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# Incorporating Project Management and Sustainability

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Norwegian University of  
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## Preface

The purpose of this report is to examine the effects.... The composition of the following thesis report was conducted in order to satisfy the requirements for a Master of Science in Project Management degree at the Norwegian University of Science and Technology in Trondheim. As such, this report is a continuation of the paper written for the course TPK4520- Project and Quality Management, Specialization Project, and portions of it will contain text from the earlier paper which served as the basis for this thesis report.

Supervision was administered by Nils Olsson, PhD, a professor within the Department of Mechanical and Industrial Engineering at NTNU. I appreciate his assistance and guidance throughout the composition of this paper. Likewise, I wish to thank those at Ridgemont Commercial Construction, specifically Randy Allen, Hector Rivera, and Paul Camp, who graciously offered their time, knowledge, and data to assist me in detailing a case that will be examined later in this paper.

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## Abstract

The project management industry has the ability to greatly affect sustainability and sustainable development, but often misses the mark in reality. This is often linked to the long-standing idea that project managers are to only be concerned with fulfilling their obligations in regard to the iron triangle. Hence, only short-term effects of the projects they deliver are often considered.

This paper will address the theoretical basis for project management and project delivery along with the challenges and potential abilities the industry faces in incorporating sustainable practices into project management methodology.

Likewise, laws and regulations often influence the processes and outputs which project's employ and deliver. Therefore, this paper will also examine the extent to which these laws affect project success.





# Table of Contents

<b>Preface</b> .....	<b>iii</b>
<b>Abstract</b> .....	<b>v</b>
<b>Table of Contents</b> .....	<b>vii</b>
<b>List of Figures</b> .....	<b>x</b>
<b>1 Introduction</b> .....	<b>1</b>
<b>1.1 Motivation</b> .....	<b>1</b>
<b>1.2 Problem Description</b> .....	<b>2</b>
<b>1.3 Research Questions</b> .....	<b>3</b>
<b>1.4 Report Scope</b> .....	<b>3</b>
1.4.1 Literature Review .....	3
1.4.2 Case Presentation .....	4
<b>1.5 Objectives</b> .....	<b>4</b>
<b>2 Background</b> .....	<b>7</b>
<b>2.1 Project Management</b> .....	<b>7</b>
<b>2.2 Ridgemont Commercial Construction</b> .....	<b>8</b>
2.2.1 Interaction with Staff .....	9
2.2.2 Ridgemont Commercial Construction Case .....	10
<b>2.3 Waters of the United States</b> .....	<b>10</b>
2.3.1 Contention .....	11
<b>3 Methodology</b> .....	<b>15</b>
<b>3.1 Literature Review</b> .....	<b>15</b>
<b>3.2 Case Study</b> .....	<b>16</b>
3.2.1 Interview Methodology .....	16
<b>3.3 Report Organization</b> .....	<b>17</b>
<b>4 Theory</b> .....	<b>20</b>
<b>4.1 Project Management</b> .....	<b>20</b>
4.1.1 Triple Constraint .....	21
4.1.2 Efficiency vs. Effectiveness.....	22
4.1.3 Stakeholders .....	23
<b>4.2 Sustainable Development Goals</b> .....	<b>26</b>
<b>4.3 Triple Bottom Line</b> .....	<b>28</b>
4.3.1 Economic.....	30
4.3.2 Social .....	30
4.3.3 Environmental.....	31
<b>4.4 Corporate Social Responsibility</b> .....	<b>31</b>
<b>4.5 Operational Sustainability vs Sustainable Execution</b> .....	<b>33</b>
<b>5 Findings</b> .....	<b>36</b>
<b>5.1 Industrial Park Interviews</b> .....	<b>36</b>
5.1.1 Interview with Mr. Norman .....	36

5.1.2 Interview with Mr. Rivera .....	40
<b>5.2 Implemented Changes.....</b>	<b>42</b>
<b>6 Discussion .....</b>	<b>44</b>
<b>6.1 Stakeholder Involvement and Influence .....</b>	<b>44</b>
<b>6.2 Clear Metric Definitions .....</b>	<b>47</b>
<b>6.3 Varying Channels of Regulation in the United States .....</b>	<b>48</b>
6.3.1 Political Influence.....	49
<b>6.4 Case .....</b>	<b>52</b>
<b>6.5 Need for a New Model .....</b>	<b>52</b>
<b>7 Conclusion .....</b>	<b>55</b>
<b>7.1 Practical Implications .....</b>	<b>55</b>
<b>7.2 Further Work .....</b>	<b>56</b>
<b>References.....</b>	<b>58</b>
<b>Appendices.....</b>	<b>64</b>
<b>Appendix 1: Interview Guide.....</b>	<b>64</b>



## List of Figures

Figure 1: Map of States Maintaining Clean Water Rule (Federation of American Scientists 2019)

Figure 2: Report Structure

Figure 3: The Iron Triangle

Figure 4: Stakeholder Map (Hussein, 2018)

Figure 5: Stakeholder Strategies

Figure 6: Sustainable Development Goals and their Descriptions

Figure 7: Triple Bottom Line (Silvius and Schipper, 2010)

Figure 8: Sustainability Sweet Spot (Savitz, 2013)

Figure 9: The Pyramid of Corporate Social Responsibility (Carrol, 1991)

Figure 10: Examples of Sustainability in Projects

Figure 11: Sustainable Project Management Scope (Silvius et al., 2017)

Figure 12: Linking Sustainability Metrics to Project Success (Silvius and Schipper, 2015)



# 1 Introduction

## 1.1 Motivation

Is the world on track to avoid surpassing the 2°C increase in global temperatures by the end of the century as outlined by the Paris Climate Agreement? Not a single expert on the climate panel at Trondheim's 2018 Energy Transition conference believes so (Energy Transition Conference, 2018).

Climate change, natural resource degradation, poverty, and inequality are shaping up to be some of this generation's greatest challenges. Numerous governmental bodies, citizens, and organizations all across the globe are making various promises concerned with addressing and attacking these issues. In 2015, 195 member-countries of the United Nations pledged to make reductions in their greenhouse gas emissions (Rose et al., 2018), a leading contributor to the planet's warming. Whether it is by policy, customer demand, or supply chain shifts, organizations are experiencing the necessity to address their shortcomings regarding their perceived contributions to sustainability.

Traditional project management models place little to no focus on sustainability itself. It has been up to project managers or organizational culture to dictate the level of sustainable measures implemented in projects or project outputs. While extensive literature exists addressing both sustainability and project management individually, the intersection of these two subjects is much less defined. Tufinio et al. (2013) note the importance of drivers and how they encourage organizations to achieve and maintain their goals. Because "sustainability is becoming a prime driver in organizations and projects, making the relation between project management and sustainability crucial" (Tufinio et al., 2013), the

application of sustainable principles into project management theory must be better understood.

Considering the aforementioned lack of crossover in theoretical and practical applications of sustainability in project management led to the development of the first research question.

With project managers accounting for little to no addition of sustainable practices into project management, mainly due to the principle theory based on the triple bottom line, what effects on project success might be present in a time where sustainability and efficiency are global initiatives?

The objective of this paper will be to examine the industry of project management as it exists today, evaluate and discuss the existence or non-existence of project manager influenced sustainability factors, recommend ways in which project managers can better contribute to the ideals of sustainability, and study the effects of foregoing a sustainable-led mindset on project success through the study of a specific United States-based case in the construction industry.

## 1.2 Problem Description

The global effects of all forms of pollution, be they air, water, noise, soil, or another form, are under increasing scrutiny and research. Federal regulations departments like the Environmental Protection Agency in the United States, government sponsored agencies like the National Aeronautics and Space Administration, for-profit corporations like Tesla, international organizations like the United Nations, non-profit organizations like the World Wildlife Fund, institutions of higher education like the Norwegian University of Science and Technology, and so many more are contributing in some way by studying factors contributing to climate change, limiting pollutants that negatively affect the environment, educating the populace regarding what is happening and what they can do to curb their



involvement, and working to prevent the progression of what a majority of research shows to be the Earth's future: devastating climate change.

The field of project management is not exempt from innovating its traditional theories and practical applications to better align with prioritizing sustainability. Økland (2015) notes the gap existing between literary resources and existing theory "and what is carried out in practice" (Økland, 2015).

With this assertion in mind, what is presently being done to address the gaps between practice and theory? Likewise, what ability, if any, do project managers have to maneuver within the confines of the scope for the jobs that are expected of them in a way that addresses sustainability shortcomings?

### 1.3 Research Questions

RQ1) What are the limitations or barriers for project managers when considering sustainable project management versus more traditional approaches for completing projects, and in what ways can organizations and project managers alike implement sustainable practices into projects?

RQ2) In the face of volatile climate change policy, what tools for project managers will be necessary to deal with an ambiguous future, and in what ways are environmental policies affecting project success?

### 1.4 Report Scope

#### 1.4.1 Literature Review

In order to limit the scope of the following report, when considering sustainable development and sustainability, a more highly general view will be used to present the report's following sections. The field of sustainability is vast and the technologies and

products that exist to address sustainability issues are numerous. Therefore, while issues like emission reductions in project processes may be discussed, the specific and various products that may aid in achieving this goal will not be examined or presented.

Likewise, topics concerning sustainability as it relates to the field of project management were given priority when concerning the literature review and the discussion portions of the report. This includes the exclusion of certain subject matter in the theory section which stands alone and therefore has little to no interdependence with project management within the scope of the arguments this report is studying. Also, greater importance was placed on literature that concerned project management in the construction industry within the United States, but in many cases, for the sake of theory, this was not always necessary.

