

Mining Scars of Single Industry Communities:

An Architectural Response to the Ecological Impact of the
Mining Industry in the Lakeshore Basin, Kirkland Lake, Ontario.

by

Holly Sutton

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Abstract

This research aims to create a better understanding of the ecological economies and cultural identity within industrial communities and create a strategy for the second life of single industry cities and towns. Communities which are dependent on a single industry for employment become established in parallel with industrial economies, industry in turn becomes integrated in their identity, landscape and urban fabric. With a high number of these towns and cities reliant on mining in particular, they become incredibly susceptible to world price fluctuations.¹ The mine within the community is a double-edged sword, in that through settlement it provides jobs and economic benefits, but in its reliance on finite minerals it creates an unsustainable resource for the community. Having been born and raised in Kirkland Lake, Ontario which is a single industry mining town, I have a good understanding that this reliance guides many communities into boom bust cycles, which ultimately leads to population decline, decreased local services, and reduced property value.² This understanding has led me to choose Kirkland Lake as the location for my thesis, my connection to the community will be an asset within this body of research.

¹ Facing the Challenge of Industry Closure: Managing ... [Internet]. A Report by the Provincial and Territorial Departments Responsible for Local Government, Resiliency and Recovery Project Committee . ICURR ; 2005 [cited 2018Nov21]. Available from: <https://www2.gnb.ca/content/dam/gnb/Departments/lg-gl/pdf/FacingTheChallengeOfIndustryClosure.pdf>

² A Voice for Rural and Northern Ontario [Internet]. Rural Ontario Institute. Rural Ontario Municipal Association; 2011 [cited 2018Dec1]. Available from: <http://www.ruralontarioinstitute.ca/file.aspx?id=239b60b7-072f-490c-89e3-bca156ad924b>.

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Thank you to my community; Natasha Dombrowski and Kirkland Lake Gold for not only being very open with me but also for doing their best to plan for the future of the Lakeshore Basin and the community; Neighbours and friends who inspired me to give back to a community who has given me so much.

Thank you to my family; Mom whose creativity inspired me to pursue the field of architecture and who supplied me with endless containers of frozen spaghetti sauce; Dad whose interest in geology I evidently ended up inheriting after all despite all of my efforts not to; Nana whose confidence in me always outweighed my own; Connor and Cora for always making me laugh; Dom and Arya for always brightening my days. Thank you, all of your support and love got me through this final push.

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I am from a mining town.

Introduction

“I am from a mining town”, when asked about my background I methodically refer back to this phrase. Born and raised in Kirkland Lake, Ontario, I had a preconceived notion about communities based on the mining industry, I used to rest assured that I knew exactly what this statement meant. Found in the hinterland of society, Kirkland Lake and communities like it are thoroughly marginalized in terms of diverse architectural intervention within the built world, and through my work in the field of architecture I wanted to create a strategy or tool which could work as a catalyst in terms of regeneration. In trying to do so, I realized how little I actually knew about what it essentially means to be from a mining town, this understanding was flawed based on the economic reliance, ecological balance and sociological issues these communities actually face. Strategies of architectural intervention which would work in more diverse and balanced communities fall flat when introduced to these complex scenarios based on a lack of understanding of the conditions of the community. Before architectural intervention can be implemented in mining reliant towns and cities, there must be an understanding of the community framed through lenses of temporality, ecology and the lived experience, which are the parameters of this body of research.

Position

Communities such as Kirkland Lake live in the grey area, in the hinterlands of our country they represent the reach of industrial capitalism. As finite resources dwindle within these regions and they approach the end of this chapter in their lives, there is a notion of either fight or flight; to deny their cultural identity as industrial communities and morph into something else, or to be drained of life and become the proverbial ghost town. Alternatively, I propose there is a third way of living which draws upon architecture as a means of surviving while acknowledging and accepting the unavoidable change. This outlook is pessimistic to some, by those who view these communities with nostalgia and hope. To others it is naïvely optimistic, thinking that there is something left for these communities to offer. I argue that this outlook is both pessimistic and optimistic, seeing alternative potential despite the reality of decline in industry.

Temporality: Rather than catalytic architectural intervention which aims to diversify instantaneously, these communities need to be re-thought as built environments, growing, morphing, shrinking and changing through time.

Ecology: Finding balance between the built and un-built by acknowledging that the un-built world is not actually un-built because industrial processes leave scars visible and invisible.

Lived Experience: Designing for the lives who depend on mining because they themselves are depended on by others, the lives who exist in this morphing built world and in this scared un-built world. I am designing for the people who call this place home.

Thesis Question

As a result of the changing economies within single industry communities, how do designers respond to the need to design for the temporal and ecological aspects of a towns lifecycle, while maintaining the lived experience of that place?

Theoretical Grounding

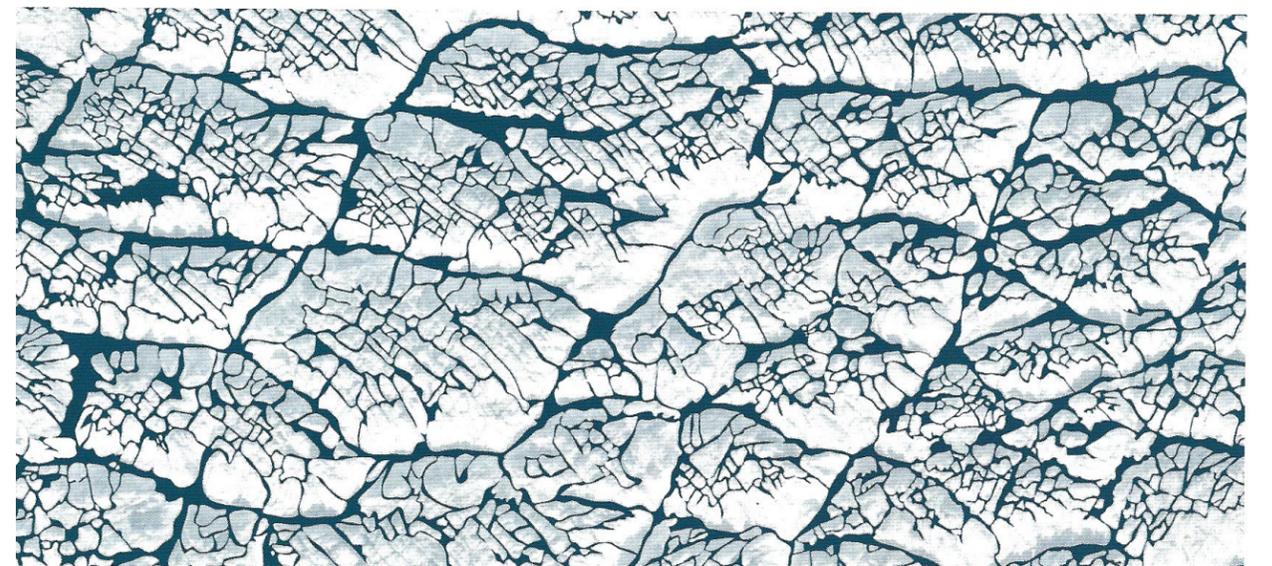
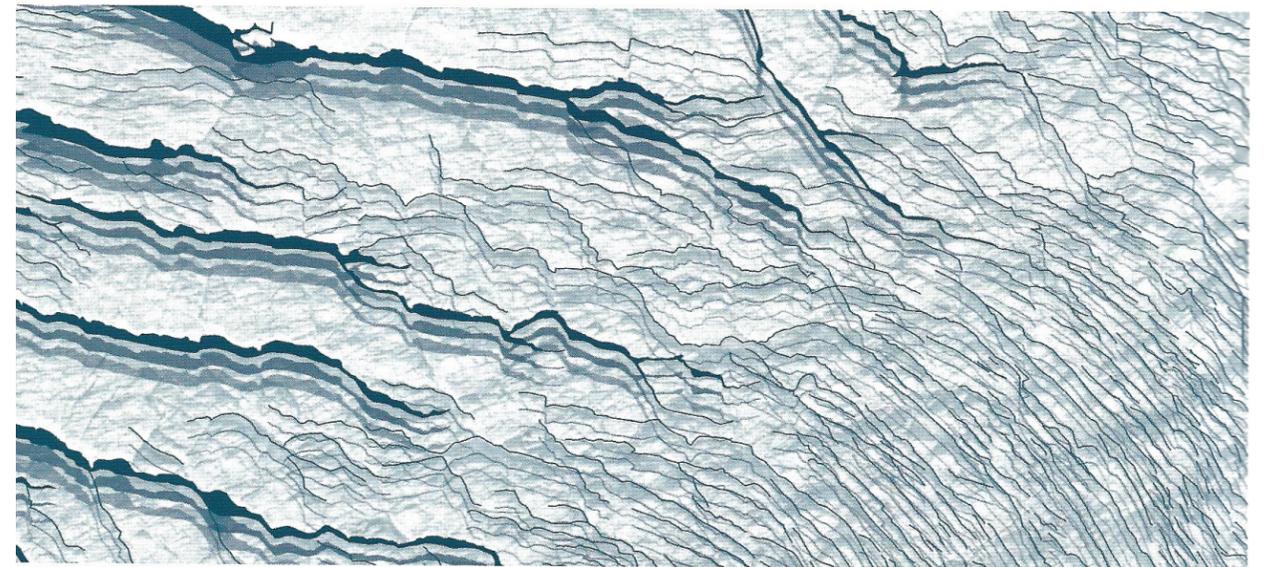
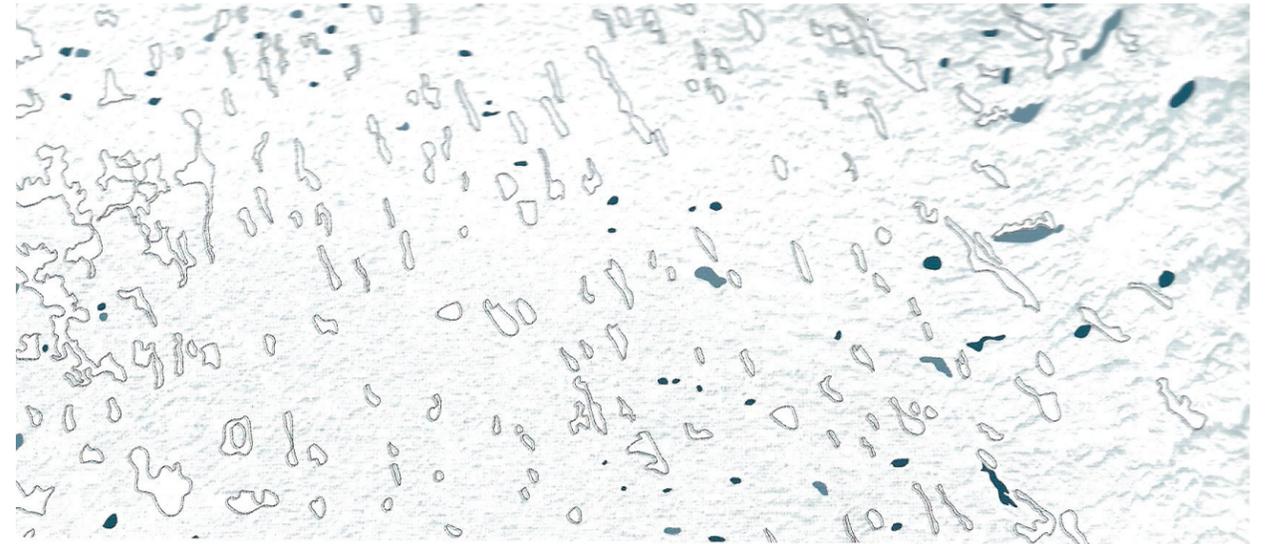


Figure 2.1 Frozen Flow from *Architecture of Nature* by Diana Agrest. This image represents the change our world is going through as a result of the growth and consumption. Her work investigates how we live in the aftermath of these changing landscapes.

Anthropocene

The detachment that we as a society have held nature could best be described by what some would call the new age of Anthropocene, as humanity's impact on the Earth is now so profound that a new geological era has begun.³ As most of the natural world has been impacted by the consequences of human life, is it appropriate for our world to be called "natural" anymore? This disconnect from nature is in regard to the gap between everyday consumption and the resource extraction which makes that lifestyle possible. This gap between knowledges can be comprehended as an interconnectedness between all aspects of life, human and non-human.⁴ Our relationship to the earth has been appropriated through exploitive technology. This provokes a question as to whether the world is a reserve of energy to be taken by mankind?⁵ Industry has been a critical part of human history for a relatively short period of time, but within that time the priority of economic growth became an unparalleled devotion to a capitalist lifestyle.⁶ This necessity for consumerist materialism calls for the exploitation of our environment, not stopping at the surface of our world, but reaching into its depths.

Stemming from a scientific understanding of systems of geology, the ability to identify relationships in geology has allowed the mining industry to utilize mineral deposits for economic gain to feed this consumerist demand. Our scientific understanding of the environment around us through the discipline of geology has created a mechanism for a shortsighted system of unsustainable growth. Capitalist growth is only possible by ensuring the flow of resources sourced and extracted from the land; through the industry of human economy, and returned back to the land as waste.⁷ Our reliance on these limited resources and carelessness with regards to waste as a byproduct posits capitalism as a system based on finite modes of existing, Timothy Morton's text *The Ecological Thought* argues that this system will have an ultimate reckoning, and we need to think in terms of a future that holds economic and social change as a consequence.⁸

3 Carrington, Damian. "The Anthropocene Epoch: Scientists Declare Dawn of Human-Influenced Age." *The Guardian*. Guardian News and Media, August 29, 2016. <https://www.theguardian.com/environment/2016/aug/29/declare-anthropocene-epoch-experts-urge-geological-congress-human-impact-earth>.

4 Morton, Timothy. *The Ecological Thought*. Cambridge: Harvard University Press, 2012.

5 Frampton, Kenneth, *Studies in tectonic culture: the poetics of construction in nineteenth and twentieth century architecture*. Ed. John Cava, Cambridge, Mass., MIT Press, 1995

6 Daly, Herman E., and Joshua C. Farley. *Ecological Economics: Principles and Applications*. Washington, DC: Island Press, 2011.

7 Ibid.

8 Morton, Timothy. *The Ecological Thought*. Cambridge: Harvard University Press, 2012.

Figure 2.2 Photography of oxidized iron within the mining landscape of Sudbury Ontario.



De-growth

There are clear correlations between the growth in the population, consumer economies and the expansion of metal and mineral resource exploitation. Yet there are serious consequences when the meager availability of finite resources results in environmental degradation.⁹ With this ever-expanding growth there has been an assumption that cities throughout history have followed a rapid urbanization pattern. Yet, only a limited number of cities have demonstrated such trends of rapid growth.¹⁰ Where the upward trajectory have been evidenced in some cities, it has mostly occurred at the expense of a majority of other urban centres that have either experienced declining economic trends or have actually started to 'shrink'.¹¹ This is particularly obvious among the developed countries of the global North.¹² The marginalization of industrial extraction is partially to blame for this concentrated growth; taking place at the boundaries of the urban edge, and in the hinterlands of society,¹³ single industry communities are often remote and isolated. When the growth in these regions declines in concert with the commodity of mineralization, the remnants of industry are left strewn and abandoned across these regions as disaffected communities and ravaged landscapes. These single industry communities have been built up to be torn down. The premise of de-growth has emerged from the realization that we live in a finite world with a drive for infinite growth.¹⁴ The concept of de-growth calls for a change in consumption economies, the transition will require the richest nations such as Canada to radically downscale their resource and energy demands.¹⁵ This inevitable

change in consumption patterns will specifically need to be dealt with in how we as designers prepare for the second life of communities who were built on resource demand. The goal of this shift for single industry communities would be to localize the economy as far as possible to reduce carbon-intensive global trade, while also building resilience in the face of an uncertain and turbulent future.¹⁶ I believe that a key to exploiting this phenomenon is to understand that de-growth does not necessarily require an end to development in these regions, but rather an approach to development where we live through alternate means and processes which seek sustainability rather than exploitation.¹⁷ The challenge of re-building a de-growth world within the shell of the old promises to be immensely meaningful,¹⁸ even if it requires a fundamental shift in our presumption of what defines growth.

