary data collection instrument in this qualitative multiple case study, I was the only interviewer to conduct data collection interviews with the research participants. Interviews are preferable to questionnaires in generating a range of insights from participants who are knowledgeable concerning the phenomenon under study (Rowley, 2014). Castillo-Montoya (2016) emphasized the use of an interview protocol with open-ended questions in semistructured interviews can provide rich and detailed qualitative data for research. I used semistructured interviews with open-ended questions to obtain rich data quality. The rich data quality from the interviews enabled me to develop an in-depth understanding of the strategies for sustainable O&G asset retirement in Alberta. Semistructured interviews involve preparing questions in advance that lead the direction of the conversation but allow the respondents to answer openly (Hancock & Algozzine, 2016). One-on-one interviews enable the researcher to conduct an in-depth exploration of participants' experiences and perspectives of a particular topic (Marshall & Rossman, 2016). To foster quality interviews, I ensured appropriate interview conditions to facilitate rich data collection. The conditions included the location, length of time of the interview, the order, quality, and clarity of questions, a digital audio recording of the interview, and use

of interview protocol, as recommended by several scholars (Castillo-Montoya, 2016; Rowley, 2012; Rubin & Rubin, 2012). An effective interviewer needs to be an active listener, ask relevant questions, have a firm grasp of the topic, and avoid bias (Hancock & Algozzine, 2016; Yin, 2018). During the interviews, I was an active listener, ask relevant questions, have a firm grasp of the topic, show flexibility, and avoid bias.

Semistructured interviews involve preparing questions in advance that lead the direction of the conversation but allow the respondents to answer openly. One-on-one interviews enable the researcher to conduct an in-depth exploration of participants' experiences and perspectives of a particular topic (Marshall & Rossman, 2016). One central research question with several semistructured, open-ended, interview questions guided the interview data collection. The interview protocol ensures that the researcher is consistent in asking the same interview questions and procedures with all the research participants and avoids bias (Yin, 2018). The interview protocol included a script of what the researcher will say before the interview, the interview questions, and the comments after the interview (Castillo-Montoya, 2016). However, the interview protocol must be comprehensive, and the interview questions should enable the researcher to gain insights into the study's research question (Castillo-Montoya, 2016). Hancock and Algozzine (2016) noted that the successful interview data collection included ensuring participants meet established criteria, providing participants with an informed consent form, using an interview protocol, selecting an ideal interview location, recording the interview, and adhering to legal and ethical requirements. See Appendix A for the interview protocol and Appendix B for the interview questions. The interview protocol included a script of

what the researcher will say before the interview, the interview questions, and the comments after the interview (Castillo-Montoya, 2016; Jacob & Furgerson, 2012). Castillo-Montoya (2016) highlighted four considerations for developing an effective interview protocol. The four considerations included (a) ensure interview questions align with the research question, (b) construct an inquiry-based conversation, (c) receive feedback on interview protocols, and (d) piloting the interview protocol. The use of the interview protocol helps increase the reliability of the data findings (Yin, 2018).

Yin (2018) noted that data collection from multiple sources improves the rigor of a study. I collected data from multiple sources including documentation reviews and semistructured interviews with three O&G business leaders to produce multiple sources of evidence and ensure a rigorous research quality. Data collection for the current study came from multiple collection sources namely interviews, observations, audio recordings, and archival company documents, which enhances the research reliability and validity (Fusch & Ness, 2015; O'Reilly & Parker, 2012). All interviews were recorded using a digital recorder to ensure accurate recollection of participants' responses. I employed member checking for participants to review my interpretation of their interview responses, check for correctness, and provide further insights (Hancock & Algozzine, 2016). To further enhance credibility, I used methodological triangulation to compare and confirm the interview data with archival company documents. Data triangulation is the use of different data sources to strengthen the reliability of the findings (Graue, 2015; Mayer, 2015). Yin (2018) noted that data collection from multiple data sources enables

methodological triangulation to improve reliability and ensure the validity and credibility of research findings.

Data Collection Technique

Data collection from multiple sources enhances research reliability and validity (Fusch & Ness, 2015; O'Reilly & Parker, 2012). In qualitative research, there are four categories of data collection namely observations, interviews, documents, and audiovisual materials (Marshall & Rossman, 2016). Interviewing using semistructured, open-ended questions is a widely used and effective method of data collection in qualitative research (Alshenqeeti, 2014; Patton, 2015; Stuckey et al., 2014). The data collection technique comprised of semistructured interviews and the examination of company documents including websites and social media sites. Craig-Henderson and Lewis (2015) emphasized the limitation of data collection at one point in time and improvement in data integrity is achieved via a longitudinal design enabling data collection over time. The purpose of this study to explore the strategies O&G business leaders use for asset retirement sustainability is exploratory, which is ideal for semistructured interviews. Data collection for this qualitative multiple case study were from two primary multiple data sources namely interviews and company documents. I conducted interviews with three business leaders of medium size O&G businesses and then gather additional data from public sources such as websites and private company documents. I used member checking, data saturation, and methodological triangulation to reduce researcher bias, ensure validity, and improve reliability. Using multiple data

sources enable methodological triangulation to improve reliability and ensure the validity of research findings (Yin, 2018).

An interview is a data collection technique in which the researcher asks the respondents qualitative questions using a structured, semistructured, or unstructured format (Goodell et al., 2016). Using the interview data collection method enables the researcher to gain insight and context, facilitates a working relationship with participants, allows for probing questions by the researcher, permits participants to ask questions, and allows participant observations while actively listening (Alshenqeeti, 2014; Reischauer, 2015). Brayda and Boyce (2014) noted, however, that interviewing could be time consuming, prone to research bias, and ineffective if the researcher does not have the interpersonal skills and cultural competence to establish rapport with the participants. However, the benefits of interviewing have been well documented (Stuckey et al., 2014), and I collected data from interviewing business leaders and company archival documents to enable methodological triangulation.

For the current study, the interviews were face-to-face, and the format was semistructured with open-ended interview questions. Semistructured interviews and open-ended interview questions enable the researcher to obtain rich data quality that enables an in-depth understanding of the phenomenon (Castillo-Montoya, 2016). To facilitate a natural flow conversation that is rich in detail with the participants, the researcher needs to select an appropriate interview location free of disruptions and noise, manage the interview time, be an active listener, maintain eye contact, and ensure participants' comfort (Hancock & Algozzine, 2016; Rosenthal, 2016). I audio recorded

the interviews and took notes to capture contextual details, initial impressions, and emotions. The digital audio recording of all interviews ensured the preservation of all interview data for accurate post-interview analysis (Goodell et al., 2016; Rosenthal, 2016). Some participants may be wary of the interview recording (Brayda & Boyce, 2014), and I minimized any negative impact of recording the interview by reaffirming confidentiality and explaining the research objectives and procedures before conducting the interviews.

For effective data collection using interviews, Patton (2015) highlighted six categories of questions that researchers can use to obtain rich data from participants. These categories are (a) experiential and behavior questions, (b) opinion and value questions, (c) feelings questions, (d) knowledge questions, (e) sensory questions and (f) demographic questions. Asking questions in a particular order could facilitate a conversational style of interview, which would enhance the quality and detail of responses from participants (Brayda & Boyce, 2014; Patton, 2015). To increase participant responsivity, Reischauer (2015) underscored the importance of considering the current state of the organization when formulating interview questions. I conducted a current evaluation of all participants and their firms and incorporated Patton's categories of questions in formulating the interview questions.

Using a face-to-face interview enables the researcher to collect rich data through the responses from the participants and also allows for participant observation which is an additional detail to the responses (Alshenqeeti, 2014; Stuckey et al., 2014). Brayda and Boyce (2014) underscored the importance of participant observation during the

interview, which allows the researcher to observe participants' body language to see the effects of the questions and adjust accordingly to maintain the participant's engagement and avoid physical discomfort. The advantages of face-to-face interviews included a high return rate, fewer incomplete answers, immediate clarification to avoid ambiguity, controlled answer order, and flexibility (Alshenqeeti, 2014). However, face-to-face interviews also have the drawback of research bias as participants can provide subjective rather than objective responses, and researchers can influence the interview results (Marshall & Rossman, 2016). Another drawback could be the researcher's failure to ask the in-depth probing question out of fear, intimidation, or cultural incompetence (Goodell et al., 2016; Yin, 2018).

I used reflexivity and bracketing (epoché) to increase awareness of personal bias and mitigate research bias with the interview data collection process (Darawsheh, 2014; Greene, 2014). Also developing a rapport with the participants by respecting their time, understanding cultural competency, political awareness, sensitive issues, and providing honest, transparent responses to participants will build trust and eliminate several interview drawbacks (Brayda & Boyce, 2014; Stuckey et al., 2014). To enhance the objectivity of the interview, I used an interview protocol to ensure uniformity of the interviews. The use of interview protocol ensures that the researcher is consistent in conducting the same interview questions and procedures with all the research participants and avoids bias (Yin, 2018).

I transcribed the interviews (verbatim) to increase familiarity with the data and conduct a review of the notes taken during the interviews to capture any additional detail.

Du-Babcock and Tanaka (2016) emphasized the importance of member checking, data triangulation, and data saturation to limit researcher bias. Member checking is a validation technique that involves participant validation of data to ensure the credibility of the results (Birt et al., 2016; Harvey, 2015). I employed member checking for participants to review my interpretation of their interview responses, check for correctness, and provide further insights. To further enhance credibility, I used methodological triangulation to compare and confirm the interview data with archival company documents. Methodological triangulation is the use of multiple data collection techniques to increase confidence in data findings, research validity, and reliability (Fusch & Ness, 2015; Goodell et al., 2016). The company documents served as a secondary source of data collection. I expect data saturation to occur after the interviews with the three senior business leaders because Roy et al. (2015) recommended three to five cases in a multiple case study to achieve data saturation.

Data Organization Technique

In a qualitative case study, using a database for organizing and documenting data is essential, and a well-organized database facilitates easy data retrieval for the researcher (Marshall & Rossman, 2016; Yin, 2018). Baškarada (2014) underscored data might become corrupted during data collection, storage, retrieval, integration, and analysis. Effective data organization involves organizing and labeling the dataset using some organizational structure or scheme to facilitate easy data retrieval (Hancock & Algozzine, 2016). The database may entail documents, electronic files, field journals, personal logs (reflective journals), and other materials that enable easy data retrieval. Applebaum

(2014) noted that researchers use reflective journals to keep personal logs that help with the interpretation of field data. I maintained all research data including the recorded interviews and field journals in a database for easy data retrieval. My data organization involved the use of word processing and spreadsheet software (Microsoft Word and Microsoft Excel) as well as computer-assisted qualitative data analysis software (QDAS). Though Microsoft Excel is a cost-effective software to thematically analyze qualitative data (Bree & Gallagher, 2016). Woods, Paulus, Atkins, and Macklin (2016) highlighted NVivo and ATLAS.ti as two commonly used QDAS in qualitative research, and I used NVivo for the data analysis.

Fletcher and Islam (2015) highlighted the rising awareness of privacy and the potential for distrust due to a breach of individual privacy. According to the 1979 Belmont Report, the researcher needs to protect the participants by maintaining confidentiality. The trust between the researcher and the participants hinges on the promise of confidentiality, anonymity, and privacy, which should not be broken to maintain the integrity of the research (Novak, 2014). However, absolute anonymity is rarely preferred, and the researcher should balance anonymity with the participant's accountability of information (Novak, 2014). To protect the privacy of the participants, I differentiated each participant by assigning a distinct code and label for each participant, and I maintained a log of the research progress.

I used a digital device to record the audio of the interviews, and after every interview, I created a backup of the recorded interviews to an external drive and Google cloud drive for redundancy. Cloud storage such as Google drive has become a popular

and cost-effective option for government and businesses to store, access, collaborate, and disseminate data (Quick & Choo, 2014). However, there are still risks to cloud storage. These risks included exploitation by unauthorized persons, data remnants on devices used to access cloud data, and long-term preservation and interpretation due to the lack of standardization across the cloud storage services (Quick & Choo, 2014; Roussev & McCulley, 2016). I mitigated some of these cloud storage risks by accessing the cloud data only from my personal computer and using password protection on cloud data. I transcribed all recorded interviews into text and backup the data to an external drive and Google cloud drive. I used password protection for all the research data stored on my personal computer, the external drive, and cloud to ensure confidentiality. I will store all the research data for 5 years, and after 5 years, I will destroy the research data by shredding or electronic erasure.

Data Analysis

The data analysis process in qualitative research involves investigating, categorizing, tabulating, critically evaluating, or rearranging data collected to produce findings relevant to the research question (Marshall & Rossman, 2016). Moser and Korstjens (2018) highlighted that the data analysis and interpretation process is of critical importance to the validity and outcome of the research. The three major components of qualitative data analysis are (a) data reduction (content analysis), (b) data display, and (c) drawing and verifying conclusions (Mayer, 2015).

Data reduction or content analysis constantly occurs during analysis and involves selective data reduction without losing information. Mayer (2015) noted that data

reduction techniques included editing, coding, memoing, conceptualization, and summarization. Data display refers to the use of graphs, charts, or diagrams to arrange, condense, and assemble information (Mayer, 2015). Drawing and verifying conclusions is possible after effective data reduction, evaluating the data display, and interpreting the data (Mayer, 2015). However, Hancock and Algozzine (2016) emphasized the importance of using the research question and related literature as guidelines for data analysis. I used the participants' responses from the interview data collection and the examination of company artifacts to provide answers to the research question: What strategies do O&G business leaders use to manage retired O&G assets to increase organizational sustainability?

Moser and Korstjens (2018) underscored the importance of the iterative approach and an emerging design to accumulate rich data and interesting findings, which means cycling between sampling, data collection, and analysis. After the first interview with an O&G business leader, I prepared field notes and conducted preliminary data analysis which helped shape subsequent sampling decisions. Clark & Vealé (2018) noted that organizing qualitative data requires thematic analysis with coding and sorting techniques. Thematic analysis involves observing and recording patterns in the data. Coding is the term used to describe the transitional process between data collection and data analysis, and the code is a word, phrase, or sentence that represents aspects of data or captures the essence of data (Clark & Vealé, 2018).