#### 1.4.2 Case Presentation

The report will detail a single case. The case presented and discussed later in the paper will be examined in order to qualify the negative effects experienced by a project and its team for unknowingly violating a federal environmental regulation. The single case that will be discussed is that of a warehouse construction project in Texas by Ridgemont Commercial Construction. It is my hope that the outcome of this single case study can in some way contribute to the objective of this report and provide some substance in the coming sections.

#### 1.5 Objectives

The main objectives of this report will be to adequately answer the two aforementioned research question. This will be accomplished by providing an effective and sufficient theoretical section to cover what is currently known about topics that will aid in addressing the research questions, detailing the gaps in what is currently available as scholarly knowledge, and discussing the challenges and possible solutions raised by the research

questions. More specifically, the aim of this report will be to draw a link between sustainability and project management, discuss the challenges and lack of adoption of sustainability into project management practices, and by presenting a case from the construction industry in the United States, detail an example portraying the effects of sustainability politics on project success.

It is my hope that this report will address an important and global environmental issue by offering scholarly insight into a way forward for the industry of project management.



## 2 Background

### 2.1 Project Management

The field of project management is ultimately concerned with delivering projects within the constraints of what is known as the iron triangle: cost, time, and scope. Therefore, a project manager's success is typically only reliant upon their ability to meet or exceed the requirements for each of these three constraints. This leads to the mindset that nothing more than what is explicitly required should be delivered by project managers at a project's completion (Olsson, 2018). And because profitability is a main concern in projects, sustainable efforts like environmental impact and social responsibility will receive much less attention (Silvius and Schipper, 2010).

However, there is an established and growing field of research addressing the shortcomings of traditional project management concerning sustainability. Published articles by various authors detail subjects like using projects as a means to develop organizational sustainability (Silvius and Schipper, 2010), the importance of stakeholder partnerships in order to transition to a more sustainable state (Elkington, 1998), the power project managers hold in influencing stakeholders (Silvius, 2017), and the creation of organizational value by investing in sustainable practices and corporate responsibility during projects (Godfrey and Merrill and Hansen, 2009).

Alongside the shift toward sustainable development and practices, project management has also seen a shift away from shareholder importance toward a more robust involvement of all necessary stakeholders. This is largely due to outside pressure on organizations to "broaden their accountability beyond simply ensuring financial performance for

shareholders, to demonstrating triple bottom line performance for stakeholders” (Visser, 2002).

Quite possibly the strongest argument against project managers investing heavily in sustainability is that traditional project management models allocate the responsibility for the realization of value in the product, which would include value created by sustainability, to the project owner (Olsson, 2018). This means that if a project owner places little to no importance on sustainability, project managers also have little to no responsibility to deliver a product that does more than simply meet the laws and regulations concerning project processes and delivery. It is this specific issue that birthed the research questions which will be discussed and addressed in the remainder of this report.

## 2.2 Ridgemont Commercial Construction

Ridgemont Commercial Construction, based in Irving, Texas, specializes in the construction of healthcare, retail, automotive, industrial, office space, and senior living construction projects (Ridgemont Commercial Construction, 2019). Ridgemont Commercial Construction prides itself on providing a comprehensive service that covers many different facets or pre-construction, vendor and subcontractor selection, in-house project management and field operations, quality control, risk and safety responsibilities, as well as warranty support for post-construction claims (Ridgemont Commercial Construction, 2019).

Strong, strategic collaboration with clients is one of the points that Ridgemont Commercial Construction believes helps set it apart from its competitors. It is in this way that Ridgemont Commercial Construction helps engineer value both for the client and for their own organization.

### 2.2.1 Interaction with Staff

My partnership with Ridgemont Commercial Construction was ushered about by my uncle, Randy Allen, a superintendent for the company. Mr. Allen has been with Ridgemont Commercial Construction as a superintendent for 7 years and has been in the commercial construction business for nearly 25 years. While formulating possible avenues for the direction of my research and the statement of research questions, Mr. Allen's knowledge and expertise within the field of construction and construction management helped steer my thinking.

Mr. Allen was instrumental in connecting me with Paul Camp at Ridgemont Commercial Construction. Mr. Camp serves as a Principal and the Vice President of Operations for the company and accepted the role of contact person within the organization for my research. Mr. Camp has been a valuable resource by making sure I have access to the data I need to complete my study as well as linking me to other helpful contacts within Ridgemont Commercial Construction who may be able to better address certain specifics and subject matters regarding my studies.

One such contact Mr. Camp directed me to is Hector Rivera. Mr. Rivera serves as one of Ridgemont Commercial Construction's project managers. Specifically, Mr. Rivera served as project manager for the site of which my research will later explore as a real-life case example of environmental regulations affecting the success of construction industry projects in the United States.

Last, Damon Norman supplied an overview of the Industrial Park project from a different point of view which allowed me to analyze the case from an altered angle.

### 2.2.2 Ridgemont Commercial Construction Case

The case that will be examined is entitled Industrial Park Loop 820 Building 1, hereafter referred to as Industrial Park. Ridgemont Commercial Construction was contracted to begin this large construction project, which consisted of two separate office/warehouse buildings and associated paved parking and drive areas in Fort Worth, Texas, where design and preconstruction began in November 2016.

Prior to construction and site excavation, the entire site was specifically an agricultural use space for hay production.

Ultimately, the Industrial Park construction project would violate regulations regarding the Clean Waters Act, also known as Waters of the US. This violation would end up delaying the original schedule for the project's completion by 14 months and causing a considerable budget overage. The Waters of the US program will be further discussed in section 2.3.

### 2.3 Waters of the United States

In 1948, the Federal Water Pollution Control Act was enacted. This act would serve as the basis for The Clean Waters Act, a large expansion and reorganization of its predecessor. The Clean Waters Act was authorized in 1972 and is "the principal law governing pollution of the nation's surface waters" (Copeland, 1999). It falls under the jurisdiction of the United States Environmental Protection Agency.

The Clean Waters Act is made of up two major sections. The first section, which will not be covered in any form during this report, outlines subjects concerning financial assistance for the construction of water treatment plants in municipalities across the United States for the treatment of sewage. The second section details the regulations concerning pollutant runoff or "discharge" from industrial entities as well as local municipalities (Copeland, 1999). The history and regulatory impact of the second section we be examined in greater detail.



The Clean Waters Act “establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters” (EPA, 2019). The act was passed in an effort to control (through the issuance of permits), mitigate, and reduce the number of pollutants being dumped or released into “navigable” waters within the United States.

The Clean Water Rule, also known as the Waters of the United States rule, was established in 2015 in an effort to clarify information and regulations set forth by the Clean Waters Act. This regulation is a partnership between the United States Environmental Protection Agency and the United States Army Corps of Engineers and was born out of the necessity to more clearly define what areas were protected under the Clean Waters Act after multiple challenges and rulings occurred in the Supreme Court of the United States. The Supreme Court was ultimately left with the task of interpreting the extent of waters regulated by the act.

Thus, the Waters of the United States rule was finalized in 2015 after taking into account the opinions and input of over 400 various stakeholders who wished for the resolution of “issues involving scope, clarity, consistency, and predictability” in the governance of the agencies responsible for the handling of permitting under the Clean Waters Act (Gatz, 2018).

### 2.3.1 Contention

In February of 2017, President of the United States, Donald Trump, issued an executive order for the review of the Waters of the United States rule and the possible rescinding or revision of its current state. The reason for the review was stated as having to do with spurring economic growth and “minimizing regulatory uncertainty” (Trump, 2017).

Beginning in March of the same year, then head of the United States Environmental Protection Agency, Scott Pruitt, announced that his agency and the Department of the Armies had begun the process of reviewing the regulation per direction of the executive order issued by the president (Federal Register, 2017), and in January of the following year, Administrator Pruitt announced a two year suspension of the Waters of the United States rule saying an updated version would be issued at a later time (Davenport, 2018).

In December of 2018, the two agencies announced a new rule detailing the latest verbiage defining specifically what would be classified as waters of the United States in an effort to further reduce confusion concerning what bodies of water fell under the jurisdiction of the Clean Waters Act and the governing bodies tasked with enforcing the rules (Federation of American Scientists, 2019). The agency published it in February of 2019 (Federal Register, 2019).