“We are a raw and casual people, we Canadians - a people with little respect for the things we have built, be they houses or primitive curling rinks or social institutions. That which we have we are apt to crush and mix with cyanide. We sell the good stuff and keep the dross. In the name of vague progress, we set out to destroy what we have so painstakingly created. We forget that once everything has been bulldozed, there will be nothing left.” -Tom Walkom¹⁹

9 "Mining & Minerals." Natural Resources Canada, December 15, 2017. <https://www.nrcan.gc.ca/earth-sciences/geography/atlas-canada/selected-thematic-maps/16878#mining>.

10 Nebojša. "The Trap Within Anticipated Regrowth : Two Sides of Strategic Respo..." Articulo - Journal of Urban Research. Journal of Urban Research, August 1, 2018. <https://journals.openedition.org/articulo/3596>.

11 Ibid.

12 Ibid.

13 Bélanger, Pierre. Extraction Empire: 2017-1217, Undermining the Systems, States, & Scales of Canadas Global Resource Empire. Cambridge, Massachusetts: MIT Press, 2018.

14 Daly, Herman E., and Joshua C. Farley. Ecological Economics: Principles and Applications. Washington, DC: Island Press, 2011.

15 Alexander, Samuel. "Life in a 'Degrowth' Economy, and Why You Might Actually Enjoy It." The Conversation, December 19, 2019. <http://theconversation.com/life-in-a-degrowth-economy-and-why-you-might-actually-enjoy-it-32224>.

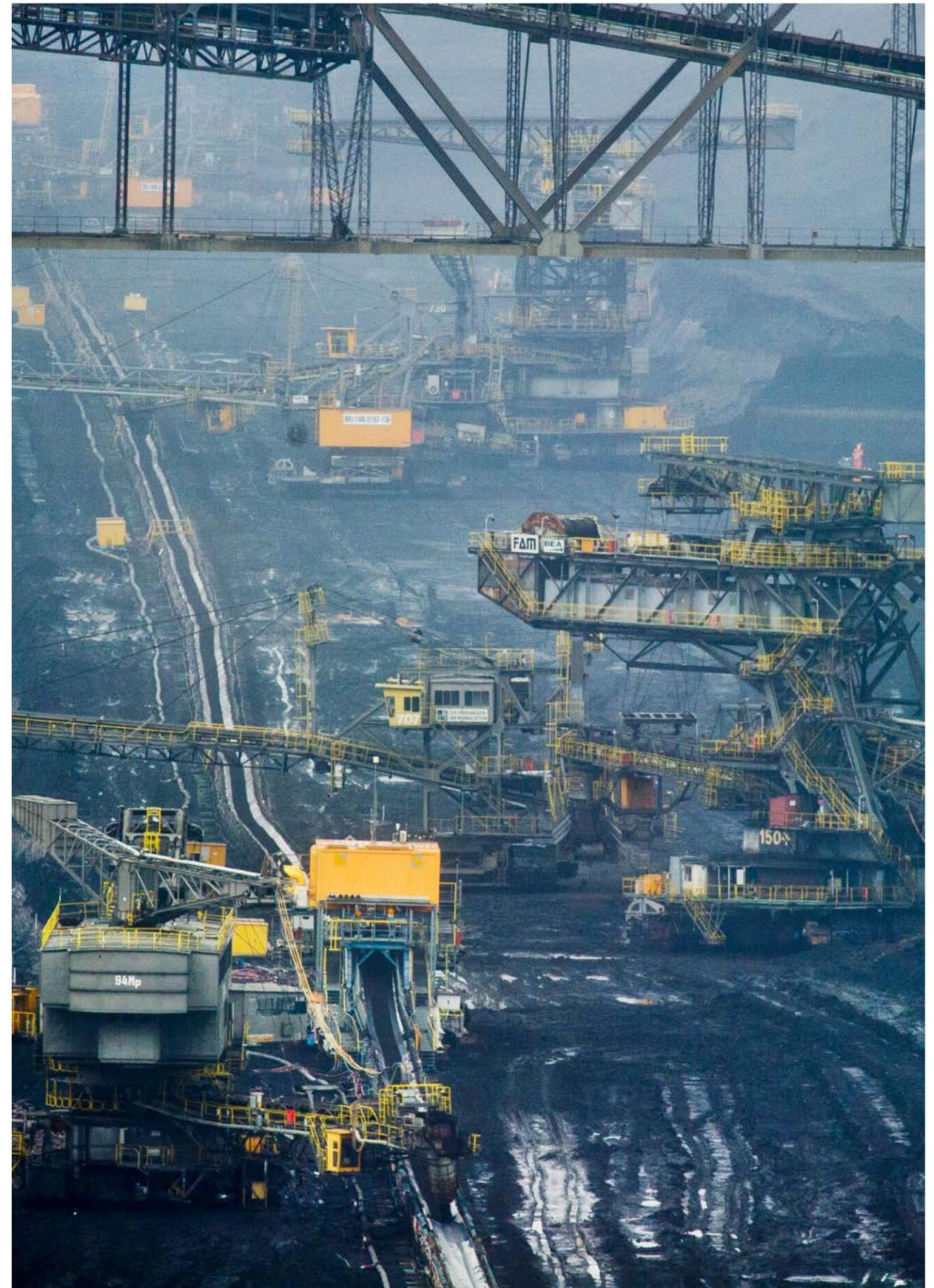
16 Ibid.

17 Daly, Herman E., and Joshua C. Farley. Ecological Economics: Principles and Applications. Washington, DC: Island Press, 2011.

18 Alexander, Samuel. "Life in a 'Degrowth' Economy, and Why You Might Actually Enjoy It." The Conversation, December 19, 2019. <http://theconversation.com/life-in-a-degrowth-economy-and-why-you-might-actually-enjoy-it-32224>.

19 Bélanger, Pierre. Extraction Empire: 2017-1217, Undermining the Systems, States, & Scales of Canadas Global Resource Empire. Cambridge, Massachusetts: MIT Press, 2018.

Figure 2.2 Image by Patrick Pleul of brown coal operation in Eastern Germany which will soon displace another town.



Industry as Artifact

If we are to reconsider our current practices of consumerist habits, then we must ultimately reconsider our beliefs in relation to the exploitation of nature. In terms of industry and urban growth we must take a hard look at the belief that 'nature' is there for us to take, that the Earth is there to be ravaged without even any compulsion to repair it.²⁰ Rather, we need to see ourselves as part of nature and part of the planet.²¹ For single industry communities this means reevaluating the land we have forsaken, which is littered with what are perceived as the relics of previous industrial revolutions.²² These relics, be they industrial buildings, machinery, or scarred landscapes, are often seen as urban decay, discarded and under-utilized, but are also the defining characteristics of the regions they come from. In contrast towards the capitalist compulsion to erase history or a strategy of growth, the concept of de-growth in this context is a returning to nature while acknowledging past identity.²³ There is a need for buildings and sites of past use to be respected regardless of their origins. There is also a question of reversing the "disposable" trend, infrastructure in these communities is regarded as disposable. Alternatively, Liliane Wong argues that understanding characteristics of industrial identity is a key to engaging these sites into an existing condition.²⁴ Potentially, architecture could be utilized to enhance and give value to derelict sites based on their industrial history.

20 Bélanger, Pierre. *Extraction Empire: 2017-1217, Undermining the Systems, States, & Scales of Canada's Global Resource Empire*. Cambridge, Massachusetts: MIT Press, 2018.

21 Ibid.

22 Louw, Michael. *Industrial Heritage Protection and Redevelopment*. Victoria: The Images Publishing Group, 2018.

23 Heatherington, Catherine. *Reimagining Industrial Sites Changing Histories and Landscapes*. London: Routledge, Taylor & Francis Group, 2018.

24 Wong, Liliane. *Adaptive Reuse Extending the Lives of Buildings*. Basel: Birkhäuser, 2017. Page 133.

“The problems of mining are a bit like Humpty Dumpty. In other words, Humpty Dumpty sat on the wall, Humpty Dumpty had a great fall, all the king’s horses and all the king’s men couldn’t put Humpty Dumpty back together again. The idea in mining is that a lot of people would like to put the landscape back together again the way it was, back in the nineteenth century. And of course that won’t happen. But you will be able to perhaps confer a different kind of value through a different kind of cultivation.”²⁵

25 Smithson, Robert, Eugenie Tsai, Cornelia H. Butler, Thomas Crow, and Alexander Alberro. *Robert Smithson*. Berkeley, CA: University of California Press, 2004. Page 94.

Figure 2.3 Image of Spiral Jetty by Robert Smithson, land art which changes and morphs through time.



Lived Experience

Regarding landscape and economic uncertainty through the lens of a lived experience, Alice Mah's research examines the spatial, material, and economic dimensions of landscapes of industrial ruination. Her work is also concerned with landscapes as inhabited places in which people live through processes of change.²⁶ Innovation and alternative ways of doing must rely on a trans-disciplinary approach which provides multiple perspectives on highly complex systems of industrial ruination.²⁷ A large part of this must be completed not just through an ecological methodology which aims for a return to nature, but in terms of the humanities and arts as well. As ecology exposes areas of life that we find annoying, boring, and embarrassing, a trans-disciplinary approach can help us, because art and design is a place in our culture that deals with intensity, shame, abjection, and loss.²⁸ Architecture and art are a means of expressing the lived experience of industrial culture, but also architectural craft is a means of working against the grain of production and consumption, to re-build and adapt with quality, sustainability and uniqueness to place. Innovation through craft in a capitalist society depends largely on a self-conscious rereading, remaking, and re-collection of tradition, including the tradition of the new, just as tradition can only be revitalized through innovation.²⁹

26 Mah, Alice. *Industrial Ruination, Community, and Place: Landscapes and Legacies of Urban Decline*. Toronto: University of Toronto Press, 2013.

27 Daly, Herman E., and Joshua C. Farley. *Ecological Economics: Principles and Applications*. Washington, DC: Island Press, 2011.

28 Morton, Timothy. *The Ecological Thought*. Cambridge: Harvard University Press, 2012.

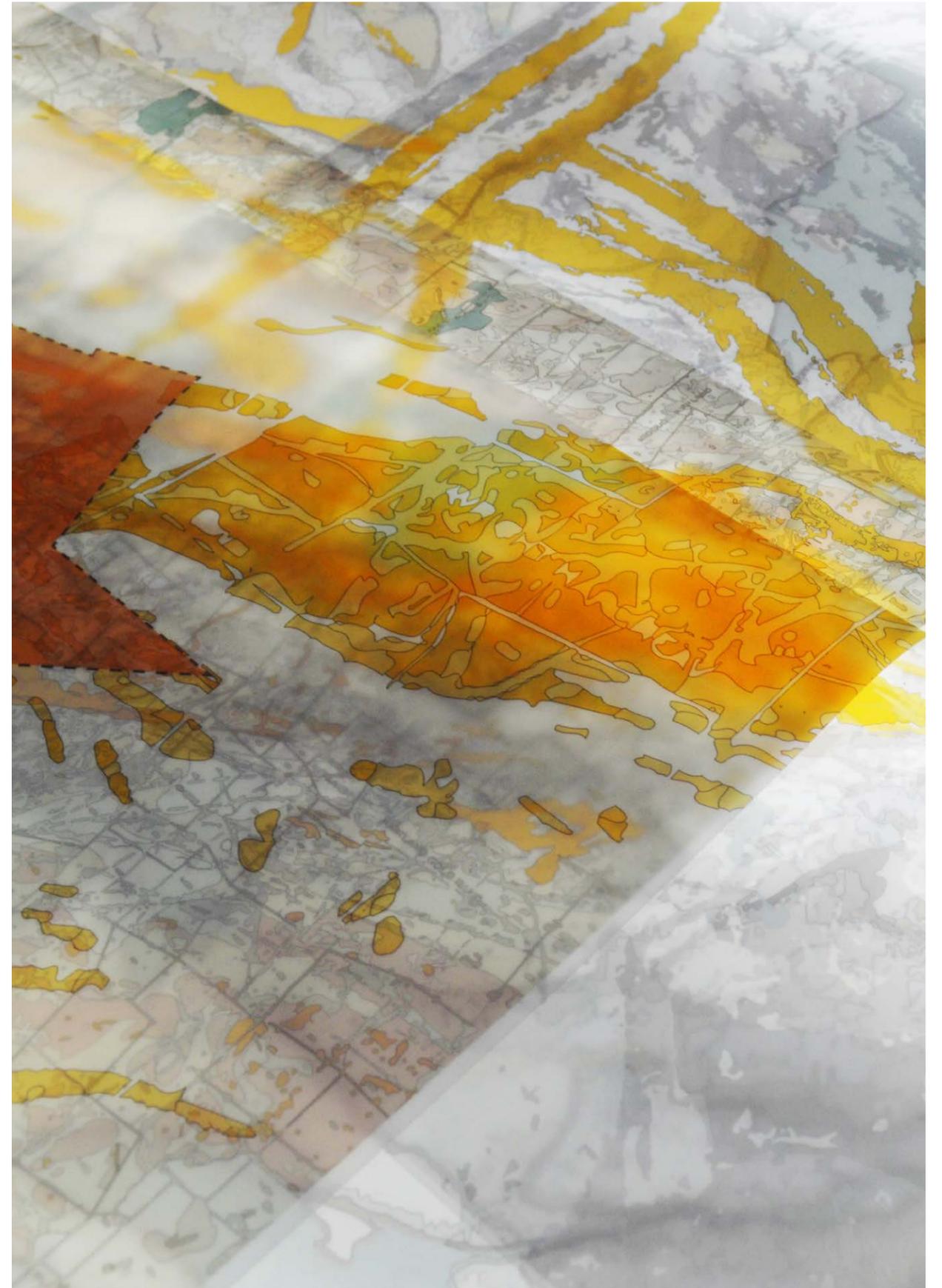
29 Frampton, Kenneth. *Studies in tectonic culture: the poetics of construction in nineteenth and twentieth century architecture*. Ed. John Cava. Cambridge, Mass., MIT Press, 1995.

Figure 2.4 Photo of Love Canal resident Lois Gibbs in the 1980s. Living through processes of industrial ruination of the chemical waste catastrophe that was the Love Canal led Gibbs to become an environmental activist. The lived experience of the site is documented in Alice Mah's book *Industrial Ruination*.



