

Interpretation Planning Purcell's Cove Granite Quarries

Halifax, Nova Scotia



(Steam locomotive at Purcell's Cove, Nova Scotia Archives, 1916)

School of Planning, Dalhousie University
Honours Thesis
April 8, 2016

Cole Grabinsky
Supervisor: John Zuck

Acknowledgements

I am deeply appreciative of all of the help I was given to complete this project. Thank you to John Zuck for your continued support and guidance throughout the year. Thank you to Marcos Zentilli for sharing your enthusiasm and knowledge about the historic quarries at Purcell's Cove. Thank you to Sean Weseloh-McKeane, Lawrence Plug, Lynda Rogers, and Jennifer Strang for providing technical support for this project. And finally, thank you Rachael Groat for your ongoing determination and collaboration on this Honours Thesis.

Executive Summary

Purcell's Cove is a small community located on the western shore of the Northwest Arm in Halifax, Nova Scotia. The industrial heritage of this site is significant for the founding of Halifax and the history of the province. Historically, quarrying was an important activity at Purcell's Cove. Granite quarries located at this site supplied the building material for many historic structures in downtown Halifax including the Town Clock, St. Mary's Basilica, and the Halifax Citadel. The first railroad in Eastern Canada was built to service these quarries. This project focuses on the industrial history of the Purcell's Cove granite quarries and follows an interpretation planning process to identify character defining elements. I collaborated with Rachael Groat who explored the geologic history of this area.

In this report, I prepared background material for an interpretation plan for Purcell's Cove. Interpretation planning is about connecting people with places. I gathered information to identify significant themes, stories, and locations for interpretation. I then created a timeline of events related to quarrying and identified character defining elements of this area. These elements were selected based on historical records, site visits, my acquired knowledge of quarrying methods, and insight from local experts. The site of the historic railroad tracks, shims and wedges left in the rock, drill holes, quarry cuts, quarry pits, and a rock wall foundation were the most significant elements I found. All of these features were recorded using GPS coordinates and mapped using ArcGIS. Given the historical significance of these quarries, I also reviewed municipal, provincial, and federal approaches that could recognize the heritage value of this site.

Land ownership and zoning are the main constraints to heritage conservation at the Purcell's Cove quarries. Many historic artifacts are situated on private property. In several cases, private dwellings have been constructed right on top of old quarry sites. To protect the character defining elements of this area from future development, Rachael Groat and I have prepared an application to the Maritime Archaeological Resource Inventory and made a list of recommendations. The history of quarrying in this area, stunning views of the Northwest Arm, access to hiking trails on conservation lands, and proximity to downtown Halifax make Purcell's Cove an ideal location for interpretation planning. Purcell's Cove has a rich cultural, geologic, and industrial heritage which deserves to be celebrated and protected into the future.

Table of Contents

Acknowledgements.....	i
Executive Summary.....	ii
Table of Contents.....	iii
List of Figures.....	v
Introduction.....	1
Background.....	2
Literature Review.....	3
• The Role of Interpretation Planning	
• Defining Interpretation Planning	
• Interpretation Methods	
Project Goals.....	6
Method.....	7
• Process and Workflow	
• Data Collection and Analysis	
• Synthesis	
Results.....	9
• Site Overview	
• History of Granite Quarrying at Purcell’s Cove	
• Techniques for Quarrying Granite	
• Site Inventory	
• Local Planning Context	
• Heritage Conservation	
Synthesis.....	31
• Character Defining Elements	
• Potential Interpretation Materials	
• Site Opportunities	
• Site Constraints	
• Conservation Potential	
Recommendations.....	37
Conclusion.....	38
References.....	39
Appendix.....	42

List of Figures

Figure 1: Purcell's Cove.....	1
Figure 2: Purcell's Cove in the context of the HRM.....	2
Figure 3: Purcell's Cove Backlands.....	3
Figure 4: Interpretation planning workflow chart.....	7
Figure 5: Purcell's Cove granite quarries context map.....	10
Figure 6: Extent of interpretation signage for Purcell's Cove.....	11
Figure 7: Royal Engineers map of land grants for quarries at Purcell's Cove.....	12
Figure 8: Railroad tracks at Purcell's Cove.....	13
Figure 9: Cutting shed at Purcell's Cove.....	13
Figure 10: Fourth Halifax Citadel.....	14
Figure 11: Nova Scotia building stone production 1873 to 1973.....	15
Figure 12: Geological location map for quarries at Purcell's Cove.....	16
Figure 13: View of Queens Quarry today.....	17
Figure 14: View of Purcell's Cove Quarry today.....	17
Figure 15: View of Coughlan Quarry today.....	18
Figure 16: Tools used for granite quarrying.....	20
Figure 17: Purcell's Cove granite quarries site inventory.....	21
Figure 18: Pile of waste rock at Coughlan Quarry.....	22
Figure 19: Quarry cuts at Purcell's Cove.....	22
Figure 20: Cylindrical holes found at Queens Quarry.....	22
Figure 21: Deep blast hole along face of granite at Queens Quarry.....	23
Figure 22: Series of wide holes indicative of blasting.....	23
Figure 23: Rock wall remains found at Purcell's Cove.....	24
Figure 24: Elevated railroad platform leading to Queens Quarry.....	25
Figure 25: Shims and wedges found at Purcell's Cove.....	25
Figure 26: Glacier erratic, known as Rocking Stone, at Purcell's Cove.....	26
Figure 27: Purcell's Cove zoning map.....	27
Figure 28: Purcell's Cove property ownership map.....	28
Figure 29: Purcell's Cove granite quarries character defining elements.....	31
Figure 30: Site of the railroad tracks today.....	32
Figure 31: Shims and wedges at Purcell's Cove.....	32
Figure 32: Drill holes in granite at Purcell's Cove.....	32
Figure 33: Quarry cuts at Purcell's Cove.....	33

Figure 34: Coughlan Quarry pit.....	33
Figure 35: Rock wall foundation at Purcell's Cove.....	33
Figure 36: Timeline of quarrying events.....	34
Figure 37: Purcell's Cove quarrying process.....	35

Introduction

Interpretation planning is about connecting people with special places. The role of interpretation planning is to tell the story of a place in a way that is engaging for visitors.¹ At Purcell's Cove in Halifax, Nova Scotia, significant natural and cultural stories are intertwined. The purpose of this project is to identify significant stories related to historic quarry operations in order to prepare background information for an interpretation plan for this area. Colleague Rachael Groat has prepared a report on the geologic and natural history of this site as it pertains to interpretation planning. This project is focused on the industrial history of granite quarrying at Purcell's Cove.

Purcell's Cove on Halifax's Northwest Arm has been a significant location for the quarrying of granite, ironstone, and slate. In the early history of Halifax, quarries at Purcell's Cove supplied the material to build the Citadel, the historic Town Clock, and many other buildings in downtown Halifax.² Quarrying operations in this area benefited from their proximity to Halifax and access to the ocean. The railroad built to service these granite quarries is thought to be the first constructed anywhere in Eastern Canada.

Community groups including the Purcell's Cove Neighbourhood Committee and the Backlands Coalition want to protect the natural and cultural heritage of Purcell's Cove. Interpretation planning can be used as a tool to evaluate heritage elements worth saving and assess the best approach to protect these elements. The interpretation planning process identifies the objectives for interpretation, the resources of a place, and the themes or stories that can be told.³ This approach promotes protection by raising awareness of the site's heritage value.



Figure 1. Purcell's Cove, retrieved from http://www.pcnc.chebucto.org/news/images/IMG_2046-w.jpg

¹ James Carter, *A Sense of Place: An interpretive planning handbook* (Scotland: Scottish Interpretation Network, 2001), accessed March 19, 2016. <http://www.greentourism.org.uk/SOFP.PDF>

² Elsie Millington, *Purcell's Cove: The little place that helped build Halifax City* (Victoria: Desktop Publishing Ltd., 2000).

³ James Carter, *A Sense of Place: An interpretive planning handbook* (Scotland: Scottish Interpretation Network, 2001), accessed March 19, 2016. <http://www.greentourism.org.uk/SOFP.PDF>

Background

Purcell's Cove is a small community located on the western shore of the Northwest Arm in Halifax, Nova Scotia. This area is on the contact between granite and slate bedrock. The granite bedrock "forms knolls elevated up to 150m" above sea level.⁴ The slate generally occupies lower elevations. Purcell's Cove has



Figure 2. Purcell's Cove in the context of the Halifax Regional Municipality, data from Halifax Regional Municipality.

historically been an important location for the quarrying of granite, ironstone, and slate. In her book, *Purcell's Cove: The Little Place that Helped Build Halifax City*, Elsie Millington explains how important Purcell's Cove was for the building of Halifax. Many buildings in downtown Halifax including the Citadel, the historic Town Clock, the walls of the Grand Parade, and the old Post Office used stone produced by quarries at Purcell's Cove.⁵ The railroad in the granite quarry is thought to be the first constructed anywhere in Eastern Canada.⁶ There are three historic granite quarries at Purcell's Cove: Queens Quarry, Purcell's Cove Quarry, and Coughlan Quarry. At these sites, there are a number of artifacts including shims and wedges left in the rock, quarry cuts, and large amounts of waste rock from quarrying activities.

There is currently no interpretation plan for the geologic, natural, or industrial history of this area. A plaque, commissioned by Purcell's Cove Millennium Reunion in 2000, commemorates the site of the railroad leading to Queens Quarry. It states that the railroad was used to transport granite from "the hills to the wharf below". Aside from this marker, few other interpretation materials exist.

This planning project is timely given public interest in this area. The Backlands Coalition, a collection of non-governmental groups, has an interest in preserving natural, historical, cultural, conservation, educational, and recreational values in the Purcell's Cove Backlands. The Purcell's Cove Backlands, shown in Figure 3, include the entire area enclosed by Herring Cove Road and Purcell's Cove Road and extend from Williams Lake to

⁴ Derek Davis and Sue Brown (Ed.). *Natural history of Nova Scotia: topics and habitats (Vol.2)* (Halifax: Nova Scotia Museum, 1996), 210.

⁵ Elsie Millington, *Purcell's Cove: The little place that helped build Halifax City* (Victoria: Desktop Publishing Ltd., 2000).

⁶ *Ibid.*



Figure 3. Purcell's Cove Backlands, retrieved from http://backlandscoalition.ca/?page_id=32

Powers Pond. The Purcell's Cove Neighbourhood Committee (PCNC) has also shown an interest in protecting the cultural heritage value of the Purcell's Cove Backlands. In July of 2015, the PCNC submitted an application to recognize the recreational, ecological, and cultural assets of this area in the Halifax Green Network Plan.⁷ In this submission, the old railroad bed and the historic granite and slate

quarries are recognized as important cultural and historical features. This thesis project began as a result of community interest in the heritage of this area. PCNC member and expert geologist, Marcos Zentilli, has been involved with many initiatives at Purcell's Cove and was a key consultant for this thesis project.

Literature Review

Interpretation Planning Process

The focus of interpretation is on communication of ideas and telling stories about a place. Everything visitors do, think, sense, and feel is part of their experience with a place, from trail signage to online materials to guided tours.⁸ Carter describes interpretation planning as a process.⁹ This process identifies:

- goals and objectives;
- themes and stories;
- resources of a place;
- and the audience for interpretation

⁷ "News and Announcements," Purcell's Cove Neighbourhood Committee, accessed March 19, 2016, <http://www.pcnc.chebucto.org/news/index.html>

⁸ National Park Service, *Planning for interpretation and visitor experience*, (Harpers Ferry Center, 1998), accessed March 19, 2016. <http://www.nps.gov/hfc/pdf/ip/interp-visitor-exper.pdf>

⁹ James Carter, *A Sense of Place: An interpretive planning handbook* (Scotland: Scottish Interpretation Network, 2001). Accessed March 19, 2016. <http://www.greentourism.org.uk/SOFP.PDF>

The interpretation planning process begins by understanding the goals and objectives of interpretation. The goals of interpretation can include informing people, entertaining them, influencing their behaviour, and developing a sense of place.¹⁰ An interpretation theme should express “the idea you want people to take away with them”.¹¹ Themes for interpretation include archeological, urban, cultural, industrial, and natural subjects. The resources available at a place will determine how the stories can be told. An inventory of the resources can establish significant stories and locations for interpretation.¹² Finally, understanding the audience for interpretation is essential for resources, stories, and themes to be presented in an interesting and engaging way.

Principles of Interpretation Planning

Freeman Tilden is recognized by many heritage experts as the “Father of Heritage Interpretation”.¹³ In 1957, he wrote the first book on interpretation planning entitled, *Interpreting Our Heritage*. Tilden identifies six principles for successful interpretation planning which guide the interpretation process.¹⁴ They are as follows:

1. Any interpretation that does not somehow relate what is being displayed or described to something within the personality or experience of the visitor will be sterile.
2. Information, as such, is not Interpretation. Interpretation is revelation based on information. But they are entirely different things. However, all interpretation includes information.
3. Interpretation is an art, which combines many arts, whether the materials presented are scientific, historical, or architectural. Any art is to some degree teachable.
4. The chief aim of Interpretation is not instruction, but provocation.
5. Interpretation should aim to present a whole rather than a part, and must address itself to the whole person rather than any phase.

¹⁰ James Carter, *A Sense of Place: An interpretive planning handbook* (Scotland: Scottish Interpretation Network, 2001). Accessed March 19, 2016. <http://www.greentourism.org.uk/SOFP.PDF>

¹¹ *Ibid.*, 6.

¹² *Ibid.*

¹³ “Freeman Tilden,” HDC International, para.1, accessed March 19, 2016, <http://www.heritagedestination.com/freeman-tilden.aspx>

¹⁴ Freeman Tilden, *Interpreting our heritage (3rd ed.)* (Chapel Hill: University of North Carolina Press, 1977), 9.

6. Interpretation addressed to children (say, up to the age of twelve) should not be a dilution of the presentation to adults, but should follow a fundamentally different approach. To be at its best it will require a separate program.

Sam H. Ham argues that these six principles remain essential for interpretation planning today. He emphasizes the importance of relevant interpretation, which is both meaningful and personal for the audience.¹⁵ In order to make information meaningful, it is best to avoid technical terms and provide examples and analogies that the audience will understand.¹⁶ Ham references Tilden's first principle of interpretation to illustrate why interpretation must be personal. If the information is meaningful but does not offer new insight, it becomes unimportant to people.¹⁷ Successful interpretation planning seeks to understand the needs of the audience and "tailor communication methods to suit them".¹⁸

The Role of Interpretation Planning

The role of interpretation planning is to tell the story of a place in a way that is engaging and entertaining. Interpretation is "an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media".¹⁹ In almost any place, there are both natural and cultural stories that are related to one another. An interpretation plan is a tool to identify these stories and determine the best way to tell them.

Interpretation materials can take a variety of forms including guided tours, signage, pamphlets, a visitor centre, or online materials. Carter states that "[y]ou will have a clear understanding of which media are appropriate given the characteristics of your place and its sensitivity; your likely audience and how many of them you expect; the themes you are presenting; and the resources you have".²⁰ The test of good interpretation planning is what visitors take away from the experience. Carter emphasizes that it is not about the telling of information but the stirring of thoughts.