I transcribed all recorded interview data into text and employed a coding structure and scheme using the NVivo computer software in coding the research data. NVivo is a

qualitative data analysis software (QDAS), which is a computer software program for organizing and facilitating the analysis of qualitative data (Salmona & Kaczynski, 2016). Once coding was complete, I proceeded with the sorting process, which is the review of the codes for patterns and common themes, and categorizing the codes and themes based on patterns identified. A pattern is any repetitive word or phrase that consistently occurs in the transcribed data. The computer software NVivo facilitated the location of matching words or phrases after the researcher defines the set of codes (Hancock & Algozzine, 2016; Salmona & Kaczynski, 2016). Researchers characterize patterns by their similarity, differences, frequency, sequence, correspondence, or causation (Clark & Vealé, 2018; Ranney et al., 2015). The coding, sorting, and categorization of common themes and patterns enables the researcher to identify emerging themes (Maguire & Delahunt, 2017).

Maintaining transparency in the coding and analysis process by describing the researcher's background, coding, and analytical process ensure rigor in qualitative research. Rigor ensures that a similar researcher with a similar background using similar methods should arrive at similar conclusions using the same dataset (Cho & Lee, 2014). Ranney et al. (2015) underscored that the researcher should remain objective during the data analysis process to enhance the trustworthiness of the data findings. Potential threats to the validity of the research during data analysis included improper or inadequate coding, anecdotalism, and data overload which leads to superficial or inaccurate conclusions (Cook, Kuper, Hatala, & Ginsburg, 2016; Ranney et al., 2015). Therefore, I used member checking and methodological triangulation and explicit consideration of researcher bias to ensure the trustworthiness of the data analysis and to increase

confidence in data findings, research validity, and reliability. The final phase of the data analysis is the development of a clear summary of findings that provided answers to the research question of the study (Clark & Vealé, 2018; Mayer, 2015). Methodological triangulation is the use of multiple data collection techniques to increase confidence in data findings, research validity, and reliability (Fusch & Ness, 2015; Goodell et al., 2016). I collected data from interviewing business leaders and company archival documents to enable methodological triangulation. Ranney et al. (2015) noted that emerging themes from the data analysis should be compared to existing literature and conceptual framework to enhance understanding of the themes. Vaismoradi, Jones, Turunen, and Snelgrove (2016) suggested that researchers should conduct a comparative analysis between emerging themes and existing literature and provide a description of how the themes fit the research question. From the data analysis, I identified emerging themes; verified the emerging themes from the methodological triangulation of the transcribed data and documents analysis to develop a clear summary of findings.

Reliability and Validity

Reliability

In qualitative research, reliability is an evaluative measure that refers to the strength of the research rigor and data credibility (Cook et al., 2016; Darawsheh, 2014). Abdalla, Oliveira, Azevedo, and Gonzalez (2018) highlighted reliability, credibility, transferability, and confirmability as quality measures in qualitative research. Enhancing the reliability improves the trustworthiness and dependability of the study's findings and involves appropriate documentation of the researcher's processes and decisions made

during the study. Leung (2015) noted that reliability referred to the consistency and replicability of the research and highlighted five approaches to enhancing the reliability of the study. The approaches included (a) refutational analysis, (b) comprehensive data use, (c) constant data comparison, (d) inclusion of deviant case, and (e) use of tables (Leung, 2015). A dependable study refers to the high likelihood of replicating the research findings under similar conditions and using similar researcher's processes. Following Leung's five approaches, I maintained documentation of all processes and decisions including comprehensive notes, all variant cases, and used triangulation to reduce inconsistencies. The use of the interview protocol ensured consistency in the data collection process.

Rigor in qualitative research involves data collection of genuine and accurate participants' perspectives of the phenomenon (Morse, 2015a), and the use of triangulation reduces inconsistencies and enables the researcher to attain a comprehensive understanding of the phenomenon under study (Marshall & Rossman, 2016). Abdalla et al. (2018) noted that the choice of triangulation depends on the number of sources, reliability, and level of independence. For the study, I used methodological triangulation, which is widely used in qualitative studies and involves the use of multiple methods of data collection including interviews, observations, and field notes. I collected data through participants' semistructured interviews as well as collect secondary data from public sources such as websites and private company documents. I employed member checking to ensure the accuracy of the data collection.

Validity

Morse (2015a) noted that achieving rigor or trustworthiness in a qualitative study involves enhancing internal validity (credibility), external validity (transferability), reliability (dependability) and objectivity (confirmability). In qualitative research, validity refers to the use of appropriate methodology and technique for data collection, data analysis, and drawing credible conclusions that answer the research question (Leung, 2015). The quality of a qualitative case study depends on construct validity, internal validity, external validity, and reliability (Baškarada, 2014). Construct validity refers to the process of defining concepts through a set of attributes that are measurable through empirical observations. Yin (2018) noted that three strategies for improving construct validity included using multiple sources of evidence, member checking, and maintaining a chain of evidence. For this study, data collection from interviews and company documents (triangulation) provided multiple sources of evidence; documentation of the researcher's processes and decisions and member checking enhanced construct validity. Carter, Bryant-Lukosius, DiCenso, Blythe, and Neville, (2014) noted that triangulation is a strategy to test validity through the convergence of information. Abdalla et al. (2018) added that triangulation is a strategy that contributes to construct validity as well as an additional source for new knowledge and viewpoints.

Internal validity or credibility refers to the level of accuracy and well-founded inferences made in a study (Morse, 2015a). The strength of the internal validity of the study relies on the methods and processes the researcher employs to enhance the trustworthiness and credibility of the study's findings (Leung, 2015). The researcher can

enhance the validity of the study by ensuring the study's findings are relevant to the research question and reflect the participants' perspectives of the phenomenon without any researcher's bias (Marshall & Rossman, 2016). To ensure dependability, accuracy, and credibility, I employed methodological triangulation and conduct member checking sessions with the interview participants. During the member checking sessions, the participants reviewed the themes from the data collected, review my data analysis and interpretation, and provided clarifications or additional data, which increased the validity of the findings.

External validity or transferability refers to the application of a study's findings from particular research to other related situations (Baškarada, 2014). Morse (2015a) stated that researchers should provide a rich description of the context of the research as well as rich descriptions of the participants' perspectives to enable others to determine transferability. To enhance transferability, I provided a thick, rich description of the research process. Morse (2015a) emphasized qualitative researchers should strive to ensure research trustworthiness which indicates a high level of trust and confidence in the study's findings and enhances the quality and credibility of the study. Conducting member checking sessions ensures the data analysis and data interpretation from the data collected are the true representation of the participants' views, which enhances transferability.

Confirmability refers to the accuracy and objectivity of the data and the study findings which can be easily understood (Morse, 2015a). I provided a rich description of the research process including the rationale for decisions made which increases

transparency and enhances confirmability. I remained objective throughout the research process by using an interview protocol and audio recording all interviews, which ensures the same questions are asked of all participants and reduces researcher bias. I took field notes during the interview data collections and maintained a reflexive journal as an audit trail which was reviewed during the review of the interview transcripts to enhance confirmability. Also, I used the management software tool NVivio to maintain a full audit trail of all decisions made during the research process. Johnson et al. (2017) highlighted that trustworthiness through the use of triangulation enhances credibility, dependability, and confirmability. I employed methodological triangulation through interviews, document reviews, and observation to enhance confirmability.

Baškarada (2014) underscored data quality is a key validity criterion, and data may become corrupted during data collection, storage, retrieval, integration, and analysis. A researcher can enhance data quality by ensuring data saturation. Data saturation is essential for ensuring data validity (Yin, 2018). Achieving data saturation occurs when the researcher does not identify new substantive information on the phenomenon from further sampling (Morse, 2015b). I expect data saturation to occur after the interviews with the three senior business leaders because Roy et al., (2015) recommended three to five cases in a multiple case study to achieve data saturation. I interviewed the same three business leaders until there are no new emerging themes for coding to achieve data saturation. However, if data saturation does not occur after the three interviews, further sampling will continue to achieve data saturation. Achieving data saturation enhanced the trustworthiness of the study findings.

Transition and Summary

The purpose of this qualitative multiple case study was to explore the strategies asset managers in small- and medium-sized O&G companies in Alberta use to manage retired O&G assets effectively to increase organizational sustainability. Section 2 consisted of a detailed description of the different elements of the research project, including the description and justification of the research method and design that support the use of a qualitative multiple case study to address the research question. In Section 2, I provided the purpose statement, my role as a researcher, the specifics of the research study encompassing participants, population and sampling, ethical research, the data collection process, data organization, and data analysis. Section 2 also included the strategies I employed to ensure the reliability and validity of the study. Section 3 included the presentation of the study's findings, which addresses the research question. Furthermore, Section 3 included the application of the study findings to business practice, the implication for social change, my summative conclusions, and recommendations for action and future research, and reflections.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative multiple case study was to explore the strategies that asset managers in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability. The population for this study consisted of senior business leaders in small- and medium-sized O&G firms with direct involvement in the strategy development and successful management of their retired O&G assets. The management of retired O&G assets includes the abandonment, remediation, and reclamation of inactive O&G assets that are no longer in operation. I conducted interviews with senior business leaders and reviewed documents from their organizations, which served as secondary data sources. When I used NVivo 11 Pro for data analysis while applying the conceptual frameworks and information from the literature review, seven main themes emerged that related to the strategies used to manage retired assets effectively. In this section, I present my findings and discuss the themes identified. This section contains (a) the research findings, (b) application of findings to professional practice, (c) social change implications, (d) recommendations for action, (e) recommendations for further research, (f) my reflections regarding the research study, and (g) conclusions.

My findings included seven themes pertaining to the effective management of O&G retired assets to ensure organizational sustainability. The themes were (a) responsible leadership commitment, (b) adoption and communication of CSR philosophy, (c) regulatory compliance, (d) asset management software tools, (e) dedicated inactive

assets and reclamation champion/team, (f) annual budget/long-term planning, and (g) performance measurement and reporting. The themes reflected the participants' views and experiences related to successful strategies for managing retired O&G assets.

Presentation of the Findings

The overarching research question for this study was the following: What strategies do asset managers in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability? Using the data captured from interviews with O&G business leaders who had established and maintained effective strategies for retired assets management, I identified seven themes, which are presented in the following pages. The conceptual frameworks for this study included the CSM (Epstein & Buhovac, 2014) and the AMCM (Asset Management Council, 2014). In this section, I describe how the findings confirm, disconfirm, or extend existing knowledge, and I connect the findings to the conceptual frameworks used for the study. I also connect the findings to the existing literature on effective business practice.

Table 2 contains a summary of demographic information on the three O&G business leader participants in the study. The three participants had a total combined experience of 29 years as business leaders in the O&G industry, and they worked for different O&G organizations in Alberta. I interviewed all three participants using an interview protocol to mitigate my bias and ensure consistency in the interview process, as discussed by Castillo-Montoya (2016).

Table 2

Demographic Information About the Oil and Gas Business Leaders

	Characteristics	Case 1	Case 2	Case 3
Business leader	Code name	PA1	PA2	PA3
	Age	52	45	42
	Sex	Male	Male	Male
	Country of birth	Canada	Canada	Canada
	Highest level of education	Bachelor's degree	Master's degree	Bachelor's degree
	Length in current organization	9.5 years	7 years	8 years
	Years of experience as a business leader	18 years	5 years	6 years

The participants provided consistency in answers to the research question, and I used member checking to help with the clarification of all participants' interview responses. Member checking involves participants' review and clarification of data analysis and interpretation, which increases the validity of the findings (Harvey, 2015). I used methodological triangulation to compare and confirm the interview data with company documents. Methodological triangulation is the use of different data sources to strengthen the reliability of the findings (Graue, 2015). There are four types of triangulation: method, investigator, theory, and data source (Carter et al., 2014). I opted for methodological triangulation because investigator triangulation involves multiple researchers, theory triangulation involves the use of different theories, and data source triangulation involves data collection from different types of people, including groups. I confirmed data saturation after the evaluation of the three participants' interview

responses and company documents revealed repetitive data with no new themes emerging. Data saturation enhances the validity and trustworthiness of a study (Du-Babcock & Tanaka, 2016). The use of member checking, data triangulation, and data saturation enhances a study's credibility, reliability, and validity (Yin, 2018).

From the data analysis process, I identified seven main themes developed from field notes, transcribed interview responses, and company documents related to the research question, conceptual frameworks, and literature review. The themes highlighted the strategies that O&G business leaders used to manage their retired assets effectively. The seven themes were (a) responsible leadership commitment, (b) adoption and communication of CSR philosophy, (c) regulatory compliance, (d) asset management software tools, (e) dedicated inactive assets and reclamation champion/team, (f) annual budget/long-term planning, and (g) performance measurement and reporting.

Theme 1: Responsible Leadership Commitment

All of the participants emphasized the importance of responsible leadership commitment as an essential and critical element in any organization striving toward effective management of retired assets. All participants confirmed that the success of their asset retirement programs started with commitment at the top of the organizational hierarchy to provide financial resources, human capital, policies, and a framework focused on retired asset management. Eisenbeiss et al. (2015) highlighted that responsible leadership should be present at all levels of the organization and executive leaders must incorporate CSR initiatives in strategic planning and business performance goals to ensure organizational sustainability. Responsible leadership commitment toward retired

asset management emphasizes the importance of asset lifecycle management to employees and stakeholders. The theme of responsible leadership commitment as one of the primary factors for the effective management of retired assets to ensure organizational sustainability resonates with both conceptual frameworks and existing literature.

According to PA1 and PA2, having an asset retirement strategy will not lead to effective management of retired assets without responsible leadership committed to that strategy. PA1 stated that "the key to managing inactive assets starts with the management commitment to environmental stewardship," and PA2 emphasized that "no strategy on inactive assets can be successful without the support and commitment of top management." PA1 affirmed that responsible leadership commitment should be evident in corporate values and policies. Baumgartner (2014) highlighted that responsible leadership should exemplify mature normative management, with sustainability incorporated into corporate vision and policy, governance, and culture.

PA1 and PA3 mentioned that a key difference between O&G businesses that have successful retired asset management and those that do not is a lack of responsible leadership commitment in the latter. PA1 stated that leadership commitment must align with the corporate CSR philosophy and policies, which develops the organizational CSR culture. Eisenbeiss et al. (2015) noted that leaders are responsible for developing, implementing, and sustaining socially responsible business practices and behaviors that integrate into the organizational culture. PA3 highlighted that a positive organizational CSR culture is a key driver for regulatory compliance in all aspects of business operations, including retired assets. PA1 recognized that responsible leadership

commitment dictates the integration of retired asset management as a key focus of business operations irrespective of the O&G commodity prices or economic outlook, which is essential for long-term effective retired asset management. Eisenbeiss et al. posited that organizational culture developed from established CSR policies is essential for CSR performance.