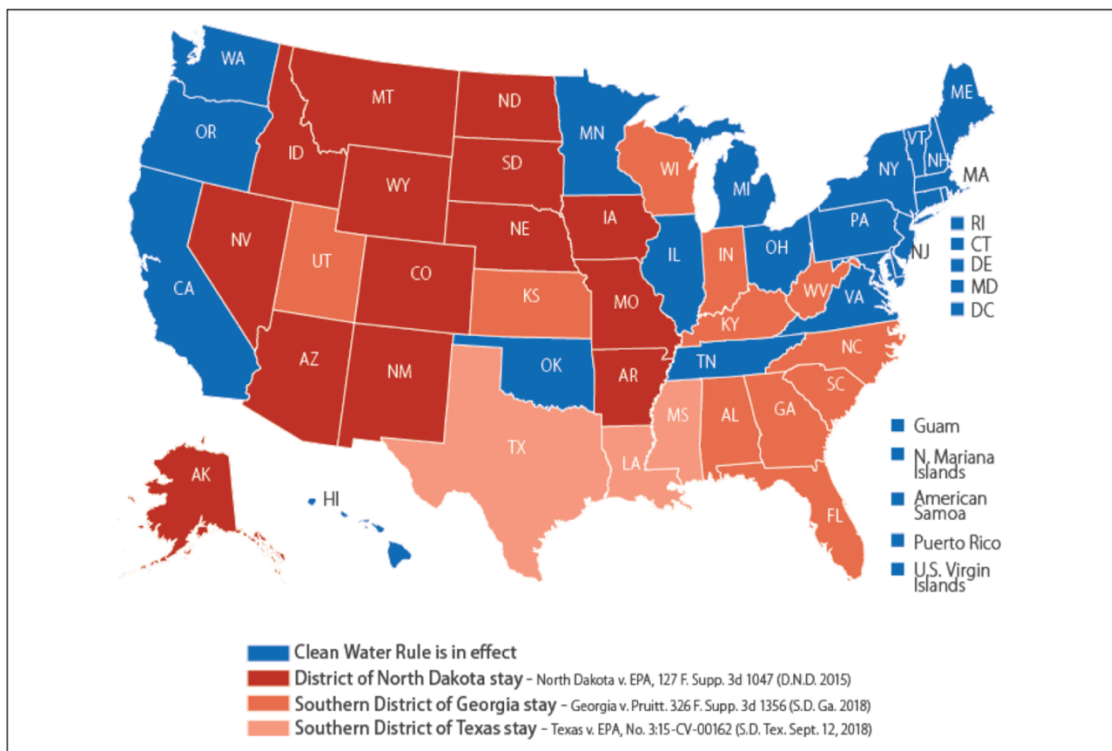


Figure 1: Map of States Maintaining Clean Water Rule (Federation of American Scientists 2019)

Of special note is the number of lawsuits filed during the life of both the Clean Waters Act and the Waters of the United States rule and how the transition of power from one political party to the opposing party affected these legal challenges. This issue will be discussed further in section 6.3.1. Also, even though the Waters of the United States rule was rescinded at the federal level, a number of states moved to leave the original, more stringent regulations in place. A map detailing those states which left the rule in effect can be seen in Figure 1.

Litigation and policy concerning the Clean Water Act will continue to evolve over the coming years as litigation cases close and policy makers move to define what constitutes federal protection for the different waterways of the United States.



## 3 Methodology

### 3.1 Literature Review

To best set the groundwork for answering the research questions, a literature study will be conducted. This crucial step in any research report will aid in explaining the existing knowledge base of the subjects within the academic arena that are necessary to discuss and examine topics that may arise in later sections of the report. The literary review will assist in outlining theories and various topics concerning sustainability and sustainable development as well as project management and their interrelations.

An investigation into current sustainability issues and standards will be explored. This information will be collected by reviewing various lecture materials that detail sustainability and sustainable efforts in terms of projects and project management along with researching relevant literature concerning this topic. The additional literature will be located through scholarly article search engines, Google Scholar and Oria using pre-determined key terms. To limit the scope, articles detailing industry-specific sustainability challenges, specifically the construction industry in the United States, will be given priority as will articles and journals that have been published most recently.

*keywords: sustainable development goals, sustainability drivers, triple bottom line, organizational sustainability*

Likewise, an assessment of assorted lecture material along with a similar literature review was conducted concerning project management to cover general theory and models. Similar to the literature search for sustainability, the scholarly article search engines Google Scholar and Oria were again used. The importance of timeliness and recency was of less priority for

this section because of the vast library of articles detailing project management theory and practice.

*keywords: project management, project management models, triple constraint, shareholder and stakeholder theory*

### 3.2 Case Study

Following the literature review, a case study will be presented. The case study with Ridgemont Commercial Construction regarding the Industrial Park project was conducted through two mediums of interview. Alongside the interviews, data from the completed project was gathered to briefly quantify some of the negative effects the project faced due to regulation violations under the Clean Waters Act. This data was collected from and supplied by Ridgemont Commercial Construction.

#### 3.2.1 Interview Methodology

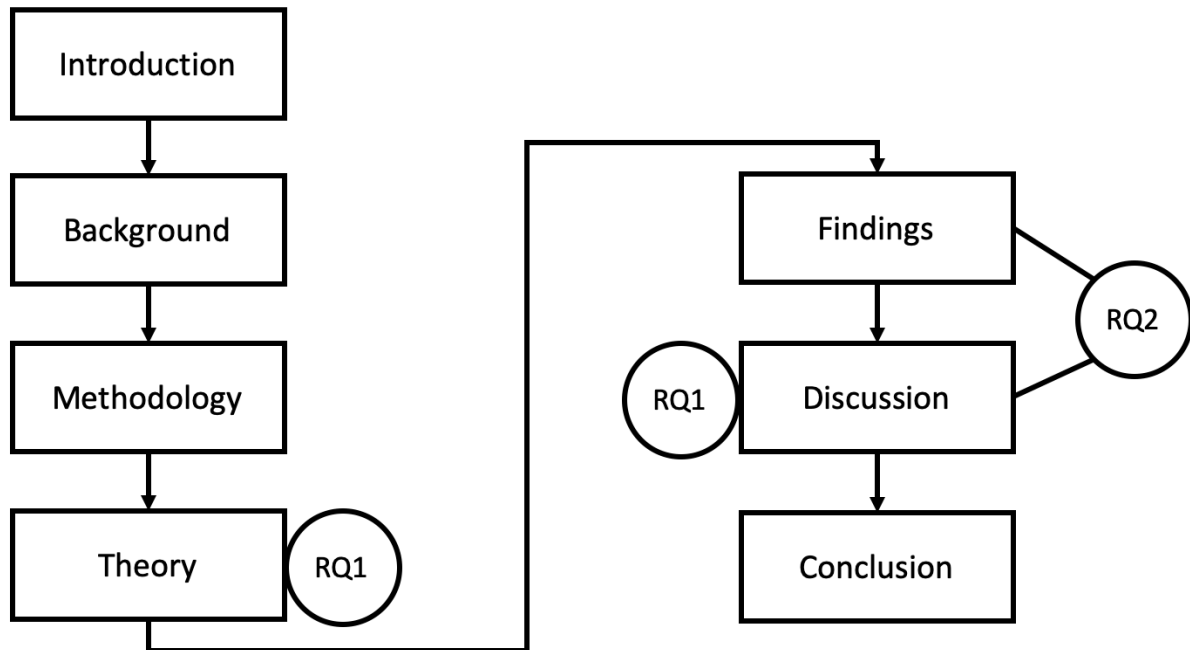
Interviews are often used in research when an interviewee's opinions and knowledge need to be accessed and where quantitative data may not provide all of the information you are seeking. Therefore, a semi-structured, in-person interview was conducted with the project manager for the Industrial Park project. Having received a brief overview of the project and its difficulties beforehand, I was able to form questions of relevance to my research topics and steer the interview in a clear direction. A copy of the interview questions and responses can be found in Appendix 1.

Later, it became clear that I was missing pertinent pieces of information that I had not covered during the in-person interview, so I reached out via electronic mail with specific questions regarding topics such as outcomes and lessons learned.

The outcome and applicable knowledge gained from the interview will be discussed in 5.2.

### 3.3 Report Organization

This thesis is divided into 6 major sections along with a conclusion. Figure 2 is provided as an overview for the structure of the report and as a guideline in order to examine in which sections the majority of the two research questions will be answered.



*Figure 2: Report Structure*

The outline for this report will follow a standard formal research format. First, a section entitled Introduction detailing the motivation and scope of the report as well as introducing the problem description and research questions will be presented. After, a section entitled Background discussing the circumstances and current state of project management and its relationship with sustainable development will be presented alongside a company profile of Ridgemont Commercial Construction, its Industrial Park project, and an explanation of the Waters of the United States program.

Following this current section entitled Methodology, which is meant to explain the methods employed to conduct my research, a section entitled Theory detailing theoretical knowledge concerning the topics of interest needed to establish a necessary base for discussing the

outcomes of my research and for answering the research questions will be presented. Next, a section entitled Findings will succeed the theory section in which knowledge gained through interviews concerning Ridgemont Commercial Construction's Industrial Park project will be presented. Finally, a section entitled Discussion will follow in which the remaining dialogue needed to answer the research questions will be presented. To sum up my findings and address areas concerning future research, a section entitled Conclusion will end the report.





## 4 Theory

### 4.1 Project Management

What constitutes the base for project management theory is simply a collection of best practices (Garel, 2013). There is no one size fits all approach guaranteeing the successful completion of a project, and as such, “project success is interpretable in many ways” (Silvius and Schipper, 2015). These best practices along with standards and various models and methods presented by organizations such as the Project Management Institute and the International Project Management Association (IPMA) help guide the field of project management.

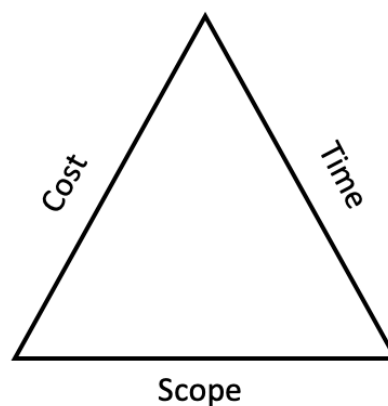
Økland (2015) defines projects as “vehicles of beneficial change, the most efficient way of organizing a response when faced with a need” whereas the Project Management Institute defines a project as “a temporary endeavor undertaken to create a unique product, service, or result” (PMBOK, 2017). The definition of a project inherently creates a time box. Projects are meant to be temporary and therefore terminate once a specific output has been achieved. These products, services, or results can be anything from an incremental software update meant to patch a security flaw, a new business process aimed at making a production line more efficient, or a massive 30-story condominium high rise in the middle of a busy downtown metropolitan area.