Interpretation planning can help shape the economic and cultural landscape of a place. In Nova Scotia, interpretation planning is important for tourism. In 2013, tourism was

¹⁵ Sam Ham, *Environmental Interpretation: A practical guide for people with big ideas and small budgets* (Golden: North American Press, 1992), accessed March 19, 2016, <https://serceducationvolunteers.files.wordpress.com/2012/12/interpretation-sam-ham1.pdf>

¹⁶ *Ibid.*

¹⁷ *Ibid.*

¹⁸ *Ibid.*, 6.

¹⁹ Freeman Tilden, *Interpreting our heritage* (3rd ed.) (Chapel Hill: University of North Carolina Press, 1977), 8.

²⁰ James Carter, *A Sense of Place: An interpretive planning handbook* (Scotland: Scottish Interpretation Network, 2001), 10. Accessed March 19, 2016. <http://www.greentourism.org.uk/SOFP.PDF>

a \$2 billion industry in Nova Scotia and provided 24,000 jobs across the province.²¹ Tourists are interested in the stories of a place and the way people engage in tourism is changing. Studies show that 65 percent of travellers explore destinations online before going.²² Nova Scotia has a goal to grow tourism across the province through consistent messaging and branding.²³ Interpretation planning could help establish significant environmental and cultural themes for the benefit of tourism across the province.

In 2009, Nova Scotia Tourism, Culture and Heritage produced the Interpretive Master Plan in conjunction with Nova Scotia Museum. It is a useful tool for shaping interpretation in Nova Scotia. The goals of this plan are to contribute to a common appreciation for Nova Scotia's heritage; allow interpretation to be authentic, relevant, and inclusive for all audiences; and ensure best practices in interpretation are followed.²⁴ This master plan includes an objective to increase emphasis on natural history and to integrate natural and cultural stories.²⁵ Exploring natural and cultural stories of Purcell's Cove aligns with this provincial objective.

Project Goals

The goal of this project was to prepare background material for an interpretation plan at Purcell's Cove and explore ways in which the character defining elements of this site could be protected. To carry out this work, I collaborated with colleague Rachael Groat, who examined the geology and natural history of this site. My thesis focused on quarrying operations as they relate to the cultural and industrial heritage of Purcell's Cove. To meet the goal of this project I:

1. Gathered information to identify significant themes and stories
2. Established significant stories, locations, and character defining elements
3. Reviewed municipal, provincial, and federal approaches that recognize industrial heritage sites
4. Prepared a background report and completed an application for site recognition

²¹ Government of Nova Scotia, *A tourism strategy for Nova Scotia*, (Nova Scotia Tourism Agency, 2013). Accessed March 19, 2016. https://tourismns.ca/sites/default/files/page_documents/tourism-strategy-final-2013.pdf

²² *Ibid.*

²³ *Ibid.*

²⁴ Nova Scotia Tourism, Culture and Heritage & Nova Scotia Museum, *Interpretive master plan*, (Form Media, 2009). Accessed March 19, 2016. <https://museum.novascotia.ca/sites/default/files/inline/images/nsimp.pdf>

²⁵ *Ibid.*

Method

Process and Workflow

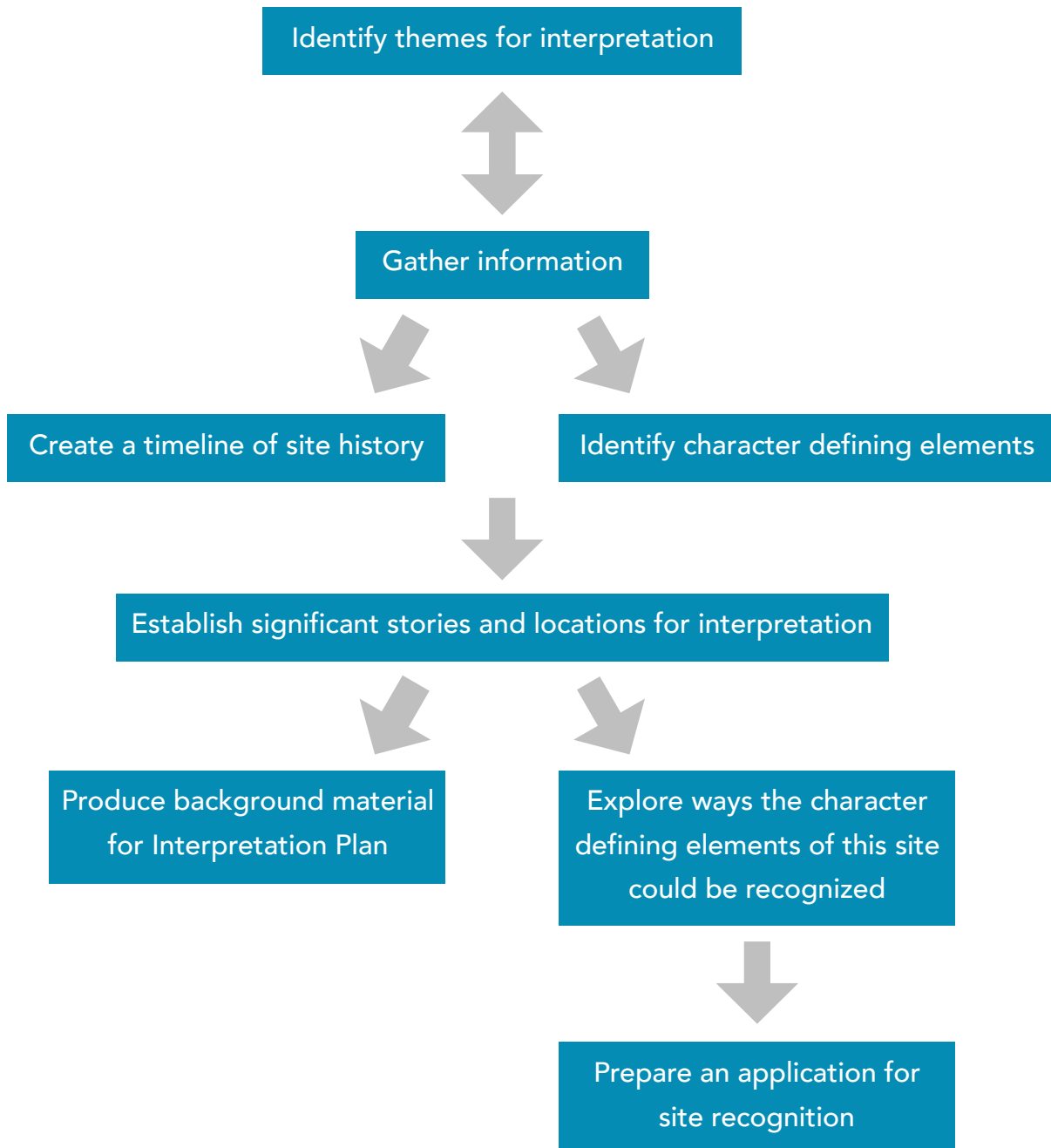


Figure 4. Interpretation planning workflow chart.

The interpretation planning process begins by selecting themes that have been identified by community members and local experts. Purcell's Cove has a long history of quarrying, therefore the themes for interpretation include the historical significance of quarrying in Nova Scotia, the traditional methods of quarrying, and the transportation of quarried granite at this site. Through research and fieldwork, I gathered information about these themes and constructed a timeline of significant events. I also collected GPS coordinates and mapped character defining elements such as quarrying remains. Using these maps, I established significant stories and locations for interpretation. All of these steps allowed me to produce background material for an Interpretation Plan. Finally, I conducted a policy review to explore ways the character defining elements of this site could be recognized.

Data Collection and Analysis

In order to collect data for this project, I:

- Reviewed property deeds and maps produced by the Royal Engineers available through the Nova Scotia Archives
- Gathered historic photographs of the granite quarries available through the Nova Scotia Archives
- Gathered information about the historical significance of quarrying in Nova Scotia through reports published by the Nova Scotia Department of Natural Resources
- Gathered information about the methods of quarrying and transporting granite through historical resources available online and Marcos Zentilli, an expert source from Dalhousie's Geology Department
- Conducted site visits to identify and map character defining elements of the quarries
- Collected and mapped GPS coordinates to document the boundaries of the quarries
- Collected and mapped GPS coordinates to document the location of quarry artifacts and existing trails
- Reviewed and mapped zoning and land ownership data available through the Halifax Regional Municipality and Dalhousie University's Geographical Information Sciences Centre
- Reviewed and summarized existing municipal, provincial, and federal approaches to protecting industrial heritage sites

- Combined online, on-site, and archival information to construct a timeline of events related to granite quarrying at Purcell's Cove
- Constructed the method of how granite was quarried and transported at Purcell's Cove

Synthesis

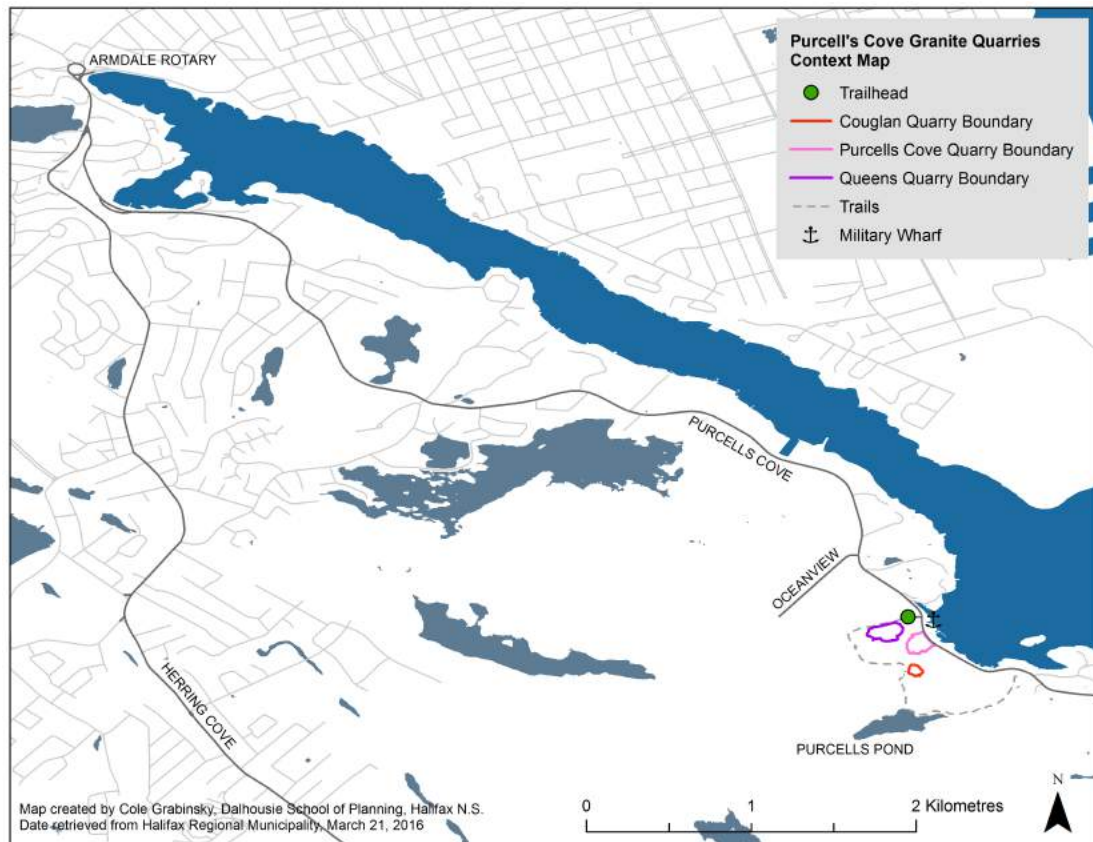
In order to synthesize data for this project, I:

- Produced a timeline of significant events for granite quarrying at Purcell's Cove
- Produced background material about how granite was quarried and transported
- Determined the most significant character defining elements of this site and mapped these features
- Discussed opportunities and constraints associated with interpretation planning at Purcell's Cove
- Identified ways to recognize the character defining elements of Purcell's Cove
- Prepared an application for this site to be submitted to the Maritime Resource Inventory

Results

Site Overview

The Purcell's Cove granite quarries are located on the western shores of the Northwest Arm in Halifax, Nova Scotia. To get to the site from the Armdale Rotary, take the exit toward Purcells Cove Road. Then continue onto Purcells Cove Road (NS-253 S) for 5.9 kilometres. Turn onto 18th Battery Road and the parking lot is located north of the Purcell's Cove Social Club. The site of these historic quarries is roughly 86,250m² or 8.6 hectares in size. The area extends from Oceanview Drive to Purcells Pond and to the site of the historic Military Wharf. The main trailhead is located between the Purcell's Cove Social Club and the Dalhousie Playground. At the start, the trail runs parallel to the historic railroad bed. It goes past Queens Quarry, Coughlan Quarry, Purcells Pond, and exits further down onto Purcells Cove Road.

Figure 5. Purcell's Cove granite quarries context map.

Currently, there are only two signs with interpretation material at Purcell's Cove. At the parking lot there is a stone marker, shown in Figure 6, which designates the site of the railroad leading to Queens Quarry. This marker serves as a trailhead to the unofficial network of trails that provide access to Queens Quarry and Coughlan Quarry. Today, a private residence and a boat yard are situated in the middle of Purcell's Cove Quarry, which is only accessible from Purcell's Cove Road. On the other side of Purcell's Cove Road is the site of the historic Military Wharf. At the Military Wharf, there is another sign that recognizes the founding of Purcell's Cove and the site of Eastern Canada's earliest railroad. No other interpretation signage, or amenities such as washrooms, trail maps, or pamphlets exist.

Figure 6. Extent of interpretation signage for Purcell's Cove.



History of Granite Quarrying at Purcell's Cove

The development of granite quarries at Purcell's Cove is entwined with the early history of Halifax. Historians such as Elsie Millington, who wrote *Purcell's Cove: The Little Place that Helped Build Halifax City*, have recognized how important Purcell's Cove was for the establishment of Halifax. Purcell's Cove was a large supplier of both granite and ironstone which were used in buildings and in the construction of defences.²⁶ Many iconic historic buildings in Halifax, including the Town Clock, the Citadel, and the facade of St. Mary's Basilica were constructed with granite from Purcell's Cove quarries. The following timeline details significant local and global events with connection to quarrying activity at Purcell's Cove.

²⁶ Elsie Millington, *Purcell's Cove: The little place that helped build Halifax City* (Victoria: Desktop Publishing Ltd., 2000).