Although all participants admitted that in business practice O&G commodity prices influenced their annual budget for retired assets management, they all noted that maintaining a continuous yearly program was critical for organizational sustainability. Panwar et al. (2015) noted that during an economic downturn, firms engaged in sustainability initiatives had a decline in sustainability initiatives. PA1 and PA3 concurred that in the current economic downturn in the Alberta O&G industry, some O&G companies struggle for survivability, and commitment toward retired asset management becomes a low priority. However, the ensuing public and financial scrutiny as a result of the January 2019 Supreme Court of Canada ruling (*Orphan Well Association v. Grant Thornton Ltd*, 2019) will facilitate the adoption of responsible leadership in the Alberta O&G industry. As a result of this 2019 Supreme Court ruling, O&G leaders in Alberta will place priority on retired asset management to ensure their firm's sustainability. PA1, PA2, and PA3 highlighted that their companies had a successful track record of retired asset management because they maintained a continuous yearly program even when low O&G commodity prices influenced a program reduction.

The review of organizational documentation included annual CSR reports from 2013 to 2017, materials on the licensee liability rating program; materials on the remediation and reclamation management program; materials on the abandonment management program; consolidated management reports; materials on health, safety, and environmental policies; and company websites. The review of company artifacts confirmed the alignment of responsible leadership commitment in company values and policies. All participants' organizations had sustainability, environmental responsibility, and stakeholder engagement embedded in their company values and policies. The review of the documentation confirmed that each participant's organization had maintained a continuous annual abandonment and reclamation program for at least 5 years. The allocation of financial and human resources for at least 5 consecutive years to address retired assets was confirmation of the responsible leadership commitment in the participants' organizations.

Correlation to current literature. Responsible leadership plays an important role in sustainability advancement (Szczepanska-Woszczyna et al., 2015). All participants in this study noted the significance of responsible leadership commitment as the foundation and driver of their companies' successful track record of managing retired assets. Responsible leadership should be present at all levels of the organization, and executive leaders must incorporate CSR initiatives in strategic planning and business performance goals to ensure sustainability (Eisenbeiss et al., 2015). PA1 noted that responsible leadership is disseminated throughout the organization through company policies, company values, and training provided to all employees. PA2 emphasized that

responsible leadership influences how the rest of the organization conducts business. Pearce, Wassenaar, and Manz (2014) emphasized the importance of disseminating responsible leadership across the organization through shared leadership. Empowering employees and stakeholders to adopt responsible leadership is necessary for long-term sustainability, which supports the findings of this study. Antunes and Franco (2016) confirmed that responsible leadership influenced the *modus operandi* in organizations and infused principles and ethical values that enhanced stakeholder engagement and strengthened employee development.

Patzer, Voegtlin, and Scherer (2018) underscored that responsible leadership is both a strategic and a communicative action that enables organizational leaders to influence employees and stakeholders to achieve sustainability goals. PA3 noted that the increased scrutiny in the O&G industry demands more responsible leadership among O&G companies, and PA1 emphasized the need to balance profitability with stakeholder and societal obligations. Shi and Ye (2016) iterated the increased levels of attention attributed to business leaders' responsibilities and ethical behaviors, which supported the need for the adoption of responsible leadership. All participants acknowledged the high level of media and stakeholder attention garnered by the large inventory of inactive O&G assets in Alberta, which supports the argument for more responsible leadership commitment in O&G companies. Zhao and Zhou (2019) affirmed the role of responsible leadership in promoting employee organizational citizenship behavior for the environment.

Responsible leadership involves the process of interaction with stakeholders based on values and principles of ethics in the pursuit of organizational goals (Shi & Ye, 2016). PA2 noted that the company's values reflected the management's commitment to ethical business practice and stakeholder relationships. PA1 noted the value of stakeholder engagement for current and future business operations. PA3 confirmed that responsible leadership promoted a business practice that fostered a positive relationship and trust with stakeholders and communities. Responsible leadership encompasses ethical value-based leadership in the pursuit of economic advancement, societal progress, and sustainable development (Shi & Ye, 2016). Though Waldman and Balven (2014) acknowledged that businesses have difficulties managing internal and external stakeholder priorities, they proposed a responsible leadership approach that enables the pursuit of multiple goals that benefit multiple stakeholders.

Moody-Stuart (2014) highlighted the importance of responsible leadership in developing trust among governments, businesses, and stakeholders. PA2 noted the mistrust that exists between the O&G industry and the public, especially environmental groups, based on past O&G environmental events. The lack of responsible leadership attributed to the failure of O&G companies in fulfilling the rhetoric of their CSR claims, which has justified the cynicism and negative perceptions of the global O&G industry (Moody-Stuart, 2014). For long-term organizational sustainability, Miska and Mendenhall (2018) recommended the adoption of responsible leadership, providing a multistakeholder perspective relating to values-based leadership, ethical decision-making, and quality stakeholder relationships. Current literature supports the responsible

leadership commitment theme in this study and confirms the benefits of increased adoption of responsible leadership in the O&G industry

Correlation to the conceptual framework. The responsible leadership commitment theme aligned with both the CSM and AMCM conceptual frameworks. Epstein and Buhovac (2014) posited that the core of the CSM is the leadership function, which drives management commitment to sustainability as a core value within the organization. Schaltegger, Hansen, and Lüdeke-Freund (2016) noted that responsible leadership is central to the sustainable value proposition in organizational sustainability transformation. PA1 explained that environmental stewardship was a priority for the company, and PA2 noted that sustainability was a core value in the organization. The success of implementing a CSM depends on the leadership commitment to establish the organizational structure and systems required for that CSM. PA3 explained that the management of inactive assets was a sustainability issue that management took seriously. Evans et al. (2017) highlighted that integrated thinking and organizational capabilities including responsible leadership, culture, stakeholder relationships, and knowledge management facilitated innovations in sustainability business models. All participants recognized that the responsible leadership within their organizations empowered strategies toward retired asset sustainability. Business leaders use responsible leadership to influence organizational citizenship behavior toward achieving sustainability goals (Zhao & Zhou, 2019). Using the conceptual framework of Epstein's CSM in evaluating retired asset sustainability confirmed the role of responsible leadership in driving corporate sustainability.

In the AMCM conceptual framework, one of the four critical elements is the leadership component (Asset Management Council, 2014), which refers to visible senior management leadership and commitment to promoting a culture of effective asset management. Leadership, culture, human performance, and asset management systems are essential in every organization to establish sustainable asset management strategies (Asset Management Council, 2014). Business leaders are responsible for establishing a culture of sustainable asset management with an emphasis on asset life cycle and end of life costs. Ilori (2015) identified the need for leaders in O&G companies to integrate a culture of continuous improvement in the areas of asset lifecycle and engineering maintenance strategies for long-term organizational sustainability. Using the AMCM conceptual framework responsible leadership is the driver to change behavior and culture through policies and values, which establishes the level of excellence towards retired asset management.

From a retired asset management perspective, PA2 highlighted the potential environmental impact to stakeholders in their operating communities from inactive assets including methane leakage and groundwater contamination. PA1 noted the gas migration and surface casing vent flows issues from inactive wells, and PA3 noted the risk of emissions from retired assets. The potential safety and environmental impact from retired assets justify the stakeholder scrutiny of the O&G industry in Alberta. Stakeholders are critical to all asset management processes, plans, and decisions and responsible leadership in O&G companies ensure understanding and management of stakeholder

expectations. Stakeholders include shareholders, regulators, employees, joint venture partners, service providers, operating communities, government, and the broader public.

The responsible leadership commitment theme confirms with the findings of Eisenbeiss et al. (2015) that underscored the importance of leadership commitment for successful organizational sustainability. The responsible leadership commitment theme also confirms with the findings of Baumgartner (2014) that commitment from responsible leadership through policies, strategies, resource allocation, and frequent communication is critical for organizational sustainability. To ensure effective long-term management of retired assets, responsible leadership commitment towards retired asset management irrespective of O&G commodity prices is a key factor. Table 3 contains the participants' statements about responsible leadership commitment in their organizations.

Table 3

Theme 1: Responsible Leadership Commitment

Participant	Participant's comments
PA1	In our organization, a key focus for our executive leadership is environmental responsibility and stewardship. Our leadership commitment to environmental responsibility and stewardship ensures a yearly budget to address our abandonment, remediation, and reclamation (ARR) needs. We tailor our ARR budget to align with expected cash flow which is influenced by O&G commodity prices.
PA2	As a medium-sized O&G company, our top management recognizes the importance of our responsibility for environmental stewardship and is committed by implementing policies and programs that enable us as a company to safely develop our natural resources while eliminating or reducing our environmental impact. The cleanup of our inactive sites is a priority.
PA3	The governance structure of our organization has established a strong commitment to sustainability with a strong focus on economic growth, environmental responsibility and community relations. The abandonment and reclamation side of our business is driven by our executive leadership mandate to maintain regulatory compliance and reduce our liabilities, which in turn is good for the environment and the communities in which we operate.

Theme 2: Adoption and Communication of CSR Philosophy

All three business leaders highlighted the importance of a corporate philosophy focused on CSR principles and business practices, which facilitated the strategies used to manage retired assets. PA1 noted that many O&G companies in Alberta had adopted a corporate CSR philosophy, but PA2 highlighted that the CSR philosophy is not evident at

all segments of some O&G companies. PA3 noted that since 2000 some scandals from unethical business practices in the O&G industry that were not reflective of CSR values jeopardized public goodwill towards the O&G industry. Rahbek, Pedersen, Gwozdz, and Hvass (2016) underscored the organizational sustainability benefit of establishing entrenched corporate values through open, honest, and transparent communications relating to social and environmental stewardship. PA2 noted that "honest communications" was one of the corporate values and PA3 highlighted that "open and honest communications" was one of their company values. PA1 highlighted their annual community engagement workshops that foster honest communications with stakeholders. All participants agreed that their organizations' communication of the corporate CSR philosophy guided their business conduct and practices.

PA1 explained that corporate CSR philosophy should be communicated at all levels of the organization and should be evident in the corporate values, policies and resource allocation. PA3 noted that the responsible leadership commitment must align with the corporate CSR philosophy, and the communication of that philosophy cultivates an organizational culture focused on organizational sustainability. PA1 explained, "an organization such as ours with a strong corporate philosophy on environmental responsibility and stewardship has a competitive advantage over its peers." The participants agreed that effective and frequent communication of CSR initiatives that included retired asset management to all employees and stakeholders demonstrates a commitment from leadership to asset retirement sustainability.

Correlation to current literature. Organizational culture refers to learned beliefs, values, habits, attitudes, behavioral norms, procedures, practices, and expectations that influence how employees work in an organization (Mohelska & Sokolova, 2015; Northouse, 2016). A workplace culture that fosters environmental responsibility encourages corporate citizenship (Fistis et al., 2014) and such a culture facilitates the integration of asset retirement sustainability in CSR resource allocation. PA2 mentioned that "as an environmentally responsible organization we have a culture that places priority on our abandonment and reclamation programs." PA3 emphasized that leadership communication of a corporate CSR philosophy demonstrates transparency which develops trust between the firm and the employees, stakeholders, and enhances the firm's reputation. All participants confirmed that their organizations highlighted their asset retirement sustainability as part of their CSR performance in their CSR reports.

The review of the company artifacts including the annual CSR reports from 2013 to 2017 and the health, safety, and environment policies highlighted the communication of the corporate CSR philosophy to stakeholders. Neugebauer, Figge, and Hahn (2016) posited the use of tools of corporate CSR communications provided company legitimacy and avoided reputational damage. The annual CSR reports from PA1 organization highlighted the firm's commitment to stakeholder engagement and the environment with the different stakeholder groups including indigenous groups, local communities and landowners, employees, contractors, government and regulators, shareholders, and industry groups. The CSR reports from PA2 organization highlighted the firm's community relations policy, environmental performance, business conduct and ethics

policy, and initiatives for safe operations. The CSR reports from PA3 organization emphasized the priority on safety and sustainability and highlighted the health, safety, and environmental performance. All the participants' organizations had established ethics policy, health, safety, and environmental policies, stakeholder engagement, and community relations policy, which confirmed with the findings of this study.

Many firms claim the CSR mantra but lack substance in action and implementation (Jones et al., 2014). Buldybayeva (2014) emphasized one of the issues of CSR communications is the reporting, but George et al. (2016) noted the value of using various communications platforms to disperse honest and transparent information relating to social and environmental performance. Using an adage, leaders of O&G companies should not just "talk the talk but walk the walk." Some O&G companies in Alberta claim the CSR mantra, but their Licensee Liability Rating (LLR) and Liability Management Rating (LMR) from the AER provided evidence contrary to a corporate CSR philosophy. The LLR and LMR are metrics measured by the AER for every O&G company in Alberta to assess each company's ability to address its retired assets liability. Muehlenbachs (2017) highlighted that O&G leaders had neglected retired asset management as part of their focus on CSR. PA2 noted that some Alberta O&G companies neglect their responsibility for retired asset management, especially during low commodity prices. It is the responsibility of the leadership of an O&G firm to establish the structure, policies, resources, and communication for the adoption of a corporate CSR culture at all levels of the organization.

PA1 noted that many Alberta O&G companies have excelled in maintaining a safe working environment and reducing their environmental impact from operations by minimizing spills, fugitive emissions, and impact on wildlife habitats. However, PA1 also noted that some Alberta O&G companies have failed to integrate or prioritize retired asset management as part of their CSR focus. Business leaders in O&G firms with a corporate CSR philosophy should adopt the paradigm shift that integrates retired assets management in its annual CSR goals, and the communications to employees and stakeholders should reflect the CSR goals. The alignment of the leadership commitment with the communication of the corporate CSR philosophy develops a high level of trust between leadership, employees, and stakeholders. Efficient management of retired assets emphasizes the importance of asset lifecycle management (LCM) and develops an environmentally conscious culture in the organization with internal and external stakeholders (McDonald, 2014; Tian & Robertson, 2019).

Correlation to the conceptual framework. Both conceptual frameworks support the theme of the adoption and communication of a corporate CSR philosophy to facilitate environmental responsibility and organizational sustainability. The CSM conceptual framework incorporates the need for business leaders to communicate the CSR and sustainability values to establish a culture for integrating sustainability into day-to-day decision making (Epstein & Buhovac, 2014). The leadership commitment to sustainability should be evident in the mission statement, company values and policies Baumgartner (2014). The mission statement of PA1's firm included the phrase "to be a

responsible corporate citizen to our stakeholders and the environment," and the mission statement for PA2's firm included the phrase "commitment to the sustainable world."