Silvius et al. (2017) defines projects as “temporary organizations most often across organizational structures and boundaries, aimed at realizing a defined deliverable or result, logically or preferably linked to the organization’s strategy or goals with specified resources or budget.” Again, this definition of project management makes note of the inherent time box and necessary output. The resources and budget described tie into what is commonly

known as the triple constraint of project management and will be further explained in section 4.1.1.

#### 4.1.1 Triple Constraint

The triple constraint, sometimes referred to as the iron triangle seen in Figure 3, bounds the infinite space in which a project can be completed. These constraints form the typical basis used for measuring project management success and includes the project budget (cost and resources), time (schedule and duration), and scope (requirements and quality level) (PMP, 2004).



*Figure 3: The Iron Triangle*

Meeting or exceeding the requirements for each of the three constraints is arguably the most important task for project managers. These three dimensions are often continuously monitored in order to evaluate project performance and make any corrections necessary to ensure successful completion within the given constraints.

The model is meant to show that there is an interrelationship between the three constraints and that deviations or changes in one constraint will ultimately have an effect on at least one of the other constraints (Van Wyngaard and Pretorius, J and Pretorius, L, 2012). A classic example portraying this involves a project that after evaluation at a certain point

looks to be behind schedule. The project manager can bring in more workers to speed some processes up, but this obviously will come at a cost to the budget.

The triple constraint is one of the most widely used and understood frameworks for measuring project management success, but the method also has many critics. Silvius and Schipper (2015) are one such critic. A study of theirs conducted in 2015 identified 27 separate measures of project success. They argue that the iron triangle or triple constraint method is not able to account for all of the intricacies that make up what they consider a multi-dimensional concept: project success.

#### 4.1.2 Efficiency vs. Effectiveness

Efficiency and effectiveness are two important terms to understand when evaluating a project's success. Efficiency is associated with doing the project right, while effectiveness involves doing the right project (Williams and Samset, 2010).

The former term is more closely associated with project management success and performing well in comparison to the triple constraints. Efficiency is an internal measure comprising of "the agreed scope, quality, cost, and time" (Olsson, 2006) which can typically be assessed and measured at any point or stage throughout a project's duration.

Effectiveness of a project can be more challenging to evaluate and "harder to reach than efficiency" (Miller and Lessard, 2001). This measure concerns value creation in terms of the project owner and users and therefore cannot easily be quantified as the realization of a project's value may take time.

Olsson (2006) notes a relationship between efficiency and effectiveness. He goes on to detail how change requests by project owners may increase the project's effectiveness but decrease the project's efficiency as changes incur costs and delays.

Because the outcome of a project is closely aligned with an owner's strategic goals for the project, maximizing the effectiveness of the project is a priority for the project owner.

Therefore, it is not uncommon for project owners to request changes in order to realign or better fit their strategy.

#### 4.1.3 Stakeholders

Stakeholders are the "people, groups, or organizations that could impact or be impacted by the project" (PMBOK, 2017). This definition has been worded in the way that it has in order to convey the broad spectrum in which stakeholders may exist. Each individual stakeholder has the ability to assert some level of power or governance, often referred to as influence, over the project as well as some varying degree of non-static interest in the project's completion. Therefore, understanding and managing stakeholders is an important and necessary role of project management.

##### 4.1.3.1 Stakeholder Management

It is important to note the possibility for new stakeholders to arise making the process of managing stakeholders continuous. In the same regard, both the amount of influence and the level of interest each stakeholder has in the project can vary over time and throughout the project's lifecycle.

Bjørn Andersen outlines stakeholder management as a 5-step process:

1. Stakeholder Identification
2. Stakeholder Classification
3. Understand Stakeholder's Needs and Expectations
4. Attempt to Anticipate Stakeholder's Behavior
5. Plan and Implement Action to Handle Stakeholders

### Stakeholder Identification

The first step of the iterative stakeholder management process is to identify all probable entities in which the project may have some interaction. These entities can display interconnectedness, they may include anything from key partners like direct suppliers to non-governmental organizations (NGOs) that take interest in your project for certain reasons, and they have the ability to make some impact on the project's success (PMBOK, 2017).

### Stakeholder Classification

The second step includes the task of organizing all of a project's stakeholders in a way that demonstrates each stakeholder's relationship with the project. This is often done through a process called stakeholder mapping whereby each stakeholder is placed in 1 of 4 categories based on their interest and power (Maylor, 2010).

		Interest	
		Small	Large
Influence	High	The contribution of this group is critical, but initially it does not have significant requirements of the project	The project is critically dependent on this group. The group has significant expectations regarding the project or its outcome
	Low	This group comprises stakeholders who expect little and have minor influence on the project	This group includes stakeholders who have marginal influence on the project, but nevertheless have significant requirements and expectations

Figure 4: Stakeholder Map (Hussein, 2018)

### Understand Stakeholder's Needs and Expectations

One of the prime underlying principles of stakeholder theory is the necessity to create value for both the internal and external stakeholders (Elvenes, 2018).

Economic prosperity is not always the only priority for a stakeholder. This is often

the case for NGOs. Understanding what is important to your stakeholders by maintaining an open line of communication will keep stakeholders involved and foster an organic sharing of a stakeholder’s needs and expectations.

*Attempt to Anticipate Stakeholder’s Behavior*

Once a stakeholder’s needs and expectations are more thoroughly understood, a project manager can then begin to look for interactions or patters among various stakeholders.

Andersen (2017) suggests the use of a network analysis model in order to determine both network density and network centrality. He makes the point that the closer an organization is to the center of the network, the more power or control that entity can assert over other players. This view is much more holistic as it calls into question where your specific organization or project exists in a large, interconnected network of actors.

*Plan and Implement Action to Handle Stakeholders*

Strategies regarding how to interact with each stakeholder is prescribed depending on which quadrant the stakeholder is placed into (Maylor, 2017).

		Interest	
		Low	High
Power	High	<b>Keep Satisfied</b> -Moderate priority group -Need to keep this group sufficiently involved	<b>Manage Closely</b> -Highest priority for the project manager -Manage through active engagement
	Low	<b>Monitor Only</b> -Lowest priority for the project manager -Don't overload them with communication	<b>Keep Informed</b> -Moderate priority group -Objective is to sustain their interest and leverage when useful to the project

*Figure 5: Stakeholder Strategies*

A stakeholder's position within the map, seen in Figure 5, has the ability to change, so the need to monitor, update, and amend the approach used is ever-present.

#### 4.2 Sustainable Development Goals

The dangers of a changing climate fueled by human activity have ushered in a time in which current business practices and lifestyles to which many have grown accustomed are coming under great scrutiny and intensified observation. In 1987, the World Commission on Environment and Development (WCED) outlined the necessity for a shift toward sustainable development. They defined sustainable development to be “meeting the needs of the present without compromising the ability of future generations to meet their needs” (WCED, 1987).

But as early as 1972, sustainable development has been a topic of discussion for members of the United Nations. In Stockholm that year, the General Assembly met in order “to serve as a practical means to encourage, and to provide guidelines ... to protect and improve the human environment and to remedy and prevent its impairment” (Handl, 2012). This highlights the fact that for nearly five decades the member states of the United Nations have acknowledged the necessity for measures to protect the environment from human-caused, negative effects along with the need to address matters such as poverty and widespread inequality.

In 2015, the United Nations Development Program (UNDP) outlined 17 goals in their “Transforming Our World: The 2030 Agenda for Sustainable Development” report, known as the Sustainable Development Goals (SDGs), which are described as a “call to action” in order “to improve life for future generations” (UNDP, 2018) and in order to “stimulate action over the next 15 years in areas of critical importance for humanity and the planet” (United



Nations, 2015). UNDP describes these goals as interconnected while they cover various issues. A list of the 17 SDGs and a description of their meanings can be found in Figure 6.

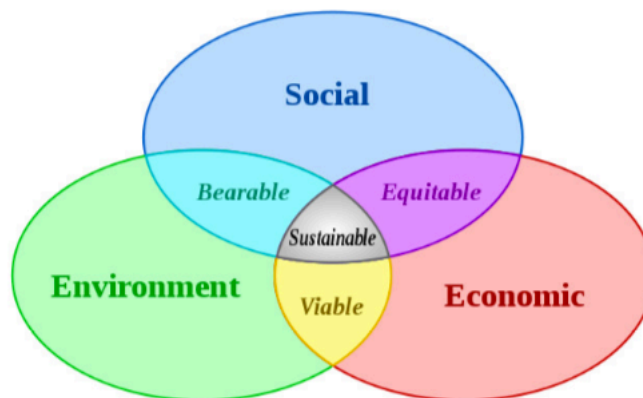
Goal	Title	Description
1	No poverty	End poverty in all its forms everywhere
2	Zero hunger	End hunger, achieve food security, and improved nutrition and promote sustainable agriculture
3	Good health and well-being	Ensure healthy lives and promote well-being for all at all ages
4	Quality education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5	Gender equality	Achieve gender equality and empower all women and girls
6	Clean water and sanitation	Ensure availability and sustainable management of water and sanitation for all
7	Affordable and clean energy	Ensure access to affordable, reliable, sustainable, and modern energy for all
8	Decent work and economic growth	Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all
9	Industry, innovation, and infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation
10	Reduced inequalities	Reduce inequality within and among countries
11	Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient, and sustainable
12	Responsible consumption and production	Ensure sustainable consumption and production patterns
13	Climate action	Take urgent actions to combat climate change and its impacts
14	Life below water	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development
15	Life on land	Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation, and halt biodiversity loss
16	Peace, justice, and strong institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels
17	Partnerships for the goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development

*Figure 6: Sustainable Development Goals and their Descriptions*

### 4.3 Triple Bottom Line

The triple bottom line (TBL) accounting method introduces differing dimensions of measurement than traditional frameworks which may solely focus on an organization's economics (Hall, 2011). Along with conventional economic factors, TBL includes social and environmental dimensions. It should be noted that these three factors are also referred to as the 3 P's in various other literature. The three P's stand for people (social), planet (environmental), and profit (economic). The triple bottom line urges corporations "to adapt to a world in which business goals are inseparable from the societies and environments in which they operate" (Økland, 2015).