Date	Historic Events Related to Granite Quarrying in Purcell's Cove, NS
1749	Town of Halifax is founded by Edward Cornwallis who arrived with 2,576 colonists from Britain. ²⁷ First license to quarry lots at Purcell's Cove is granted to Robt. Dickey. ²⁸
1765-83	The American Revolution forces Britain to increase their military presence in Halifax resulting in the construction of defensive infrastructure. ²⁹
1804	The first steam locomotive to run on rails is invented in the United Kingdom by Richard Trevithick. ³⁰
1826	License to Queens Quarry is granted to Gustavus Nicolls, Esq., a colonel in His Majesty's arm commanding the Royal Engineers at Halifax, the Hon. Charles Morris, Surveyor General, and Sir Rupert De George, Bart., Secretary of the Province of Nova Scotia. ³¹

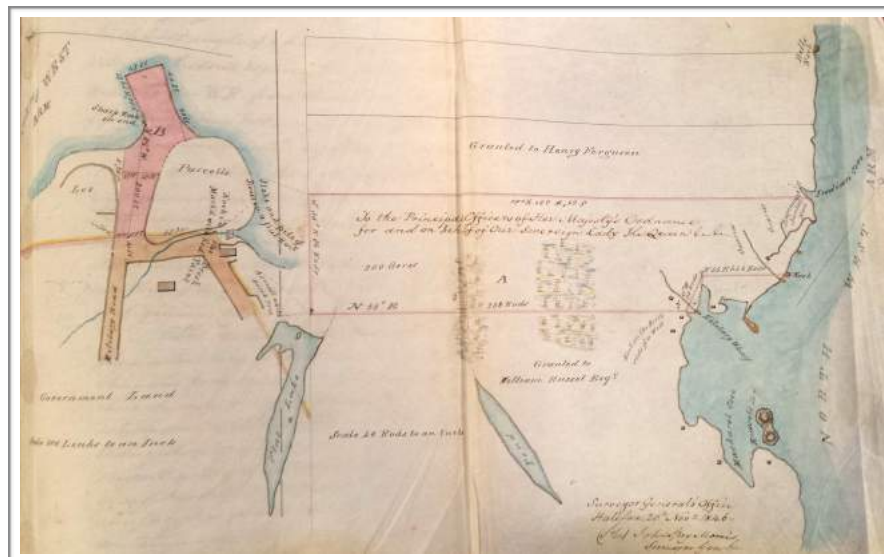


Figure 7. Royal Engineers map of land grants for quarries at Purcell's Cove, Nova Scotia Archives, 1846.

1829 St. Mary's Basilica is constructed using stone quarried at Purcell's Cove.³²

²⁷ "Halifax Citadel National Historic Site of Canada," Parks Canada, accessed March 19, 2016, <http://www.pc.gc.ca/eng/lhn-nhs/ns/halifax/natcul/natcul3.aspx>

²⁸ Marcos Zentilli, *The Purcell's Cove Stone Quarries* (PowerPoint Presentation), accessed March 19, 2016.

²⁹ "Halifax," *The Canadian Encyclopedia*, accessed March 19, 2016, <http://www.thecanadianencyclopedia.ca/en/article/halifax/>

³⁰ "Richard Trevithick - Locomotive Inventor," *Train History*, accessed March 19, 2016, <http://www.trainhistory.net/train-invention/richard-trevithick/>

³¹ John W. Regan, *Sketches and Traditions of the Northwest Arm* (Halifax: McAlpine Publishing Company, 1908).

³² Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1993).

- 1830** Shim and wedges method, also called the plug and feathers method, for quarrying granite is adopted across the Eastern United States.³³ In this method, stonecutters make a series of holes across the intended line of fracture and gently apply pressure to get regular blocks of granite.
- 1834** Tracks leading to Queens Quarry are constructed, considered to be the first railroad in Eastern Canada.³⁴ The steam locomotive and the railroad were instrumental in transporting granite from the quarry to the cutting shed to the wharf below.



Figure 8. Railroad tracks at Purcell's Cove, Nova Scotia Archives, 1916.

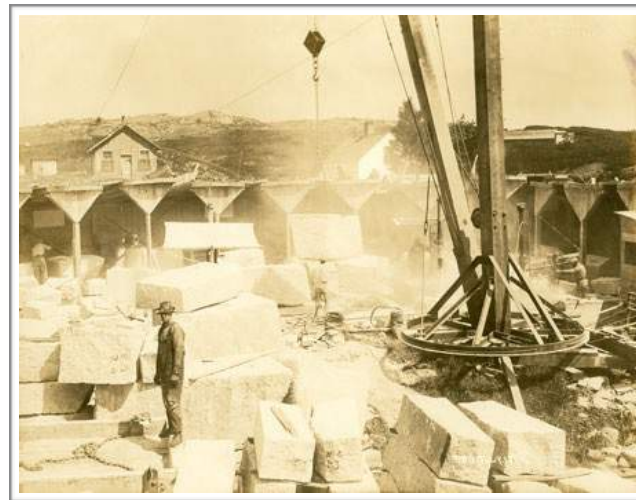


Figure 9. Cutting shed at Purcell's Cove, Nova Scotia Archives, 1916.

³³ James L. Garvin, *Granite Splitting Tools and Techniques* (State of New Hampshire Department of Cultural Resources, 2007). https://www.nh.gov/nhdhr/publications/documents/stone_splitting_handout.pdf

³⁴ Elsie Millington, *Purcell's Cove: The little place that helped build Halifax City* (Victoria: Desktop Publishing Ltd., 2000).

- 1856** The Halifax Citadel, designed by Gustavus Nicolls, is built by the Royal Engineers to strengthen the town's defences.³⁵ Granite quarried at Purcell's Cove is transported by barge and used in the construction.³⁶



Figure 10. Fourth Halifax Citadel, retrieved from <http://www.pc.gc.ca/eng/lhn-nhs/ns/halifax/natcul/natcul6.aspx>.

- 1863** The sandstone quarry in Wallace, Nova Scotia opens.³⁷ The Wallace Quarry is still the largest stone producer in Nova Scotia.³⁸
- 1914** Geologists from Ottawa conduct a survey of building and ornamental stones in Nova Scotia. By this time, Queens Quarry has been abandoned.³⁹
- 1960s** Production at Coughlan Quarry shuts down marking the end of granite quarrying at Purcell's Cove.⁴⁰

³⁵ "Halifax Citadel National Historic Site of Canada," Parks Canada, accessed March 19, 2016, <http://www.pc.gc.ca/eng/lhn-nhs/ns/halifax/natcul/natcul6.aspx>

³⁶ Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1996).

³⁷ "The Quarry Then," Wallace Quarries Ltd., accessed March 19, 2016, <http://www.wallacequarries.com/the-quarry-then.html>

³⁸ Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1993).

³⁹ William A. Parks, *Building and Ornamental stones of Canada Volume 2* (Ottawa: Government Printing Bureau, 1914).

⁴⁰ Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1996).

1973 From 1873 to 1973, 1,000,000 tonnes of stone production is recorded by the Nova Scotia Department of Mines.⁴¹ Quarries at Purcell's Cove account for most of the granite produced in the province during this period.

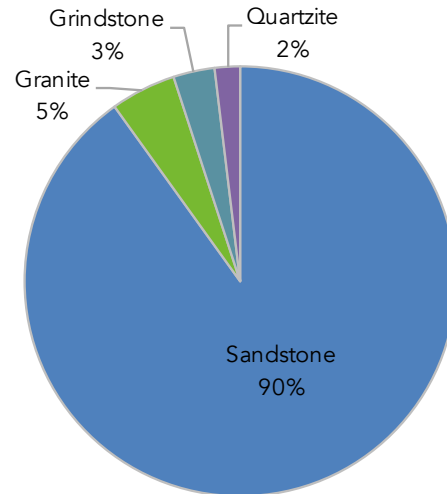


Figure 11. Nova Scotia building stone production 1873 to 1973, Nova Scotia Department of Natural Resources, 1993.

1993 The geological location of the quarries at Purcell's Cove is studied and mapped in the *Building Stone in Nova Scotia*, report by Gordon B. Dickie.⁴²

2013 The Backlands Coalition is formed with a mission to protect the natural and cultural heritage of the Purcell's Cove Backlands.⁴³

2015 The Purcell's Cove Neighbourhood Committee submits an application to recognize the recreational, ecological, and cultural assets of the Purcell's Cove Backlands in the Halifax Green Network Plan.⁴⁴

⁴¹ Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1993).

⁴² *Ibid.*

⁴³ "About us," The Backlands Coalition, accessed March 19, 2016, http://backlandscoalition.ca/?%20%20%20page_id=6

⁴⁴ "News and Announcements," Purcell's Cove Neighbourhood Committee, accessed March 19, 2016, <http://www.pcnc.chebucto.org/news/index.html>

In Gordon B. Dickie's report, *Building Stone in Nova Scotia*, the site history, type of building stone, and location is provided for all of the quarries at Purcell's Cove. Although the specific dates of quarrying operation are not known for all of these quarries, it is a useful overview of the industrial heritage of this area. The three granite quarries, Cougлан, Purcell's Cove, and Queens Quarry, as well as Kings Quarry which produced ironstone, are shown in the map in Figure 12. The geologic interpretation of why these four quarries are located in this area is the focus of colleague, Rachael Groat's thesis project.



Figure 12. Geological location map for quarries at Purcell's Cove, Nova Scotia Department of Natural Resources, 1996.

Queens Quarry, shown in Figure 13, is one of the earliest quarries to operate in Nova Scotia.⁴⁵ This quarry produced grey granite which was used as building stone in many historic structures, including the Citadel, in downtown Halifax.⁴⁶ Queens Quarry was an ideal location to produce building stone because of the granite outcrop exposure, quality of the granite, and the proximity to the ocean and downtown Halifax.⁴⁷ The construction of railroad tracks to service this area is a testament to the value of the granite in this quarry. Eventually, Queens Quarry was abandoned as quarrying operations transitioned to the Purcell's Cove Quarry located closer to the water.⁴⁸

⁴⁵ Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1996).

⁴⁶ *Ibid.*

⁴⁷ *Ibid.*

⁴⁸ *Ibid.*

Figure 13. View of Queens Quarry today.



Purcell's Cove Quarry, shown in Figure 14, is located on the western side of Purcell's Cove Road where the water comes closest to the road. This quarry began production of grey granite building stone as Queens Quarry was abandoned.⁴⁹ The size of the quarry blocks is estimated to have been 2 metres by 2 metres by 1 metre.⁵⁰ In later

years, Purcell's Cove Quarry was used for the quarrying of granite armour stone and rip rap.⁵¹ There is evidence of the use of black powder and dynamite at this quarry.⁵² These explosives were traditionally used to break apart rock into fragments used for rip rap and armour stone. The quarry is 125 metres in diameter with the western face rising over 35 metres in a near vertical wall.⁵³ The quarry is semicircular in shape. There are several 10 centimetre blast holes along the top of the quarry.⁵⁴ This suggests that holes were drilled at the top of the wall and stone was blasted off the face to the quarry floor.⁵⁵ Today, there is a private residence, work sheds, and boat storage occupying the floor of Purcell's Cove Quarry.



Figure 14. View of Purcell's Cove Quarry today.

⁴⁹ Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1996).

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

⁵² *Ibid.*

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*

The most recent granite quarrying at Purcell's Cove occurred at Coughlan Quarry. The Coughlan family quarried granite building stone at this site for generations.⁵⁶ The estimated quarry block size is 1 metre by 50 centimetres by 50 centimetres.⁵⁷ Granite from this quarry was mainly used for monuments and building stone.⁵⁸ Coughlan Quarry produced a high volume of waste rock due to the unpredictable nature of the fracture pattern in this area.⁵⁹ Evidence of the amount of waste rock can be seen in Figure 15 below. The railroad tracks were extended up the hill to connect Coughlan Quarry to the Military Wharf.⁶⁰ In the 1960s, granite production ended when the business died.⁶¹ There has been no granite quarrying at Purcell's Cove since.



Figure 15. View of Coughlan Quarry today.

⁵⁶ Gordon B. Dickie, *Building Stone in Nova Scotia* (Nova Scotia Department of Natural Resources, 1996).

⁵⁷ *Ibid.*

⁵⁸ *Ibid.*

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*

⁶¹ *Ibid.*

Techniques for Quarrying Granite

Two techniques for granite quarrying have been prevalent in the Eastern United States and Nova Scotia from the early 1800s up until recently. The most popular technique prior to 1830, known as the flat wedge method, used a tool called a cape chisel which was struck with a hammer to cut shallow slots in the face of the stone.⁶² Holes were chiseled at 4 inch intervals across the intended line of fracture.⁶³ The holes were larger at the top than the bottom, due to the shape of the chisel, and extended 2 inches deep.⁶⁴ Flat steel wedges were then placed between shims of sheet iron and pounded into these slots to split the stone apart.⁶⁵ This method allowed dimension stone to be cut, however it did not always split the rock in a predictable way.

After 1830, a new technique called the plug and feathers method was developed which split rock more uniformly. This method used a plug drill with a “V” shaped point, shown in Figure 16, which allowed cylindrical holes to be drilled into the rock.⁶⁶ Using the plug drill, holes would be made at 4 to 6 inch intervals across the intended line of fracture.⁶⁷ Between hammer blows, the drill would be rotated at 1/4 turns in order to create a cylindrical hole two or three inches deep.⁶⁸ A wedge or “plug” was then inserted into each hole between two shims or “feathers”.⁶⁹ One after another, each wedge was lightly hammered into each hole.⁷⁰ This process was repeated until a cracking noise was heard.⁷¹ Then wedges were tapped the rest of the way in or the rock was separated with a crow bar.⁷²

⁶² James L. Garvin, *Granite Splitting Tools and Techniques* (State of New Hampshire Department of Cultural Resources, 2007). https://www.nh.gov/nhdhr/publications/documents/stone_splitting_handout.pdf

⁶³ James E. Gage & Mary E. Gage, *Stone Splitting Methods* (Stone Structures of Northeastern United States, 2015). http://www.stonestructures.org/html/quarry_methods.html

⁶⁴ James E. Gage & Mary E. Gage, *Stone Splitting Methods* (Stone Structures of Northeastern United States, 2015). http://www.stonestructures.org/html/quarry_methods.html

⁶⁵ James L. Garvin, *Granite Splitting Tools and Techniques* (State of New Hampshire Department of Cultural Resources, 2007). https://www.nh.gov/nhdhr/publications/documents/stone_splitting_handout.pdf

⁶⁶ *Ibid.*

⁶⁷ James E. Gage & Mary E. Gage, *Stone Splitting Methods* (Stone Structures of Northeastern United States, 2015). http://www.stonestructures.org/html/quarry_methods.html

⁶⁸ James L. Garvin, *Granite Splitting Tools and Techniques* (State of New Hampshire Department of Cultural Resources, 2007). https://www.nh.gov/nhdhr/publications/documents/stone_splitting_handout.pdf

⁶⁹ James E. Gage & Mary E. Gage, *Stone Splitting Methods* (Stone Structures of Northeastern United States, 2015). http://www.stonestructures.org/html/quarry_methods.html

⁷⁰ *Ibid.*

⁷¹ *Ibid.*

⁷² *Ibid.*

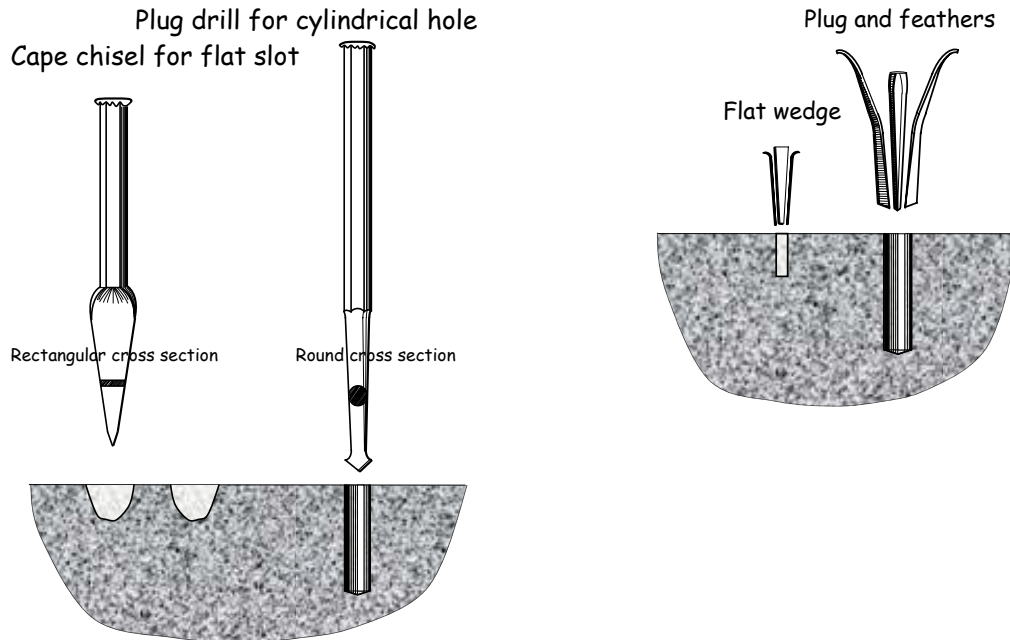


Figure 16. Tools used for granite quarrying, retrieved from https://www.nh.gov/nhdhr/publications/documents/stone_splitting_handout.pdf.