Epstein and Buhovac (2014) emphasized in the CSM framework, the need for distributed leadership, which disseminates the CSR philosophy across the organization and fosters the involvement of the entire organization towards sustainability. Macagno (2014) emphasized the importance of developing an organizational culture in a CSM conceptual framework that promotes sustainable decision-making and behavior in establishing long-term sustainability. Regular communications of CSR values and performance helps overcome sustainability-oriented change within an organization (Joyce & Paquin, 2016), which aligns with the findings of this study as a strategy to overcome ineffective retired assets management.

The theme also confirms with the Plan, Do, Check, Act (PDCA) elements of the AMCM conceptual framework, which emphasizes the importance of communication in promoting a culture of effective asset management. Kuei and Lu (2013) identified that the PDCA cycle was essential in developing a sustainability management culture in organizations. Sroufe and Gopalakrishna-Remani (2018) noted that firms that adopted and communicated sustainability practices enhanced reputation and social responsibility. Cerdas et al. (2017) acknowledged the value of transparent internal and external communication as motivation for stakeholders toward environmental sustainability and asset life cycle management. Baumgartner (2014) posited that the governance of sustainability starts with the support and commitment from leadership through policies, strategies, resource allocation, and frequent communication. Ultimately, leaders are

responsible for developing, implementing, and sustaining socially responsible business practices and behaviors that integrate into the organizational culture (Christensen et al., 2014; Kilskar et al., 2018). Table 4 contains the participants' comments on the communication of the CSR philosophy in their organizations.

Table 4

Theme 2: Adoption and Communication of CSR Philosophy

Participant	Participant's comments
PA1	An organization such as ours with a strong corporate philosophy on environmental responsibility and stewardship has a competitive advantage over its peers. It is my responsibility to communicate and demonstrate our corporate values in our operations.
PA2	Our corporate culture has been consistent over the years in ensuring a very minimal impact on the environment from our development of natural resources. As a company, we prepare an annual corporate responsibility which is our way of showing our stakeholders our commitment to the environment and community engagement.
PA3	We conduct several community and stakeholder engagement events every year to communicate our plans to the communities in which we operate. Our corporate mandate is to ensure that our operations do not impact the environment for generations which means restoring all operational sites back to its natural state when our operation is done. Abandonment and reclamation have been a hot topic in Alberta in recent years, and as a company, we are committed to cleaning up all our old sites.

Theme 3: Regulatory Compliance

PA2 acknowledged that the pursuit of regulatory compliance was a critical element embedded in the strategies used for managing their retired assets. PA1 noted that maintaining regulatory compliance of all inactive assets was an organizational goal every year. PA3 mentioned the potential negative impact on organizational sustainability due to regulatory non-compliance, which included the revoke of the license to operate was a motivation for the firm to ensure regulatory compliance of inactive assets continuously. The trend of ineffective retired asset management in Alberta's O&G industry demonstrates a failure of corporate socially responsible business practices, self-regulation, and regulatory enforcement (B. Robinson, 2014; Muehlenbachs, 2017).

All three business leaders reiterated that historically some O&G business leaders had taken advantage of some of the loopholes in the regulations to defer their responsibility for asset retirement continuously. Varadarajan (2014) noted that if government regulations and enforcement are soft, businesses will find loopholes to take advantage of these soft laws. Alberta's lax policies and ineffective monitoring processes contributed to the increasing trend of inactive wells from 25,000, in 1989, to 81,602, in November 2016 (AER, 2016d; B. Robinson, 2014; Muehlenbachs, 2017). However, since 2013 Alberta's energy regulator AER has improved their monitoring processes and introduced regulatory changes designed to reverse the trend of the growing number of inactive O&G assets.

The Alberta O&G companies with a poor history of addressing retirement of assets (inactive wells, pipelines, and facilities) at the end of their assets' lifecycle risked

significant financial liabilities, environmental impact, public safety, and social ramifications (B. Robinson, 2014; Robinson, 2015). However, the significant risk exposure to these O&G companies did not deter their irresponsible business practices because there existed a lack of transparency and lax enforcement from the AER (B. Robinson, 2014; Muehlenbachs, 2017). The AER has since identified that transparency and effective monitoring processes are essential to facilitate compliance and enforcement of AER inactive assets regulations (AER, 2016d). PA1 acknowledged that the AER had implemented different inactive assets compliance and monitoring programs that provided transparency to the O&G industry, stakeholders, and the public. PA2 emphasized the continuous monitoring of AER regulations to ensure regulatory compliance. PA3 mentioned the importance of active engagement with AER to stay current on any regulatory updates and to ensure the firm's regulatory compliance status. Programs like the Inactive Well Compliance Program (IWCP), Licensee Liability Rating (LLR) Program and updates to several AER Directives enable the AER to monitor compliance of inactive assets and enforce regulations against non-compliant O&G companies.

All participants highlighted the monthly AER Liability Management Rating (LMR) report, Inactive Well License List, and the compliance of AER Bulletin 2014-19 as key drivers embedded in their strategies for retired assets. AER Bulletin 2014-19 stipulates that every licensee bring 20% of its inactive wells into compliance every year and the monthly LMR report provided an assessment of every licensee's deemed assets to deemed liabilities, which is an indication of the licensee's ability to address its asset retirement obligations. The participants concurred that an organization with a strong

focus on CSR would ensure regulatory compliance as a minimum. PA1 mentioned that the goal of maintaining regulatory compliance places priority on regulatory driven retirement of assets. PA2 emphasized that at a minimum their annual strategy for asset retirement is to ensure regulatory compliance and they constantly evaluate and schedule regulatory driven projects as a high priority. PA3 noted that regulatory compliance ensures the sustainability of their license to operate and is a top priority with their management. Conducting regular reviews of current and forecasted non-compliant inactive assets, and staying informed on all updated AER regulations are strategies to maintain regulatory compliance on all retired assets.

The review of organizational documentation confirmed that all the participants' firms monitored AER's non-complaint inactive assets and implemented programs to restore regulatory compliance with timelines. The licensee liability rating program of PA1's firm included data of regulatory non-compliant assets, which influenced the decision on prioritization. PA2 firm highlighted the regulatory-driven abandonments in their abandonment management program and PA3 firm set annual organizational goals relating to regulatory compliance of inactive assets. All three participants confirmed that the pursuit of regulatory compliance was a major driver in their firm's strategy for managing retired assets.

Correlation to current literature. Existing literature corroborate the significance of focusing on regulatory compliance to maintain effective asset retirement sustainability. Several studies highlighted the need for more effective regulations to promote further sustainability in the O&G industry (Kirat, 2015; Kairouz et al., 2016). Though inadequate

self-regulation and ineffective regulatory enforcement are contributory factors to the Alberta inventory of retired assets (B. Robinson, 2014; Muehlenbachs, 2017), a firm's focus on regulatory compliance improves self-regulatory capabilities (Park et al., 2017). Scholars and practitioners agree that CSR consists of legal, ethical, and philanthropic responsibilities, which drives an organization to self-regulate compliance with laws and regulations (Park et al., 2017; Scheltema, 2014). PA1 noted the difficulty for a firm to garner good CSR reputation if the firm has a track record of regulatory non-compliance. PA2 explained that regulatory compliance should be the minimum goal for all O&G companies. The pursuit of regulatory compliance reaffirms the ethical values of an organization, which motivates stakeholders to achieve superior CSR performance (Park et al., 2017).

Regulatory non-compliance has been the catalyst to several O&G environmental events including surface and groundwater contamination, land spills, methane leakage, and greenhouse gas (GHG) emissions (Charpentier et al., 2009; Friedman, 2016; Guo, Xu, & Chen, 2019). Therefore, integrating the pursuit of regulatory compliance in the organizational culture confirms the firm's responsible leadership and encourages corporate citizenship, which facilitates the integration of sustainability in daily decision making and operations (Fistis et al., 2014; Zhao & Zhou, 2019). With the implementation of stringent regulations in Alberta's O&G industry, regulatory compliance is an effective strategy for not only managing retired assets but for organizational sustainability.

Correlation to the conceptual framework. An important input for long-term organizational sustainability using the CSM conceptual framework is the adaptation to

the external context, which refers to the government, regulations, and geographical influences. In the CSM framework, regulatory compliance involves the government regulations, and industry codes of conduct and non-compliance have a significant impact on organizational sustainability including reputation, fines, legal costs, and closure of operations (Epstein & Buhovac, 2014). The CSM framework recognizes the challenges for firms operating in an ever-changing environment with varying stakeholder requirements and the constant struggle between short-term profits and environmental performance. PA1 noted that Alberta O&G companies struggle with decreased cash flow in low O&G commodity price environment, which resulted in some firms avoiding asset end of life costs and neglecting inactive assets.

The CSM framework challenges business leaders to focus on the external context input as a strategy to manage trade-offs between profitability and sustainability. George et al. (2016) highlighted the regulatory compliance-driven strategy as an effective strategy for long-term organizational sustainability in the O&G industry. The consistent pursuit of regulatory compliance enables business leaders to develop strategic competence in sustainability risk management, innovation, and superior environmental performance (Engert, Rauter, & Baumgartner, 2016). Ensuring the regulatory compliance of assets emphasizes the value of asset life cycle within the organization (Epstein & Buhovac, 2014), which is essential for effective management of retired assets.

The AMCM conceptual framework supported the strategy of regulatory compliance as part of the asset management principles. One of the four key principles of the AMCM framework is the “level of assurance,” which refers to the condition and use

of assets in achieving asset objectives and the compliance of the assets to regulations and standards (Asset Management Council, 2014). Exposure to negative consequences including penalties and the revoke of operating license due to regulatory non-compliance are risks that business leaders must manage for organizational sustainability (Guo et al., 2019). Asset assurance entails the monitoring, auditing, and continuous improvement of processes and outcomes to ensure assets and systems are operating effectively in compliance with standards (Asset Management Council, 2014). ISO 55001 highlighted the requirements of an asset management strategy to include consistency, appropriate policy for firm's assets, commitment to legal and regulatory compliance, clear objectives, and communication (Asset Management Council, 2014).

Asset risk management is a key component of asset management, and the level of assurance incorporates risk management by ensuring assets deliver required capabilities (Khuntia, Rueda, Bouwman, & Van der Meijden, 2015). However, the level of assurance for retired assets requires that the retired assets do not create negative environmental impacts and minimizing the risk demands the regulatory compliance of retired assets. Maletič, Maletič, Al-Najjar, & Gomišček (2018) highlighted that asset risk management, which is critical for organizational sustainability challenges business leaders to focus on asset lifecycle management. Therefore, the adoption of a sustainability-oriented holistic view of retired assets justifies the pursuit of regulatory compliance as an asset risk management strategy (Maletič et al., 2018). The AMCM framework supports the regulatory compliance theme as an effective strategy for managing retired assets. Table 5

contains the participants' comments on the pursuit of regulatory compliance for retired assets in their organizations.

Table 5

Theme 3: Regulatory Compliance

Participant	Participant's comments
PA1	Also, our goal is to ensure regulatory compliance on all inactive assets, which places a priority on all regulatory driven abandonments including mineral expiries. We have done a good job in identifying current and upcoming non-complaint inactive asset issues and addressing those issues with how we schedule our abandonment and reclamation.
PA2	… at a minimum our annual strategy is to ensure regulatory compliance, and we regularly review all our databases, and the AER reports to ensure we are prioritizing and scheduling abandonments.
PA3	We have a responsibility to our shareholders, and the communities in which we operate to be environmentally conscious and our license to operate relies on our diligence in exploiting our O&G reserves with little or no impact to the environment. This means that we must remain focused on executing our abandonments and reclamations in compliance with all the AER regulations, and this is a top priority from our management.

Theme 4: Asset Management Software Tools

All three participants recognized the relevance of the use of asset management software packages as an integral part of their successful strategies for effective retired assets management. PA1 noted the superior capability of their in-house asset management software packages including Roughneck and MaxiTrak. PA2 explained that

having asset management software packages best suited for their firm enabled faster asset management decision making. PA3 highlighted the ease of data reconciliation with the AER database due to the in-house asset management software packages. However, PA1 and PA2 agreed that the competitive advantage was the innovative competence, capability and knowledge sharing developed in-house from the full utilization of the software packages.

Loebbecke, van Fenema, and Powell (2016) underscored the benefits of knowledge sharing and improved decision making as a sustainable competitive advantage. Mao, Liu, Zhang, and Deng (2016) posited that the effective utilization of information technology resources, which included the hardware and software infrastructure, enhanced a firm's knowledge management capability, which is a competitive advantage. PA1 acknowledged that though the asset management software packages were external third-party firm purchases, the competitive advantage was the full utilization of the different software packages. Lecklider (2017) noted that there are several different asset management software packages available in the market and each organization should evaluate the software package best suited for their operations. The participants highlighted the different software packages used in their respective organizations, which confirms that the full utilization of different software packages can be effective in managing retired assets. PA2 noted that the suite of in-house asset management software had evolved with the increasing demand for better asset management integration, which facilitated knowledge sharing. Asset management software packages facilitate knowledge sharing and improve decision making within an

organization, which enables continuous improvement of processes and workflows (Lecklider, 2017).

The use of asset management software in conjunction with AER inactive asset databases and reports enabled each participant's organization to effectively track, monitor, and manage all inactive O&G assets. All participants emphasized the use of asset management software packages were an essential feature of their effective strategies. PA1 noted the full utilization of the Roughneck and MaxiTrak asset management software packages, which are embedded in their strategy workflows and enable proper documentation. PA2 commended their in-house suite of software packages including Inactive Well Management System (IWMS), Maximo, Peak, and Wellcore that are utilized simultaneously for the effective lifecycle management of assets. PA3 identified other software including Synergi for wells, MaxiTrak for facilities, Cenozon for pipelines and ARO databases that are part of their workflow process in managing retired assets. PA1 highlighted that maintaining current data in the asset management software enabled faster decision making and facilitated regulatory compliance of assets. PA3 noted that efficient and accurate reporting to AER via the Digital Data Submission System (DDS) is easier if all the data on asset management software are current.

Correlation to current literature. Scholars and practitioners agree with the strategy of utilizing asset management software to improve the efficiency of managing assets (Lecklider, 2017; Maletič et al., 2018). However, the sustainable competitive advantage of asset management software tools is the knowledge sharing capabilities which enhances business intelligence and develops in-house competence of managing

assets (Loebbecke et al., 2016). The full utilization of asset management software refers to the ease of information flow between software to improve data consistency, integrity, accuracy, and accessibility (Lecklider, 2017). PA1 noted that their competitive advantage was the full utilization of the different software packages, which enabled the free flow of information between different asset teams. Asset management software tools are ideal for managing retired assets, but these software tools can also have the capability to manage active assets. Idachaba (2016) highlighted the use of asset management software in the management of active O&G pipeline assets.