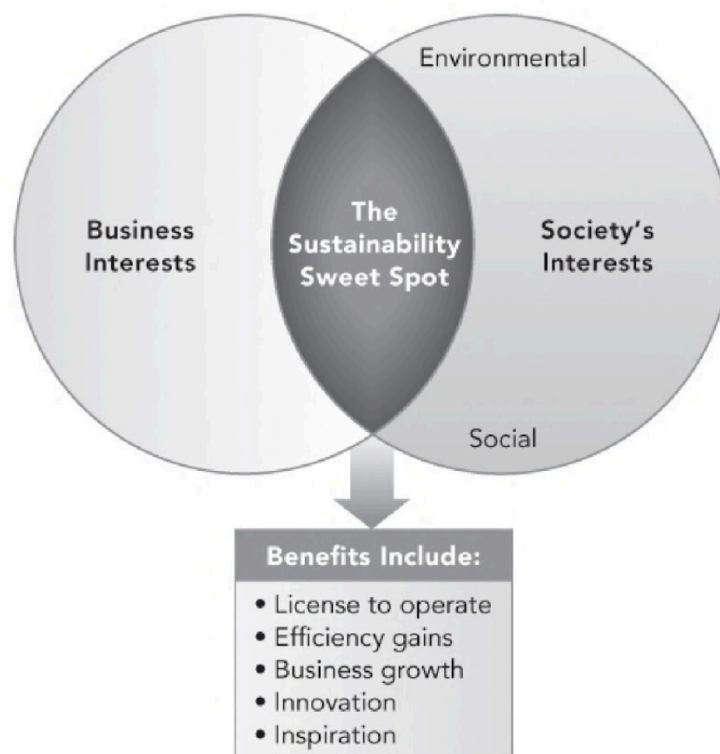
Silvius and Schipper (2010) discuss the necessity for a balance among the three dimensions of the TBL. Figure 7 illustrates the interconnectedness of the dimensions and how they have the ability to influence one another.



*Figure 7: Triple Bottom Line (Silvius and Schipper, 2010)*

The TBL has shifted the focus of firms from solely measuring project performance and success based on economic variables toward a broader societal view to include "local communities and governments, not just those stakeholders with whom it has direct, transactional relationships" (Hubbard, 2009).

The terminology Triple Bottom Line was first introduced in literature in 1995 by John Elkington. He detailed the belief that organizations had specific responsibilities pertaining to their social, environmental, and economic impacts (Miller and Buys and Summerville, 2007). Since that time, various other frameworks addressing related issues have emerged as customers and users have begun to expect and demand better responsibility efforts from organizations.



*Figure 8: Sustainability Sweet Spot (Savitz, 2013)*

Birch references *The Millennium Poll on Corporate Social Responsibility* noting that “two in three respondents wanted companies to... contribute to broader social and environmental goals” alongside their financial goals (Birch, 2002).

Savitz (2013) describes the struggles modern day organizations face when attempting to balance business and shareholder interest with the interests of the public and non-financial stakeholders. His illustration in Figure 8 of the sustainability sweet spot details “the place

where the pursuit of profit blends seamlessly with the pursuit of the common good” (Savitz, 2013).

It is within this “sweet spot” that organizations should aim to focus, venture, and endeavor.

Savitz (2013) also asserts and justifies that businesses employing the use of the Triple Bottom Line were not only honoring their responsibilities to sustainable development but also enhancing their profitability by becoming more sustainable in a majority of cases.

“Silvius and Schipper 2014 conclude that 86% of the studies in their sample used the triple bottom line as dominant definition and concept” (Silvius, 2017).

#### 4.3.1 Economic

The economic dimension is the traditional factor organizations use to measure performance. This factor is typically measured by some form of currency and can be linked to an organization’s profitability. Financial success is critical for an organization to continue operating. However, as firms began to move away from shareholder-centric business practices toward the modern stakeholder theory, focus on other dimensions of performance emerged because ““firms cannot be successful in the long run if they consistently disregard the interests of key stakeholders” (Norman and MacDonald, 2004).

#### 4.3.2 Social

The social dimension is arguably the most difficult to quantify due to the lack of a consistent standard by which to measure and the validity and comparability of these measures (Miller and Buys and Summerville, 2007). The interconnectedness of supply chains that transcend geographical boundaries and the continued strengthening of international business cooperation has brought forth a necessity to evaluate partners and their commitment to social responsibility.

Waddock, Bodwell, and Graves (2002) note the imperativeness of the shift toward greater responsibility. They detail social challenges that businesses must address including human rights, labor, equal opportunity, and war or military use (Waddock and Bodwell and Graves, 2002).

Silvius et al. (2017) also claim the importance of project managers protecting their internal human capital. They note the high levels of pressure that are present in many projects which may lead to employee burn-out. Therefore, project managers are tasked with balancing not only the external dimensions of the triple bottom line but those internally as well.

#### 4.3.3 Environmental

The environmental aspect of the Triple Bottom Line deals with an organization's impact on the natural world. Typical categories measured may include emissions like carbon dioxide, amounts of waste produced, recyclability of products, energy consumption, or noise pollution to areas surrounding workplaces. These indicators are easily measured and comparable year-over-year and present the ability for organizations to easily detail their efforts and success or be scrutinized by activist groups or media.

#### 4.4 Corporate Social Responsibility

Per Investopedia, the definition of corporate social responsibility is "a self-regulating business model that helps a company be socially accountable — to itself, its stakeholders, and the public" (Chen, 2018). In 2010, a set of guidelines by the International Organization for Standardization (ISO) was published to "clarify what social responsibility is, helps businesses and organizations translate principles into effective actions and shares best practices relating to social responsibility, globally" (ISO, 2017). ISO 26000 is the set of

standards published addressing corporate social responsibility; however, the standards are only published as guidelines and not actual requirements (ISO, 2017).

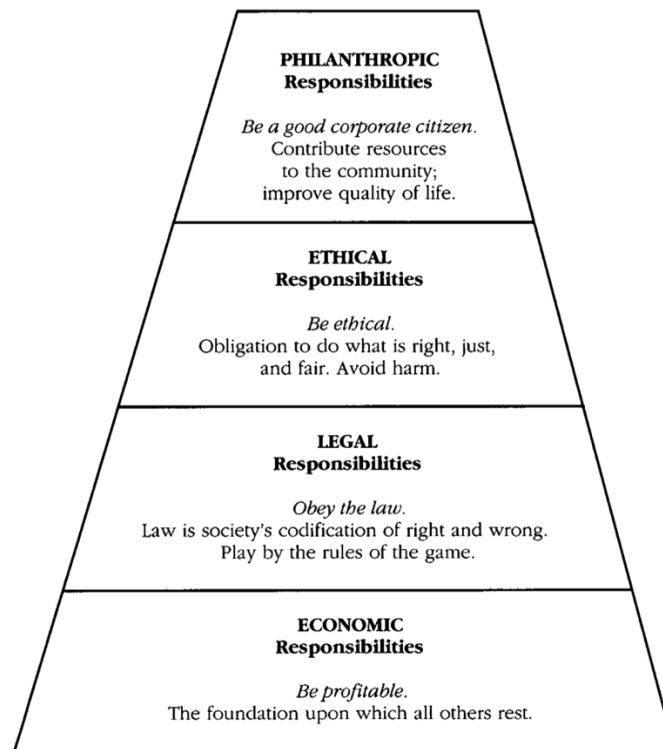


Figure 9: The Pyramid of Corporate Social Responsibility (Carroll, 1991)

As shown in Figure 9, the CSR pyramid portrays four areas of focus for organizations when considering their social and economic responsibilities. These organizations should “strive to make a profit, obey the law, be ethical, and be a good corporate citizen” (Carroll, 1991).

Depicting this representation as a pyramid was intentional and meant to portray that a business’s primary objective, its base is the economic responsibility a business has to make money and create value; however, each layer was meant to be observed and executed at all times during a business’s operations (Carroll, 1999).

Carroll (1999) also goes on to draw what he believes is a link between the social aspect of the corporate social responsibility concept and an organization’s stakeholders. As presented in section 4.1.3, stakeholders exist in a wide spectrum and include entities with various

needs and expectations. Stakeholder theory shifted the focus away from creating value only for shareholders to a wider perspective that encompasses all bodies that may affect or be affected by a project.