Site Inventory

In order to identify character defining elements of this site, I conducted a site inventory. I documented the boundaries of the three historic granite quarries, artifacts left over from quarrying activities, existing trails, trailheads, lookouts, and significant environmental features. This information was collected using GPS coordinates through the BackCountry Navigator application and mapped using the ArcGIS program. The results of this fieldwork are shown in Figure 17. Potential character defining elements, include building foundations, visible quarry cuts, sites where shims and wedges were abandoned in the rock, drill holes in the granite, waste rock, and quarry pits. The sites of the railroad tracks, military wharf, and the old military road are also documented and included in this inventory map.

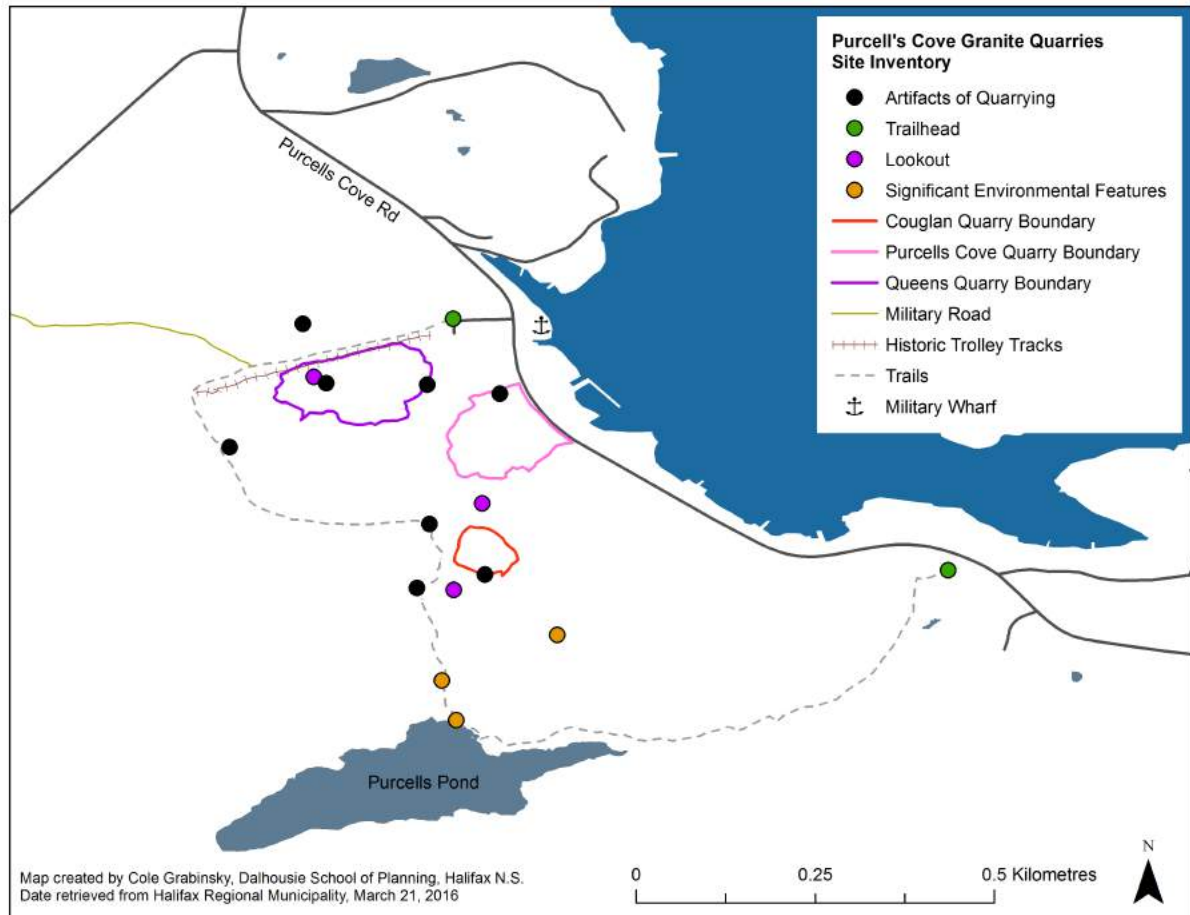


Figure 17. Purcell's Cove granite quarries site inventory.

Waste Rock, Quarry Cuts, and Evidence of Blasting

Evidence of quarrying at Purcell's Cove is exhibited by the abundant amount of waste rock, shown in Figure 18. Waste rock often has cylindrical holes or markings indicative of quarrying activities. In the quarrying process, if the stone does not split properly it is discarded as waste rock. As a result, there are piles of fractured and broken granite throughout this area. There are numerous sites where evidence of quarrying operations can be found on the granite that was not removed. Quarry cuts, which appear as stairs in Figure 19, are one type of feature left over from quarrying. Another sign of quarrying includes the one inch cylindrical holes placed at three to six inch intervals at the top of granite blocks. These markings, shown in Figure 20, are left from the plug and feathers method which become visible after the adjoining block of granite has been removed. Holes 2 inches in diameter visible on the face of the granite, as shown in Figure 21 and Figure 22, indicate where blasting took place.

Figure 18. Pile of waste rock at Coughlan Quarry.



Figure 19. Quarry cuts at Purcell's Cove.



Figure 20. Cylindrical holes found at Queens Quarry.



Figure 21. Deep blast hole along face of granite at Queens Quarry.



Figure 22. Series of wide holes indicative of blasting.



Building Remains, Railroad Tracks, and Shims and Wedges

Built structures are an important part of the industrial history of Purcell's Cove. There are remains of what could have been a cutting shed near Couglan Quarry. Cutting sheds were an important step between quarrying the rough blocks of granite and loading them onto barges at the wharf. A rock wall, shown in Figure 23, can still be observed at this site. Another important part of the quarrying process is the overland transportation which was made possible with the construction of the railroad tracks. Although no tracks can be found at the site today, the railroad platform, shown in Figure 24, is well preserved. I identified two locations at Purcell's Cove where shims and wedges can be found in the rock. These features, shown in Figure 25, are potential character defining elements because they illustrate significant methods of quarrying used in this area.

Figure 23. Rock wall remains found at Purcell's Cove.



Figure 24. Elevated railroad platform leading to Queens Quarry.



Figure 25. Shims and wedges found at Purcell's Cove.



Trailheads, Lookouts, and Significant Environmental Features

Trailheads and lookouts are important elements for accessing and enjoying the heritage and natural features of this area. Along with colleague Rachael Groat, I collected GPS coordinates for three lookouts and two trailheads at this site. We also documented the location of significant environmental features including the site of a large glacial erratic, known as Rocking Stone, the site of a popular swimming location at Purcells Pond, and the location where granite exposures, known as granite whalebacks, can be found. These are important features because they offer evidence of the geologic and natural history of this area.



Figure 26. Glacier erratic, known as Rocking Stone, at Purcell's Cove.

Local Planning Context

The local planning context affects opportunities for site conservation and interpretation. This section identifies the zoning and property ownership of the area in which the historic granite quarries at Purcell's Cove are located. Implications of the zoning and property ownership will also be discussed as it relates to interpretation planning at this site.

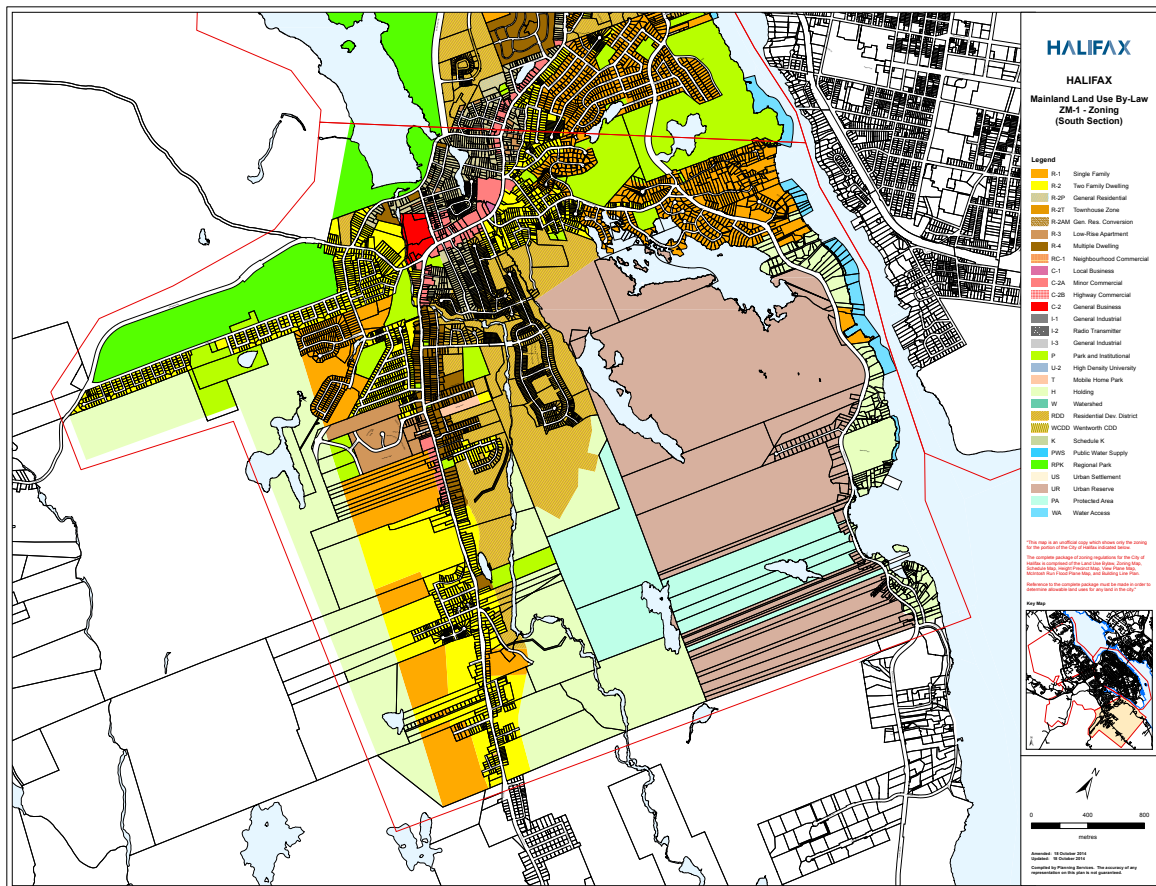
Zoning

Couglan Quarry is the only quarry that is fully included in the Protected Area zone shown in mint green in Figure 27. All of Queens Quarry and the majority of Purcell's Cove Quarry are located in an Urban Reserve zone. This designation is intended to reserve these lands for development until after the 25 year lifetime of the Regional Plan ending in 2031. Property developers in this area have been pressuring Council to rezone these lands to Rural Commuter.⁷³ The Rural Commuter zone allows for low to medium density development that would enable property owners to capitalize on their landholdings in this area.⁷⁴

⁷³ Tim Bousquet, "Purcells Cove backlands targeted for development," *The Coast*, February 20, 2014, accessed March 24, 2016. <http://www.thecoast.ca/RealityBites/archives/2014/02/20/purcells-cove-backlands-targeted-for-development>.

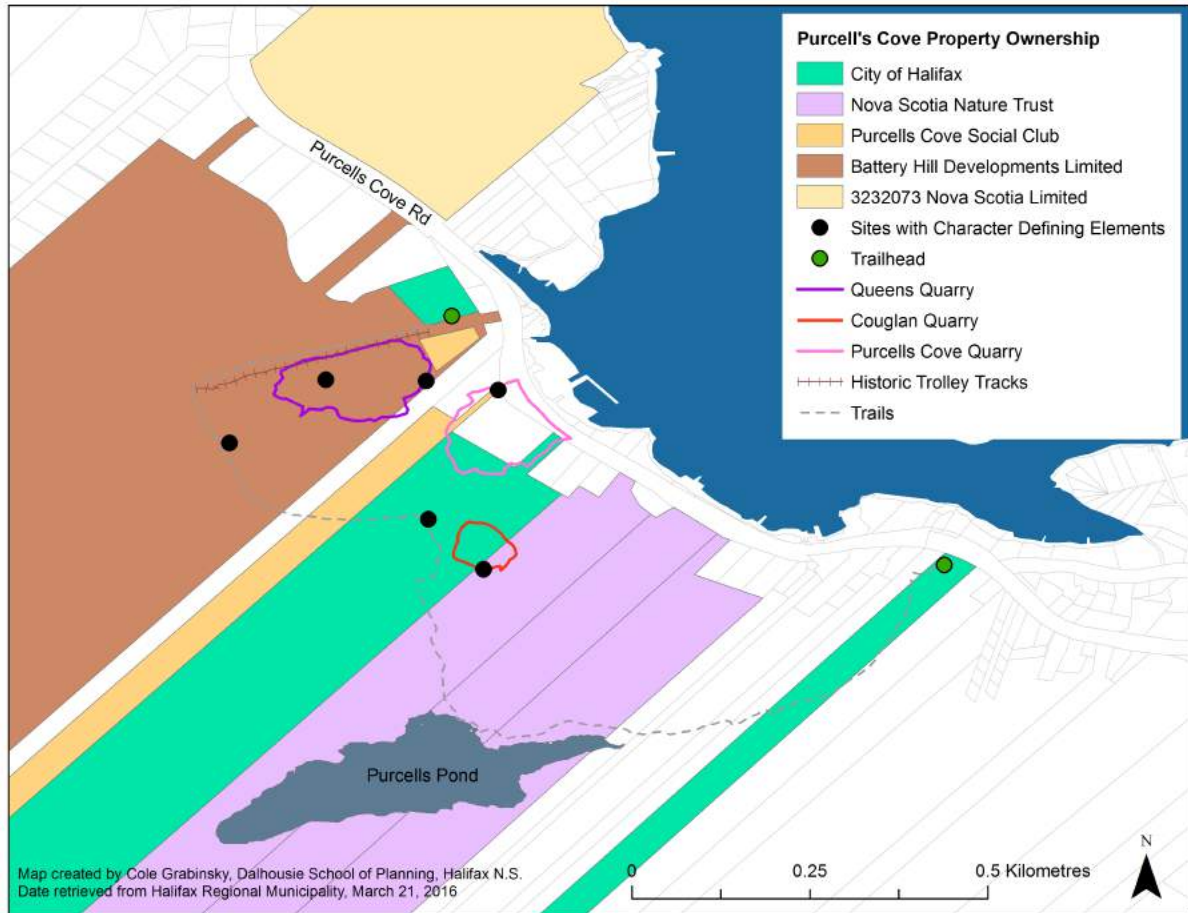
⁷⁴ *Ibid.*

Figure 27. Purcell's Cove zoning map, retrieved from http://www.halifax.ca/planning/documents/HalifaxMainland_LUB_ZM1_ZoningSouth18October2014.pdf



Property Ownership

There is a mix of property ownership in this area. Artifacts from granite quarrying are dispersed over nine properties in Purcell's Cove. The two access points to this area, or trailheads, are located on land owned by the City of Halifax. The City of Halifax also owns a large parcel in this area which includes sections of Purcell's Cove and Coughlan Quarry. The Nova Scotia Nature Trust, a non-government charitable land conservation organization, owns three land parcels in Purcell's Cove. One of these parcels contains the remainder of Coughlan Quarry. Purcell's Cove Quarry is largely located on private land, which is left white in Figure 28. The oldest quarry, Queens Quarry, the site of the historic railroad tracks, and three other sites with significant character defining elements are all located on land owned by Battery Hill Developments Limited.