With the advancement of computational technology and the volume of data generated from asset management, Khuntia, Rueda, Bouwman, and Van der Meijden, (2016) emphasize that effective asset management is dependent on efficient data management, which justifies the need for asset management software packages. PA2 reiterated the difficulty of managing the vast volume of data from all the assets without asset management software tools. Beitelmal, Molenaar, Javernick-Will, and Pellicer (2017) highlighted the ineffective data management as a root cause of many asset management issues in organizations. However, the full utilization of asset management software is dependent on the knowledge and competence of the employees to exploit these software packages to manage retired assets effectively fully. Varela, Méxas, and Drumond (2018) underscored the benefits of asset management software tools include effective monitoring of assets, conformity, efficiency and cost reduction. However, each organization must evaluate the compliance of the best-suited asset management software in its workflow process of asset management (Varela et al., 2018)

Nilsson-Lindén, Baumann, Rosén, and Diedrich (2014) emphasized the lack of integration of life cycle management tools and processes in business practice. PA1 noted from previous work experiences in different firms the difficulty of knowledge sharing amongst business units. PA2 noted that knowledge sharing between asset teams is essential for effective management of inactive assets. Beitelmal et al. (2017) identified lack of knowledge sharing and unreliable data as some of the barriers to effective asset management. PA1 emphasized that business leaders should ensure data is not isolated and fragmented in standalone asset management software programs that stifle knowledge sharing within the organization.

In addition to management of retired assets, Campbell, Jardine, and McGlynn (2011) highlighted that asset managers could integrate the effective utilization of asset management software in green practices by salvaging usable parts of retired assets, which results in costs reduction. PA2 noted that the effective monitoring and tracking of inactive assets with software ensured the timely transfer of inactive equipment to new field sites that need them before the purchase of new equipment. Ghazali and Anuar (2017) identified asset utilization with software management was integral for asset lifecycle management and Milanese et al. (2017) highlighted the importance of an asset integrity management system in organizational sustainability. PA1 noted the use of the asset management software enabled the free flow of information and better decision making. Komljenovic et al. (2015) underscored that the strategic asset management decision-making framework improved long-term sustainability.

Correlation to the conceptual framework. The use of asset management software as an effective strategy for managing retired assets fosters continuous workflow improvements and aligns with the provision for sustainability systems in the CSM conceptual framework. Epstein & Buhovac (2014) posited that leading sustainability firms incorporated sustainability infrastructures that foster continuous improvement. The concept of "learning" organizations refers to a firm's ability to learn faster than its competitors to create a sustainable competitive advantage (Epstein & Buhovac, 2014). PA2 noted the firm's pursuit of continuous improvement in retired asset management by recognizing limitations in the workflow process and finding innovative and efficient solutions. Long-term sustainability requires business leaders to balance the end of life costs with value management of assets to ensure optimal utilization of physical O&G assets, and asset monitoring and tracking is essential for better decision making (Ghazali & Anuar, 2017). The CSM framework challenges leaders to improve the firm's processes and capabilities to achieve long-term sustainability (Epstein & Buhovac, 2014).

Yeung (2016) highlighted that organizational sustainability relied on employee innovative thinking and leaders should provide the appropriate environment and infrastructure to enable employees to use their knowledge to develop innovative ideas. Using the concept of CSM framework, Epstein, and Buhovac (2014) highlighted the need for leaders to improve the employee skills and knowledge and to provide technical systems including software and databases to facilitate innovations towards sustainability. PA3 noted the innovative solutions developed from the knowledge sharing capabilities of the asset management software which resulted in process improvements. The

improvements in internal knowledge sharing capabilities from asset management software facilitate regulatory compliance (Beitelmal et al., 2017). The full utilization of the asset management software tools and the pursuit of workflow processes improvements allows for innovative ideas for managing retired assets. Understanding the sustainability needs of internal and external stakeholders, improving the processes and capabilities allows leaders to manage the inventory of assets effectively

In alignment with the four principles of the international standard on asset management ISO 55000, the utilization of asset management software is part of the capabilities component of the AMCM conceptual framework. The capabilities component refers to the inherent infrastructure, systems, and competences in an organization that facilitates effective asset management (Asset Management Council, 2014). Business leaders need to understand the value or output of asset management and then provide alignment to achieve value through the capabilities. PA1 noted that documentation is very important and explained that all workflow process including audits and use of the asset management software have documentation for consistency and continuous improvements. Beitelmal et al. (2017) highlighted the significance of documentation for effective asset management.

The AMCM serves as a conceptual framework that highlights asset management is a process with a start and finish and in between feedback loops to continuously sustain alignment of assets and stakeholders to achieve desired value or output focus. The Plan process involves the output focus or value; the Do process involves using capabilities to execute the plan, Mao et al. (2016) posited that the effective utilization of information

technology resources, which included the hardware and software infrastructure, enhanced a firm's knowledge management capability, which is a competitive advantage. Table 6 contains the participants' comments on asset management software tools in their organizations.

Table 6

Theme 4: Asset Management Software Tools

Participant	Participant's comments
PA1	… we have proper programs and scripted workflows in place, and by that, I think that documentation is very important. We also use software programs to help track and store the data when it comes to well sites facilities equipment and our pipelines. In particular, we use a software program for our wells and Facilities called Roughneck and we use a software program on the pipeline side of things called MaxiTrak.
PA2	… we use several asset management and financial software packages and databases including ARO, IWMS, Wellcore, Maximo, Peak, Business Objects, etc. to keep updated records of all our wells, pipelines and facilities assets.
PA3	The tracking and monitoring of our assets (well sites, pipelines, and facilities) are done in-house with the help of different software programs like Oplii, Welltraxx, and ARO databases, which enables us to be flexible and make any adjustments to our program fast.

Theme 5: Dedicated Inactive Assets and Reclamation Champion/Team

The effective management of retired assets is a subset of asset lifecycle management, which requires consistent monitoring, tracking and optimization for organizational sustainability (Campbell et al., 2011). The focus on asset lifecycle

challenges firms to consider the short, medium, and long-term goals of assets including the end of life costs (Khuntia et al., 2016). The paradigm shift for more effective asset management led to the innovation and creation of multi-disciplinary teams managing assets with a full lifecycle view, which many firms have adopted today (The Institute of Asset Management, 2015). All the participants confirmed the existence of a dedicated person or a multi-disciplinary team within their organization responsible for managing all inactive assets, which has been an invaluable resource in managing retired assets effectively. PA1 confirmed the role of an Inactive Assets coordinator working in conjunction with a Reclamation team, PA2 confirmed the role of an Abandonment coordinator working with a Reclamation Group and PA3 confirmed the role of the Remediation coordinator and Liability Management Group.

Though the job titles or the names of the dedicated champion and teams vary in each organization, two important strategic elements were evident in all organizations - the reporting channels and breadth of responsibility. It was important to note that all the dedicated champions or dedicated teams reported directly to senior management instead of functional managers or business unit managers. PA1 noted that the team reporting directly to senior management eliminates the risk of undue influence or bias by functional or business unit leaders and ensures that all decision-making and prioritization of work are from an organizational perspective. PA2 mentioned the strategic benefit of the dedicated champion or team reporting directly to senior management ensured the appropriate resource allocation required to execute the management of retired assets effectively. PA3 highlighted that the direct two-way communication between the

dedicated teams and senior management also served as a continuous feedback loop for responsible leadership to upper management. The continuous feedback loop notifies upper management if the allocated financial resources, human capital, policies, strategies, systems, and structures focused on retired asset management are effective and what changes if any are necessary.

PA1 confirmed that the dedicated champion and teams were responsible for all inactive assets across all business units, which was essential for effective prioritization of work and decision-making. PA2 noted that the dedicated champion and team with the responsibility of managing all inactive assets in the organization create opportunities for cost savings from economies of scale and operational effectiveness. PA1 mentioned other strategic benefits included enhanced service provider/contractor relationship due to the volume of work, facilitates long-term planning, reduced budget overruns due to lessons learned and innovative best practices. PA3 noted the benefits of improved stakeholder engagement and sustainable asset regulatory compliance with the existence of the dedicated team focusing on all inactive assets. PA2 noted that historically different asset teams were responsible for the management of retired assets within their business units, but the results were disappointing because each asset team worked in silos and there were no synergies and cost savings between asset teams. PA3 noted that the offices of the dedicated team were close to each other to facilitate effective communications, foster teamwork, and knowledge sharing.

PA1 underscored the advantage of the quarterly and yearly audit conducted by the dedicated team, which eliminated discrepancies between internal ARO database and the

AER inactive well database. PA2 emphasized that their dedicated team focusing on the inactive assets enables the team to identify cost saving and efficiency opportunities that non-dedicated teams might not identify. An example was the reduction of reclamation liability costs on multiwell pads due to an enhanced understanding of reclamation liability calculation on multi-well pads. PA3 highlighted the advantage of having a dedicated liabilities management team liaising with all business units and the acquisitions and divestments (A&D) group to provide senior management with a current state of the organization's liabilities.

The January 2019 Supreme Court of Canada ruling (*Orphan Well Association v. Grant Thornton Ltd*, 2019) has significant sustainability implications in the Canadian O&G industry regarding the management of retired assets (Gaston, Buckingham, & Paplawski, 2019). With the anticipated scrutiny on retired assets management based on the Supreme court ruling and future AER stringent policies, more Alberta O&G companies may adopt the dedicated team format to manage retired assets. PA1 recognized that some O&G business leaders fail to address the management of their inactive assets as an integral function of the CSR framework. However, PA2 acknowledged that some O&G firms fail to address inactive assets effectively because those firms did not have a dedicated team managing inactive assets and each asset team was responsible for managing their assets which were not ideal. PA3 agreed that the adoption of a dedicated champion or team structure is an emergent strategic element for effective retired assets management especially with the introduction of more stringent AER programs and stricter enforcement policies.

Correlation to current literature. Since 2000, the Government of Alberta and the AER have introduced new programs and policies to address the growing backlog of inactive O&G wells (Canadian Association of Petroleum Producers, 2017). The AER's introduction of *Directive 013: Suspension Requirements for Wells* in December 2004 was intended to impose stringent suspension requirements for all inactive O&G wells. However, the stringent suspension requirements failed to address the timely abandonment and reclamation of inactive wells, and the backlog of inactive wells persisted (B. Robinson, 2014). In July 2014, 47% of the approximately 80,000, inactive wells were not in compliance with the suspension requirements of *Directive 013* (B. Robinson, 2014). With a growing backlog of over 81,602, inactive wells in November 2016, and many of the wells had been inactive for more than 25 years the AER has intensified its enforcement approach with new updates to existing programs or new programs (B. Robinson, 2014; Muehlenbachs, 2017).

The AER's IWCP introduced in July 2014 is a more stringent policy to address all *Directive 013* non-compliant inactive wells by March 2020. Also, the AER's Licensee Liability Rating (LLR) Program introduced in October 2000 and the 2013 and 2014 updates provided a stringent monthly evaluation for every O&G company in Alberta and its ability to address its retired assets liability. PA1 noted that the firm's management of inactive assets involves an evaluation of the LLR program. The LLR program evaluates an O&G company's deemed assets over its deemed liabilities as an indicator to assess the company's ability to address suspension, abandonment, remediation and reclamation liabilities (AER, 2016a). The AER then requests for a security deposit from every O&G

company with a high degree of risk associated with addressing its retired assets liability (AER, 2016a). Despite the implementation of AER's various regulations, the ongoing issue of ineffective retired assets management is a reflection of weak self-regulation by O&G companies (B. Robinson, 2014; Muehlenbachs, 2017).

Though government regulatory agencies have established stringent policies, Carter and Eaton (2016) highlighted the ineffective enforcement of regulations as the government relies on industry self-regulation. Ekhator (2016) suggested enhancing self-regulation in the O&G industry by integrating the needs of stakeholders in the self-regulatory framework. PA3 noted the benefits of improved stakeholder engagement from a dedicated team managing all inactive assets. Crane et al. (2014) underscored that active community engagement facilitated community buy-ins which promoted trust and goodwill for the firm. A dedicated team managing all inactive assets would be motivated to engage with the community and address stakeholder concerns in a timely manner. Wiesner et al. (2018) highlighted that a dedicated team or champion leading sustainability initiatives is critical for continuous improvements.

With the 2019 Supreme court ruling (*Orphan Well Association v. Grant Thornton Ltd*, 2019) and AER's ongoing commitment to stringent policies and enforcement, organizational sustainability for O&G companies will depend on self-regulation to ensure long-term inactive asset regulatory compliance. Scheltema (2014) highlighted the need for effective self-regulation by O&G companies to address the increased regulatory demand on O&G companies. Self-regulation justifies the need for a dedicated inactive asset and reclamation champion or team to ensure consistent and continuous tracking and

monitoring of retired assets. All three participants concurred that establishing and maintaining an effective strategy for managing retired assets requires a dedicated champion or dedicated team that has the responsibility and accountability for the retired assets program.

PA2 highlighted the competitive advantages of their dedicated team focused on inactive assets included an improved relationship with AER due to timely interactions and in-depth understanding of existing and new AER policies and programs. In December 2017, the AER updated *Directive 67*, which pertains to the eligibility requirements for acquiring and holding energy licenses and approvals. With the new update, the AER now requires considerable more information to evaluate the liability risks of companies seeking licenses. Also on August 8, 2018, the AER released a press release confirming the future introduction of more stringent processes following a recent 2018 report of an O&G that ceased operations without addressing over 4,000 wells, pipelines, and facilities (AER, 2018c). The disclosure of more stringent AER processes further highlights the importance of a dedicated team in an O&G company overseeing liability management daily, which would facilitate efficient interactions with AER for timely approvals of licenses.

Correlation to the conceptual framework. The use of a dedicated inactive asset and reclamation champion or team as an effective strategy for managing retired assets aligns with the provision for sustainability structure in the CSM conceptual framework. The dedicated team is part of the essential human resources embedded in a CSM sustainable structure, and Epstein and Buhovac (2014) recognized that a sustainable

structure fosters innovation. Bocken and Short (2016) identified innovation as a driver for successful sustainability initiatives, and Pedersen et al. (2018) posited the positive relationship between innovation and CSM success. Using the CSM framework, a dedicated team managing inactive assets minimizes the ethical conflicts since all decisions focus on the best interest of the organization. Schaltegger and Burritt (2015) highlighted the different ethical motivations that could create conflict in the pursuit of sustainability including reactionary, reputational, responsible, and collaborative. Therefore, a dedicated team with the same common goals of managing all inactive assets would share the same ethical motivations and reduce conflicts.