#### 4.5 Operational Sustainability vs Sustainable Execution

Although the focus of this paper is not concerned with how to deliver sustainable projects, this brief section will detail theoretical aspects considering what the difference is between sustainability in the operation of the deliverable and the execution of a project. Figure 10 also demonstrates how each relates to the three factors given in the triple bottom line method: environmental, social, and economic.

<b>Sustainability in the Operation vs Execution</b>		
	<b>Execution</b>	<b>Operation</b>
<b>Environmental</b>	- emissions - federal regulations	- NYC carbon tax
<b>Social</b>	- fair wages - safe working conditions	- livable space
<b>Economic</b>	- project monetary cost	- cost of operation/maintenance

*Figure 10: Examples of Sustainability in Projects*

Operational sustainability concerns the impacts made through the use of the project deliverable (typically after delivery). If considering the construction industry, an example of this would include the amount of energy needed to maintain a comfortable temperature within an office building or how the floorplan design contributes to a sense of well-being and collaboration among workers.

Sustainability in the execution has to do with the impact of the processes chosen while completing the project deliverable. Using the construction industry again as an example, fair and safe labor practices on a job site address a number of the sustainable development goals and contribute to operational sustainability. Likewise, water contamination due to site waste runoff may pose a threat to local species and is a negative impact of a project's execution.





## 5 Findings

### 5.1 Industrial Park Interviews

The following sections 5.1.1 and 5.1.2 are excerpts from communications with two separate employees of Ridgemont Commercial Construction. Each had direct involvement with the Industrial Park project.

The first is an email interview with Damon Norman, Director of Office and Industrial Services. Portions of it have been modified, edited, and reordered for clarity and cohesion; however, the scope and underlying content of the summary he provided have not been altered. The email was a response to a question I posed to Damon in order to attain a better understanding of the Industrial Park project and the issues it faced with the Waters of the United States program and Clean Waters Act.

The second is a combined section featuring the answers given by Hector Rivera, Project Manager for the Industrial Park project, through two channels of interview, in-person and email. The email communications with Mr. Rivera were used as clarification means following our in-person interview. Therefore, the communications are combined again in order to ensure clarity and cohesion. Certain portions of the interview that would be considered redundant following section 5.1.1 will be excluded.

A copy of the in-person interview guide can be found in Appendix 1.

#### 5.1.1 Interview with Mr. Norman

The delay Ridgemont Commercial Construction encountered due to the Waters of the United States program can be pinned to a civil engineer from another firm who did not identify critical areas of the site as restricted zones which would have needed special, specific permits from the federal government. As a result of this oversight, after Ridgemont

Commercial Construction was contracted to start the project, the construction team began clearing and preparing the site for construction to begin, unknowingly, in the areas that should have been marked as restricted.

The site had previously been under agricultural use for hay production prior to the start of site excavation. The area that would have fallen under Waters of the United States protection was nothing more than a narrow, dry, and shallow drainage ditch across the site. Because of the state the area was in at the time of site preparation, nothing obvious pointed to there being an established creek bed, waterway, or existing body of water that might prompt concern or questions about the status of the area and its protection. This thought was furthered by the fact that, again, the site had been previously used for agricultural purposes and no permits had previously been attained for the land.

A consultant working for the civil engineer on the Waters of United States permitting noticed and identified the violation. The consultant then elected to self-report the site violation to the United States Army Corps of Engineers (USACE) in an attempt to receive a more favorable decision concerning what penalties, if any, would be levied. The hope was that USACE would consider the violation as a minor incident, not require any further action, and issue the proper permit so that the project could properly resume.

Once the incident was reported, a USACE agent was assigned to the case. There is a government statute stipulating and outlining the amount of time to be expected for a Waters of the United States permit to be issued from the time of a permit application submission. However, there is no such statute regarding issuance of a permit after a violation has been discovered. As a result, although agents are bound to respond to a Waters of the United States permit application in a timely manner, post-violation permitting can sit unanswered indefinitely.

To further complicate the issue, the United States Environmental Protection Agency has seen massive budget cuts under the President Trump administration. This, along with an overall lack of support within the environmental agency for the Waters of the United States program, due to the agency's seemingly too strict guidelines for national water management that were established during the President Obama administration, led to a cut in the number of review agents within the agency available to: process new Waters of the United States permit applications, handle other agency related issues concerning water protection, and most important to the Industrial Park project, review and make violation decisions.

Around the same time, natural disasters like hurricane Harvey in Texas, hurricane Irma in Florida, and hurricane Maria in Puerto Rico thinned the resources and ability of the United States Environmental Protection Agency's agents to act on much else aside from these crises in a timely manner, excluding those things specifically mandated by law. The project seemed to be caught in the "perfect storm".

The review of the initial violation stretched from the date of self-reporting, which was in the early fall of 2017, until May of 2018. This led to a delay of approximately 8 months in the Industrial Park project's schedule for the areas within the restricted zone. During that time, construction outside of the restricted zone was allowed to continue moving forward; however, an inadvertent crossing through the Waters of the United States creek bed by an unknown entity led to a second violation being processed against the project. The second violation was submitted while the first violation still did not have a response.

In the project team's opinion, the USACE agent assigned to the case, under pressure from the developer, the civil engineer, his Waters of the United States consultant, and Ridgemont Commercial Construction to render a decision, decided to get the case off of his desk and

submitted his report to the United States Environmental Protection Agency for a judgement on what was now considered a “willing full violation” due to the terms of the second violation’s occurrence. Under this violation, the United States Environmental Protection Agency could levy substantial fines, recommend jail time for certain parties, and deny permitting if deemed a purposeful violation.

After some time, the United States Environmental Protection Agency referred the case back to USACE with a no action required notice as a final decision. This verdict may have been partially due to the fact that USACE had made an error by never issuing an official violation to the land owner or contractor as required by statute. Instead, a violation was issued to the Waters of the United States consultant who never forwarded the official paperwork to any other parties.

In closure, a full investigation of the perceived damage was made. Then, a remediation plan was issued by the Waters of the United States consultant to USACE. After many months of back and forth commenting on the plan, a contract agreement between the developer, who in this case was the owner of the land, USACE, and Ridgemont Commercial Construction, the general contractor, was signed.

All necessary remedial work in order to return the Waters of the United States zone to its natural and original condition was made. Inspections were performed and an initial acceptance was provided contingent on the developer and Ridgemont Commercial Construction maintaining the area for an additional 3 years. This also includes annual inspections in order to verify that the zone remains in its natural state.

### 5.1.2 Interview with Mr. Rivera

*Mr. Rivera served as the project manager for the general contractor, Ridgemont Commercial Construction, alongside a project manager working for the developer/owner of the site and another project manager for the engineering teams.*

As project manager for the construction facets of the Industrial Park project, I was tasked with delivering the project on time and within the constraints of the budget and project scope. The conclusion of this project taught me a valuable lesson: project managers are responsible for environmental issues, and I unfortunately learned this the hard way.

As stated by Mr. Norman, detection of the creek bed that ultimately ended up as a protected area through the Waters of the United States program should have been the responsibility of the civil engineer and the civil engineer's team. From the outset of the project, we assumed their work to be both thorough and correct.

We later found that the developer/owner's project manager was not familiar with the importance of the Waters of the United States program, so the dried creek bed that ultimately became the point of contention and source of violations went completely overlooked.

Once the creek bed was discovered to be part of the Waters of the United States program, ownership of the issue was transferred to another project manager aside from myself so that construction in the non-restricted zones could continue without delay. Here lies one of the first mistakes: no follow up was ever made concerning the issue as it was assumed that the project manager owning the matter would see it through to the end and make updates to the rest of the heads of teams as necessary.

During the design stage, the development plans included a large number of utility lines to cross or run over the creek area. To achieve this, we needed to acquire specific permitting,

so fencing and erosion control measures were erected around the creek area in order to mitigate and avoid potential damage to the restricted section after the initial violation was self-reported by the civil engineer's consultant. The permit applications were submitted 10 months after the project began. In reality, this should have occurred before any work started. Because a major portion of the project site relied on these utility lines, progress on the site had to stop until the permits were granted. Had work continued, we would have been liable for an intense legal battle and the possibility of a fee of \$100,000 per day that work continued.

The project coming to a stop caused nearly all parties involved to lose money. This is not a good situation for anyone involved. Subcontractors had to be sent home, and a date to begin work again was uncertain.

Once the proper permits were processed and attained, work on the site began again. However, the permits came with specific clauses and rules which were not relayed to Ridgemont Commercial Construction properly. One such clause forbade the crossings over of the creek area by workers and machinery. As one can imagine, without having known that this clause was included with the permit, crossings did occur.

Later, regulators from USACE returned to the site to follow up and noticed the open violation of the aforementioned clause. This caused a major issue, and as explained by Mr. Norman, was seen as a "willing full violation" which carries the possibility of severe repercussions.

In the end, the project was ultimately delayed for a period of over one year due to the two separate violations and experienced extensive cost overruns. The project itself from a project management point of view was not a success; however, because the initial violation

was not specifically the fault of Ridgemont Commercial Construction, we don't consider ourselves fully to blame.

## 5.2 Implemented Changes

The conclusion of the Industrial Park project began conversations around avoiding similar problems and outcomes in the future for Ridgemont Commercial Construction. An exact duplicate circumstance sometime in the future, of course, is not probable, but reacting to similar situations in a more proactive way and identifying areas of issue similar to the ones discussed needed to be addressed.