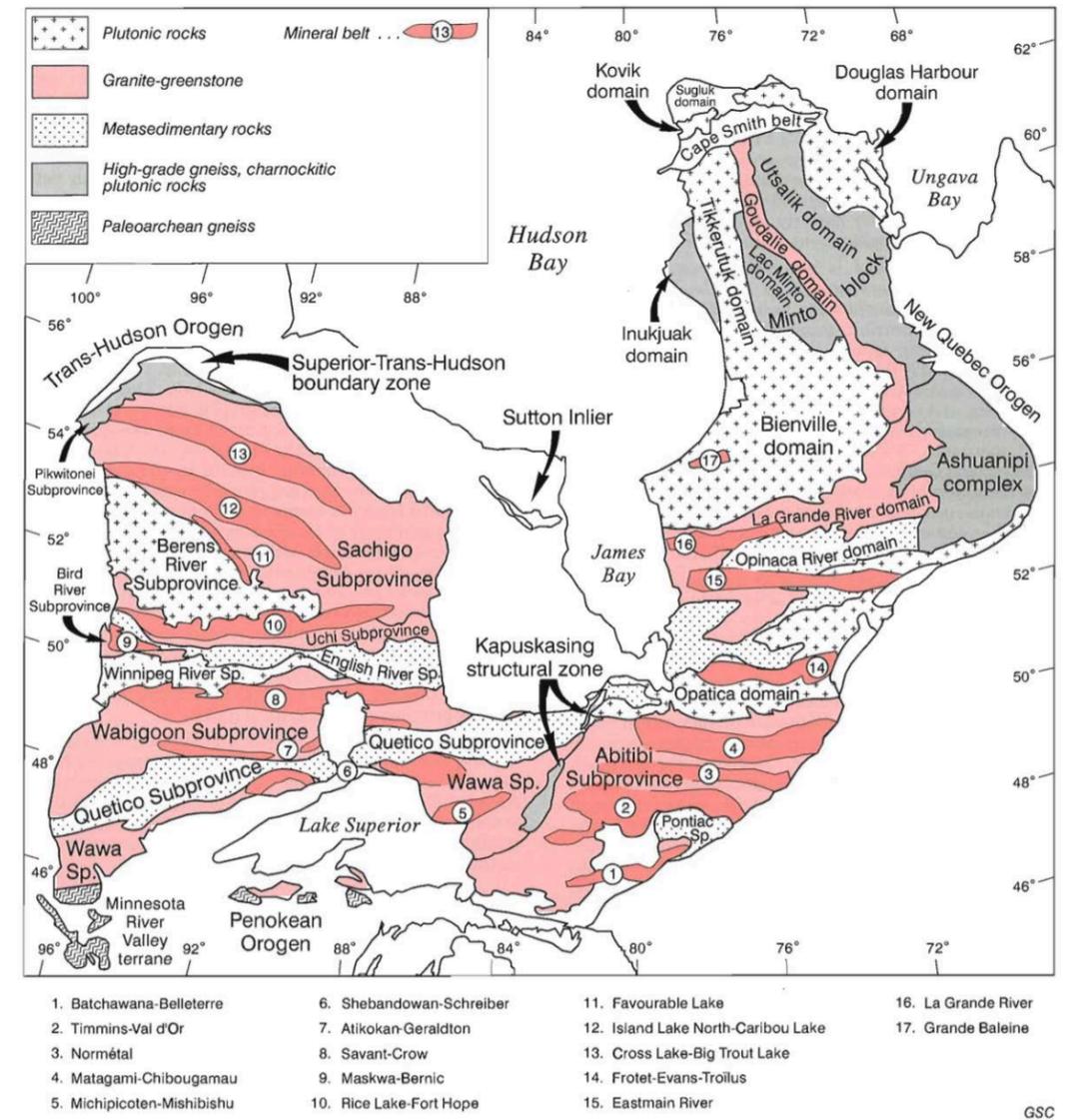
Methodology & Synthetic Work

Figure 3.1 Overlay of mylar mapping on the light table. This particular image features the various scaled geologic mapping layered with Kirkland Lake as the focal point. The layers of gold representing the geologic importance of the region.



Cartography

In searching for an understanding of the mining industry, I began looking at the connections between the economy, the environment and society in the context of industrial extraction. Studying traditional forms of cartography which are the primary modes of representing these systems. I found that it was necessary to research the topic at a variety of scales, such that I could gain a sense of the impact and ripple effect which smaller mining-based communities such as Kirkland Lake made. Traditional forms of cartography are limited in their ability to express heterogenic information across the domains of science, culture and artistic expression. Interrelated concepts of temporality, ecology and lived experience which are subjective in nature, seem to be difficult to express in a wholistic manner. As scientific mapping such as that of Denis Wood and John Fels seeks to produce a correct relational model of terrain which banishes subjectivity from the image,³⁰ the implication of this mapping is an ideological medium. Mapping as it is rooted in the westernized concept of cartography is a disciplined scientific model that, in the words of Wood and Fels is one in which it is claimed that a mirror of nature can be projected through measurement and geometry.³¹ In contrast to this traditional model, non-traditional forms of cartographic representation claim their own subjectivity: "there's no escape from the cartographic paradox: to present a useful and truthful picture, an accurate map must tell white lies"³².



30 Wood, Denis, and John Fels. "The Nature of Maps." In *The Natures of Maps: Cartographic Constructions of the Natural World*, 6-23. Chicago: University of Chicago Press, 2008. Pg 6.

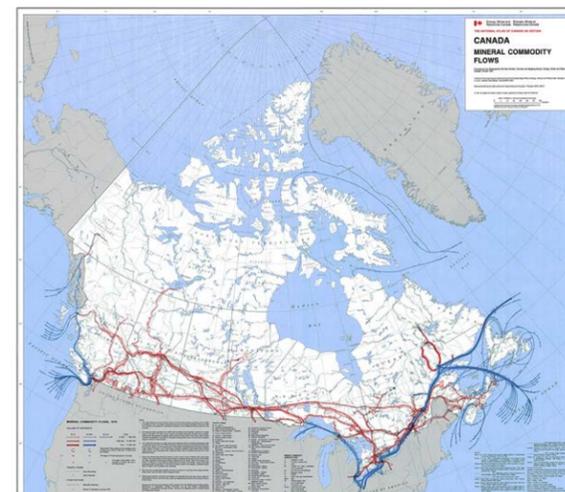
31 Ibid.

32 Monmonier, Mark S. "Introduction" and "Elements of the map." In *How to Lie with Maps*, 1-24. Chicago: University of Chicago Press, 1991. Pg 1.

Figure 3.2 (Top) Geological Sketch of Superior Province Subprovinces and Mineral Belts.

Figure 3.3 (Bottom Left) Mineral Commodity Flows.

Figure 3.4 (Bottom Right) Drainage Patterns.

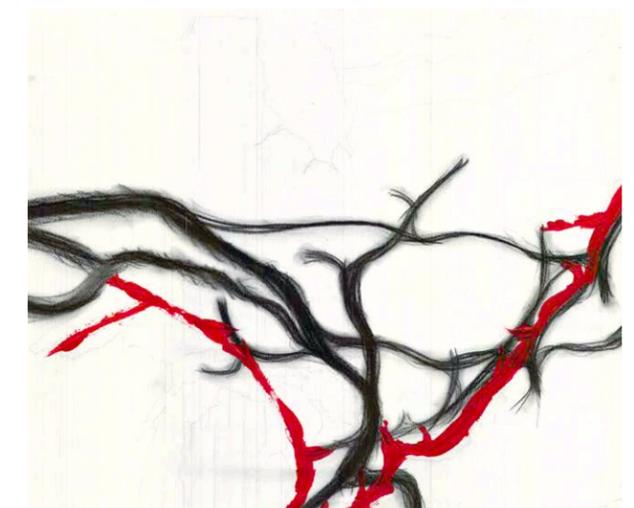
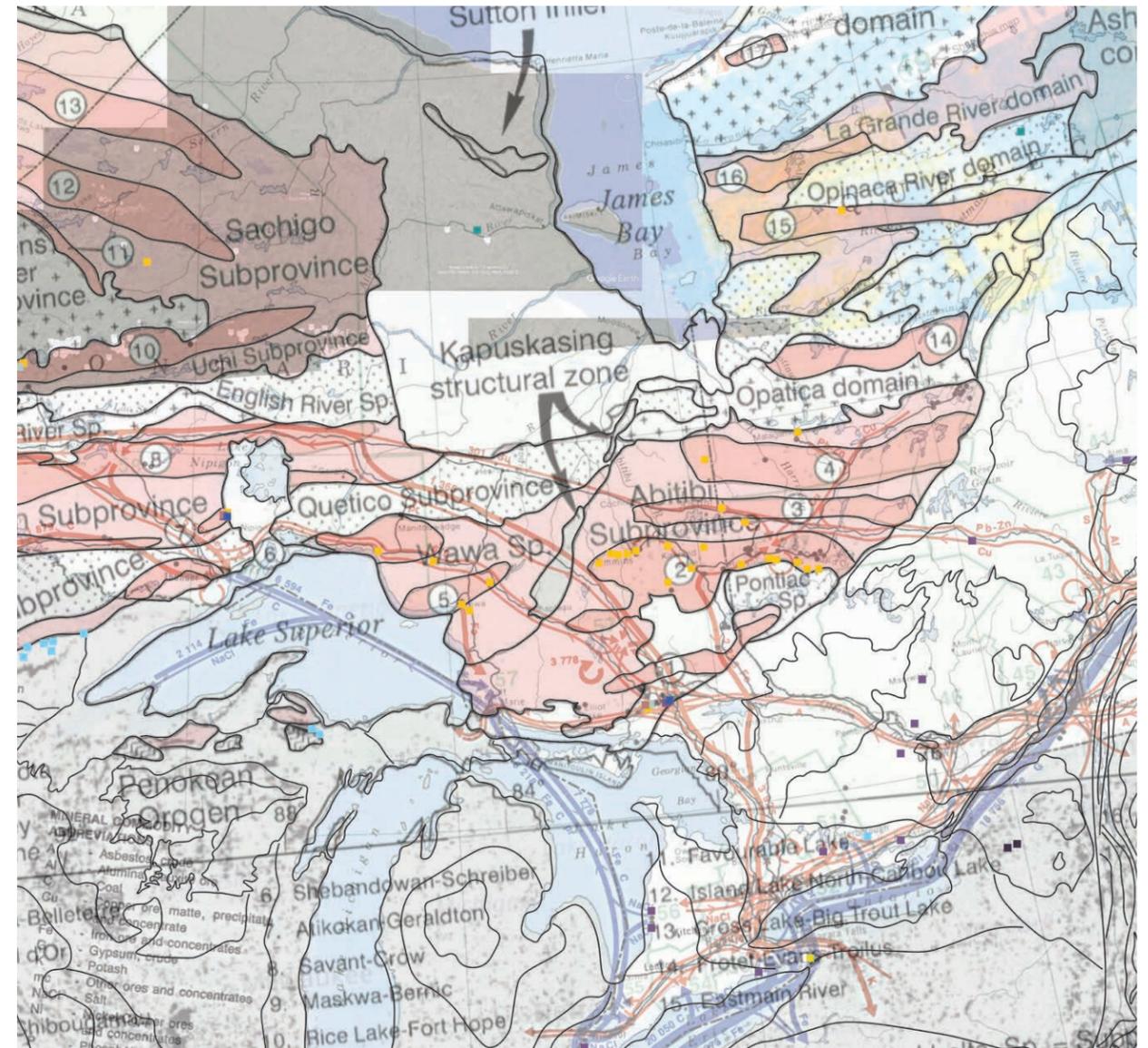


Layering

The intention in my research – creation using cartographic media is to relate geological cartography, resource extraction and societal issues through an exploration of layered mapping. Based on the inter-related nature of systems of environment, society and economy, I quickly realized that the patterns of ecology between systems needed to be observed in a method of layering to be properly analyzed. All of my own mapping sources are from the Geologic Survey of Canada (GSC) and the Ministry of Natural Resources (MNR), which are also the governing bodies related to the expropriation of the nature they are representing. For example, the setting up of the Geological Survey of Canada was to gain geological information to support minerals exploration and was closely associated with nation-building³³. As cartography is the tool of those who seek to expropriate nature, I felt that it was appropriate to utilize the same cartography to identify how the degradation of nature and communities was linked to mining reliance. First attempting to layer these scientific maps through digital representation, I found that although the systems were more easily compared, the static and biased nature of the mapping I was sourcing from limited my ability to identify how these systems are intertwined.

33 Brownsey, Keith, and Michael Howlett. *Canada's Resource Economy in Transition: the Past, Present, and Future of Canadian Staples Industries*. Toronto: Emond Montgomery Publications, 2008. Pg 149.

Figure 3.5 (Top) Digital Collage of Various Scientific Cartographies.
Figure 3.6 (Bottom Left) Watercolour painting of geological regions.
Figure 3.7 (Bottom Right) Charcoal of Mineral Commodity Flow by Volume.



Transparency

Moving forward in my synthetic work, I sought to explore ways in which I could analyze and understand the ecological patterns between systems of geological cartography, resource extraction and societal issues through alternate means of cartographic representation. The limitations of the scientific mapping previously mentioned led me to create my own representations based on factual information. This method of working allowed the mapping to remain informative but synthesized the important information for the purpose of layering. Unsatisfied with the restrictions of digital layering, I began printing this work on transparent mylar as an alternate way to view the layers. The mylar itself only allowed for two layers of information to be compared at once, which led me to investigate the light table as a tool for viewing the transparencies. This was the most successful means of analyzing and dissecting the scientific mapping I came across. The light table allowed me to see all layers of information on the mylar at once, and easily compare different combinations of information to gain insights on the workings of geological cartography, resource extraction and societal issues.

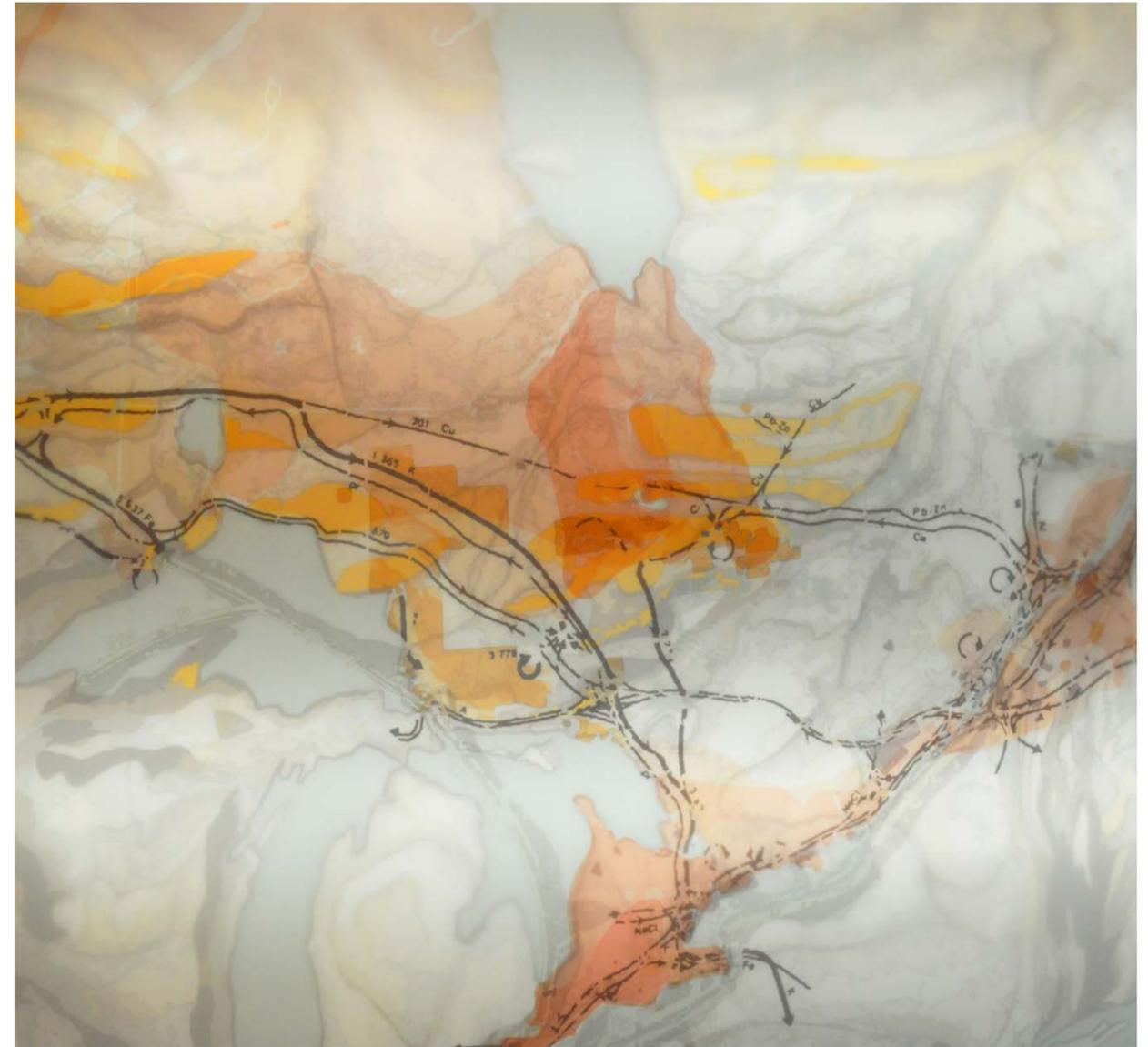


Figure 3.8 (Top) Layers of mylar on light table
Figure 3.9 (Bottom Left) Layers of mylar on light table
Figure 3.10 (Bottom Right) Layers of mylar on light table