In confirmation with the AMCM model, the utilization of a dedicated inactive asset team is part of the capability component of the AMCM conceptual framework. The capability component refers to the competence of an organization in achieving its lifecycle value, and the dedicated team enhances the capability of an organization in addressing its liabilities. Existing literature highlighted the need to minimize the conflict of interests among stakeholders to achieve sustainability success (Ekhator, 2016; Zhu et al., 2016). The dedicated team structure reporting directly to senior management minimizes conflict of interests and bias from different business units and stakeholders. The CS performance of a corporation is dependent on corporate governance which aims to minimize the conflicts of interests among diverse stakeholders with direct or indirect influence on the corporation (Jo et al., 2015; Wang & Sarkis, 2017). Implementing and maintaining an effective retired assets management program requires continuous improvement and adaptability to stakeholders (Asset Management Council, 2014). Table

7 contains the participants' comments on the dedicated inactive assets and reclamation champion or team in their organizations.

Table 7

Theme 5: Dedicated Inactive Assets and Reclamation Champion/Team

Participant	Participant's comments
PA1	… we have a person in-house an Inactive Assets coordinator that on a weekly, monthly, basis is responsible for our inactive well program. This person is responsible for knowing exactly our status at all times concerning our liabilities and specifically our LLR. This person is responsible for active engagement with the AER to understand all our current and future non-compliant issues and provide regular reports to me as part of the senior management team.
PA2	Part of our strategy was the creation of an Abandonment coordinator role working together with our Reclamation group to manage all our well, pipelines, and facilities abandonments and ensure that we are executing all the remediation and reclamation projects to restore all old company sites to their original state. The abandonment coordinator and the reclamation team report directly to the Vice President Operations, but they work closely with all business units to understand our asset retirement obligations needs consistently.
PA3	Our Remediation coordinator and Liability Management Group work closely together with our asset teams and business development group to understand our what our liabilities are from a regulatory standpoint and they get direction from upper management regarding the annual budget and they prepare a program for the year.

Theme 6: Annual Budget/Long-Term Planning

All three participants acknowledged their annual budget workflow processes and in-house competence with long-term planning are significant strengths in their strategy for managing retired assets. PA1 noted that the existence of the dedicated team responsible for continuously monitoring, tracking and auditing all inactive assets with the regulatory compliance information from AER facilitates the annual budgeting process and long-term planning. PA3 identified their firm's ability for long-term planning and annual budgeting for the retired assets as a competitive advantage. Baumgartner (2014) underscored the significance of long-term planning in sustainable corporate performance. PA2 underscored that the abandonment coordinator and the reclamation group worked closely with management to develop the annual budget. All participants confirmed that the annual budget for asset retirement obligation is not part of the approved capital or operating budget but is in the organization's financial debt. PA1 emphasized that the existence of a dedicated inactive assets champion team enables continuous monitoring, tracking and auditing of retired assets which provided essential information required for the annual budget workflow.

For budget purposes, the abandonment costs included (a) downhole suspensions/abandonment, (b) surface abandonments (cut and cap), and (c) associated facility and pipeline abandonments/removal. The remediation and reclamation costs included (a) costs of remediating any known impacts on or offsite to restore soil and groundwater conditions to meet applicable regulatory criteria and (b) reclamation costs to restore surface conditions to equivalent land capability to meet applicable regulatory

criteria. For compliance with AER regulations, O&G companies conform to *Directive 013 - Suspension requirements for Wells*, *Directive 020 - Well Abandonment*, and *Pipeline Rules - Part 10, Section 82 - Discontinuance or abandonment of pipelines*. Prioritization of abandonment projects focuses on regulatory compliance, mineral expiries, and access restrictions (seasonal, wildlife, etc.). For reclamation and remediation projects, prioritization focuses on (a) evaluation of economic resources to minimize and control the impact of the identified liability, (b) risk assessments of environmental and economic information necessary for effective decision making, and (c) selection, evaluation and implementation of appropriate measures and control to eliminate or reduce risks to a level as low as reasonably practical.

From the review of the abandonment and reclamation program documentation, each participant's firm had slight variations in their annual budget workflow process, but there were common elements in all workflow processes. These included (a) conduct an internal LLR audit with the dedicated inactive assets champion/team and the health, safety and environment, mineral land, completions, drilling, and facilities group. (b) evaluate long-term inactive well list (c) identify and select all upcoming regulatory driven and mineral expiry abandonments and reclamation projects including any possible incomplete work or deferment from current and previous years, (d) dedicated team engages with the asset and operation teams, business development and A&D groups to confirm selection, (e) engage with joint venture partners to evaluate any upcoming regulatory driven or mineral expiry retired assets projects, (f) the reclamation group conducts phase 1 environmental site assessments, (g) identify opportunities in

abandonment and reclamation projects to reduce LLR liability and improve LMR rating including prioritization and scheduling to optimize operations and realize costs savings, (h) conduct meetings with senior management for alignment of proposed budget, priority of projects, and confirmation of annual performance targets, (i) finalize senior management approval of budget and finalize schedule of operations for abandonment and reclamation phase 2, and (j) update the long-term program database.

PA2 noted that developing strong relationships with joint venture partners improved timely communication relating to the management of jointly owned retired assets, which is essential for proactive and effective long-term planning. PA1 mentioned that in cases where joint venture partners become insolvent, an application is made to the Orphan Well Association (OWA) to recoup partner costs for retired asset management. The OWA is a non-profit organization operating under the delegation of the government regulatory agency AER to manage the retired assets from insolvent O&G businesses in Alberta (Orphan Well Association, 2017). PA3 confirmed the importance of maintaining an updated long-term inactive well (LTIW) database based on (a) wells that have not produced in 6 months, (b) wells that are shut-in for different reasons, and (c) wells identified for downhole suspension or abandonment.

PA3 noted that all inactive wells in the LTIW database must comply with *Directive 013* to ensure regulatory compliance. PA1 noted during the annual budget workflow process, the evaluation of the upcoming 10-year inactive wells in the LTIW database occurs during the internal audit process. The low-risk wells that are inactive for 10 years or longer are identified as Type 6 medium risk wells and should comply with

medium risk suspension requirements (AER, 2018a). However, PA1 iterated that during the LTIW evaluation the dedicated team identifies Type 6 medium risk wells that are candidates for abandonment instead of suspension. PA2 noted the internal audit process involved evaluating internal ARO database for wells, pipelines, and facilities with the AER LLR list and AER inactive well compliance process (IWCP) to identify all non-compliance assets and resolve any clerical or administrative errors.

Correlation to current literature. Existing literature support the significance of long-term planning for sustainable corporate performance. Knight and Ellson (2017) underscored the benefits of long-term planning for CSR managers to fully understand the short-term and long-term value drivers necessary for long-term organizational sustainability. Panwar et al. (2015) noted that during an economic downturn, small and medium-sized firms continued engagement with core sustainability initiatives, which supports the significance of long-term planning for O&G firms who adopt management of retired assets as a core sustainability initiative. In small- and medium-sized companies, asset managers are often distracted with day to day operations and short term goals with little to no attention dedicated to long-term planning (Epstein & Buhovac, 2014). However, PA2 noted the benefit of the dedicated team is their responsibility and focus on long-term planning for inactive assets. Wiesner et al. (2018) identified the benefits of strategic and long-term planning in improving environmental sustainability.

Epstein and Buhovac (2014) highlighted the significance of incorporating end of life costs in the long-term planning for any capital investments decision making to ensure long-term sustainability. PA1 noted that the firm's ARO database incorporates an

estimated end of life costs for wells, pipelines, and facilities at the operational start of that asset for long-term planning of asset life cycle. However, PA1 acknowledged that some Alberta O&G firms rarely update those estimated costs. PA2 confirmed that the ARO estimated costs in many cases did not reflect today's costs in executing those end of life operations. PA1 also mentioned past incidents in their firm, in which the actual end of life costs was significantly higher than the estimated costs due to the outdated estimated costs. In light of those past incidents, PA1 noted the improvement to their workflow process, which involves the dedicated team providing updates to the ARO estimated costs based on the actual end of life operations in the different geographical field locations. The AER also recognized the long-term planning benefits of the updated end of life costs adjusted to different geographical locations and provided to the Alberta O&G industry two regional maps with updated costs based on the actual operations by different O&G firms (AER, 2016a).

In 2018, the AER launched the Area-Based Closure program (ABC), which is another strategy opportunity for small- and medium-sized O&G companies to address their retired assets (AER, 2018a; AER, 2018b). The AER, the Canadian Association of Petroleum Producers (CAPP), the Explorers and Producers Association of Canada (EPAC), and the Petroleum Services Association of Canada (PSAC) developed the ABC program. The ABC program is an innovative voluntary collaborative initiative that encourages O&G businesses to seek collaboration with one another to address their inventory of retired assets on a regional basis in a timely, efficient, and cost-effective manner. The ABC program encourages the movement of retired assets from

abandonment to reclamation certification and enables small- and medium-sized O&G business to leverage the costs savings from economies of scale and reduce liability. The AER provided incentives in the ABC program to encourage O&G companies to participate by relaxing some *Directive 013* and *IWCP* requirements for low-risk wells in exchange for companies to commit and achieve a set *inactive liability reduction target*.

To facilitate this ABC initiative, the AER created an online platform called OneStop through which O&G operators could submit proposed projects (AER, 2018a). The proposed projects included well suspensions, abandonment of wells, facilities, and pipelines, Phase 1 and Phase 2 Environmental site assessments (ESA), and remediation. The submissions of proposed work by different O&G operators encourages collaboration as operators look for opportunities to partner with other operators and execute projects on a regional basis (AER, 2018b). The economies of scale should provide cost benefits including better pricing from service providers, efficient operations from repeatability, and lessons learned and best practices from familiarity on regional projects (AER, 2018b). The incentive for firms engaging with the ABC program included better transparency for the firm, improves the relationship with AER, and enhances firm reputation with stakeholders, communities, and the public.

Correlation to the conceptual framework. Annual budgeting and long-term planning confirm with the sustainability system process required for the allocation of financial resources of the CSM. Resource allocation and talent attraction are critical aspects of the CSM input that contribute to sustainability performance, and business leaders demonstrate a commitment to sustainability by providing appropriate financial

resources and human capital (Epstein & Buhovac, 2014). From a sustainability perspective, long-term planning incorporating a life cycle approach is essential for strategy implementation of asset management (Bruaset, Rygg, & Saegrov, 2018). However, Neugebauer et al. (2016) highlighted that long-term sustainability involves the integration of planned and emergent strategies. In the context of managing retired assets, the annual budget and long term planning would constitute the planned strategies and the continuous improvement workflow process and adaptation to new regulations would refer to the emergent strategies. Using the CSM framework, Macagno (2014) posited that long-term planning of sustainability initiatives reaffirms the organizational culture of commitment towards sustainability and influences internal and external stakeholder behaviors.

In alignment with the AMCM conceptual framework, the annual budget and long-term planning represent the AMCM plan phase, which involves planning for change including analyzing and predicting the results (Asset Management Council, 2014). The output focus principle embedded in the AMCM framework incorporates the annual budget and long term planning as definitions of organizational objectives. Through performance measurement and reporting, leaders inform stakeholders on the achievement of output goals. Beitelmal et al. (2017) indicated that inadequate planning negatively impacted decision making in asset management and is a common barrier to strategic implementation. Though PA1 noted the impact of O&G commodity prices create barriers to the annual budget and long-term planning process, PA2 confirmed the regulatory compliance drivers and responsible leadership commitment ensure consistent funding for

management of retired assets. Using the AMCM framework, leaders should establish a long term planning culture to manage retired assets effectively. Table 8 contains the participants' comments on the annual budget and long-term planning in their firms.

Table 8

Theme 6: Annual Budget/Long-Term Planning

Participant	Participant's comments
PA1	We have an established annual budget workflow process in which we conduct internal audits and evaluate all our current and upcoming regulatory non-compliance and mineral expiries for abandonments, remediation and reclamation projects in our hopper to determine our optimal budget to execute our asset retirement obligations. The goal is to remain regulatory compliant, reduce our liabilities and maintain a high liability management rating (LMR).
PA2	… as a company we are committed to managing our asset retirement obligations, and our management approves an annual budget based on the evaluation and recommendation of the abandonment coordinator and the reclamation group. Management may provide rough guidance for our budget, and we initiate our yearly budget process which involves engagement with our land, reservoir, development, geology, completions, drilling and facilities group to put together a program in line with the guidance. However, if we require a larger budget due to regulatory compliance or mineral expiries, we propose an alternative budget to management for approval.
PA3	Management allocates our annual budget based on anticipated commodity pricing and regulatory obligations in subsequent years. We have a budget process engaging many groups, and we maintain consistent funding for ongoing liability reduction/asset retirement activities based on our short term and long-term planning.

Theme 7: Performance Measurement and Reporting

PA1 acknowledged the importance of continuous improvement of their strategies for managing retired assets to overcome internal and external changes that act as barriers over time. PA3 identified some internal barriers included lack of funding, budget overruns, management or leadership changes, and asset acquisitions or divestitures. PA1 noted some external barriers included changes in government regulations, oil, and gas commodity prices, credit ratings, bank interest rates, availability of service providers, and stakeholder engagements. Performance measurement of the annual targets of retired assets management enables the O&G business leaders to make continuous improvement for long-term organizational sustainability (George et al., 2016). PA1 highlighted that performance measurement is a key part of their strategy and the measurement provided a benchmark against industry and their peer group. PA2 noted the measurement of key performance metrics relating to their targets for license liability rating (LLR) and liability management rating (LMR). PA3 mentioned the measurement of key metrics including annual spend vs. liability reductions to determine maximum liability reduction vs. spend.

Historically, many organizations failed to implement the necessary stakeholder governance to ensure credibility and integrity in their sustainability activities (Jo et al., 2015). To enhance credibility in sustainability, Steinmeier (2016) emphasized business leaders should focus on deterring fraud in sustainability through performance measurement. The voluntary disclosure of sustainability performance indicates a firm's CSR commitment to transparency and improves firm legitimacy (Alakent & Ozer, 2014; Vaz, Fernandez-Feijoo, & Ruiz, 2016). Additionally, PA2 noted the performance

measurement of key business metrics and the inclusion of key metrics in employee performance goals improved the effectiveness and continuity of the strategies. All three participants confirmed that their firms produced an annual CSR report which contained performance measurement of their retired assets management and reduction of liability. Higgins et al. (2015) opined that organizations involved in CSR activities encounter difficulty with CSR or sustainability improvement when sustainability reporting is absent.