Figure 28. Purcell's Cove property ownership map.

Heritage Conservation

The purpose of this section is to review existing municipal, provincial, and federal approaches that could be applied to preserving the heritage value of this site. The policies that will be examined include the Halifax Green Network Plan, HRM's Regional Municipal Planning Strategy, Nova Scotia Special Places Protection Act, and Standards and Guidelines for the Conservation of Historic Places in Canada.

Halifax Green Network Plan

The Halifax Green Network Plan is a municipal open space and greenbelting priorities plan. The Halifax Regional Council has identified the need for a strategic planning and implementation framework for protecting and managing open space in the Halifax

Regional Municipality (HRM).⁷⁵ This plan is intended to address this need by including areas of open space that are important for wilderness and biodiversity, sustainable forestry, agriculture, and resource extraction.⁷⁶ The Plan is intended to provide direction for management of public lands as well as guidance for land-use policy and regulation to shape the planning of privately-owned open space.⁷⁷ The call for public submissions to the Halifax Green Network Plan was from May to July of 2015. The Purcell's Cove Neighbourhood Committee (PCNC) submitted an application on July 10, 2015 to include the Purcell's Cove Backlands in the Halifax Green Network Plan. The PCNC highlighted the recreational, ecological, and cultural assets of the Purcell's Cove Backlands which they argued make it an ideal candidate.⁷⁸ The Plan is currently being prepared and community engagements sessions will continue throughout 2016.

Regional Municipal Planning Strategy

Cultural and heritage resources are included in HRM's Regional Municipal Planning Strategy. The objectives of this section of the plan are to:

- preserve cultural and heritage resources in HRM and develop policies, programs and regulations to protect and enhance them;
- assist communities in identifying and celebrating cultural and heritage assets;
- broaden heritage protection through the identification and preservation of cultural landscapes.⁷⁹

The Regional Municipal Planning Strategy states that HRM shall develop a Culture and Heritage Priorities Plan to “consider the recognition, preservation, and promotion of significant cultural landscapes” through mapping, inventories, and policies.⁸⁰ The plan is still in the early stages of development. This presents an opportunity for the historic quarries at Purcell's Cove to be included in the inventory of cultural and heritage resources protected by the Plan.

⁷⁵ Halifax Regional Municipality, *Halifax Green Network Plan*, 2015, accessed March 19, 2016. <http://www.halifax.ca/HalifaxGreenNetwork/documents/HalifaxGreenNetworkFactSheetJune92015.pdf>

⁷⁶ *Ibid.*

⁷⁷ *Ibid.*

⁷⁸ Purcell's Cove Neighbourhood Committee, *Protecting the Backlands within the Halifax Green Network*, 2015, accessed March 19, 2016. <http://www.pcnc.chebucto.org/news/downloads/Green.Network.-Submission-7.10.15.pdf>

⁷⁹ Halifax Regional Municipality, *Regional Municipal Planning Strategy*, 2014, accessed April 7, 2016, <http://www.halifax.ca/regionalplanning/FinalRegPlan.php>, 81.

⁸⁰ Halifax Regional Municipality, *Regional Municipal Planning Strategy*, 2014, accessed April 7, 2016, <http://www.halifax.ca/regionalplanning/FinalRegPlan.php>, 86.

Nova Scotia Special Places Protection Act

The Nova Scotia Special Places Protection Act protects certain sites with heritage value. This Act enables the government to designate outstanding heritage features as protected sites.⁸¹ Protected sites may include land in either public or private ownership as well as underwater sites.⁸² Special provisions are given to protected sites to preserve their heritage value and allow them to be studied. An important first step is submitting an application to the Maritime Archaeological Resource Inventory. Not all sites included in the Maritime Archaeological Resource Inventory are protected by the Special Places Protection Act, however this database is reviewed before new developments are approved. There are currently no sites in the Purcell's Cove area protected by the Special Places Protection Act or part of the Maritime Archaeological Resource Inventory.

Standards and Guidelines for the Conservation of Historic Places in Canada (Second Edition)

Standards and Guidelines for the Conservation of Historic Places in Canada is a federal approach to protecting historic places. This guide outlines conservation activities as a three step process which begins with understanding the historic place, planning for its conservation, and then intervening through projects or maintenance.⁸³ This thesis project is focused on the first step of the conservation process which is understanding the site. Understanding the site is achieved through research and investigation. It is important to understand where the heritage value lies, how it has evolved over time, and why the site is significant to its community.⁸⁴ The interconnection between the historic place, its environment, and the community should also be considered. A site is recognized as a historic place through a formal process at the municipal, provincial, or federal level or by nomination to the Canadian Register of Historic Places.⁸⁵ This guide defines *character defining elements* as “the materials, forms, location, spatial configurations, uses and cultural associations or meanings that contribute to the heritage value of an historic place, which must be retained to preserve its heritage value.”⁸⁶

⁸¹ “Special Places,” Province of Nova Scotia, accessed March 7, 2016, <https://cch.novascotia.ca/exploring-our-past/special-places>.

⁸² *Ibid.*

⁸³ Parks Canada, *Standards and Guidelines for the Conservation of Historic Places in Canada, Second Edition* (Her Majesty the Queen in Right of Canada, 2010).

⁸⁴ *Ibid.*

⁸⁵ *Ibid.*

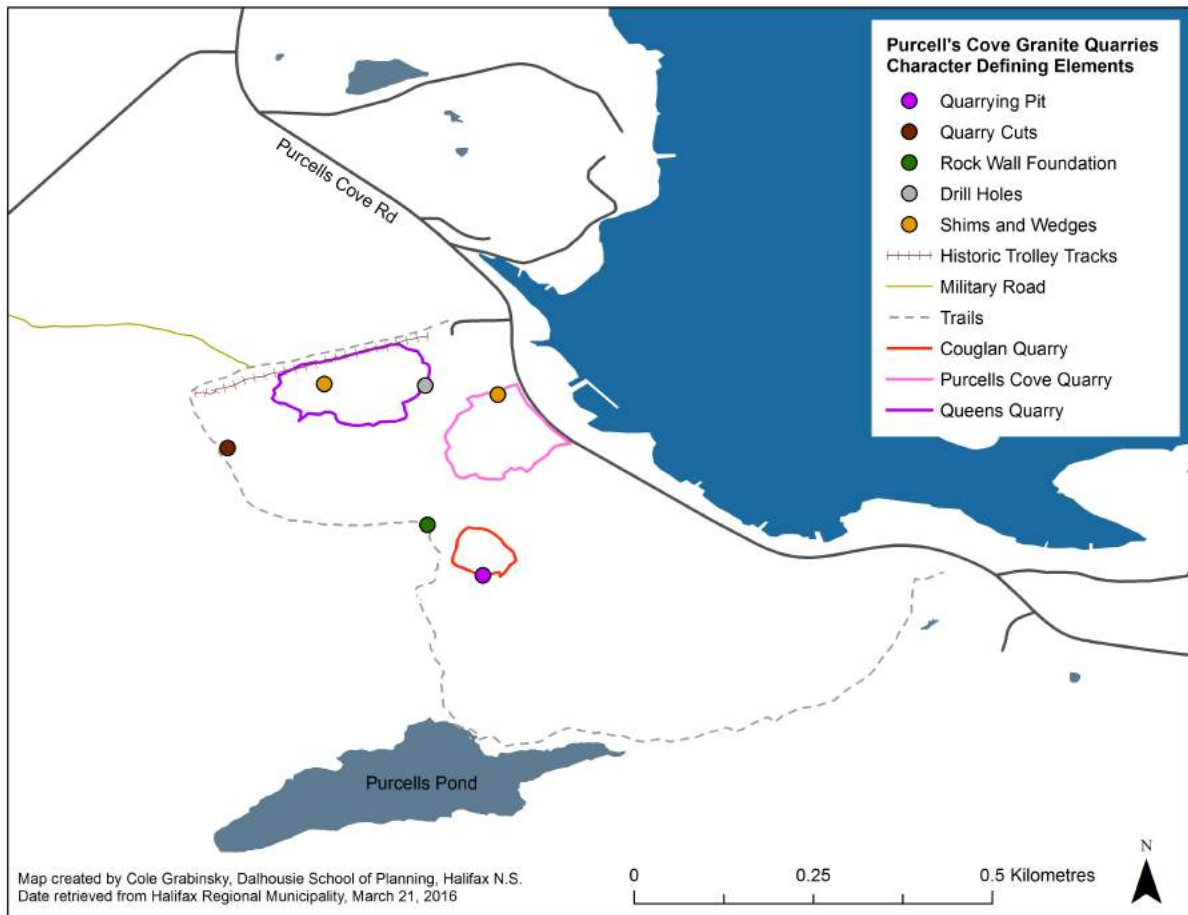
⁸⁶ *Ibid.*, 5.

Synthesis

Character Defining Elements

I prepared a list of character defining elements at the Purcell's Cove granite quarries which must be retained to preserve its heritage. I made this list based on historical records, site visits, my acquired knowledge of quarrying methods, and insight from geology expert, Marcos Zentilli. Future study in this area might uncover additional character defining elements that could be added to this list. For this project, I selected and mapped six character defining elements that are representative of the industrial history of this site. These elements are shown in the map in Figure 29.

Figure 29. Purcell's Cove granite quarries character defining elements.



Railroad Tracks

The tracks are a significant character defining element of Purcell's Cove because they are the earliest known use of a railroad in Eastern Canada. The industrial railroad that functioned at Purcell's Cove was integral to the operation of the quarries and the transportation of granite throughout this site. The railway linked Queens Quarry to the wharf below along an elevated corridor which can still be seen at the site today.



Figure 30. Site of the railroad tracks today.



Figure 31. Shims and wedges at Purcell's Cove.

Shims and Wedges

The locations where shims and wedges are found in the rock are essential for communicating the industrial heritage of Purcell's Cove. At these sites, artifacts left from the stonecutters can still be found and observed by visitors. The shims and wedges at the two locations shown in Figure 29 are well preserved in the granite. The plug and feathers method used in granite quarrying can be seen from the position and spacing of these shims and wedges left abandoned in the rock.

Drill Holes

There are numerous locations where drill holes can be observed in the granite at Purcell's Cove. Drill holes in the granite serve as a marker for the extent of quarrying activities in this area. There is one quarried granite block at Queens Quarry that has a stunning pattern of drill holes along the edges. The location of this block, shown in Figure 32, is labelled as *Drill Holes* in the map in Figure 29.



Figure 32. Drill holes in granite at Purcell's Cove.

Quarry Cuts

Quarry cuts are visible where granite blocks have been removed from the surrounding rock. These cuts are character defining features of Purcell's Cove and often resemble granite stairs.



Figure 33. Quarry cuts at Purcell's Cove.

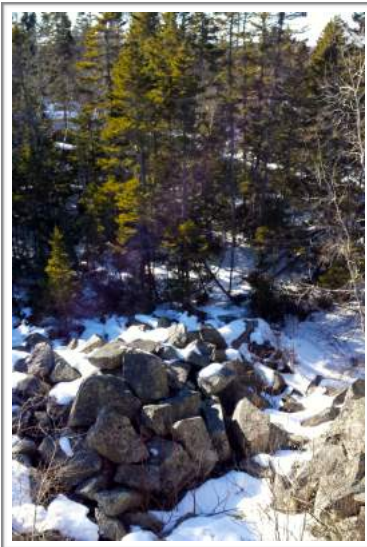


Figure 34. Coughlan Quarry pit.

Quarry Pit

There are several significant quarry pits at Purcell's Cove. The most defined quarry pits are located at Purcell's Cove and Coughlan Quarry. A large amount of granite quarrying has taken place to form these pits. Waste rock, seen in Figure 34, is a byproduct of quarrying activities. The remnants found at these sites are essential to the industrial heritage value of this area.