Project managers, assistant project managers, superintendents, and management teams have been involved in sporadic trainings since the conclusion of the Industrial Park project. Likewise, lessons-learned and notes of importance are more readily shared and presented during discussions at Ridgemont Commercial Construction's bi-weekly meetings. In addition, updates have been made and added to site checklists and routines.

Ensuring a similar event like the one encountered does not occur again in the future is Ridgemont's largest take away from the Industrial Park project.





## 6 Discussion

It is no secret that the field of project management is dominated by the importance of the triple constraint. However, “as sustainability grows in importance, the skills, knowledge, experience, and mindset associated with it will be an increasingly necessary part of every manager’s portfolio” (Savitz, 2013). Project managers and organizations alike will continue to face a shift in demand toward products, services, and processes that are more sustainable. Finding the right balance between profitability and the meeting of these new demands will be an integral part of organizational strategy. And because approximately one third of the world’s GDP is realized through projects, project managers have the ability to make a significant impact on sustainable efforts (Økland, 2015).

Økland (2015) notes the gap that remains between what literature addresses concerning sustainability in project management and what is actually carried out in practice. Bridging the gap between theory and reality will not only allow project managers to implement more sustainable practices into their projects but also reduce the risk of encountering the negative impediments that come with not implementing sustainability i.e. delays, fines, and negative stakeholder outlook.

### 6.1 Stakeholder Involvement and Influence

Even with a standardized set of sustainability indicators, not all businesses can be expected to want or even need to move in the same sustainable direction. As discussed previously, there are a number of stakeholders that will influence the degree of perceived necessary sustainability in a project. Clear corporate social responsibility principles can help project managers balance their responsibilities to a list of stakeholders.

Organizations wishing to strengthen their commitments to sustainable development will continue to experience deepening partnerships where “all stakeholders of a company or an organization, and not just the shareholders/financiers, have the right and legitimacy to receive adequate management attention that takes in to account their interests... and win-win situations [are] sought” (Silvius et al., 2017). This emphasis on relationships with stakeholders is echoed throughout numerous articles from various authors discussing sustainable project management. Silvius (2017) discusses the importance of broadening the perspective and recognition of stakeholders and possibly collaborating with them in the formulation of project objectives, whereas traditional stakeholder management would typically only cater to and address those stakeholders with the most influence or power over a project. Likewise, Elkington noted that “effective, long-term partnerships will be crucial during the sustainability transition” (Elkington, 1998). Another discusses the “pressure on companies to broaden its reporting and accountability from economic performance for shareholders, to sustainability performance for all stakeholders” (Silvius and Schipper, 2010).

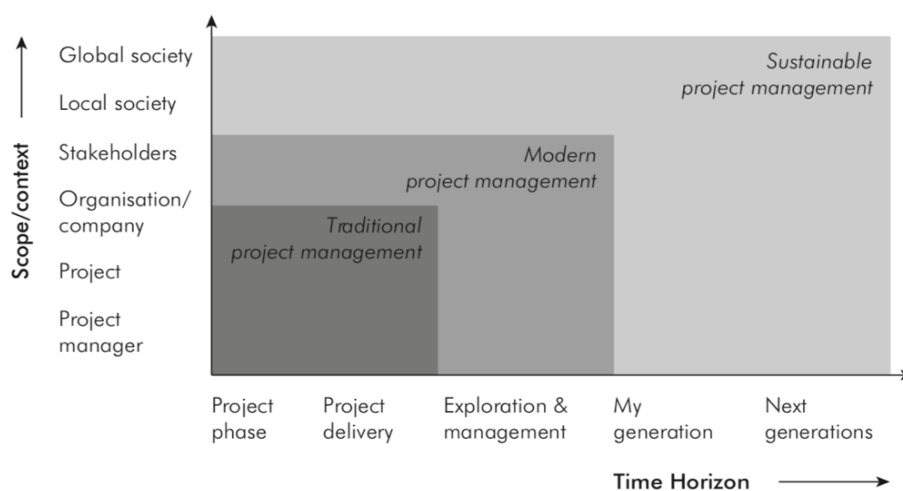


Figure 11: Sustainable Project Management Scope (Silvius et al., 2017)

Aligning with interested parties and creating effective partnerships with stakeholders will aid project managers in delivering effective projects. This open dialogue and collaboration will place the project manager into a central role that may allow them to exercise influence and discuss sustainable opportunities or concerns with stakeholders (Silvius, 2017).

Depicted in Figure 11, the long-term effects of a project as well as the broadened view of included stakeholders must occur as organizations work toward implementing sustainable project management practices.

Project managers should also concern themselves with creating values, not only in terms of economic value for their organization, but also in conjunction with project stakeholders. Økland (2015) addresses a previous paper in his research and explains that due to short-sightedness and the placing of too much importance on economic gains for shareholders, organizations themselves are often to blame when legislation is passed that restricts or impacts their ability to remain at their current competitive level. Not prioritizing the social and environmental aspects of the triple bottom line may ultimately affect an organization's bottom line.

Project success for project management is often only measured at the time of project delivery and is typically only measured against the three iron triangle dimensions: cost, time, and scope. Multiple authors, including Silvius and Schipper (2015), argue that a new approach should be taken that measures project success over a longer horizon which "involves looking at the benefits or effectiveness of the project from the perspective of the stakeholder" (Silvius and Schipper, 2015). This new approach would increase the ability to account for not only a wider economic impact but also the social and environmental paradigms introduced within the triple bottom line method.

## 6.2 Clear Metric Definitions

One of the leading challenges across the industry is the lack of clear and universal metrics by which organizations can set goals and measure progress (Silvius et al., 2017). Silvius et al. (2017) conducted a study concerning decision making processes of project managers and found that considerations regarding sustainability criteria overall ranked much lower than the criteria encompassing aspects of the triple constraint. Without tangible and explicit metrics, it may be difficult to further integrate sustainability and project management. This point is further reiterated by another author who states, “sustainability is increasingly becoming a prime driver in organization strategies; however, it is not always understood in the same way, and therefore the way it is “exercised” in an organization and through project execution and in the day to day operations varies completely according to the company” (Tufinio et al., 2013). These drivers are imperative to influence organizations to become more sustainable (Tufinio et al., 2013) and include a vast array of actors including but not limited to external customers, NGO’s, supply chain partners, and even internal customers.

The continued dominance of the iron triangle thinking in project management is also a threat to further developing a project management methodology that incorporates sustainability. When cost reductions in projects need to be executed, investments and activities whose aim was to increase the project’s sustainability are the first to be removed (Tufinio et al., 2013). However, these actions are in conflict with the idea that “a proactive approach of mitigating risk, for example by investing in sustainability, particularly aimed at secondary stakeholders, creates additional value for shareholders and stakeholders, compared to a reactive ‘paying the damage’ approach” (Silvius et al., 2017).

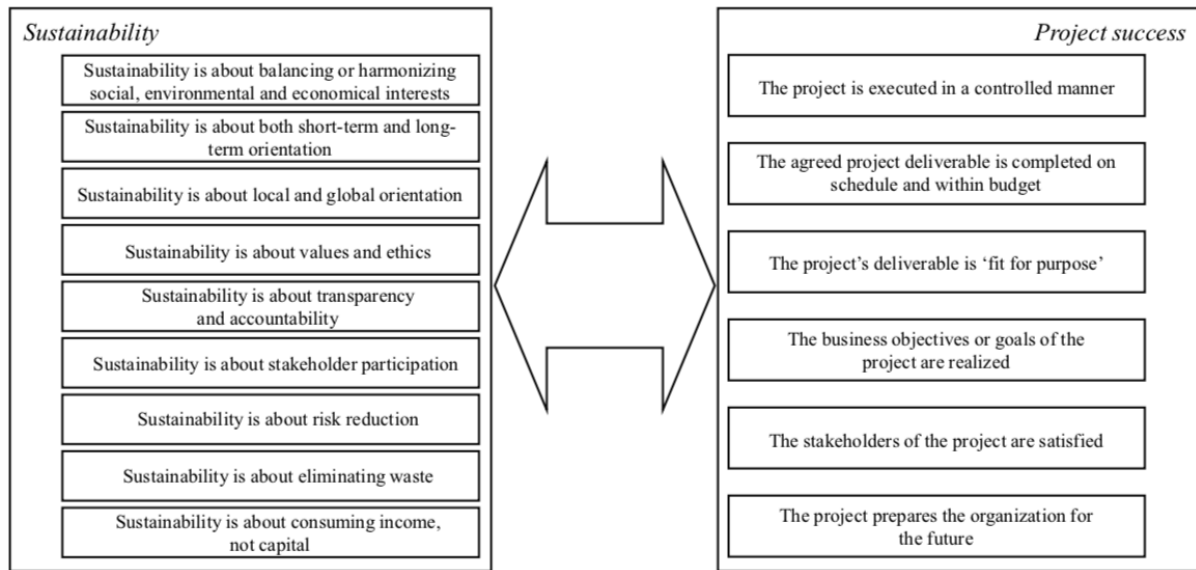


Figure 12: Linking Sustainability Metrics to Project Success (Silvius and Schipper, 2015)

As seen in Figure 12, Silvius and Schipper (2015) outlined 9 major themes of sustainability that link to project success. These themes were narrowed from a larger pool of possible dimensions to consider. Using these dimensions as a possible departure point for defining new metrics would allow for a clearer method in evaluating and measuring a project's success while including its contributions to sustainability.