PA1 emphasized the disclosure of the CSR report confirmed the firm's commitment to retired assets management and transparency, which enhanced their firm's reputation, culminating in the nomination for several industry awards every year over the last five years. PA2 acknowledged the monthly and quarterly performance measurement vs. annual targets to take necessary corrective actions to ensure the achievement of the annual targets. PA3 confirmed some performance metrics included the ratios of ARO to LMR. Morioka et al. (2016) highlighted the need to incorporate sustainability into the business by integrating a performance measurement framework to identify sustainability innovations. In the pursuit of sustainability, an important focus for firms should be a continuous improvement of deliverables which involves performance measurement and taking actions that take into account the industry evolution and external environment changes (. Performance measurement in sustainability implementation includes costing and capital investment decision making, risk management systems, performance evaluations and reward systems, measurement systems, feedback systems, and reporting and verification systems (Journeault, 2016).

Correlation to current literature. Epstein and Buhovac (2014) posited that in the pursuit of sustainability, firms should focus on continuous improvement of deliverables, which involves performance measurement and taking actions to address the industry evolution and external environment changes. Witkowska (2016) identified business leaders should establish an organizational culture that promotes performance measurement, which has a direct positive impact on stakeholder and community relations. PA2 identified that the performance measurement of their retired asset liability targets was a confirmation of their in-house competence at self-regulation driven by their organizational culture towards sustainability. However, PA1 acknowledged that the Alberta O&G industry has a poor history of self-regulation, which contributed to the dilemma of the large inventory of retired assets. Scheltema (2014) highlighted the increased regulatory demand for O&G companies are a consequence of the failure of self-regulation.

Another important element of the performance measurement strategy is the inclusion of key retired asset liability targets in the individual performance contract of employees as part of the annual organizational goals. PA2 underscored the significance of including liability reduction targets in the performance contract of employees encourages collaboration and vested interest among the employees toward a shared goal. As Dillenburg et al. (2003) emphasized "what gets measured gets managed," and the inclusion of liability reduction targets in employee performance contract influences the organizational culture and employee behavior towards improvement in retired asset management. The participants agreed that performance measurement and reporting,

which is also called CSR disclosure is a competitive advantage, which enhanced firm reputation and promoted innovations. Jeon and Gleiberman (2017) confirmed from their study that O&G companies produce an annual sustainability report in an endeavor to establish a positive firm reputation with their stakeholders. Saeidi, Sofian, Saeidi, Saeidi, and Saaeidi (2015) confirmed that reputation and competitive advantage mediate the relationship between CSR and firm performance.

The review of the annual CSR reports from 2013 to 2017 for each participant's firm unveiled several performance metrics measured. The metrics included actual abandonments vs. budgeted; actual spend vs. budget, non-compliant vs. target regulatory compliant, the ratio of the active well to inactive well, the ratio of abandoned wells to drill wells. Other metrics included actual spend vs. ARO reduction, active sites vs. the number of reclamation certificates, LLR vs. target LLR, LMR vs. LMR peer group. The future of asset retirement sustainability depends on O&G business leaders understanding the relationship of performance measurement, stakeholder engagement, and innovation (Mithani, 2017). In Alberta, the large inventory of retired O&G assets is a major stakeholder CSR concern and firms engaged in performance measurement, and reporting of retired asset management improves organizational sustainability. Oh, Hong, and Hwang (2017) identified that long-term organizational sustainability is dependent on business leaders developing an organizational culture that focuses on continuous improvement of stakeholder CSR values.

Correlation to the conceptual framework. The CSM framework supports the performance measurement and reporting theme as an essential process of managing

stakeholder reactions (Epstein & Buhovac, 2014). Stakeholder reactions are the output of the CSM model, and effective management of stakeholders reduces external pressures on an organization. Wang (2017) highlighted the importance of understanding and addressing the different stakeholder interests when producing a sustainability report. Journeault (2016) emphasized that sustainability reporting of a firm should incorporate stakeholder management, environmental, economic, and social performance to enhance credibility and support the firm's corporate sustainability strategies. Transparency of sustainability performance demonstrates the quality of CSR in a firm and enhances the relationship between stakeholders and the firm (Fernandez-Feijoo et al., 2014; Kashmanian, 2017). Calitz, Bosire, and Cullen (2018) posited that sustainability reporting enhanced a firm's business intelligence, which is a competitive advantage. The CSM framework challenges business leaders to establish a learning organization culture by engaging in sustainability reporting and learning from the sustainability performance to promote innovations and continuous improvement (Epstein & Buhovac, 2014; Morioka et al., 2016).

The AMCM framework incorporates performance measurement and reporting in its learning organization component, which is the ability of the firm to measure and analyze performance and incorporate lessons learned in a subsequent action to improve desired output (Asset Management Council, 2014). The learning organization stems from effective leadership and developing an organizational culture of continuous improvement. Existing literature confirm performance measurement as an ingredient for long-term sustainability (Taylor, Vithayathil, & Yim, 2018). Alakent and Ozer (2014) noted

performance measurement fosters continuous improvement and provide transparency to stakeholders and the public that enhances organizational legitimacy. Michaels and Grüning (2018) underscored the importance of CSR disclosure as a determinant of corporate identity and legitimacy, which influences the organizational culture and decision making for long-term sustainability. Table 9 contains the participants' comments on the performance measurement and reporting in their organizations.

Table 9

Theme 7: Performance Measurement and Reporting

Participant	Participant's comments
PA1	We measure our performance on a monthly, quarterly and yearly basis to ensure we can achieve our yearly asset retirement targets. We monitor key performance indicators including our monthly LLR and LMR ratings which we benchmark against industry and our peer group to confirm that we remain in the top percentile of our peer group.
PA2	For several years now, we put out an annual CSR report which contains our performance measurement of our abandonment and reclamation programs to reduce our ARO liability and improve our LMR rating. Our management is committed to ARO liability reduction, and our team does an excellent job of meeting and exceeding our target liability reduction including non-op assets.
PA3	Our liability management monitors several performance indicators including our monthly LMR rating to ensure that our liability reduction prevents expenditure on bonds with regulators and decreases our overall ARO, which is a metric used by banks for industry evaluation.

Applications to Professional Practice

This study is relevant for understanding the strategies involved in managing retired O&G assets as part of an organization's CSR. The findings of the study may prove valuable to current and future leaders of O&G businesses on the implementation of innovative and cost-effective strategies to effectively manage their retired assets. In consideration of the historical and current negative trend of ineffective management of inactive assets in Alberta, the results of this study could contribute towards the reversal of the negative trend as O&G business leaders adopt and implement the findings of this study. Executives at the AER confirmed in their reports that small- and medium-sized O&G businesses are more vulnerable to ineffective management of retired assets mainly due to the constraint on financial resources and corporate CSR philosophy (AER, 2017; AER, 2018c). O&G leaders may use the findings of this study to improve their knowledge and experience gap with implementing effective strategies to manage retired assets.

With the current O&G commodity price instability, Alberta O&G companies focus only on critical strategies to ensure survival and future profitability, including improving operational efficiency, cost reduction, and operational optimization. However, some O&G businesses in Alberta may not survive, especially the small- and medium-sized O&G businesses that have a higher risk of insolvency during low O&G commodity prices (AER, 2018c; Robinson, 2015). In the event of insolvency, their undisposed retired assets would create additional strain to Alberta's Orphan Program, which would compound the retired assets problem (Canadian Association of Petroleum Producers,

2017). Alberta O&G business leaders may use the findings of this study to improve business practices in which Alberta O&G businesses create partnerships and collaborative efforts to address retired assets collectively. The economies of the scale of engaging a service provider to execute operations on collective retired assets from multiple O&G businesses should provide cost savings and operational efficiency to sustain a continuous program. This new business practice should enable small- and medium-sized O&G businesses to adequately address their retired assets liabilities without jeopardizing their ability to remain operational and profitable.

Lifecycle management of assets is not a choice, but an integral part of conducting business especially in the O&G industry (Ghazali & Anuar, 2017; *Orphan Well Association v. Grant Thornton Ltd*, 2019) and business leaders should ensure that the emphasis on the end of life costs for assets is a priority consideration in their business planning. With the increasing adoption of CSR and sustainability concepts in the O&G industry (Ekhator, 2014; Fomukong, 2014), O&G leaders may use the findings of this study to integrate retried assets management as a function of CSR and organizational sustainability. Given the January 2019 Supreme Court of Canada ruling (*Orphan Well Association v. Grant Thornton Ltd*, 2019) and future implementation of more stringent AER policies on inactive asset management and corporate health scorecard, the scrutiny for the eligibility of Alberta O&G businesses to hold operating licenses will intensify. The adoption of this study's findings influences business practice by ensuring O&G business leaders place more emphasis on effective retired assets management. The evaluation of the 2018 bankruptcy of an Alberta O&G firm with a large inventory of

retired assets and its inability to address these liabilities revealed that some O&G businesses absorb unfavorable liabilities during A&D transactions (AER, 2018c). Improvements in retired O&G asset management minimizes the risk of unfavorable liability transfer involved in acquisition and divestiture (A&D) transaction of O&G assets.

The January 2019 Supreme Court of Canada ruling (*Orphan Well Association v. Grant Thornton Ltd*, 2019) was unprecedented, and the judges have established that bankrupt O&G companies shall fulfill their provincial environmental obligations before any creditor payments. This 2019 Supreme Court of Canada ruling is a finality to a four year highly contested legal issue in the Alberta O&G industry in which a bankrupt O&G company attempted to absolve its provincial environmental obligations. The provincial environmental obligations refer to the end of life costs for retired assets including abandonment, remediation, and reclamation costs. Historically, the end of life costs for retired assets of bankrupt Alberta O&G firms became the responsibility of the government, which compounded the issue of the large inventory of retired assets in Alberta (Canadian Association of Petroleum Producers, 2017). However, with this ruling, the executives of the AER have the legal justification to stop all creditor payments from any bankruptcy or insolvency proceedings of O&G companies in Alberta until the completion of all environmental obligations. This 2019 Supreme Court ruling has significant organizational sustainability implications in the Canadian O&G industry (Gaston et al., 2019). These implications include financial institutions' evaluation of O&G companies for all financial transactions, impact on stock price of listed O&G

companies with high ARO, and the increased scrutiny on O&G leaders in firms with high ARO (Gaston et al., 2019).

The use of the CSM and AMCM as conceptual frameworks for this study contributes to the business practice of incorporating sustainability constructs in asset management. O&G business leaders may use this study results to develop a reliable conceptual framework for the implementation, control, and improvement of sustainable strategies for managing retired assets. Resolving the persistent problem of ineffective asset management in Alberta demands that O&G organizations recognize this issue as a mandatory organizational sustainability issue and not an optional asset management issue. The adoption of the study findings should curtail or eliminate the unethical business practice of prolonged deferment of addressing retired assets.

Also, the adoption of this study findings might contribute to the business practice of sustainability reporting. Sustainability reporting is a communication tool for organizations to highlight their sustainability commitment to stakeholders, which can enhance the firm's reputation, financial results, and long-term sustainability (Carroll, 2015; Kilian & Hennigs, 2014). Epstein and Buhovac (2014) explained that sustainability reporting involves the evaluation and monitoring of financial and sustainability-related performance indicators, which facilitates continuous improvement in business practice. From the findings of this study, O&G business leaders should incorporate the performance of managing retired assets in their sustainability reporting to the public. With all the negative media coverage and the negative perceptions in the Alberta society regarding retired O&G assets (Robinson, 2015; Muehlenbachs, 2017), any O&G business

that presents a CSR report indicating excellent performance in managing retired assets would attain a positive reputation. A business with a positive reputation creates a competitive advantage that facilitates a stronger relationship with stakeholders, communities, and government regulatory agencies (Saeidi et al., 2015). O&G companies that are successful in effectively managing their retired assets would receive recognition as socially responsible companies and create a competitive advantage over their peers.

Implications for Social Change

The adoption of the study findings by O&G business leaders could help promote positive social change by emphasizing asset lifecycle management in O&G companies and society. Promoting the value of lifecycle management in the O&G industry develops proenvironmental behaviors with internal and external stakeholders that evolve into an environmentally conscious culture in the industry (McDonald, 2014; Tian & Robertson, 2019; Unsworth et al., 2013). In time, the environmentally conscious culture of stakeholders may spill over from work to their personal lives, which could support improvements in society's environmental attitudes and practices (Young et al., 2015). Integration of sustainability values in the organizational culture through responsible leadership commitment creates positive employee and stakeholder perceptions and attitudes of CSR that transcend beyond the workplace (Glavas & Kelley, 2014). Employee perceived organizational support through management practices fosters organizational citizenship behavior necessary for long-term organizational sustainability (Fistis et al., 2014). The reversal of the prevalent ineffective management of retired assets

in Alberta might lead to organizational culture change in most O&G businesses, which has a direct positive impact on stakeholder and community relations (Witkowska, 2016).

Alberta is the O&G hub of Canada, and in 2017, Alberta contributed 15.5% of Canada's gross domestic product (Statistics Canada, 2019). O&G business leaders may use the results of this study as a strategy guideline or strategy template to manage their retired assets and ensure long-term organizational sustainability. Businesses engaging in activities that foster long-term organizational sustainability reduce their risk of insolvency (Galant & Cadez, 2017; Pan et al., 2014). The bankruptcy of businesses has a negative spillover impact on the economy of the community including low family income due to job losses, loss of skills as people move to other localities for jobs, and risk of insolvency from associated businesses (Bernstein, Colonnelli, Giroud, & Iverson, 2018; Carter & Van Auken, 2006). Therefore, the reduction of O&G businesses that become insolvent has a significant positive impact on the Alberta economy and the lives of Albertans through job creation and family income sustenance. Improving the income of families in a society has a positive impact on the level of education in that society (Duncan & Murnane, 2016). Several scholars link the level of education in a geographical area with the level of sustainability awareness and understanding (Lago et al., 2015; Opp et al., 2014). When individuals increase their level of education, they gain an improved understanding of sustainability and place more pressure on firms to comply with public policies that benefit society and stakeholders (Opp et al., 2014). Hence, the adoption of the study findings focused on effective retired assets management could

improve a value chain that ultimately improves the level of education and sustainability awareness in Alberta.

Ultimately, the effective management of retired assets restores inactive O&G operational sites to their pre-O&G development state and reduces the environmental risks in the communities (Canadian Association of Petroleum Producers, 2017). Considering the large inventory of retired assets in Alberta, the restoration of thousands of sites across Alberta may inject financial resources into the different communities via job creations and local businesses would thrive as community members gained an income. Considering the current economic downturn due to low O&G commodity prices and the mistrust between society and the O&G industry (IEA, 2016; Wang et al., 2014), the collective industry effort to manage retired assets would have a positive social impact (Robinson, 2015). The promotion of a positive social change for the O&G industry would build trust with stakeholders, communities and facilitate easier stakeholder approvals for future O&G operations. The findings from the study could also contribute to social change by helping other business leaders in different industries implement strategies to manage retired assets.