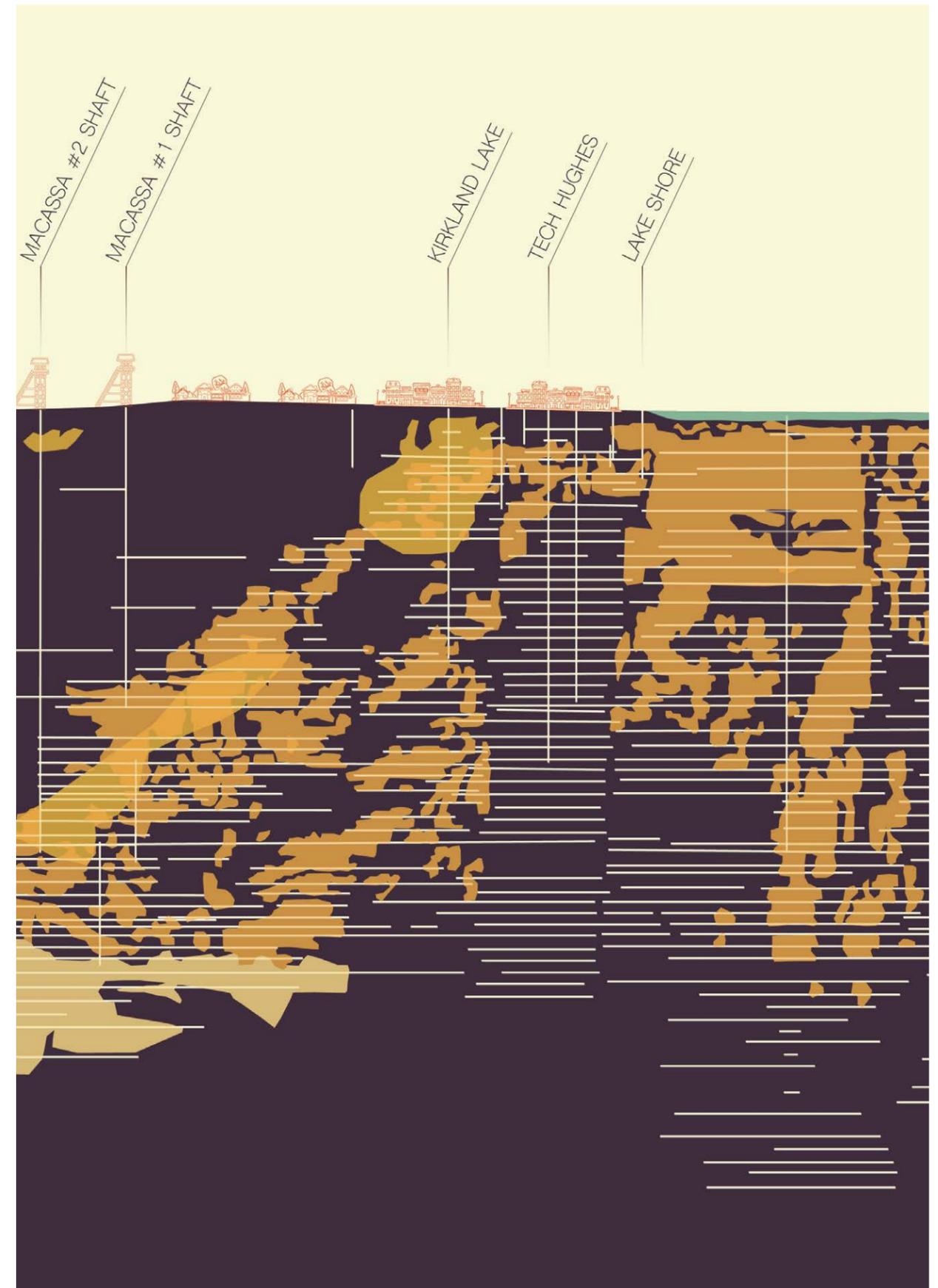
Subterranean

While cartography was helpful in terms of understanding relationships between systems of geology, resource extraction and society, I felt that I needed to further investigate how these systems intertwined at the local scale. The town literally sits on gold. That is neither a metaphor or a tall tale, Kirkland Lake in fact sits on a geologic fault laced with gold, this knowledge is crucial to the study of the local economic and physical growth of the town, and the ecological balance between industry and the environment. The more compelling part of this thought is the vast scale at which the infrastructure of the mine beneath the town exists. Like an iceberg, the headframes which connect this vein of gold at surface level are marginal to the network of shafts uniting them underground. Regarding modes of representation which embody these relationships, my methodology of working began to take shape. Considering how miners and geologists use representational drawings, namely plan and sectional views, to probe and index matter hidden beneath the earth's surface for the purpose of extraction.³⁴ Section and plan are familiar territory, they are the tools of the designer, and is this subterranean Kirkland Lake not that?

A designed built world hidden from sight but always underfoot, trembling quakes of rock bursts and blasting made real by the scars left on the land. Tunneling, burrowing and digging, to comprehend this I needed to see the relationship of geology to mine to town, modelling it being the only way to understand the scale and depth this subterranean built world takes shape.

³⁴ Berger, A. "Representation and Reclaiming: Cartographies, Mappings, and Images of Altered American Western Landscapes." *Landscape Journal* 21, no. 1 (January 2002): 1–22. <https://doi.org/10.3368/lj.21.1.1>.

Figure 3.11 Geology and Infrastructure Underground in Relation to Kirkland Lake.



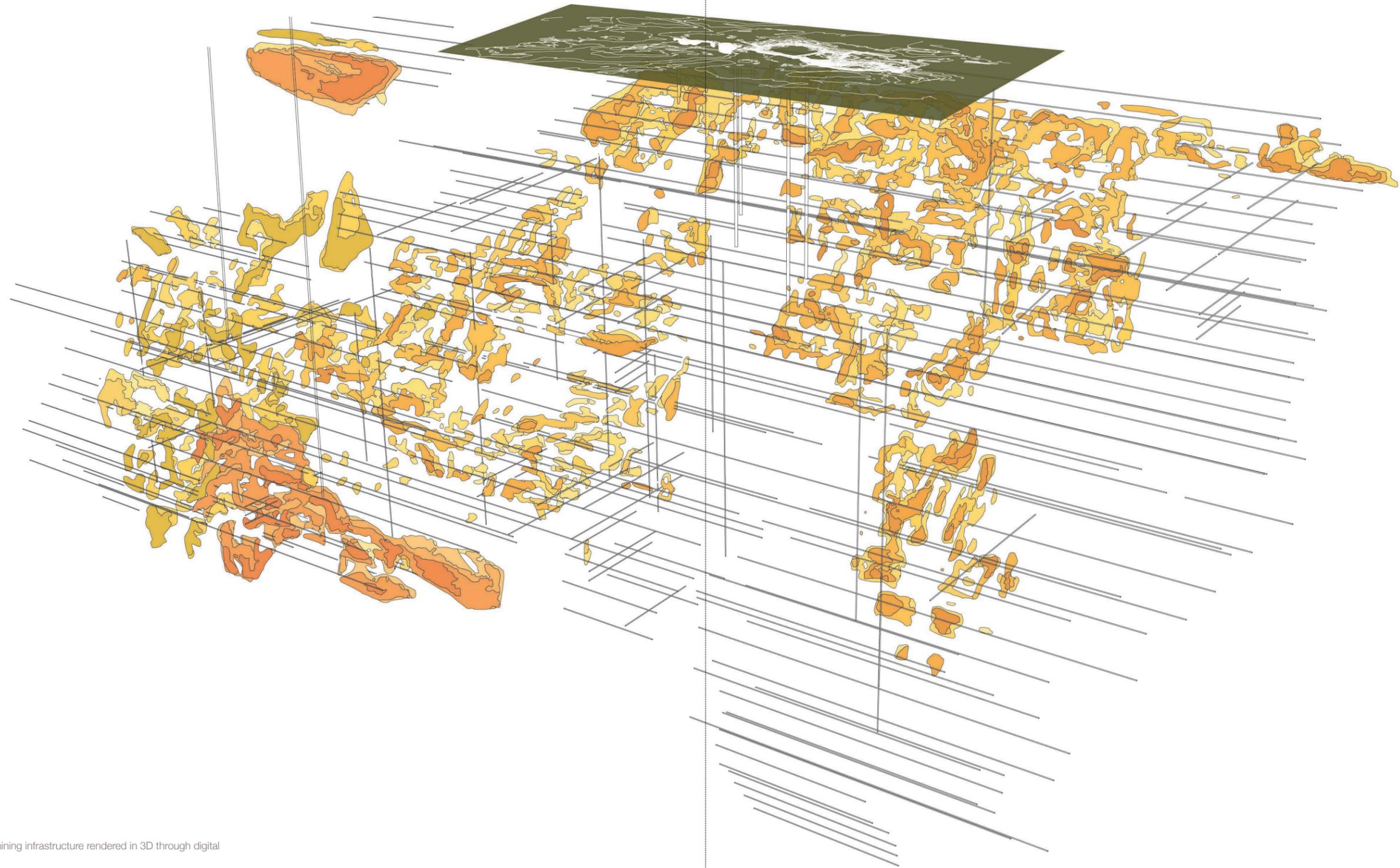


Figure 3.12 Geologic and mining infrastructure rendered in 3D through digital exploration.

Temporality

This subterranean world took over a century to build, but what has become of great concern to me is what will happen in the next century to what we have built and what we intend on building. As a large portion of my work is fixated on the different phases of the community's life I needed to find an adequate way for documenting my proposed architectural interventions over time. Events and moments in time can be written down, they can be translated into a timeline of events, or communicated verbally as a story. Timelines and lists work well for simple stories, but the reality of these places are different than most, and therefore should not be represented in the same way. Communities like Kirkland Lake grow, shrink and morph slowly through time, there are very few monumental events which mark these changes, many of these changes are also happening simultaneously. Timelines also lack the capacity to let people visualize these changes as architectural and site interventions, so I began seeking an alternative means of translating information. I began by looking at the site in plan view and began drawing what was happening to the site on trace paper. Although this way of working allowed me to visualize the changes to the site more effectively, similar to the hoarding of information from my cartographic research, it needed to be synthesized and organized. I began to organize the layers of the site plan on Adobe Illustrator next, this allowed me to view the information in layers which could be turned on and off, but still lacked the ability to express how the site morphed through time. Bringing the document into Adobe After Effects allowed me to bring the layers of information in and out through the use of keyframes, and the document became an effective tool for communicating how a site could change through time. The file was then projected onto a 3D Expanded Polystyrene foam topography model.

Figure 3.13 Projecting onto EPS foam topography model.



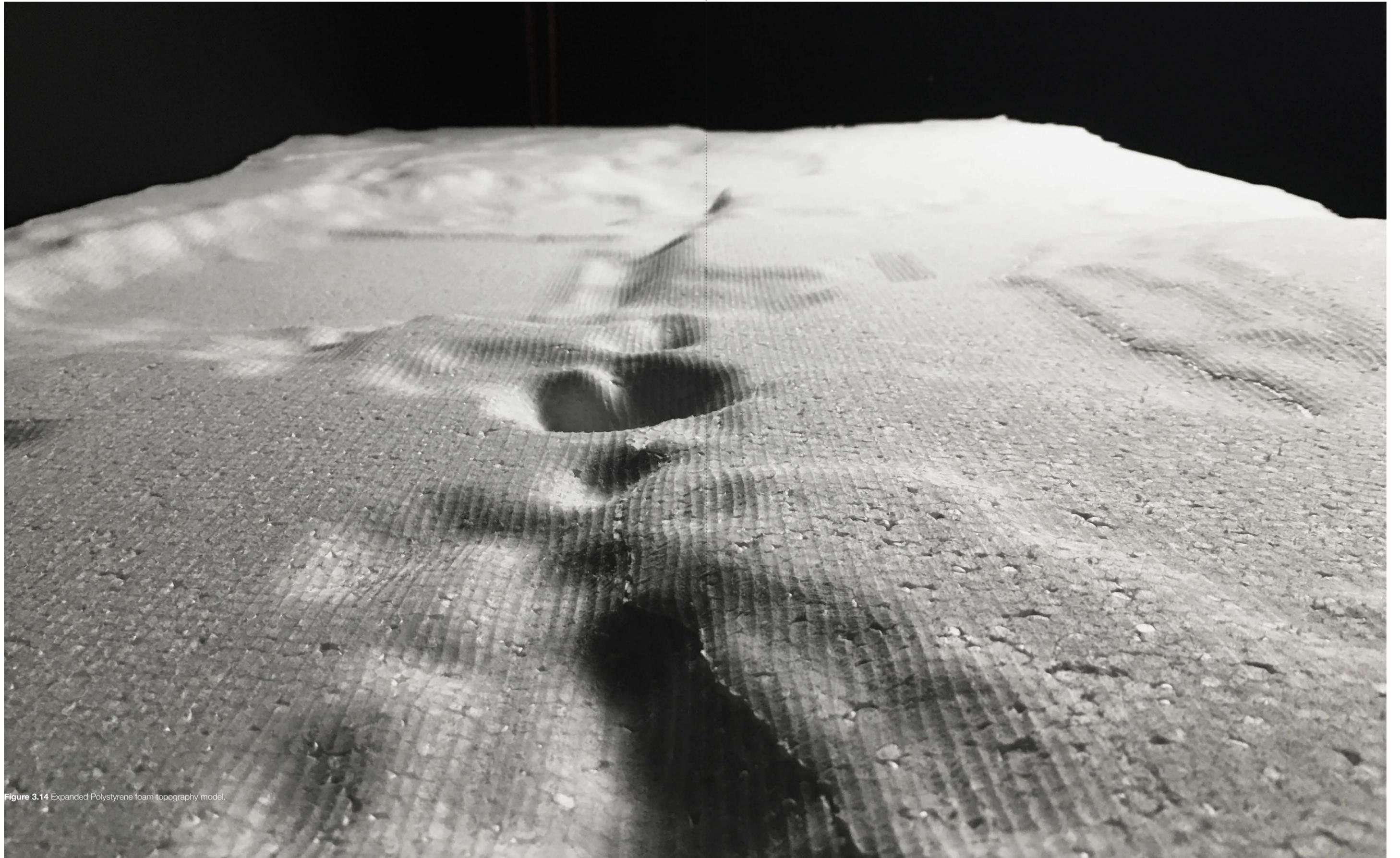


Figure 3.14 Expanded Polystyrene foam topography model.