Rock Wall Foundation

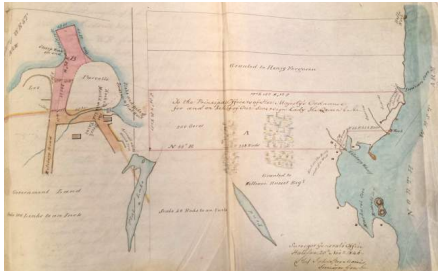
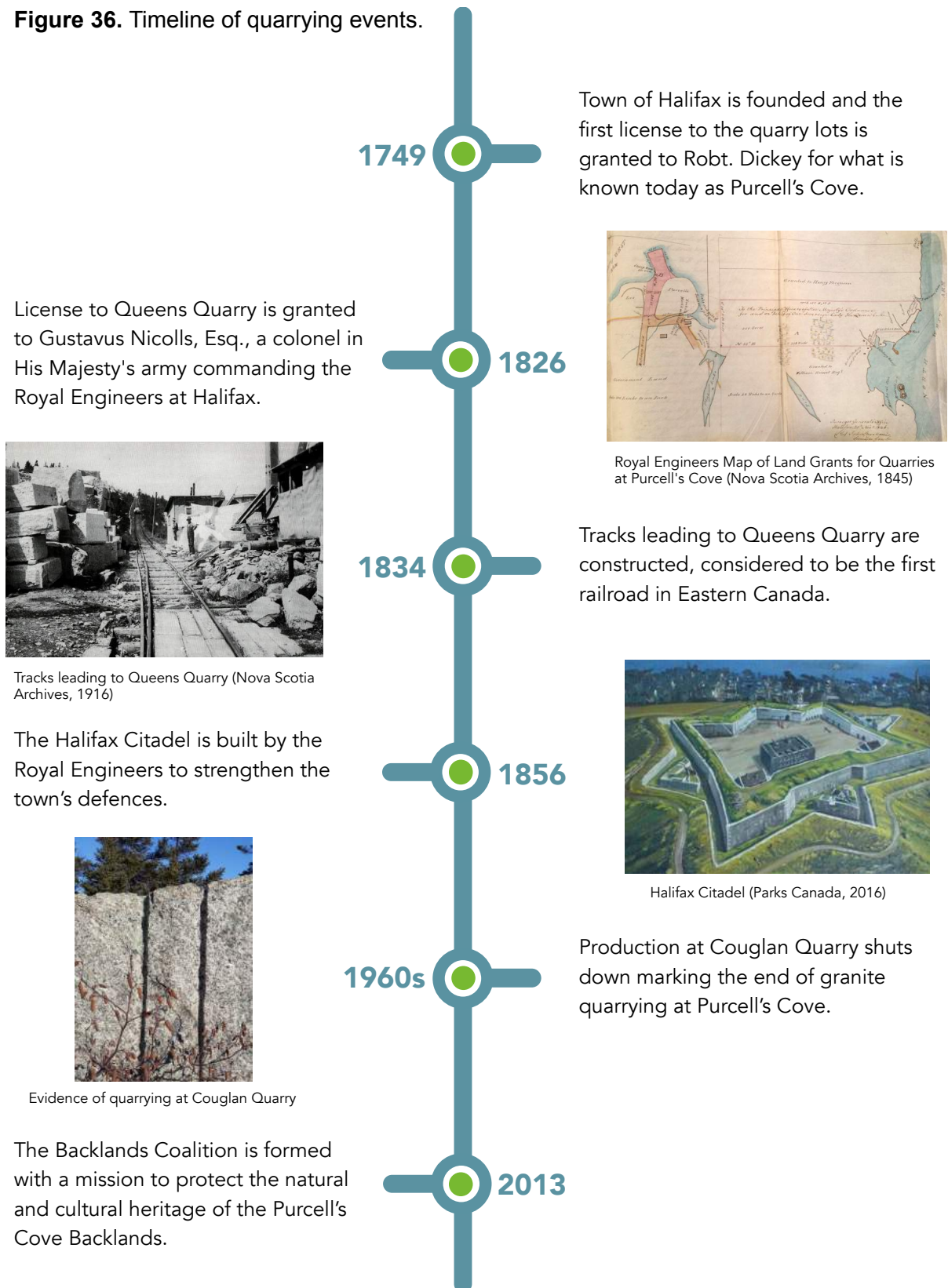
Foundations of historic structures connected to granite quarrying are rare at Purcell's Cove. This character defining element, shown in Figure 35, is thought to be the foundation of a cutting shed.



Figure 35. Rock wall foundation at Purcell's Cove.

Potential Interpretation Materials

Figure 36. Timeline of quarrying events.



Royal Engineers Map of Land Grants for Quarries at Purcell's Cove (Nova Scotia Archives, 1845)



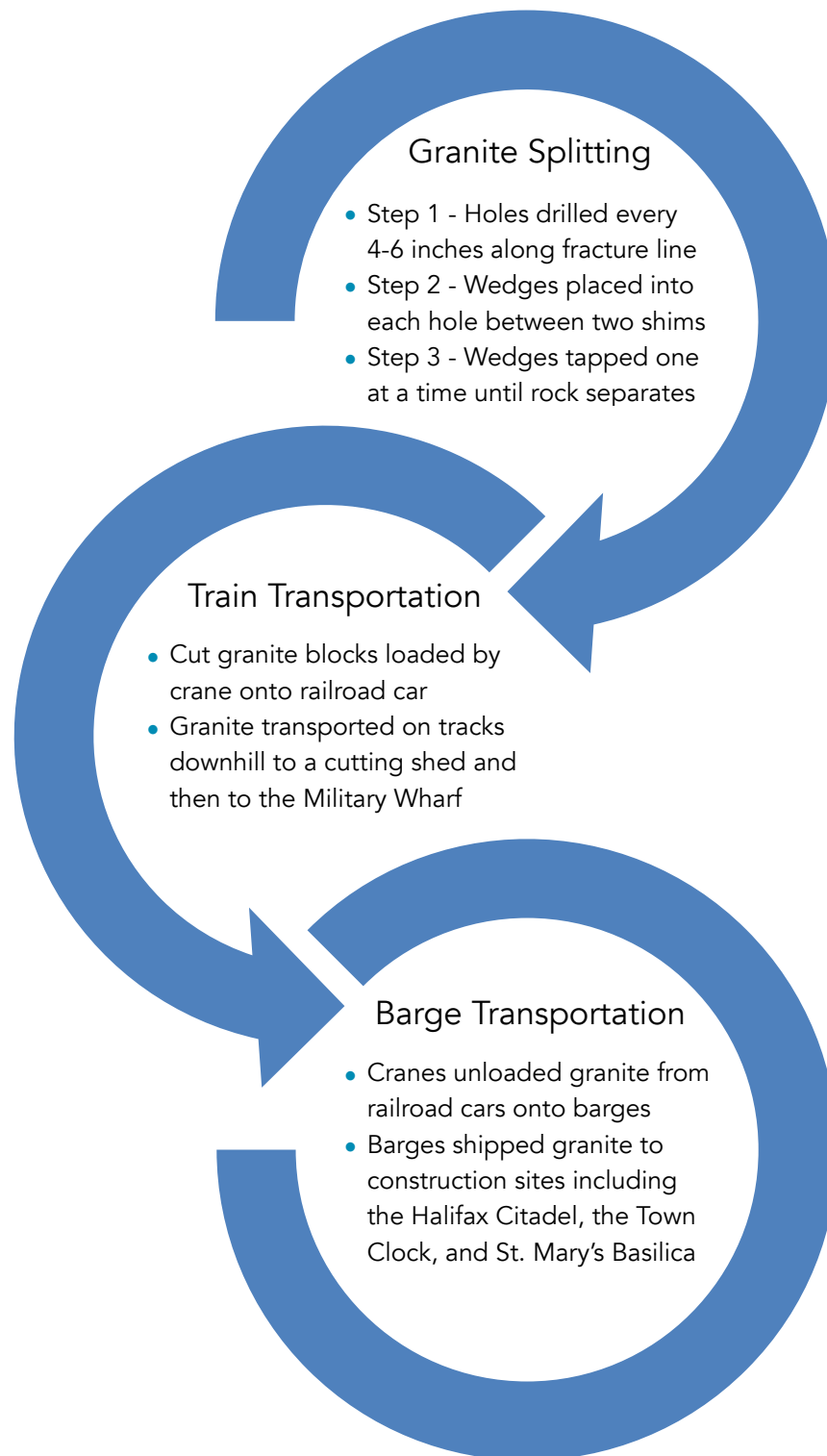
Tracks leading to Queens Quarry (Nova Scotia Archives, 1916)



Halifax Citadel (Parks Canada, 2016)



Evidence of quarrying at Coughlan Quarry

Figure 37. Purcell's Cove quarrying process.

Site Opportunities

There is a great potential to develop this site as a recreation and tourism destination. The history of quarrying in this area, stunning views of the Northwest Arm, access to hiking trails on conservation lands, and proximity to downtown Halifax make Purcell's Cove an ideal location for interpretation planning. The Province of Nova Scotia has set a provincial goal to grow tourism opportunities. The granite quarries at Purcell's Cove provide a way of taking the history of places like the Town Clock, Citadel Hill, and St. Mary's Basilica one step further. The history of the railroad tracks, the earliest known example in Eastern Canada, could be a centrepiece to draw people to this site. Little to no interpretation has been developed for granite quarrying in Nova Scotia. Purcell's Cove could set the stage for future interpretation of industrial heritage in the Province.

Site Constraints

Land ownership and zoning are the main constraints to heritage conservation at the Purcell's Cove quarries. Many historic artifacts, including one of the sites with shims and wedges and almost all of Purcell's Cove Quarry, are situated on private property. In several cases, private dwellings have been constructed right on top of old quarry sites. It is difficult to compile a complete inventory of the site because of this reality. Land ownership also poses a challenge for the development of an official trail system to access the interpretation opportunities in these quarries. Today, people walk through the quarries to Purcell's Pond using an unofficial network of trails. Although public use of these trails has not been contested, most trails are located on private property.

Queens Quarry and the site of the elevated railroad platform are two very significant character defining elements at risk of future development. Both of these elements are located on property owned by Battery Hill Developments Limited. If zoning in this area were to change and a new subdivision was built, most of the character defining elements of this site could be lost. Recognizing what character defining elements exist and where they are located is therefore an important first step toward heritage conservation.

Conservation Potential

Given the significance of this site, I considered opportunities to protect the Purcell's Cove quarries through planning policy and zoning. Large sections of this area are currently zoned as Urban Reserve. Although there would be opposition from certain property owners, the case could be made to Council that this area is provincially significant and should be

included in the Protected Area zone. This would ensure that no future development would occur where character defining elements exist.

The Maritime Archaeological Resource Inventory is another step toward having the character defining elements of Purcell's Cove recognized. An application can be made to include an outstanding heritage site in the Maritime Archaeological Resource Inventory. Although this does not guarantee that the site will be protected, it puts evidence on the record. Currently, Purcell's Cove has no sites of significance recorded in the Maritime Archaeological Resource Inventory. If an application were to be successfully submitted and approved, community members, planners, and other interested groups could access this information in the future. Rachael Groat and I prepared an application, shown in the Appendix, to include the Purcell's Cove granite quarries in the Maritime Archaeological Resource Inventory. It can be revised and submitted by our community contact, Marcos Zentilli, at a later date.

Recommendations

This project provides significant background information for the Purcell's Cove quarries. It identifies a number of character defining elements and establishes potential themes and stories for interpretation. There are several steps that could be taken to advance this work. These include:

1. Submitting the completed Maritime Archaeological Resource Inventory application to the Nova Scotia Department of Communities, Culture and Heritage
2. Performing an archaeological investigation of the Purcell's Cove quarries to have this site protected under the Nova Scotia Special Places Protection Act (a permit for this work can be obtained through the Nova Scotia Special Places Protection Act)
3. Exploring opportunities to have this site recognized through the Culture and Heritage Priorities Plan as a significant cultural landscape
4. Preparing a complete interpretation plan for the Purcell's Cove quarries

Conclusion

In this project, I explored the historic quarries at Purcell's Cove in Halifax, Nova Scotia. Purcell's Cove has many significant natural, cultural, and industrial stories. I focused on the stories surrounding the industrial heritage of granite quarries. In the early history of Halifax, quarries at Purcell's Cove supplied the building material for the Citadel, the Town Clock, St. Mary's Basilica, and many other historic buildings. The purpose of this project was to prepare background material for an interpretation plan for Purcell's Cove. To do this, I gathered information to identify significant themes and stories. I established character defining elements of mapped locations for future interpretation. Given the significance of this site, I considered opportunities to protect the Purcell's Cove quarries through planning policy and zoning. Rachael Groat and I prepared an application to the Archaeological Maritime Resource Inventory and made a list of recommendations for future work. I have developed a great appreciation for this industrial landscape and I hope to see it formally recognized and enjoyed into the future.

References

- Bousquet, Tim. "Purcells Cove backlands targeted for development." *The Coast*, February 20, 2014. Accessed March 24, 2016. <http://www.thecoast.ca/RealityBites/archives/2014/02/20/purcells-cove-backlands-targeted-for-development>
- Carter, James. *A Sense of Place: An interpretive planning handbook*. Scotland: Scottish Interpretation Network, 2001. Accessed March 19, 2016. <http://www.greentourism.org.uk/SOFP.PDF>
- Davis, Derek and Sue Brown (Ed.). *Natural history of Nova Scotia: topics and habitats (Vol. 1)*. Halifax: Nova Scotia Museum, 1996.
- Davis, Derek and Sue Brown (Ed.). *Natural history of Nova Scotia: topics and habitats (Vol. 2)*. Halifax: Nova Scotia Museum, 1996.
- Dickie, Gordon B. *Building Stone in Nova Scotia*. Nova Scotia Department of Natural Resources. 1993.
- Dickie, Gordon B. *Building Stone in Nova Scotia*. Nova Scotia Department of Natural Resources. 1996.
- Gage, James E. & Gage, Mary E. *Stone Splitting Methods*. Stone Structures of Northeastern United States. 2015. Accessed March 19, 2016. http://www.stonestructures.org/html/quarry_methods.html
- Garvin, James L. *Granite Splitting Tools and Techniques*. State of New Hampshire Department of Cultural Resources. 2007. Accessed March 19, 2016. https://www.nh.gov/nhdhr/publications/documents/stone_splitting_handout.pdf
- Government of Nova Scotia. *A tourism strategy for Nova Scotia*. Nova Scotia Tourism Agency, 2013. Accessed March 19, 2016. https://tourismns.ca/sites/default/files/page_documents/tourism-strategy-final-2013.pdf

- Halifax Regional Municipality. *Halifax Green Network Plan*. 2015. Accessed March 19, 2016. <http://www.halifax.ca/HalifaxGreenNetwork/documents/HalifaxGreenNetworkFactSheetJune92015.pdf>
- Halifax Regional Municipality. *Regional Municipal Planning Strategy*. 2014. Accessed April 7, 2016. <http://www.halifax.ca/regionalplanning/FinalRegPlan.php>
- Ham, Sam. *Environmental interpretation, a practical guide for people with ideas and small budgets*. Golden: North American Press, 1992. Accessed March 19, 2016. <https://serceducationvolunteers.files.wordpress.com/2012/12/interpretation-sam-ham1.pdf>
- HDC International. "Freeman Tilden." Accessed March 19, 2016. <http://www.heritagedestination.com/freeman-tilden.aspx>
- Millington, Elsie. *Purcell's Cove: The little place that helped build Halifax City*. Victoria: Desktop Publishing Ltd., 2000.
- National Park Service. *Planning for interpretation and visitor experience*. Harpers Ferry Center, 1998. Accessed March 19, 2016. <http://www.nps.gov/hfc/pdf/ip/interp-visitor-exper.pdf>
- Nova Scotia Tourism, Culture and Heritage & Nova Scotia Museum. *Interpretive master plan*. Form Media, 2009. Accessed March 19, 2016. <https://museum.novascotia.ca/sites/default/files/inline/images/nsimp.pdf>
- Parks Canada. *Standards and Guidelines for the Conservation of Historic Places in Canada, Second Edition*. Her Majesty the Queen in Right of Canada, 2010.
- Parks Canada. "Halifax Citadel National Historic Site of Canada." Accessed March 19, 2016. <http://www.pc.gc.ca/eng/lhn-nhs/ns/halifax/natcul/natcul6.aspx>
- Parks, William A. *Building and Ornamental stones of Canada Volume 2*. Ottawa: Government Printing Bureau. 1914.