Recommendations for Action

The purpose of this qualitative multiple case study was to explore strategies that O&G business leaders implemented to manage retired assets effectively for organizational sustainability. Based on the findings of this study, I identified six recommendations that the current and future business leaders in small- and medium-sized O&G companies can implement to improve the management of their retired assets.

Scholars and practitioners agree that implementing sustainability activities as part of an organization's CSR has a positive impact on long-term corporate performance (Lankoski, Smith, & Van Wassenhove, 2016).

The first recommendation is for O&G business leaders to adopt the responsible leadership style which stipulates an ethical value-based leadership in the pursuit of economic, societal progress and sustainable development. Responsible leadership challenges business leaders to focus on asset lifecycle management as an integral function and a priority in their CSR function. The adoption of responsible leadership demands a commitment from O&G business leaders to establish a corporate vision, policies, governance, values, and culture that reflect the ethical and sustainable responsibility of the business. The second recommendation is for the business leaders to actively engage in an effective communication strategy to regularly inform all employees, stakeholders and the public on their commitment towards managing retired assets. Clear and honest communications from management build trust. Responsible leadership should be present at all levels of the organization and executive leaders must incorporate retired asset management as a CSR initiative in strategic planning and business performance goals to ensure sustainability (Eisenbeiss et al., 2015). Sustainability reporting is an effective communication tool that increases transparency and builds trust with stakeholders, communities, and the public (Carroll, 2015).

The third recommendation is the creation and hiring of an in-house dedicated inactive assets champion or team to manage the responsibility of the firm's retired assets and reporting directly to senior management. The inventory of the retired assets would

determine the size of the dedicated team. However, the team should constitute abandonment, remediation and reclamation expertise. It is preferable that the team is in-house rather than external to ensure in-house competence for long-term sustainability. The reporting to senior management prevents undue influence or bias from different asset teams and ensures that decision making and priority is from an organizational perspective. The fourth recommendation is the evaluation of the features and selection of the best-suited asset management software tools for the specific firm. The provision of appropriate software tools enables the dedicated team to monitor, audit and track retired assets and compare discrepancies with the government database. The best-suited asset management software package for wells, pipelines, and facilities will enable timely regulatory compliance from a regular audit of retired assets and the O&G regulations.

The fifth recommendation is to establish a workflow process for annual budget and long-term planning of retired assets suitable for the specific company. Establishing a regular meeting between the dedicated team and senior management ensures adequate communication between both parties and facilitates an easier workflow process. The sixth recommendation is for O&G business leaders to establish key performance metrics to measure the performance of managing retired assets. In addition to the performance metrics, the employee annual performance objectives should include the annual targets for managing retired assets. To facilitate smooth interactions and alignment between the dedicated team, other asset teams, and A&D teams the annual retired asset management goals should be included in the annual performance objectives of the employees in these groups.

The findings of this study are important to business leaders of O&G businesses, asset managers, CSR managers, stakeholders, and scholars. I intend to publish this study and disseminate the results of this study through business journals, scholarly journals, magazines, and presentations. I also intend to share the findings of this study with all the participants of the study as well as other business leaders in the O&G industry, colleges, universities, and business forums.

Recommendations for Further Research

This qualitative multiple case study involved O&G business leaders from small- and medium-sized O&G companies to explore the strategies used to manage retired O&G assets effectively to increase organizational sustainability. The population for the study consisted of three O&G business leaders in Alberta, Canada, and the small size is one of the limitations of this study. Small sample size may limit the transferability of the findings to other organizations (Craig-Henderson & Lewis, 2015). Interviewed O&G business leaders from the small- and medium-sized O&G companies might not represent the views of O&G business leaders in large O&G companies.

The study involved only one geographical location, which is another limitation of the study. Therefore, future researchers can decide on a different location such as a different O&G city or country to enhance the generalization of the findings of this study. The three O&G businesses involved in this study operate in the upstream segment of the O&G industry, and the findings of this study may not represent the midstream or downstream segments of the O&G industry. Hence, future researchers should consider

conducting the study in a different segment of the O&G industry or other industries such as in small- and medium-sized manufacturing or public utility industries.

Furthermore, future researchers can use a mixed research method and conduct qualitative interviews on a larger O&G population while using the quantitative research method to develop hypotheses and test the correlation between effective retired assets management and the themes identified in this study. I conducted this study independently of the AER and considering the January 2019 Supreme Court of Canada ruling (*Orphan Well Association v. Grant Thornton Ltd*, 2019) and the potential industry impact from future AER initiatives future researchers may consider conducting a joint study with AER to explore effective strategies on managing retired assets. A joint study would consider both the industry and regulatory perspectives.

Reflections

The pursuit of a Doctorate in Business Administration (DBA) degree has become one of my best decisions for my professional and personal growth. I conducted a study on a very sensitive topic in the Alberta O&G industry, and there was the risk of not securing enough participants for the study due to the sensitivity of the topic. Historically, Alberta has overlooked the prevalent issue of ineffective management of retired assets until the problem has ballooned into a risky behemoth that needs urgent resolutions. There is ongoing mistrust between the Alberta O&G operators and the regulatory agency as both sides try to resolve the current situation (Robinson, 2015; Muehlenbachs, 2017). In this study, I explored the strategies that small- and medium-sized O&G companies used to manage retired O&G assets effectively to increase organizational sustainability.

Conducting this study was a good opportunity to learn, evaluate and improve my understanding of the issue from the O&G operator perspective.

Concluding this study gives me a sense of accomplishment because I was able to overcome all the challenges and sensitivity regarding this business problem and provided answers that could help O&G businesses address this problem. I experienced many challenges in securing participants, and over 60% of the business leaders I contacted did not want to participate for a variety of reasons. I had to leverage several networking contacts to identify potential participants, which enabled me to develop new relationships in the industry. Due to the sensitivity of the topic, I spent a considerable amount of time providing assurances of confidentiality and informing participants of their right to withdraw at any time and the voluntary nature of their participation. I took the time to address all of the participant's concerns, and I was successful in building trust with the business leaders, which convinced them to participate in the study. I ensured that I was flexible to the participants' schedules, which allowed me to complete all my interviews.

The use of the interview protocol ensured I asked the same questions to each participant, but I asked different follow-up questions depending on the responses of the participants. The recording of the interviews and subsequent transcription of the audio files improved the accuracy of capturing the participants' responses, although the transcription was harder than I had anticipated. I maintained a neutral perspective by taking note of my personal bias and ensuring that I relied solely on the participants' responses and company artifacts in my data analysis. Completing this study has enhanced my understanding of the qualitative research method as well as improved my appreciation

of the factors for the prevalent problem of ineffective management of retired assets. I intend to use the findings of the study to create more awareness in any O&G organization I interact with in the future.

Conclusion

Effective management of retired (inactive) assets is a common problem in most industries but a prevalent problem in Alberta's O&G industry. Ineffective management of retired assets presents increased environmental risks and negative impact on long-term sustainability (Bujok et al., 2015; Soto & Renard, 2015). O&G businesses in Alberta can experience the risk of hefty penalties, increased financial burdens, including insolvency and the revoke of operating license if leaders fail to implement effective strategies to manage retired assets.

With the increasing adoption of CSR in the O&G industry, some business leaders fail to address the management of retired assets as an integral function of their CSR framework. It is difficult for any organization to claim a CSR philosophy when it has a large inventory of retired assets that present an increased environmental risk to the communities in which they operate. The unethical business practice of prolonged deferment of retired assets needs curtailment, and with more stringent AER policies and regulations in effect, O&G businesses need to implement effective strategies to address all retired assets.

In September 2017, 44% of Alberta's O&G companies failed to meet the industry's liability management rating threshold, and a significant portion of these companies are small- and medium-sized O&G companies (AER, 2017). The high

percentage of small- and medium-sized O&G companies not meeting the industry LMR threshold indicates that small and medium-sized companies are more vulnerable to ineffective management of retired assets than larger companies (AER, 2017). Hence, the focus of this study was on the small- and medium-sized O&G companies. Considering the current and future AER initiatives to address this issue, long-term organizational sustainability is going to be dependent on the effectiveness of managing retired assets.

The January 2019 Supreme Court of Canada ruling (*Orphan Well Association v. Grant Thornton Ltd*, 2019) was unprecedented and has significant environmental, economic, and social implications in the Canadian O&G industry (Gaston et al., 2019). By this ruling, any proceeds from the asset sale of bankrupt O&G companies shall be used to fulfill all provincial environmental obligations before any creditor payments. The significance of this ruling would transform the business practices in the Alberta O&G industry towards effective management of retired assets. With the ruling, the findings of this study become more relevant in the Alberta and Canadian O&G industry as business leaders place priority on effective retired assets management. The AER and other provincial government energy regulatory agencies across Canada now have the legal justification from the Supreme court ruling to intervene in any O&G firm bankruptcy proceedings to ensure the fulfillment of all environmental obligations. The AER proposed corporate health scorecard involves a more stringent evaluation of the ability of O&G businesses to address its liability obligations, and businesses will be exposed to greater financial burden and possible revoke of licenses unless leaders implement effective strategies to address retired assets.

Business leaders in small- and medium-sized O&G companies can use the findings of this study to implement strategies that can manage their retired assets effectively. O&G business leaders should consider adopting a CSR framework that focuses on the management of retired assets as part of their sustainability programs. O&G business leaders should embody responsible leadership with a strong commitment towards managing retired assets by providing the financial resources, human capital, policies, and framework focused on retired asset management. The financial and human resources included the provision of appropriate asset management software tools, and the creation of a dedicated champion/team focused on liability management.

Effective communication of corporate CSR philosophy from the top management to all employees and stakeholders should help to develop an organizational CSR culture that emphasizes asset lifecycle management and regulatory compliance. It is important to incorporate the sustainability culture into the organizational culture for long-term organizational sustainability. O&G leaders should implement a workflow process that involves monthly, quarterly and yearly audits to facilitate a robust annual budget and long-term planning of retired assets. Finally, performance measurement and reporting are critical for the effective long-term management of retired assets. Performance measurement should include key performance indicators and benchmark indicators to foster continuous improvement and optimization of the management of retired assets.

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Appendix A: Interview Protocol

Name: _____ Date: _____

Code: _____

Title: Strategies for Oil and Gas Asset Retirement Sustainability in Alberta, Canada.

Purpose: The purpose of this qualitative multiple case study is to explore the strategies business leaders in small- and medium-sized O&G companies use to manage retired O&G assets effectively to increase organizational sustainability.

1. I will send an introductory e-mail to oil and gas business leaders of small- and medium-sized oil and gas companies describing the nature and importance of the research study regarding strategies to effectively manage retired oil and gas assets. In this e-mail, I will provide details of the research, including the expected time length of the interview, the need for audio recording the interview for transcript accuracy, and the member checking process. I will also provide information regarding the voluntary nature of the participation, the withdrawal policy that allows a participant to withdraw from the study at any time, and the assurance of confidentiality. I will send the introductory e-mail to business leaders who are responsible for sustainability and asset management in their current organization and whose company has a track record of successfully implementing strategies to manage retired oil and gas assets effectively. I will attach the informed consent form as part of the introductory e-mail.

2. I will make follow-up phone calls the day after I send the introductory emails to start the engagement process with the potential participant and to answer any questions or provide any clarifications.

3. Upon the receipt of a formal agreement to participate from respondents who gave their consent via e-mail, I will schedule the date, time, and location for the interview with the respondents. The interview location shall be free of disruptions and noise.

4. My dressing code will be business standard as it is appropriate attire for meeting with business leaders.

5. I will start each interview session with greetings and an introduction of myself to develop a rapport with the participants. I will also thank each respondent for their willingness to participate in the research study.

6. To establish trust and facilitate a natural flow conversation that is rich in detail with the participants, I will provide a brief explanation of the purpose of the research which was in the introductory e-mail. I will provide information about the member checking process for accuracy and feedback, which will involve a review of the transcribed data and a review of the data interpretation summary. I will ensure each respondent has allotted sufficient time for the interview and does not have any conflicting commitments that could jeopardize the quality of the responses. I will ensure that each respondent understands that there are no time restrictions to answer the interview questions and they should provide as many in-depth responses as possible based on their rich experience and knowledge base. Based on the respondent's answers, I will ask the respondents follow-up or probing questions to obtain rich quality data. I will ask the respondents if they have any questions before I start the interview. I will answer any questions they may have and then ask for permission to audio record the interview.

7. Before I start the audio recording, I will ask the respondents if they need a drink before we start the interview to avoid disruption of the flow of the interview in case they need a drink during the interview. I will switch on two audio recorders (to avoid data loss) and will note the date, time, and the conditions at the location (e.g., a closed office, quiet conference room, etc.).

8. I will take notes and indicate the coded sequential representation of the respondent's name, e.g., 'participant 2 (PA2)' on the paper document of the audio recording, and my copy of the informed consent form.

9. I will start the interview and proceed with asking the formulated interview questions. I will ask further probing questions to clarify any doubts or obtain further in-depth information.

10. The last interview question will be an invitation for the respondents to provide any additional information not covered in the interview that they consider important to understanding the strategies for effectively managing retired oil and gas assets.

11. At the end of the interview, I will thank the respondent for their time and participation in the study. I will reiterate their further participation with the member checking process to ensure the accuracy and reliability of the data. I will confirm that the member checking process could be done via e-mail, but I will offer my availability to meet again for the member checking process at their discretion.

12. I will transcribe the interview immediately after each interview, and I will conduct a preliminary analysis of the interview data in conjunction with my notes. After each interview, I will analyze the interview data to help identify if data saturation occurs.

Appendix B: Interview Questions

Participants will answer the following initial questions:

1. What strategies do you use to track, monitor, and manage retired O&G assets effectively?
2. Based upon your experience, what specific features of the strategies contributed to the effective management of retired O&G assets?
3. How is the budget for management of retired O&G assets created?
4. What are the principal internal and external barriers to implementing effective retired O&G asset management strategies?
5. How do you address the internal and external barriers?
6. How do you monitor the effectiveness of your strategies for management of retired O&G assets as compared to competitors?
7. How does improving the management of retired O&G assets enhance the firm's corporate social responsibility?
8. How has your effective management of retired O&G assets ensured organizational sustainability?
9. What additional information can you provide to assist me in understanding the effective management of retired O&G assets to increase organizational sustainability?