Site Analysis & Research of Kirkland Lake

Figure 4.1 Early planning of the town of Kirkland Lake, placement of lots indicate a focus on the waterfront.



Geologic Origins

The Abitibi Greenstone Belt (AGB) which the town of Kirkland Lake and many other small mining communities span across is the largest greenstone belt in the world. Covering an area of over 85 000 km²,³⁵ the AGB holds the majority of metallic mineral deposits of Northeastern Ontario and Northwestern Quebec.³⁶ This geological distinction relates directly to the distribution and growth of single industry communities of the region.³⁷ The fault acts as a separation between two types of magmatic bodies of rock which are closely associated with gold. Gold of course, resulted in the abundance of gold mines along this area.³⁸ All of the communities in the region have similar origin stories in that they were explored and then later mapped by prospectors. After settlement was designated based on possible geological prosperity, mining camps were set up, but development became more prominent once the railway reached each location.³⁹ This similar history and landscape has become the link between single industry communities across the AGB, communities such as Kirkland Lake, Timmins, Rouyn Noranda and Val D'or are quite different in other respects, but due to their founding and reliance on gold mining they all struggle with similar socio-economic and environmental issues. Through researching Kirkland Lake, I hope to be able to create strategies which would benefit other AGB communities.

35 Levesque, G S, E M Cameron, and A E Lalonde. "Duality of Magmatism Along the Kirkland Lake - Larder Lake Fault Zone, Ontario," 1991, 17-24. <https://doi.org/10.4095/132556>. Page 8-10.

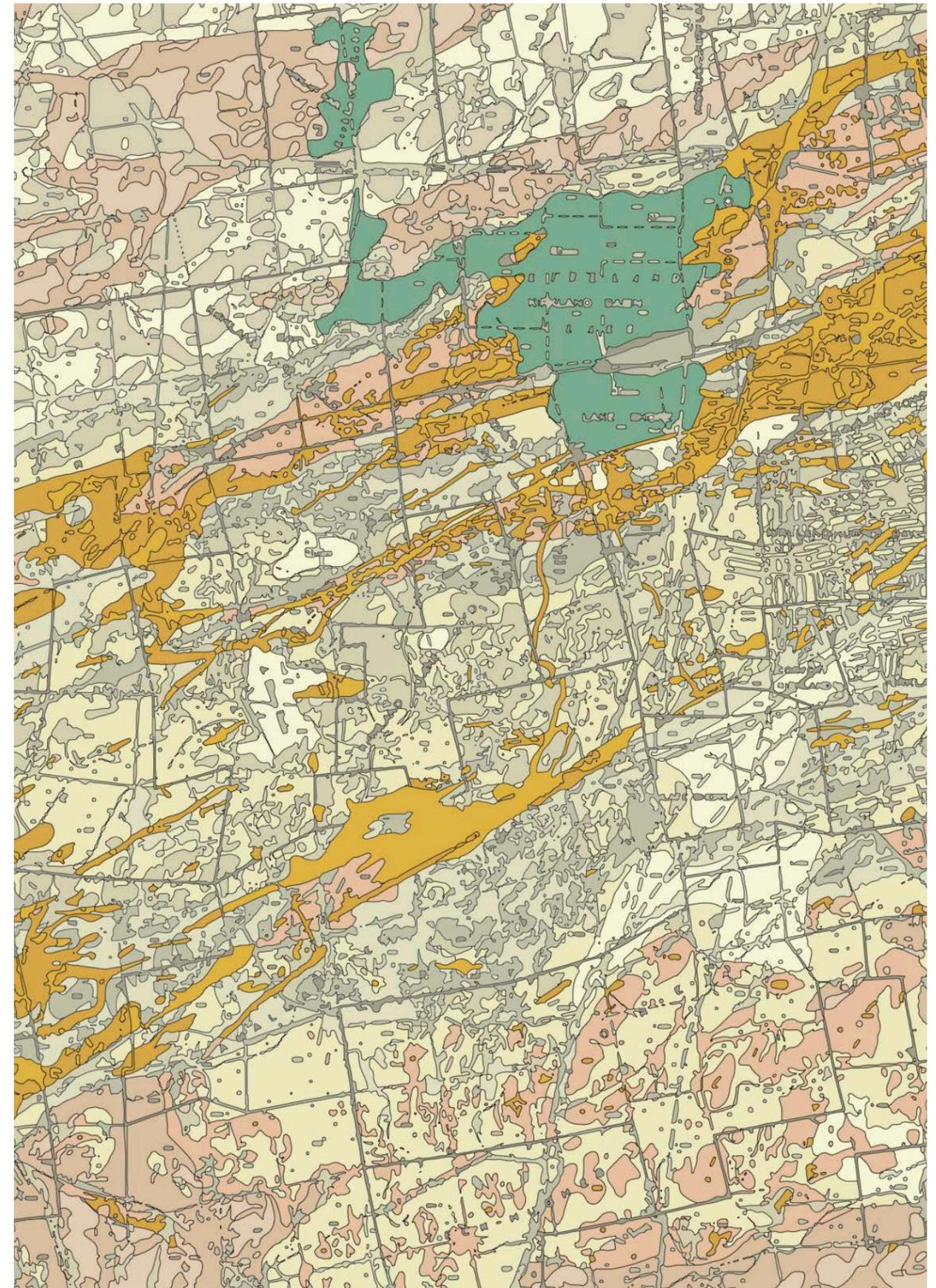
36 Ibid.

37 Ibid.

38 Ibid.

39 Wright, Phillip C. Historical Geography of Silver and Gold Mining in the Cobalt, the Porcupine and the Kirkland/Larder Lake Camps of Ontario, with Implications for an Interpretive Program. Ann Arbor, MI: ProQuest Dissertations Publishing, 1979.

Figure 4.2 Geologic rendering of formations of rock outcrops and drill holes in the AGB area.



Short History of Kirkland Lake

Much of the growth or “boom” which the community of Kirkland Lake experienced based on the mining economy was felt during the late 1930’s to the early 1940’s. Recreational buildings such as the Lasalle Theatre were built for a prospering community of 26,000 people. With the Second World War came the need not only for able bodied men from the mines, but also the production of more useful metals such as iron and steel for the war time efforts. This led to the closure of many of the mines in Kirkland Lake, inevitably, as the price in gold dropped due to its lack of necessity.⁴⁰ Kirkland Lake was also transitioning from a phase of initial rapid expansion to a second more mature phase of its life as a staple economy as the limits of easily accessible, low-cost resource supplies were reached, which limits both market growth and the rate of the expansion of the region.⁴¹ Mining relies on easily extracted ores, those of value with higher pureness result in lower processing cost. As we deplete these finite deposits to lesser stocks of pureness, the cost of the extraction process overwhelms the industrial system,⁴² which is what happened in most of the mines in Kirkland Lake. The community never returned to the peak of prosperity it reached in the late 1930s. The steady growth up to this point came to a standstill, and although the footprint of the town remains the same, the population has shrunk to less than one third of its size of the peak population. Littered across the downtown corridor are the ghosts of cultural, recreational and retail amenities such as empty theatres

and storefronts. The town is currently in the third phase of its life, which is one of disequilibrium as the private sector responds to the slowing of growth by trying to force expansion through the search for new supplies of gold.⁴³ Kirkland Lake took an economic downturn at the closure of the Macassa Mine Complex in the 1990’s due to the drop in the price of gold, the reopening of the mine in 2002 through the discovery of the South Mine Complex (SMC)⁴⁴, has brought new economic life to the community.

40 Kirkland Lake area mining & exploration activity: a new gold rush [Map] The Northern Miner; Toronto, Ont.[Toronto, Ont]26 Nov 2004: M1-M4. <https://search.proquest.com/abitrade/docview/243435918/2908B99B-997B4EF6PQ/5?accountid=12005>

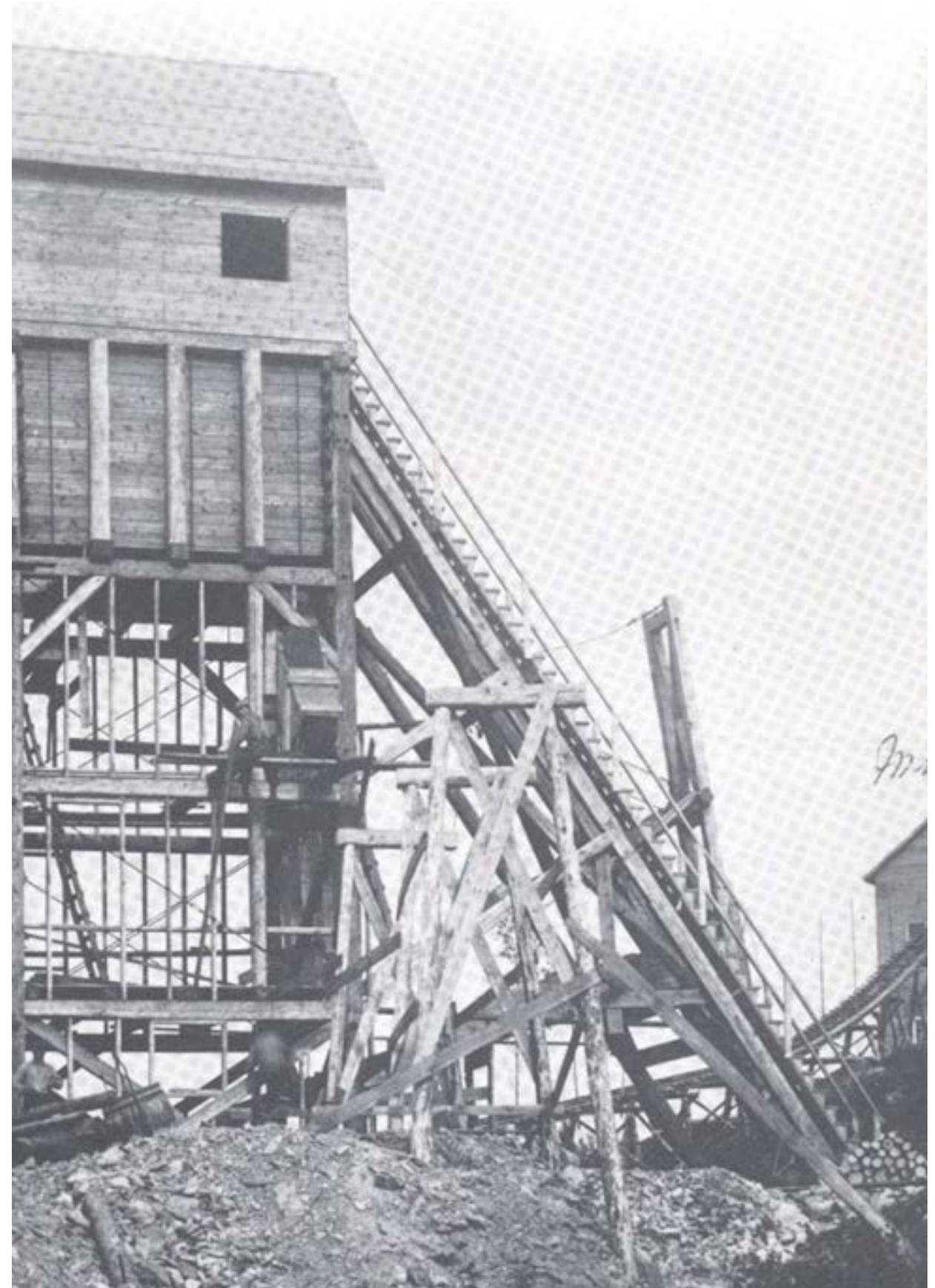
41 Brownsey, Keith, and Michael Howlett. Canadas Resource Economy in Transition: the Past, Present, and Future of Canadian Staples Industries. Toronto: Emond Montgomery Publications, 2008.

42 Daly, Herman E., and Joshua C. Farley. Ecological Economics: Principles and Applications. Washington, DC: Island Press, 2011.

43 Brownsey, Keith, and Michael Howlett. Canadas Resource Economy in Transition: the Past, Present, and Future of Canadian Staples Industries. Toronto: Emond Montgomery Publications, 2008.

44 “The Macassa Mine Is a High-Grade Gold Producer, with Grade Improving at Depth, and a Key Valuation Driver for the Company.” Kirkland Lake Gold - Our Business - Canada - Macassa Mine. Accessed November 25, 2019. <https://www.klgold.com/our-business/canada/macassa-mine/default.aspx>.

Figure 4.3 The first mine established in Kirkland Lake, the Toburn Mine headframe still stands at the East end of the town.

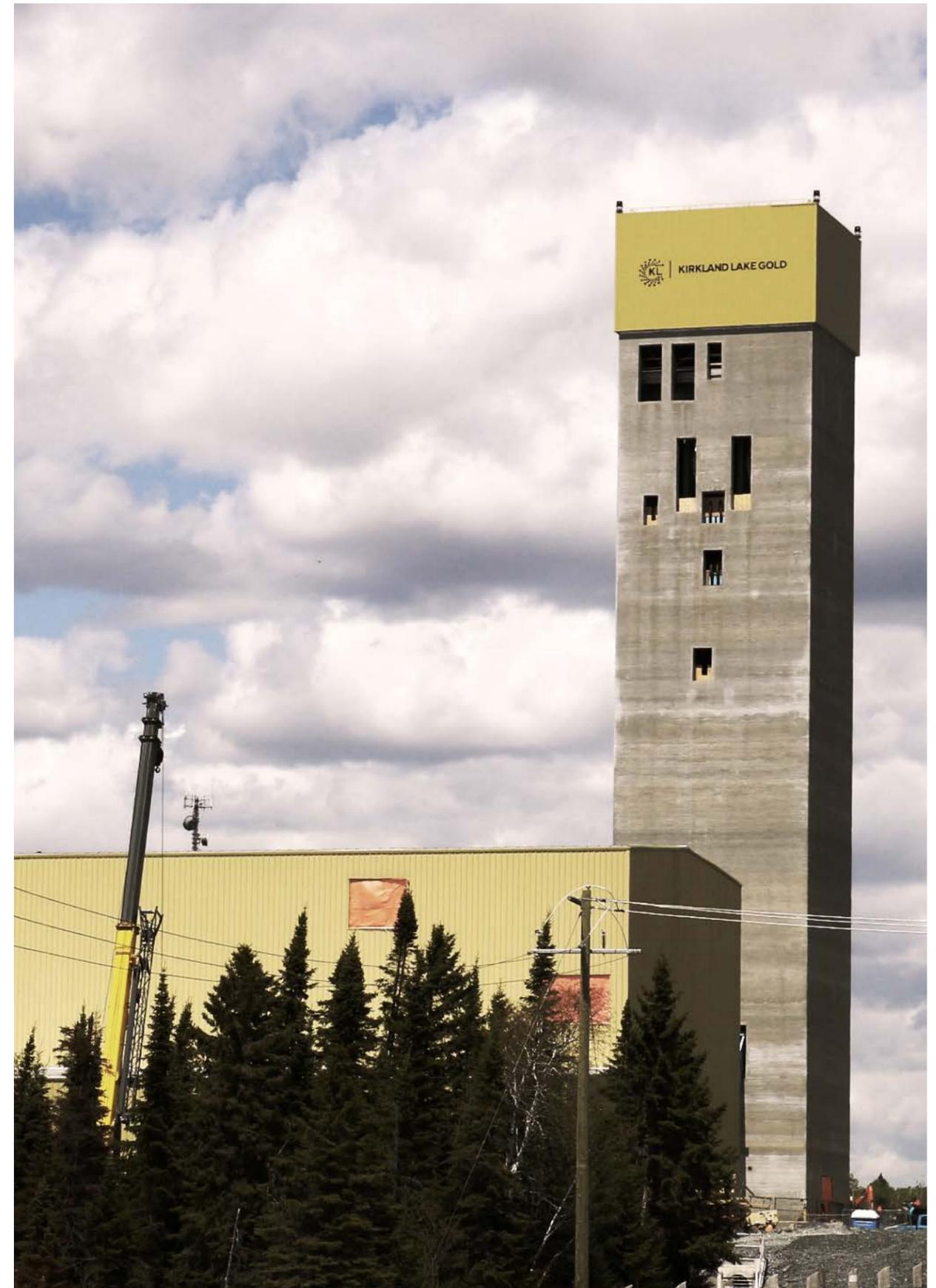


Current Conditions of Kirkland Lake

Currently the town is still reliant on the mining industry for employment. 22% of the workforce is employed by the Mining and Natural Resources industry, which is much higher than the provincial average.⁴⁵ Looking at this statistic alone does not reveal the real impact which the industry has on the community; the ripple effects of closure are deep and vast. If we consider that on average 52% of people who are of working age are married in Kirkland Lake, therefore we can assume that approximately half of the 22% of those working at the mine may be married or have a common law partner. With the closure of the mine, not only will 22% of the workforce be rendered unemployed, and most likely leave, but an additional 11% will most likely leave as well based on their marital status. This statistic only gives a partial picture: it does not account for those who also have children or those dependents who rely on this income, or the secondary businesses that service the mines, such as engineering services, mechanics and administration services. If we take all of this into consideration, it would be impossible to know the true impact which the closure of the mine would have on the community. It is safe to assume that at that moment and even beyond the impact on the community would be substantial.