Province of Nova Scotia. "Special Places." Accessed March 7, 2016.

<https://cch.novascotia.ca/exploring-our-past/special-places>.

Purcell's Cove Neighbourhood Committee. "News and Announcements." Accessed March 19, 2016. <http://www.pcnc.chebucto.org/news/index.html>

Purcell's Cove Neighbourhood Committee. *Protecting the Backlands within the Halifax Green Network*. 2015. Accessed March 19, 2016. <http://www.pcnc.chebucto.org/news/downloads/Green.Network.-Submission-7.10.15.pdf>

Regan, John W. *Sketches and Traditions of the Northwest Arm*. Halifax: McAlpine Publishing Company. 1908.

The Backlands Coalition. "About us." Accessed March 19, 2016.

http://backlandscoalition.ca/?%20%20%20page_id=6

The Canadian Encyclopedia. "Halifax." Accessed March 19, 2016.

<http://www.thecanadianencyclopedia.ca/en/article/halifax/>

Tilden, Freeman. *Interpreting our heritage* (3rd ed.). Chapel Hill: University of North Carolina Press, 1977.

Train History. "Richard Trevithick - Locomotive Inventor." Accessed March 19, 2016.

<http://www.trainhistory.net/train-invention/richard-trevithick/>

Wallace Quarries Ltd. "The Quarry Then." Accessed March 19, 2016.

<http://www.wallacequarries.com/the-quarry-then.html>

Zentilli, Marcos. *The Purcell's Cove Stone Quarries*. PowerPoint Presentation. Accessed March 19, 2016.

Appendix

MARITIME ARCHAEOLOGICAL RESOURCE INVENTORY

Date Form Filled Out
(YYYY/MM/DD)
2016/04/06

NB NS PEI

A. SITE NAME, LOCATION AND ACCESS

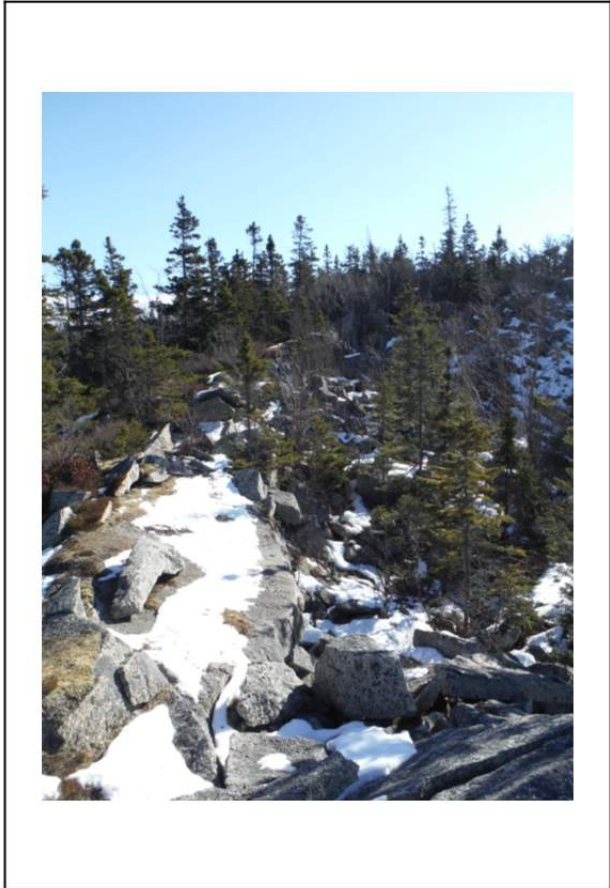
A1 SUGGESTED SITE NAME Purcells Cove Quarries

A2 TEMPORARY SITE NUMBER _____

A3 PERMIT/LICENSE NUMBER _____

A4 PERMIT/LICENSE TYPE _____

A5 WHEN DID YOU GATHER THE INFORMATION FOR THIS REPORT ?
03/11/2015 through 21/03/2016



A6 ADDITIONAL INFORMATION AND/OR RESOURCES:

	Submitted	Available
Video Footage	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Maps / Plans	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Still Photos	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Drawings	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Archival Information	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Artifacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Articles	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Contacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Other Dalhousie University Theses Projects

A7 ACTIVITY

a) Surface collecting	<input type="checkbox"/>
b) Surface recording	<input checked="" type="checkbox"/>
c) Site Revisit	<input checked="" type="checkbox"/>
b) Subsurface testing	<input type="checkbox"/>
c) Extensive excavation	<input type="checkbox"/>
d) Monitoring	<input type="checkbox"/>
e) Surveillance	<input type="checkbox"/>

A8 COUNTY Halifax Regional Municipality

A9 LOCATION DESCRIPTION
This site is located on the western shore of the Northwest Arm in Purcell's Cove, Nova Scotia.

A10 LOCATION ACCESS
Take Purcells Cove Road (Highway 253) from the Armdale Rotary towards Purcell's Cove for 5.9km. Turn right onto 18th Battery Road. Pull into the parking lot to the north of the Purcell's Cove Social Club (505 Purcells Cove Rd). The entrance to the site is located to the south of the Dalhousie playground.

A11 SITE LOCATION MAP NUMBER 11D12 (Attach section of NTS 1:50000 scale map and indicate the site location. Make sure that the map number is indicated. eg. 21H16).

Borden No. _____

A12 SITE ACCESS MAP NUMBER 1044600063500 (Attach photocopied section of a larger scale map and show your access route to the site location. Make sure that the map number and scale is indicated) Scale: 1:10 000

A13 SITE POSITION
 UTM (eg. 20TKE 1447 5362) Zone 20T E 454411 N 4939654
 Latitude _____ N Longitude _____ W

A14 METHOD(S) OF DETERMINING LOCATION and/or position.
 Projection _____ Datum _____
 GPS estimated error 10 m Total Station
 Differential GPS Estimate from description
 Map (scale =1: _____)
 Aerial Photo (scale =1: _____) Other (please specify) _____

A15 SITE ELEVATION
 Elevation 0 m. (A.S.L.) to 60 m. (A.S.L.)

A16 METHOD(S) OF DETERMINING ELEVATION
 Projection _____ Datum _____
 GPS Total Station
 Differential GPS Geodetic Marker (# _____)
 Map (scale =1: _____) Estimate from description
 Aerial Photo (scale =1: _____)
 Other (please specify) _____

A17 OTHER MAP(S) _____

A18 AERIAL PHOTO NUMBER(S) _____

A19 PROPERTY IDENTIFIER NUMBER(S) 00269282, 00334367, 00334375, 40068793, 40555526, 00334383, 00334391

A20 PROPERTY TYPE Private Federal Crown Provincial Crown First Nation Land Unknown

A21 NEAREST FIRST NATION COMMUNITY (if applicable) _____
 Contacted ? Yes No

B. SITE ENVIRONMENT

B1 NATURAL REGION # (Provincial) 851 **NATURAL REGION # (Federal)** _____

B2 HABITAT DESCRIPTION (please check those appropriate)

- | | | | |
|-------------------------------|-------------------------------------|---|--------------------------|
| Offshore | | Freshwater | |
| 1.1 Open Water | <input type="checkbox"/> | 3.1 Open-Water Lotic (Rivers and Streams) | <input type="checkbox"/> |
| 1.2 Benthic | <input type="checkbox"/> | 3.2 Open-Water Lentic (Lakes and Ponds) | <input type="checkbox"/> |
| | | 3.3 Bottom Lotic (Rivers and Streams) | <input type="checkbox"/> |
| Coastal | | 3.4 Bottom Lentic (Lakes and Ponds) | <input type="checkbox"/> |
| 2.1 Rocky Shore | <input type="checkbox"/> | 3.5 Water's Edge Lotic (Rivers and Streams) | <input type="checkbox"/> |
| 2.2 Boulder/Cobble Shore | <input type="checkbox"/> | 3.6 Water's Edge Lentic (Lakes and Ponds) | <input type="checkbox"/> |
| 2.3 Sandy Shore | <input type="checkbox"/> | | |
| 2.4 Mud Flat | <input type="checkbox"/> | Freshwater Wetland | |
| 2.5 Tidal Marsh | <input type="checkbox"/> | 4.1 Bog | <input type="checkbox"/> |
| 2.6 Dune System | <input type="checkbox"/> | 4.2 Fen | <input type="checkbox"/> |
| | | 4.3 Swamp | <input type="checkbox"/> |
| Terrestrial Unforested | | 4.4 Freshwater Marsh (Inland) | <input type="checkbox"/> |
| 5.1 Barren | <input checked="" type="checkbox"/> | | |
| 5.2 Oldfield | <input type="checkbox"/> | Forests | |
| 5.3 Cliff and Bank | <input type="checkbox"/> | 6.1 Hardwood Forest | <input type="checkbox"/> |
| 5.4 Talus Slope | <input type="checkbox"/> | 6.2 Softwood Forest | <input type="checkbox"/> |
| 5.5 Cave | <input type="checkbox"/> | 6.3 Mixedwood Forest | <input type="checkbox"/> |

Additional Habitat Description _____

C. SITE DESCRIPTION

C1 Period

Palaeo-Indian (> 9000 BP)	<input type="checkbox"/>	Contact (1500 - 1604)	<input type="checkbox"/>
Early/Middle Archaic (9000 - 6000 BP)	<input type="checkbox"/>	Colonial (1604 - 1867)	<input checked="" type="checkbox"/>
Late Archaic (6000 - 3000 BP)	<input type="checkbox"/>	Early Post-Confederation (1867 to 1950)	<input checked="" type="checkbox"/>
Maritime Woodland (3000 - 500 BP)	<input type="checkbox"/>	Other	<input type="checkbox"/>

Basis of identification

Property deeds and land grants for the quarries available through Nova Scotia Archives.

C2 TRADITION

Palaeo-Indian	<input type="checkbox"/>	Middle/Late Woodland	<input type="checkbox"/>	Jamaican Maroon	<input type="checkbox"/>
Early/Middle Maritime Archaic	<input type="checkbox"/>	Maliseet	<input type="checkbox"/>	Planter	<input type="checkbox"/>
Laurentian Archaic	<input type="checkbox"/>	Mi'kmaq	<input checked="" type="checkbox"/>	Loyalist	<input type="checkbox"/>
Shield Archaic	<input type="checkbox"/>	Passamaquoddy	<input type="checkbox"/>	Black Loyalist	<input type="checkbox"/>
Late Maritime Archaic	<input type="checkbox"/>	British	<input checked="" type="checkbox"/>	German	<input type="checkbox"/>
Susquehanna	<input type="checkbox"/>	French	<input type="checkbox"/>	Irish	<input type="checkbox"/>
Early Maritime Woodland	<input type="checkbox"/>	Acadian	<input type="checkbox"/>	Unspecified	<input type="checkbox"/>
Other	<input type="checkbox"/>				

C6 SITE FUNCTION

Aeroplane	<input type="checkbox"/>	General Activity	<input type="checkbox"/>	Religious/Sacred	<input type="checkbox"/>
Agricultural	<input type="checkbox"/>	Hunting & Gathering	<input type="checkbox"/>	Residence	<input type="checkbox"/>
Commercial	<input type="checkbox"/>	Manufacturing	<input type="checkbox"/>	Settlement	<input type="checkbox"/>
Construction	<input type="checkbox"/>	Military	<input type="checkbox"/>	Transportation	<input type="checkbox"/>
Extractive	<input type="checkbox"/>	Mining	<input type="checkbox"/>	Undetermined	<input type="checkbox"/>
Fishing	<input type="checkbox"/>	Miscellaneous	<input type="checkbox"/>	Vessel	<input type="checkbox"/>
Forestry	<input type="checkbox"/>	Other	<input type="checkbox"/>		
		Quarrying	<input checked="" type="checkbox"/>		

C7 GENERAL SITE DESCRIPTION

There are three granite quarry pits located at Purcell's Cove. These have been identified as Queens Quarry, Purcell's Cove Quarry and Coughlan Quarry. The rail bed of a trolley track, which may have been the first railroad in Eastern Canada, travels uphill towards the quarries. A trail used for recreation by the local community runs parallel to the trolley track. Evidence of quarry operations can be found throughout the site, including ledges where rocks have been cut from the granite and discarded waste rock. There are at least two locations where shims and wedges can be found. Much of the quarry pits have been reclaimed by vegetation, but the evidence of quarrying operation remains.

C8 OBSERVED SITE DIMENSIONS Length m Width m

C9 ESTIMATED SITE DIMENSIONS Length 375 m Width 230 m

C10 DISTANCE TO WATER 50 m

C11 ORIENTATION TO WATER Perpendicular Parallel Not applicable

C12 DESTRUCTIVE AGENTS

	High		Medium		Low	
	Existing	Future	Existing	Future	Existing	Future
a Natural						
Marine Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lacustrine Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetation Growth	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bioturbation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b Cultural						
Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Construction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forestry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mining/Quarrying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dam/reservoir	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vandalism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Site Visitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Military	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BASIS OF ASSESSMENT

Through site visits and reviewing historic photographs, we observed that vegetation growth is currently reclaiming artifacts of quarrying. Construction is a potential destructive agent as much of the land is owned by a private development company. Property ownership data is available through Dalhousie's GIS Centre.

D. REPORTER INFORMATION

D1 REPORTER'S NAME Cole Grabinsky and Rachael Groat

D2 MAILING ADDRESS 6172 Quinpool Road Apt.1 **D3 POSTAL CODE** B3L 1A3

D4 PHONE (H) 902-809-3748 **D5 PHONE (W)** _____

D6 FAX _____ **D7 E-MAIL** rachael.groat@dal.ca

D8 AFFILIATION Dalhousie School of Planning

D9 HOW DID YOU FIND THE SITE?