Organizations must be willing to treat projects as more than short term investments which are mostly evaluated solely on their economic impact. This paradigm shift can be assisted by implementing decisions that reflect the direction in which an organization wishes to move. Implementing clear metrics will help organizations with strategic sustainability goals implement progressive steps in their tangible operations.

### 6.3 Varying Channels of Regulation in the United States

The United States legal jurisdictions are structured in such a way that citizens and corporations alike must comply within a multi-tiered hierarchy of rules and regulations. At the base level, one is subject to the local city ordinances and codes that are unique from town to town. Moving up a level to state law, again the same underlying principle applies.

Each state has the responsibility and ability to pass legislation that is not covered at the federal level. It is also important to note that many professional licensures occur at the state level in the United States. In particular, this means that certain professionals are only allowed to practice their profession within the states in which they have received a license. This is most common in the healthcare, legal, engineering, and architectural professions. The last tier in the hierarchy is federal regulations.

As a corporation, complying at every level of the regulatory hierarchy can become quite complex. Understanding the laws of doing business federally, at the state level, and within the boundaries of the city you're located in can require an enormous amount of research and diligence. Operating across city and/or state lines adds a further level of complexity in conducting business the right and lawful way.

The logistics regarding passage of new laws, regulations, and ordinances at each level differs some from the other two levels. However, at each level within this hierarchy and as is the case in most legal settings around the world, laws are not static. New laws are passed, and existent laws can be amended or removed completely (e.g., Clean Waters Act).

### 6.3.1 Political Influence

A major force influencing regulations is political parties and partisanship. The United States is in the midst of an era of great contention among its two major political parties. As such, the party controlling a majority of the federal government, the Republican Party headed by President Donald Trump, has moved to enact policies that more closely align with their positions and party ideology while also moving to rescind or revise the policies of the current president's predecessor, Barack Obama.

As of January 2018, the Trump administration had moved to undo or change 189 rules and laws in eight major policy groups enacted preceding his time as president. 70 of these

specifically target environmental laws and regulations (Eilperin and Cameron, 2017). It is not unwise to assume something similar may occur when power transitions following Trump's presidency should it be to the opposing party.

This back and forth shifting of power occurs at all three levels within the hierarchy of regulations and law passage further adding to the complexity of understanding the legal expectations of doing and conducting business.

Banihashemi et. al (2017) states "integration of sustainability into project management practices will not occur in absence of support from policy makers." It is my belief that part of the gap Økland (2015) discusses between theory and practice regarding sustainability in project management is the fault of policy and policy makers. A business's main function is to make money. This function is often bolstered by reducing costs. As previously cited, items or processes concerning sustainability are often the first to be revisited in projects when budgets need to be revised. Because of this, organizations often perform at the bare minimum to satisfy federal regulations or local ordinances that are meant to foster the two non-economic factors of the triple bottom line.

#### *6.3.1.1 Carbon Taxes*

A carbon tax is a direct tax added to the emissions of the greenhouse gas carbon dioxide which contributes to climate change. Carbon dioxide emissions are often linked to the burning of fossil fuels and other fueling products. The purpose of the tax is that in the hopes of its levying, consumers and organizations alike will seek out alternatives which produce far less emissions i.e. in individuals' commutes and energy usage and in organizations' processes and products.

The tax itself adds a tangible, measurable dollar amount in which consumers can then link to their contribution in emitting carbon dioxide. Organizations and individual consumers



alike are then faced with decisions between reducing their usages of products that emit carbon dioxide, switching to an alternative which does not emit carbon dioxide and therefore has no tax levied, or paying a premium for their contributions to carbon dioxide emission.

#### 6.3.1.1.1 New York City Carbon Tax

In 2017, New York City conducted a study aimed at measuring and quantifying the city's carbon dioxide emissions to better understand the topography of their contributions to global climate change. The study concluded that nearly 70 percent of the city's emissions is due to buildings and the energy needed to run them properly (Cummins, 2019). A further analysis by a third party "found that just 2 percent of the city's buildings consume 45 percent of its energy" (Ivanova, 2019).

Buildings require electricity to run their lighting, heating and cooling technologies, as well as their staff-aiding electronics. Older buildings in the city often do not have proper or adequate insulation meaning large amounts of electricity are wasted in the summers and winters trying to maintain a pleasant, workable temperature inside.

The carbon tax enacted by New York City is meant to encourage building operators to begin retrofitting their buildings with more energy efficient materials i.e. replacing windows that allow large amounts of heat transfer, installing heat recovery systems, and sealing roofs or attics that are not properly insulated (Cummins, 2019).

Newer building projects often employ at least some of these energy saving technologies and processes, but with the enactment of the city's new carbon tax, building operators, owners, and construction project managers will all be more heavily inclined to incorporate ideas aimed at reducing a building's energy needs.

## 6.4 Case

The Industrial Park case with Ridgemont Commercial Construction served as a prime example of how not being fully aware of the effects of federal programs and regulations can have devastating consequences.

As Mr. Norman also mentioned, restructuring of the priorities within the United States Environmental Protection Agency played a significant role in the delays of decision making encountered for the granting of the required permits. This led to large amounts of uncertainty regarding scheduling as well as delays in the construction schedule itself. Had the Waters of the United States program been better understood and had the application for proper permitting been submitted before site development began, the delays and cost overruns Ridgemont Commercial Construction faced during the Industrial Park project most likely would have been avoided.

Incorporating lessons learned and re-evaluating and updating processes to more stringently account for environmental regulations which projects may encounter are some of the steps Ridgemont Commercial Construction is taking to improve their chances for successful project delivery in their future work.

## 6.5 Need for a New Model

In the Intergovernmental Panel on Climate Change's "Summary for Policy Makers", the report states "climate change impacts and responses are closely linked to sustainable development" and that "the United Nations Sustainable Development Goals... provide an established framework for assessing the links between global warming of 1.5°C or 2°C and development goals" ("Summary for Policy Makers", 2018). Asserting the link between climate change and SDGs as a framework to mitigating climate change provides a basis for departure on developing a new model within project management theory that will better

address the goals of sustainable development. Literature on sustainability in the project management field is not scarce, but again, the gap between theory and what occurs in practice must continue to be addressed.



## 7 Conclusion

### 7.1 Practical Implications

Sustainability has been and will continue to be an area of much focus for industries around the globe. The threat of climate change, the degradation of the environment and natural resources, as well as the goal to abolish hunger and extreme poverty will continue to influence the policy makers, internal and external customers, and supply chain partners that organizations interact with. Project managers must be willing and able to adapt to new demands in order to stay competitive and relevant.

The iron triangle has affected the field of project management by maintaining that social and environmental dimensions pale in comparison to aspects of economic success. This thinking has disallowed project managers and their teams from contributing fully to a more sustainable future by emphasizing profit over people and planet.

However, as the focus in project management continues to move more toward a broad stakeholder view away from one heavily entrenched in economic and financial gain, projects and organizations themselves will be driven toward sustainable development. This will be accomplished through stronger collaboration with stakeholders and responding to their calls for more sustainable products and processes.

Organizations can ease this transition by implementing clear metrics that are designed to foster a greater contribution to sustainability and continuing to move toward a broader stakeholder view that values creating value for all involved stakeholders. Organizational strategy will ultimately dictate at least the minimum level to which project managers implement sustainability into their projects.

As experienced by Ridgemont Commercial Construction, a project's successful completion can be heavily influenced by environmental regulations. The Industrial Park project faced delays and budget overruns due to failing to secure proper permits. Although this failure was internally viewed as the fault of an external partner, Ridgemont Commercial Construction was able to implement lessons learned and changes to processes that may help the company avoid the same outcome in a later project.

A major contributor to the delays and cost overruns that Ridgemont Commercial Construction encountered was the fact that the United States Environmental Protection Agency, under new leadership, had adjusted its priorities. This adjustment specifically impacted the regulation with which Ridgemont Commercial Construction had violated and stalled decision making regarding proper procedure and penalties.

As climate change and its causes continue to be a contentious topic in the United States, policy and regulations regarding the subject will most likely remain volatile. Maintaining an accurate and timely knowledge of current sustainability laws will be necessary for project managers and their teams, or they stand to face issues like those experienced by Ridgemont Commercial Construction during the Industrial Park project.

## 7.2 Further Work

The conclusion of this report possibly leaves further work to be completed.

An analysis of more project cases would allow for a quantification of costs and delays due to the effects of sustainability regulations to be completed. Calculating these factors may be helpful in presenting a case for stabilizing the volatility of sustainability regulations by showing the direct impacts to projects due to this instability.

Likewise, as other authors have suggested, there is still a need for a new paradigm or model in the project management industry. Organizations' practices must catch up to literature and stakeholder expectations.

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## Appendices

### Appendix 1: Interview Guide

Ask for permission to take notes.

Briefly explain the objectives of my research.

Ask if clarification is needed or if questions have arisen.

Questions:

1. What was your specific role during the Industrial Park project?
2. Who were the invested parties for the project?
3. When did the project begin, and how involved was Ridgemont Commercial Construction in the pre-construction phase?
4. What led to the delays?
5. In your opinion, how could the root cause of the delays have been avoided?
6. If there is fault able to be assigned, who would be responsible?
7. What was the total delay?
8. What was the total impact on the budget?
9. Have any changes been made within the company to ensure something similar does not occur again?