⁴⁵ "Kirkland Lake, Town [Census Subdivision], Ontario and Ontario [Province]." Census Profile, 2016 Census. Statistics Canada, 2016. [https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?B1=All&Code1=3554068&Code2=35&Data=Count&Geo1=CSD&Geo2=PR&Lang=E&SearchPR=01&SearchText=Kirkland Lake&SearchType=Begin&TABID=1](https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?B1=All&Code1=3554068&Code2=35&Data=Count&Geo1=CSD&Geo2=PR&Lang=E&SearchPR=01&SearchText=Kirkland%20Lake&SearchType=Begin&TABID=1).

Figure 4.4 Macassa Mine recently sunk another shaft on their property after the discovery of a new potential reserve of gold, the #4 Headframe stands at the West end of town.



Critical Analysis of Economic Development in Northern Ontario

Unfortunately, changing from a single industry economy to a stable and diverse economy is easier said than done. Even with economic development efforts, it is an eventually that Kirkland Lake will fall into the fourth and final phase of this economic cycle as a mining reliant economy; one of either decline or crisis as the industry is shut down and either downsizes, moves, or makes a shift to a new method of resource activity.⁴⁶ The reality of shrinking industrial communities needs to be addressed through a strategic planning framework which acknowledges the derelict and the vacant nature of towns like Kirkland Lake after the fallout of industry. Often these small resource-based communities have looked to tourism and culture to provide economic stability. Throughout the North under the provincial government's Northern Ontario Tourism Partnership program in the late 1990s and early 2000s, millions of dollars in capital funding for touristic and cultural projects were available, afterwards municipalities and citizen groups were left to operate the attractions.⁴⁷ Projects such as Hockey Heritage North in Kirkland Lake, the Shania Twain Centre in Timmins, or the Polar Bear Habitat in Cochrane have either struggled to stay afloat or closed altogether after their initial construction because they did not meet the economic potential that their developers promised due to their population size and remoteness. It is understandable why these communities implemented these projects as "last ditch" efforts to bring people into their towns and cities. With such grim outlooks, communities often turn to a romanticized image of their lucrative past, which tends to ignore the destructive nature

of the resource extraction which their communities are built on.⁴⁸ This understanding is critical to the second life of redeveloped landscapes in single industry communities, the struggle of communities and their derelict sites is based on a lack of pride associated with industrial place.⁴⁹

46 Brownsey, Keith, and Michael Howlett. *Canadas Resource Economy in Transition: the Past, Present, and Future of Canadian Staples Industries*. Toronto: Emond Montgomery Publications, 2008. Pg 5.
47 White, Erik. "Troubled Northern Tourist Attractions: 'There's No Use to Putting up the Taj Mahal When It's Empty' | CBC News." *CBCnews*. CBC/Radio Canada, December 10, 2019. <https://www.cbc.ca/news/canada/sudbury/northern-ontario-tourist-attractions-financial-trouble-1.5388999>.

48 Stone, Sally. *UnDoing Buildings: Adaptive Reuse and Cultural Memory*. New York, NY: Routledge, 2019.
49 Heatherington, Catherine. *Reimagining Industrial Sites Changing Histories and Landscapes*. London: Routledge, Taylor & Francis Group, 2018.

Figure 4.5 Hockey Heritage in Kirkland Lake sits on the edge of the Lakeshore Basin. Once a museum dedicated to hockey, it now acts as a banquet hall. The question that remains is how long it can stay operational as a banquet hall with all of the maintenance fees.



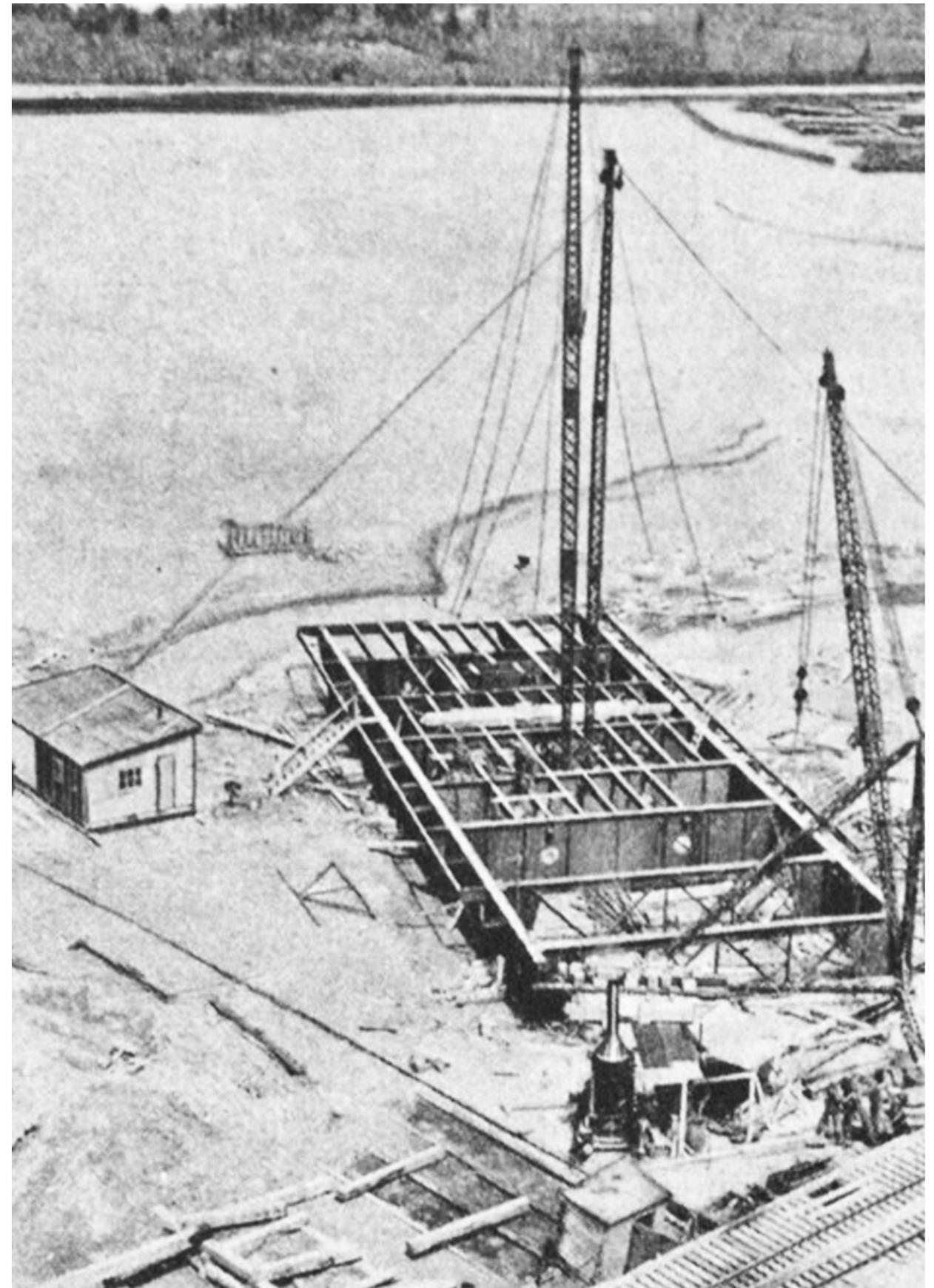
The Lakeshore Basin

As the remnants of past mining practices are often left scattered and engraved into the earth, these industrial processes of mining are not only unsustainable in terms of the economic welfare of its dependent communities, but also in the physical degradation of the surrounding environment. The vein of gold which brought Kirkland Lake all of its former prosperity is located underneath the downtown core. Which led to the drainage of the lake which originally sustained the town. The drainage of the Kirkland Lake into an empty basin (now known as the Lakeshore Basin) was fulfilled for the intention of storing mine tailings from the mine mills, a process involving the pulverization of rock, the gold extracted and the waste discarded.⁵⁰ A mining shaft was sunk in the tailing filled lake, proving extremely difficult as the lake became a sort of boggy swamp with the deposition of the tailings.⁵¹ The Lakeshore Basin was eventually dredged in the late 1980's for the last vestiges of gold found in the early tailings from the site, leaving an empty pit next to the downtown corridor.

The town itself was originally planned around the lake and has since turned its back on it in a more literal sense. The buildings of the downtown core situated on the edge of the basin now have their backs turned on the now derelict site, with windows either boarded up or entirely removed. For reasons of safety purposes the basin itself is fenced off from the rest of the community, adding to the segregation of this industrial artifact. The shaft within the basin can be seen clearly from outside of the fenced off basin; steam emanating from it in the winter from the depths of the earth. Harder to spot are the "glory holes"; these scars are punctures of the surface which go deep into the shaft system below. Caused by the collapsing of the original shafts from dangerous upwards mining practices of the past, the glory holes are a testament to the disruption of nature within the Kirkland Lake landscape.

50 McFarlane, Leslie. "How Deep Is Down?: Maclean's: MARCH 1 1938." Maclean's | The Complete Archive. Accessed November 2019. <https://archive.macleans.ca/article/1938/3/1/how-deep-is-down>.
51 Ibid.

Figure 4.6 Photograph of mining shaft being sunk in the Lakeshore Basin.



Forward Thinking

The interconnected network of shafts beneath the Lakeshore Basin are pumped seasonally of the accumulating water. This is done to moderate the infiltration and water management requirements underground in the Macassa Mine.⁵² The resulting dewatering from the mine is fortunately a fairly clean by-product of mining in the area compared to other mines faced with acid mining drainage.⁵³ This raises the important question of what happens once the mine shuts down operations? With the new construction of the N0.4 Shaft there is an estimated 15-20 years added to the life of the mine,⁵⁴ the lifespan of the mine past that point in time can only be speculated. Moving forward, this project assumes that the closure of the mine will happen between the next 30-40 years, it must be stressed that these are speculations based on articles published by Kirkland Lake Gold, and could change depending on many variables. According to Klohn Crippen Berger who assessed the potential for the Lakeshore basin to flood following closure, it was determined based on hydrologic and hydrogeologic studies that re-establishing a stable lake following closure would be feasible.⁵⁵ At the closure of the mine, not only will the shafts begin to fill with water, but the Lakeshore Basin and surrounding glory holes will also fill with water.⁵⁶ In these concerns, much of what will take place at that time is speculation, predicting how

the landscape will change is impossible to say. Based on the Closure Assessment Report by Klohn Crippen Berger LTD in 2011, we do know that the Lakeshore Basin will take four years to fill with water, and the estimated cost for preparing the site for this time is \$400,000.⁵⁷ There is prediction based on the surrounding tailing re-vegetation efforts that the closure lake will have a high potential of supporting various fish species and other organisms such as amphibians, mammals and birds.⁵⁸ Throughout this reclamation the basin will be monitored and treated until it is seen fit that it can be left alone.⁵⁹ All built structures within the property will be decommissioned, openings to underground will be permanently fenced off, and areas containing tailings will be re-vegetated.⁶⁰

52 Chute, A., and N. Dombrowski. 2015. "From Tailings Basin to Aquatic Ecosystem : The Ecological Recovery of Two Waterbodies in Kirkland Lake, Ontario, Canada." C. British Columbia Mine Reclamation Symposium. doi:http://dx.doi.org/10.14288/1.0305866.

53 Ibid.

54 "Headframe Rises at Macassa Mine." Northern Ontario Business. Northern Ontario Business. Accessed March 15, 2020. https://www.northernontariobusiness.com/industry-news/mining/headframe-rises-at-macassa-mine-1138027.

55 Chute, A., and N. Dombrowski. 2015. "From Tailings Basin to Aquatic Ecosystem : The Ecological Recovery of Two Waterbodies in Kirkland Lake, Ontario, Canada." C. British Columbia Mine Reclamation Symposium. doi:http://dx.doi.org/10.14288/1.0305866.

56 Ibid.

57 Moncrieff, Josh, Lindsay Robertson, and Lawrence Cielland. "Lakeshore Property Closure Lake Phase II Assessment." Sudbury, Ontario: Klohn Crippen Berger LTD, 2011.

58 Ibid.

59 Ibid.

60 Ibid.

Figure 4.7 Remaining Mine Shaft in Lakeshore Basin.