Chance Find Field Survey Local Contacts
 Map Or Chart Historical Research Existing Site Records

Comments

Marcos Zentilli and John Zuck

D10 CONTACT'S NAME Marcos Zentilli

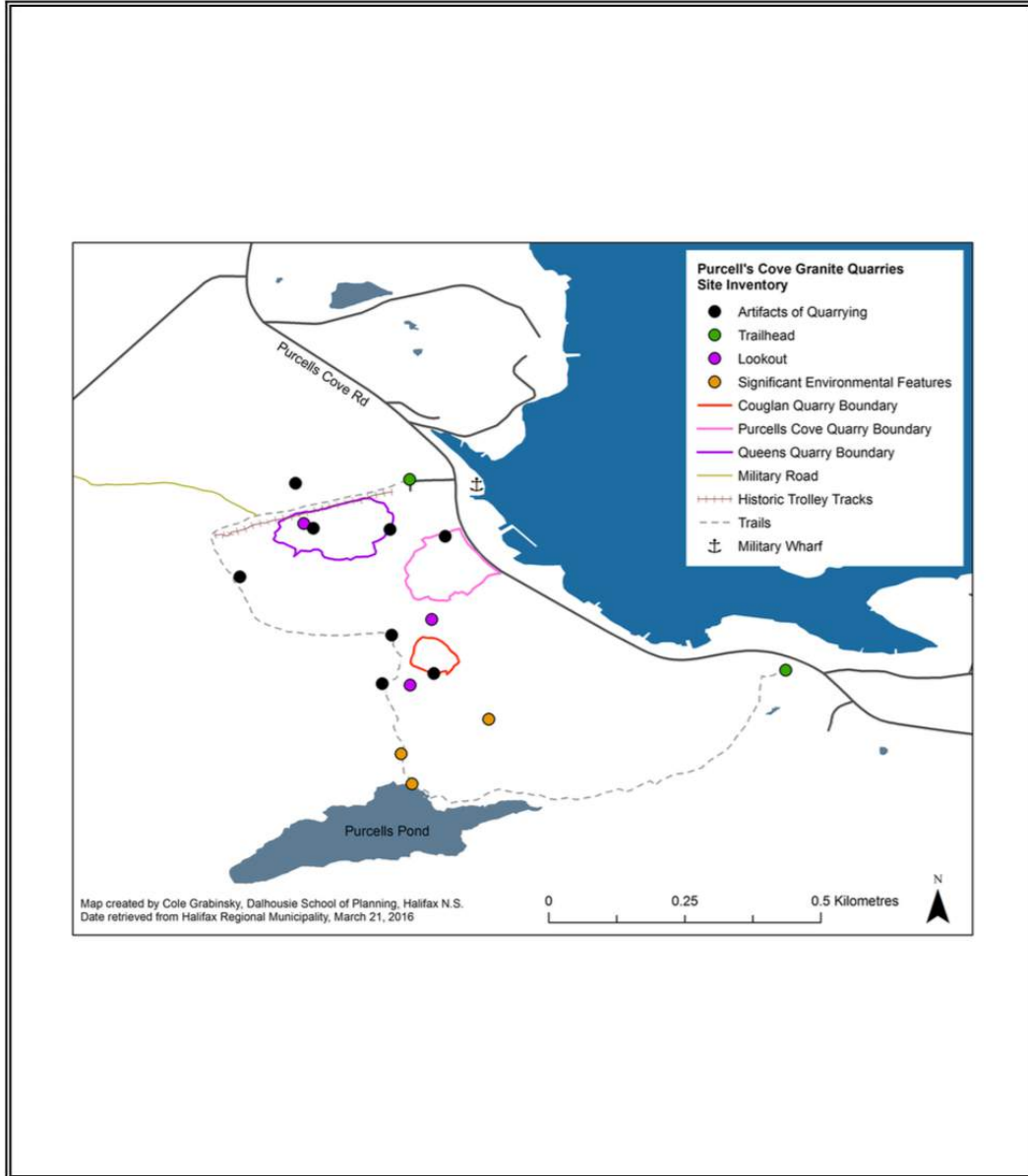
D11 MAILING ADDRESS _____

D12 POSTAL CODE _____

D13 PHONE (H) _____ **D14 PHONE (W)** _____

E. SITE PLAN

Please provide a drawing or sketch of the site, indicating prominent features, the orientation of the site and overall dimension, including artifact scatter fields. Relate the location of features in the Site Plan with features identified in the Site Access Map. Note the direction of true North and the scale of the plan.



Extent of Site/Étendue du Site	—————
Building/Édifice	■
Foundation/Fondation	□
Road/Chemin	————— - - - - -
Trail/Sentir	—————
Railway/Voie Ferrée	+ + + + +
Fence/Cloture	- x - x - x - x -
River-Creek/Rivière-Ruisseau	~~~~~
Steep Rise/Pente Abrupte	

1:50,000 Map No./Carte No. _____

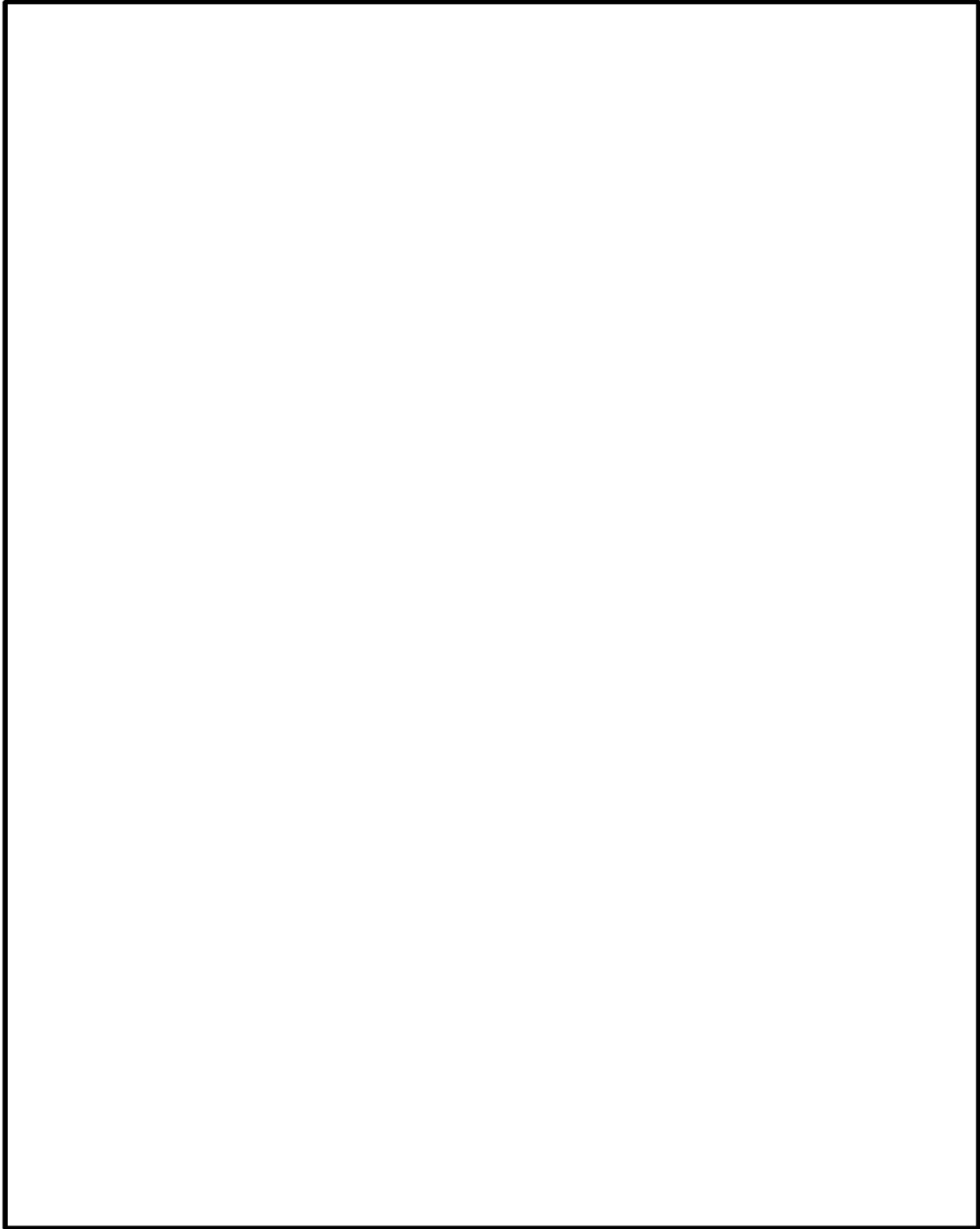
True/Vrai []

Magnetic/Magnétique []

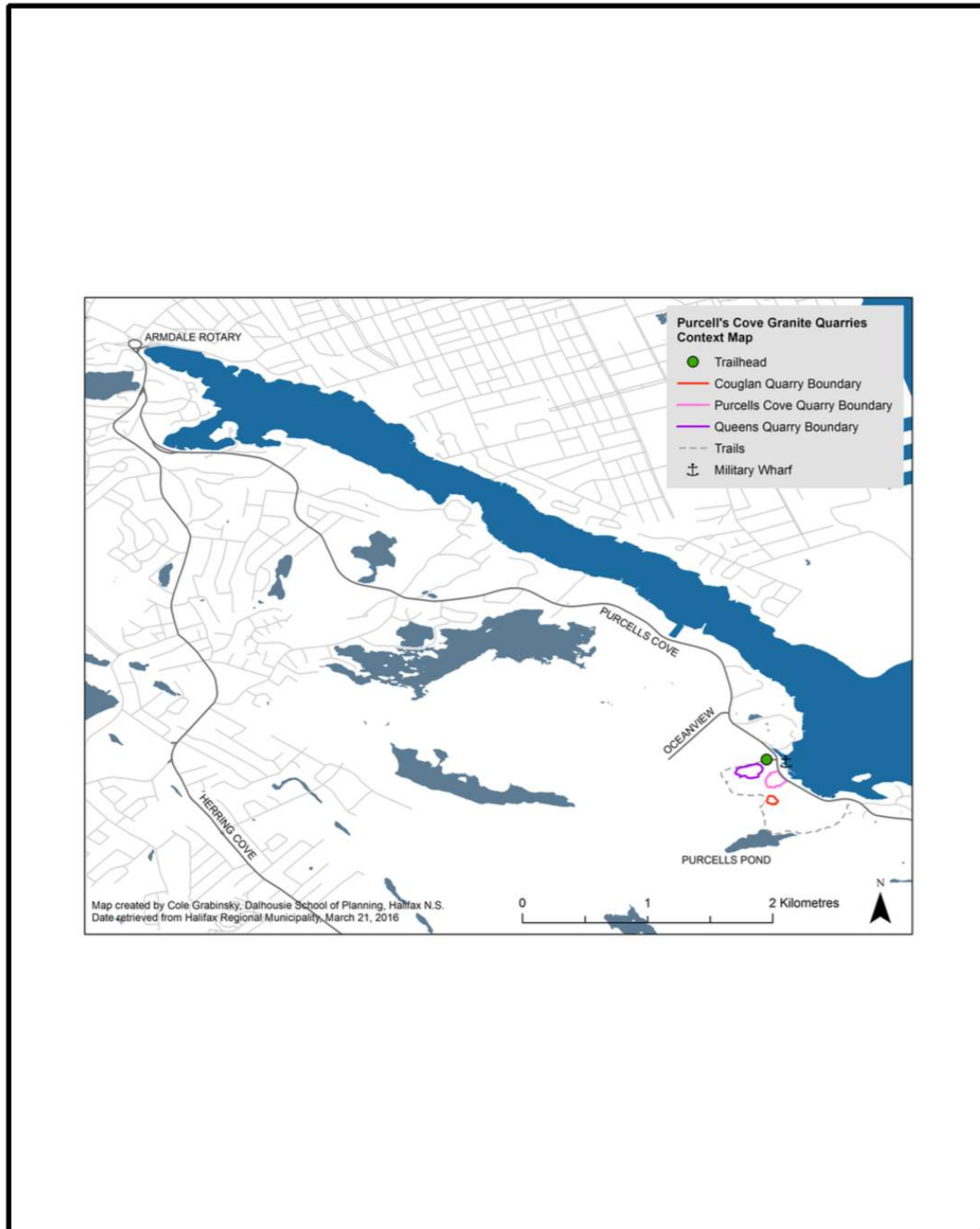
Date _____

Scale/Echelle 1cm=___m.

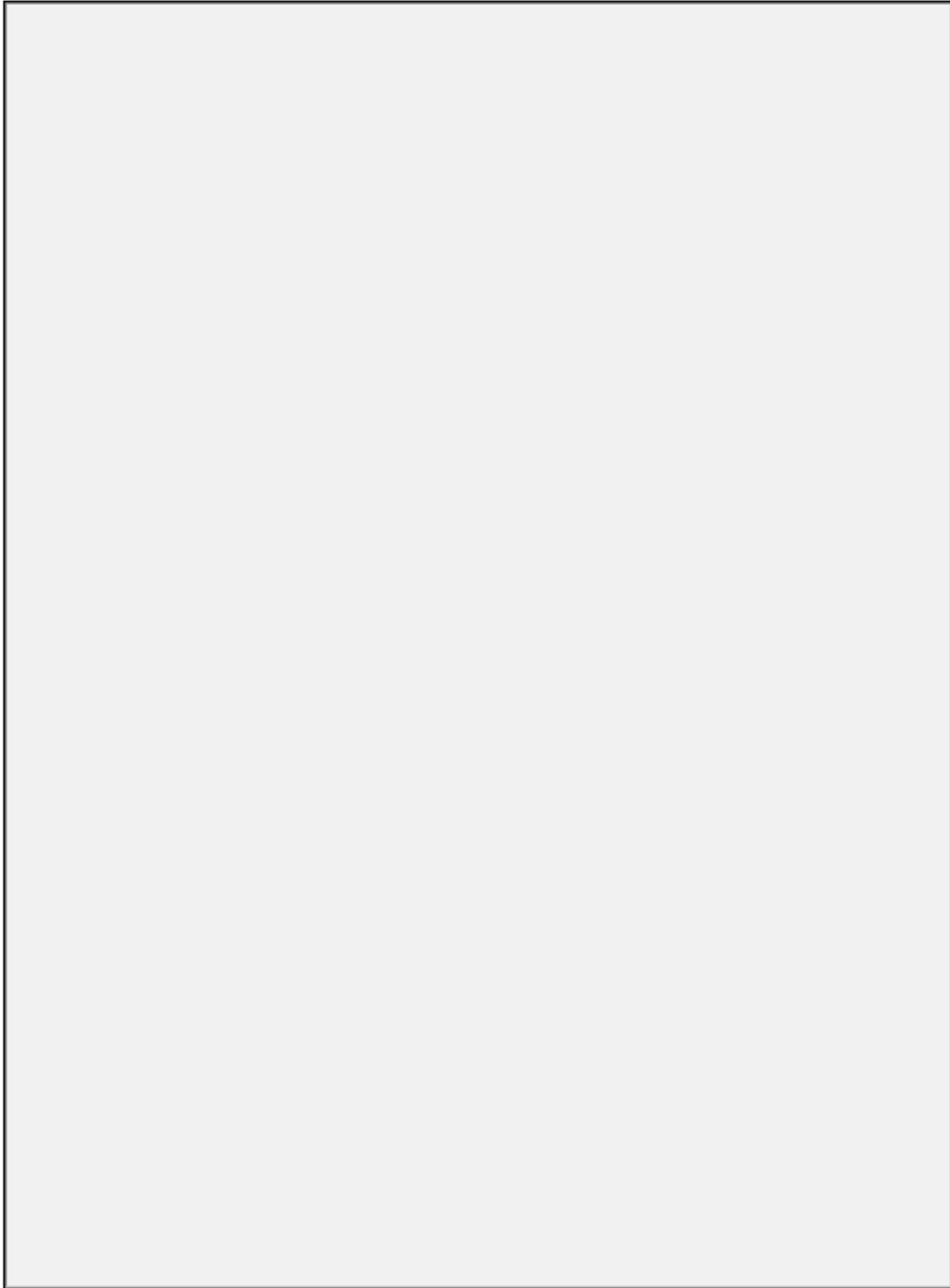
F. **SITE LOCATION MAP** (general view e.g. 1:50000)



G. SITE LOCATION MAP (detail view e.g. 1:10000)



H. REMARKS

A large, empty rectangular box with a black border, intended for handwritten remarks. The box is currently blank and occupies most of the lower half of the page.