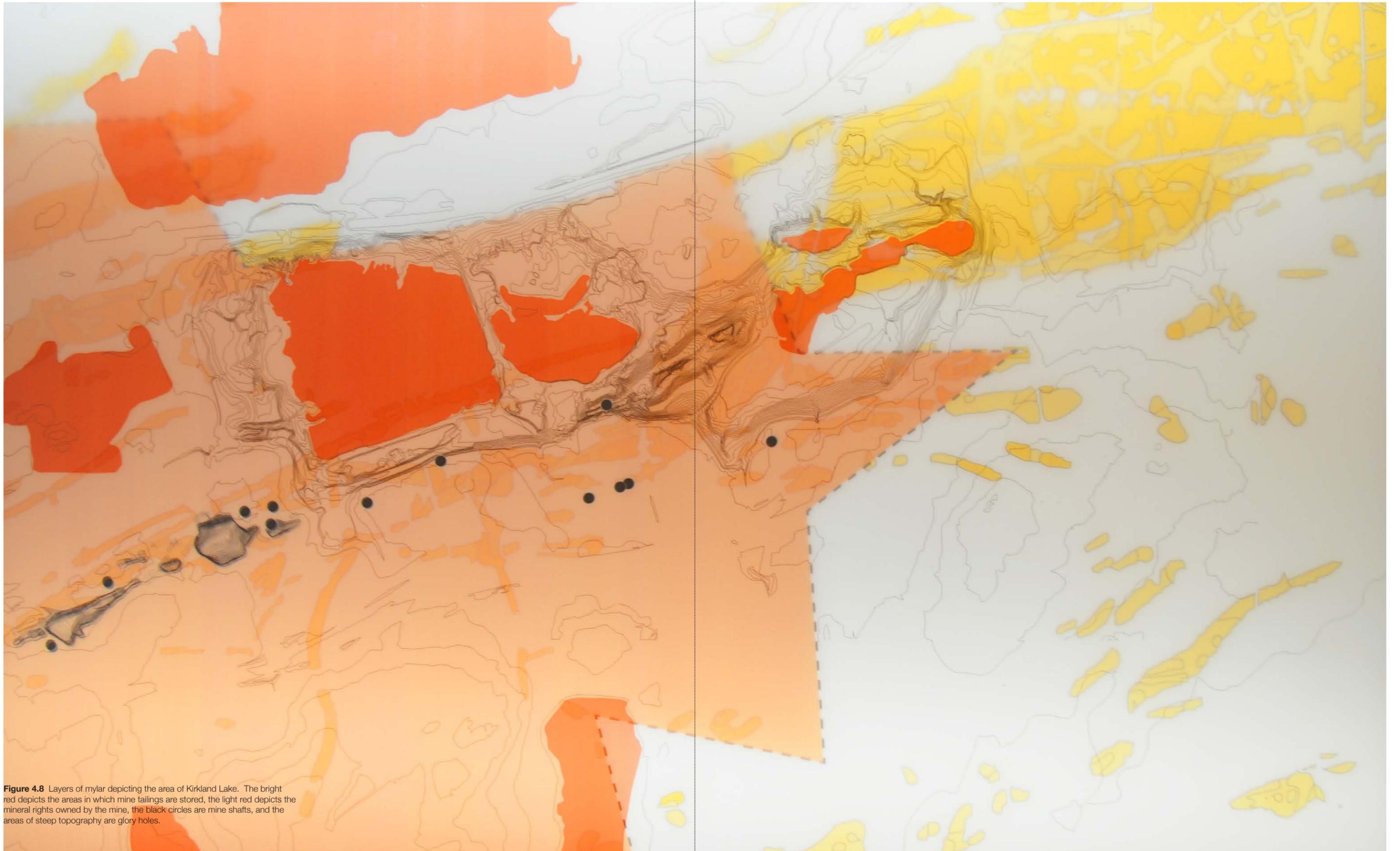


Figure 4.8 Layers of mylar depicting the area of Kirkland Lake. The bright red depicts the areas in which mine tailings are stored, the light red depicts the mineral rights owned by the mine, the black circles are mine shafts, and the areas of steep topography are glory holes.

Critical Analysis of Closure Plan

The relationship society holds to its infrastructure and industry is incredibly complex, but in this there are opportunities to utilize areas of environmental degradation such as the Lakeshore Basin. With such a vast amount of utilizable industrial infrastructure underused, I believe that the plan for the closure of the mine is flawed in that it only plans for life after the mine has closed. The plan should be temporal and expand over time. Not as it currently is proposed: a finished product wiped clean of the scars of industry, but an improving landscape which is going through processes of change. To establish new urban parks along such industrial infrastructure currently would provide two synergistic benefits; the site itself would become cleaner and more livable and the rehabilitation of the landscape would enable connective networks.⁶¹ The plan to decommission and demolish all traces of industrial history on the site prioritizes post-industrial areas returning to nature. Meanwhile, research has found that within derelict industrial areas there was a variance between the views of local people who desired for a return to a green, pre-industrial landscape and tourists who were interested in the layers of history that might be highlighted in an alternative form of redevelopment.⁶² Based on this difference of views it is understandable why Kirkland Lake Gold would like to leave the land in a desirable state, their environmental team has done an exemplary job in that matter. Many hinterland communities aspire to substitute “exploitation” with “sustainability” as the operational image of their livelihood,⁶³ but I believe in returning to

nature completely there is a danger of valuable industrial culture being lost. A former tailing pond turned recreational pond across the main road attests to this. Now a thriving productive ecosystem inhabited by a variety of aquatic organisms,⁶⁴ while Kinross Pond is a successful story of the return of nature it does little to represent the relationship Kirkland Lake holds to the mining industry.

61 Gamble, David, and Patty Heyda. *Rebuilding the American City Design and Strategy for the 21st Century Urban Core*. New York: Routledge, 2016. Page 9.
62 Heatherington, Catherine. *Reimagining Industrial Sites Changing Histories and Landscapes*. London: Routledge, Taylor & Francis Group, 2018.
63 Brownsey, Keith, and Michael Howlett. *Canada's Resource Economy in Transition: the Past, Present, and Future of Canadian Staples Industries*. Toronto: Emond Montgomery Publications, 2008. Page 6.

64 Chute, A., and N. Dombrowski. 2015. "From Tailings Basin to Aquatic Ecosystem : The Ecological Recovery of Two Waterbodies in Kirkland Lake, Ontario, Canada." C. British Columbia Mine Reclamation Symposium. doi:<http://dx.doi.org/10.14288/1.0305866>.

Figure 4.8 Photograph of private property sign and building from the Lakeshore Mine taken through fence.



Design

Figure 5.1 Drone aerial photograph of Lakeshore Basin.



Programming Strategy

The Lakeshore Basin will be utilized within this project with the intention of supporting the community of Kirkland Lake. While this site is currently fenced away it has tremendous potential to be used for a variety of programming across the site. While this programming might not be obvious to someone from outside of the community, having been born and raised there I know that informal sites such as pits and quarries are utilized as places of gathering and pathways in communities like Kirkland Lake. People gather in industrial landscapes for a number of reasons; extreme sports such as dirt biking and snowmobiling, or recreational dog walking, tobogganing, snow shoeing and cross-country skiing. Sometimes even just teenagers use them as hideaways for partying.

The goal of this project is to not only rehabilitate the site to make it habitable and accessible for people, but to play to the unique characteristics of the community and improve the site through interventions which would support this type of programming. To be clear, while some of this programming could be viewed as an attraction to a struggling mining community, the programming is ultimately aimed at appealing to the lives of the people currently living in Kirkland Lake. Splitting the project into various phases allows for a distribution of this programming throughout the life of the entire project, beginning with the remediation of the site and continuing to allow for the site to be reclaimed by the community which it belongs to.

Figure 5.2 Informal Site Vignettes of cross country skiing, gathering and four wheeling.



Phase I

In the years leading up to the closure of the Macassa Mine Complex, one of the main concerns of the community and the mine will be the environmental remediation of the existing site. In order to meet the guidelines of their Closure Plan and Environmental Management Plan⁶⁵, Kirkland Lake Gold will require a Monitoring and Research Facility for their Environmental Division to monitor the water quality and returning ecosystems in the Lakeshore Basin. The current Closure Plan proposes the demolition of the existing Hoist Building (Figure 4.8) from the previous Lakeshore Mine Site which was decommissioned in the 1960's. I propose that instead the mine opts to use this building as the Monitoring and Research Facility for their Environmental Division to work out of. The reuse of existing mining infrastructure supports the cultural identity of the town, while also restricting an unnecessary spread of development in the area. Not only will this allow the team to work more closely with the landscape which they are remediating, but it will bring them closer to the community they are advocating for and give them room to grow, while potentially diversifying the workforce of the community. Additionally, at the recommendation of members of the Environmental Division, I propose that on the Eastern Shore of the Lakeshore Basin an additional structure be built, which would act as a Storage Shelter for monitoring equipment.

⁶⁵ Moncrieff, Josh, Lindsay Robertson, and Lawrence Clelland. "Lakeshore Property Closure Lake Phase II Assessment." Sudbury, Ontario: Kohn Crippen Berger LTD, 2011.

Figure 6.1 Phase I Site Plan & Axonometric featuring the Monitoring and Research Facility and Storage Shelter.

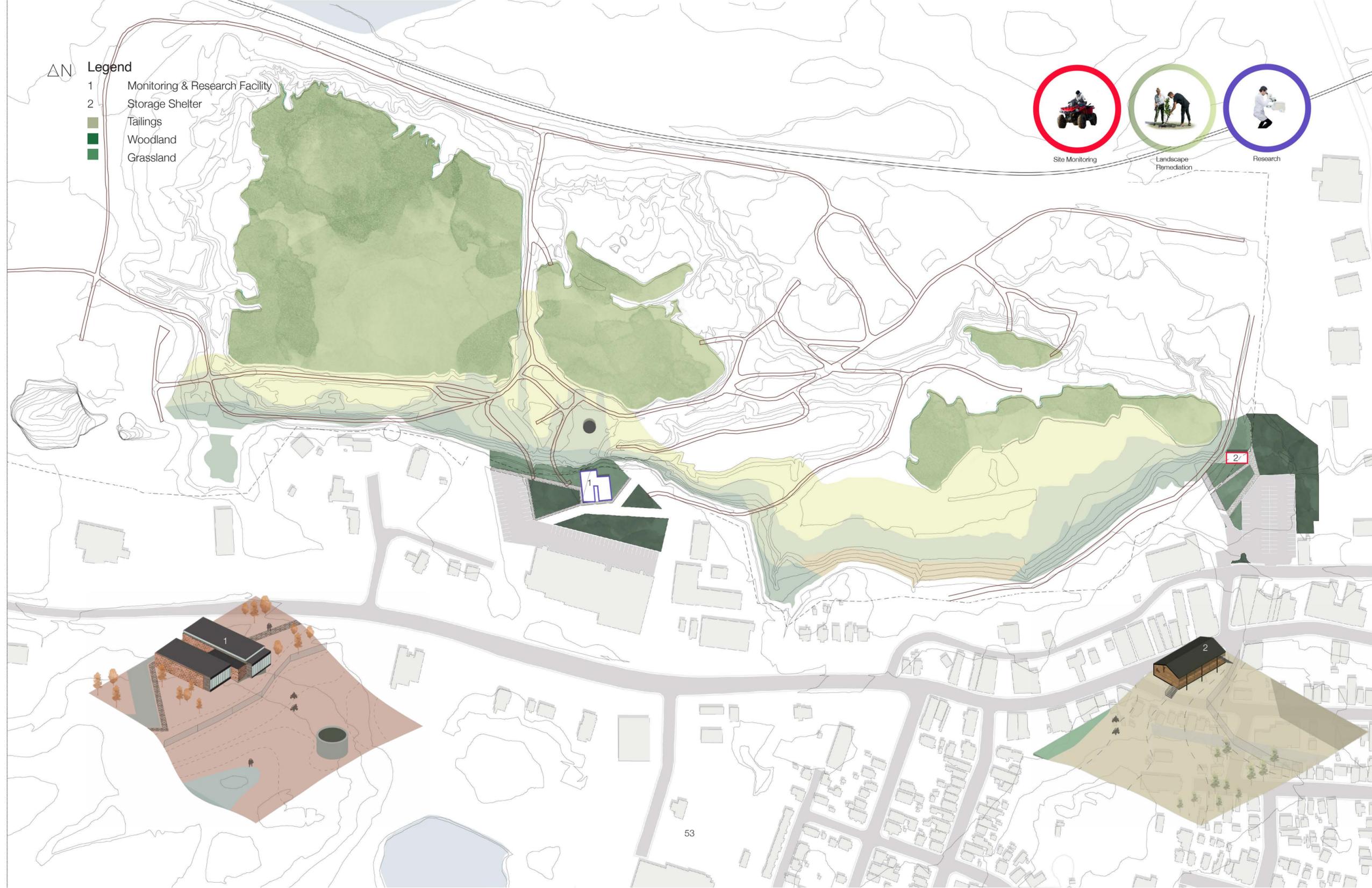




Figure 6.2 Phase I Plan of Monitoring and Research Facility. Scale 1:325.

Legend

- 1 Storage Room
- 2 Mechanical Room
- 3 Universal W/R
- 4 Office
- 5 Open Office
- 6 Additional Storage Space

Phase I - Monitoring & Research Facility

The Monitoring and Research Facility will hold office and storage space through the adaptive reuse of the existing Hoist Building, which will not only minimize the carbon footprint of the construction process, but will also give the building a sense of industrial heritage. The Hoist Building will act as a shell for the new construction, which will be nested within the original building construction. This will allow flexibility in design and the expansion process, as new plumbing and electrical systems can be installed throughout the building without interference from the existing Hoist Building. The new construction will utilize local materials such as cedar and quartz throughout the design and provide transom windows above the existing brick façade to bring light into the space while maintaining the existing outer shell.

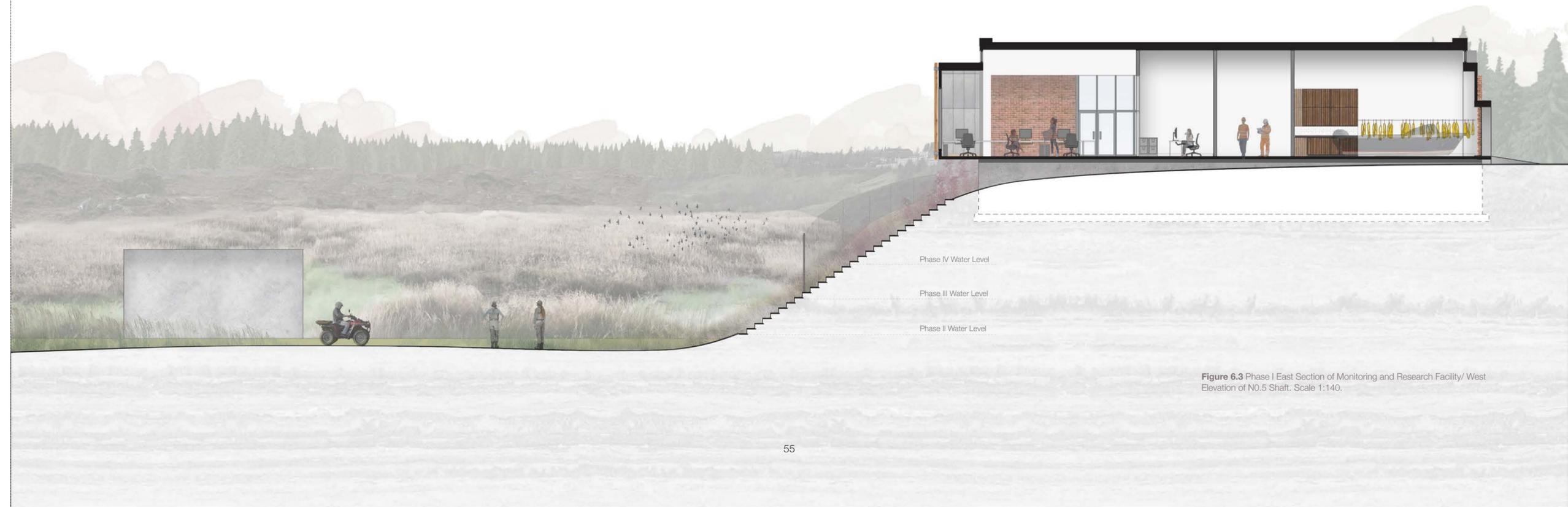


Figure 6.3 Phase I East Section of Monitoring and Research Facility/ West Elevation of N0.5 Shaft. Scale 1:140.



Figure 6.4 Phase I Interior Render of Monitoring & Research Facility Open Office.

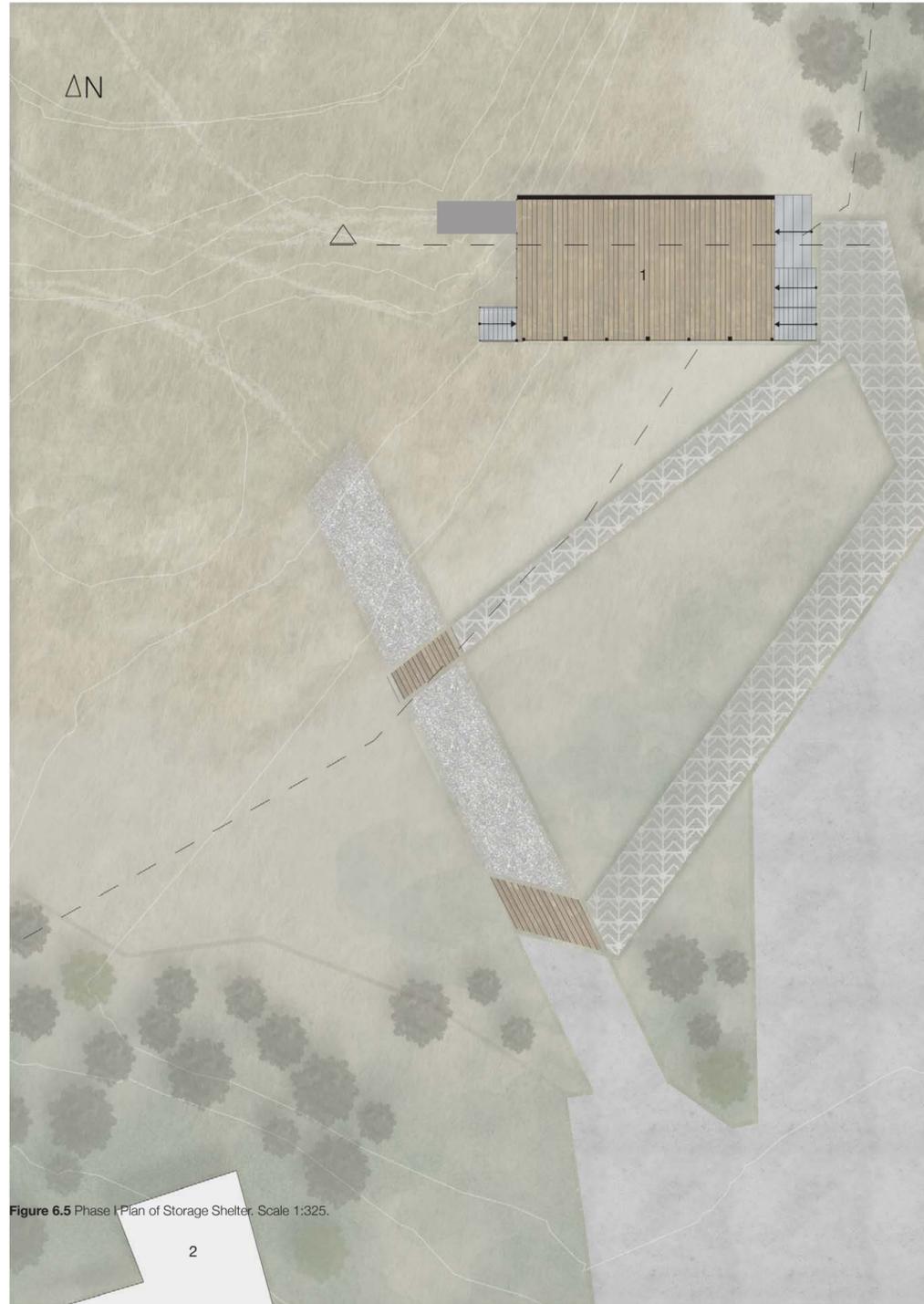


Figure 6.5 Phase I Plan of Storage Shelter. Scale 1:325.

2

Legend

- 1 Storage Shelter
- 2 Curling Club

Phase I - Storage Shelter

The Storage Shelter will be built with the intention of being an open structural shell lifted from the ground. As this site is temporal in nature and will change many times over, it is necessary to design with its future use in mind. In this case acknowledging that this structure will be used for different purposes in the future. The structure should also be constructed using helical piles to elevate the structure from the ground as the water levels in this area may fluctuate at the Lakeshore Basin's full capacity.



Figure 6.6 Phase I East Section of Storage Shelter. Scale 1:110.



Figure 6.7 Phase I Interior Render of Storage Shelter.

Phase II

At the closure of the mine there will be various transformations within the community happening simultaneously. Firstly, we can expect the population of the community to drop drastically, as some of the working population leaves the region to find new work. Some of this movement out of the community might be mitigated if the livelihood of the population is diversified with the introduction of environmentally related programming such as the remediation of the Lakeshore Basin. Once the Lakeshore Basin is remediated to an acceptable standard for human use and the Basin begins to fill with water, some of the fencing will be removed to allow the community to use the land for informal activities (snowshoeing, cross country skiing, dog walking, gatherings and snowmobiling). These activities will be supported by the proposed architectural interventions; the Winter Sports Centre on the Eastern Shore of the Lakeshore Basin and a Lookout Tower above the abandoned N0.5 Shaft. The Sports Centre will provide rentals for different equipment such as snowshoes, ice skates, cross country skis and mountain bikes. Meanwhile, the Lookout Tower will allow the community and visitors to observe the transformation of this industrial landscape.

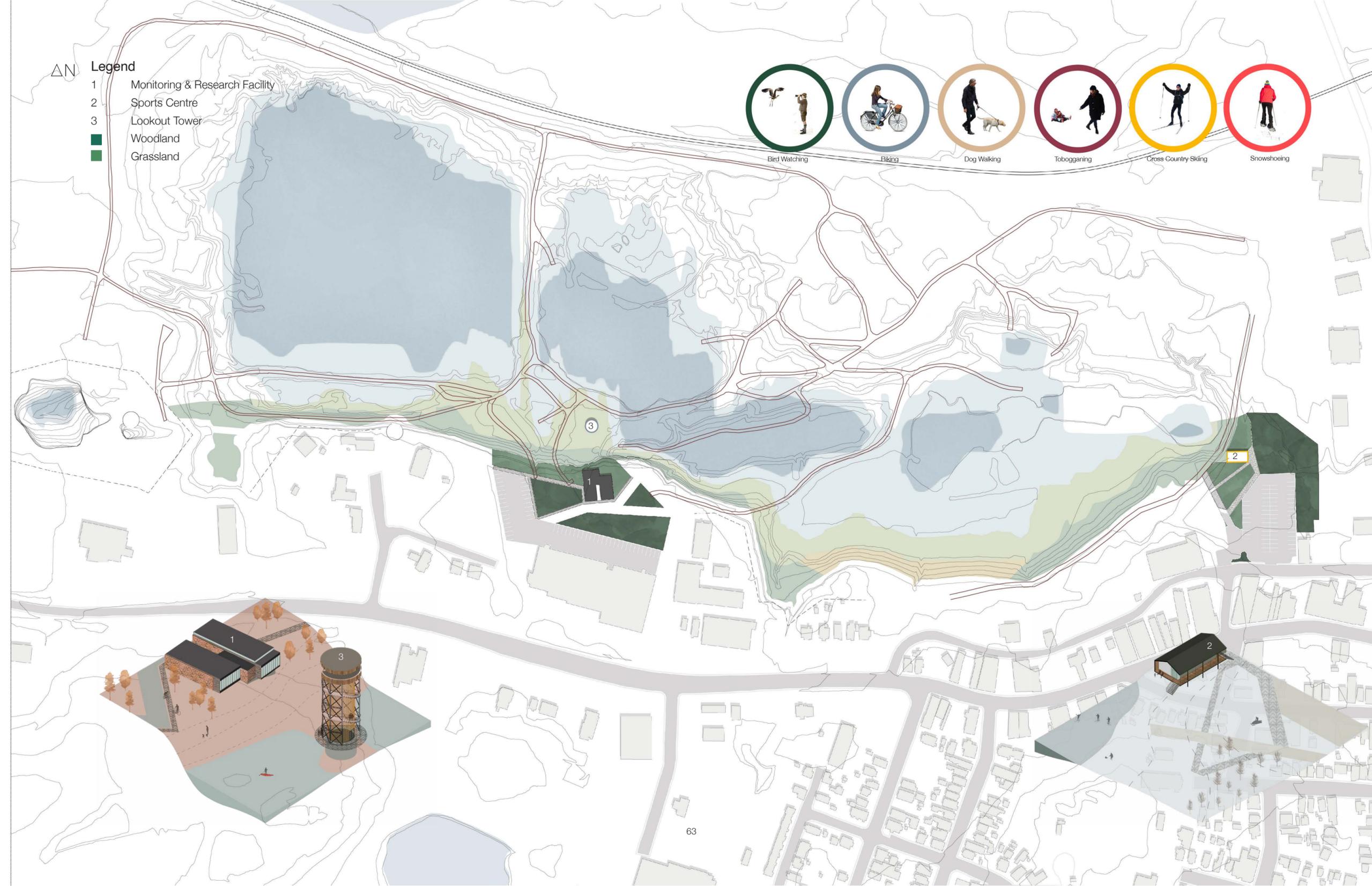


Figure 7.1 Phase II Site Plan & Axonometric featuring the Lookout Tower and the Winter Sports Centre.



Figure 7.2 Phase II Plan of Lookout Tower & Monitoring and Research Facility. Scale 1:325.

- Legend**
- 1 Storage Room
 - 2 Mechanical Room
 - 3 Universal W/R
 - 4 Office
 - 5 Open Office
 - 6 Additional Storage Space
 - 7 Lookout Tower



Figure 7.3 Phase II East Section of Lookout Tower/West Elevation of Monitoring and Research Facility. Scale 1:140.

Phase II - Lookout Tower

At this time the Lakeshore Basin will begin to fill with water as the Macassa Mine Complex stops operations. Allowing the community to watch the landscape transform is the primary program of the Lookout Tower. As the mine stops operating, water will not need to be pumped out of this area through the process of dewatering. This will give a window of opportunity for the N0.5 Shaft to be renovated before the Lakeshore Basin fills to capacity. The renovation will require an access to the shaft to allow entry for when the water fills to surround the N0.5 Shaft. A berm will be built to create this access. The N0.5 Shaft will be capped to keep water from filling the shaft, and an Expanded Polystyrene (EPS) base will be used for the construction of the Lookout Tower in case the water levels rise higher than the N0.5 Shaft opening.



Figure 7.4 Phase II Exterior Render of Lookout Tower & Monitoring and Research Facility.

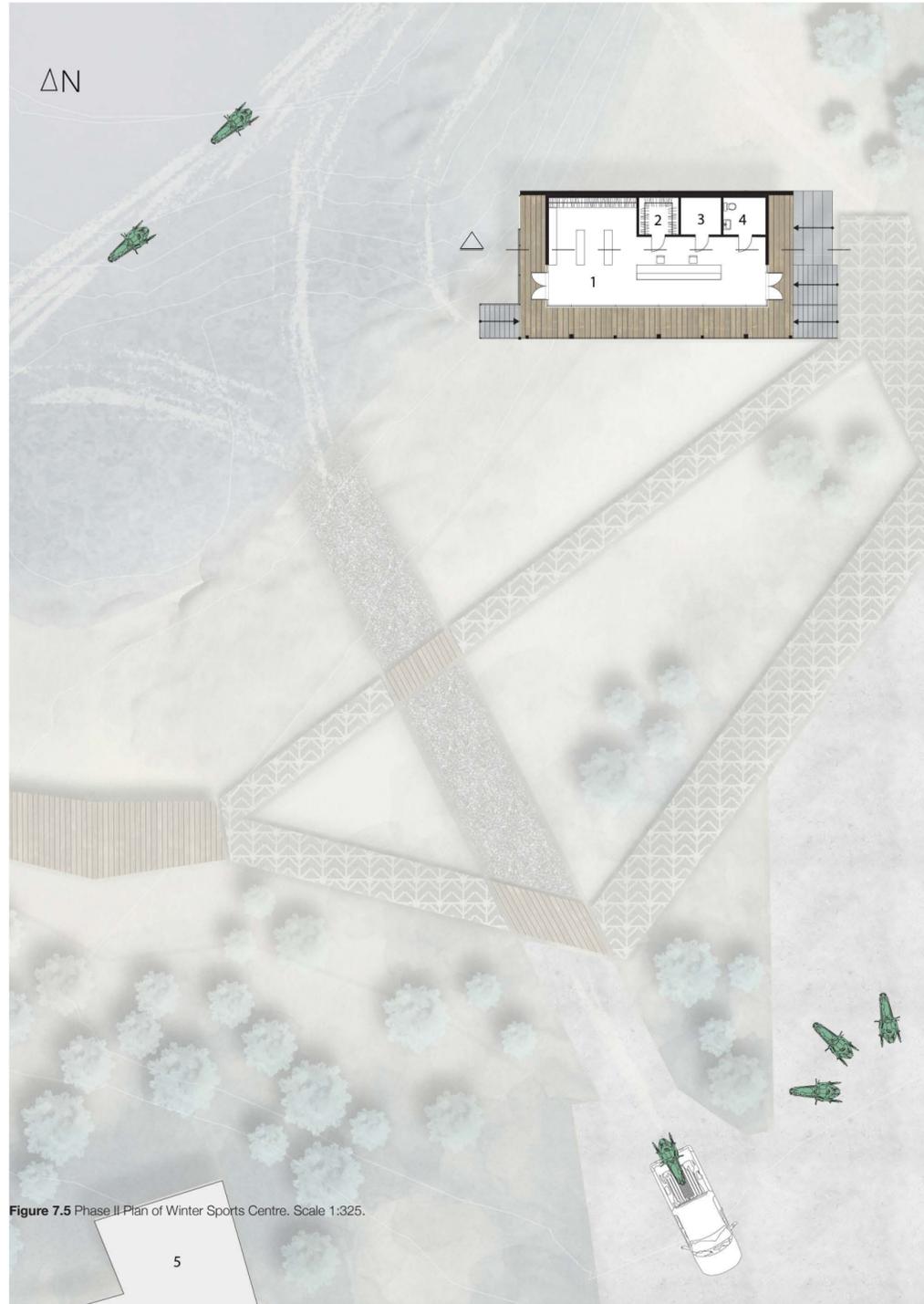


Figure 7.5 Phase II Plan of Winter Sports Centre. Scale 1:325.

Legend

- 1 Rental Area
- 2 Storage Room
- 3 Mechanical Room
- 4 Compostable Toilet
- 5 Curling Club



Figure 7.6 Phase II Section of Winter Sports Centre. Scale 1:110.

Phase II - Winter Sports Centre

The Winter Sports Centre will be constructed within what used to be the monitoring Storage Shelter and will hold rental equipment for local winter sports enthusiasts (cross country skiing, skating & snowshoeing). The Storage Shelter will act as a shell to the new construction, nested within the existing construction. This will allow flexibility in design, as new plumbing and electrical can be installed throughout the building without interference from the existing storage shelter. The new construction will utilize local materials such as cedar and recycled metal from the mine complex.



Figure 7.7 Phase II Exterior Render of Winter Sports Centre.

Phase III

The Lakeshore Basin is an opportunity for the mining industry to not only return a damaged ecosystem to a habitable state, but also to work with different stakeholders within Northern Ontario to create a symbiotic relationship which would benefit the community, the economy and the environment. I believe that the Closure Plan should extend further than just the remediation of the landscape and assure that the community the mine leaves behind is also supported throughout this transition. If Kirkland Lake Gold were to partner with educational entities such as the local Northern College Campus or Laurentian University, they could use the new Monitoring and Research Facility as a training facility for a hands on Environmental Studies program such as Ecological Restoration and Rehabilitation or Ecosystem Management. As a previous research outpost for the mine in Phase I, the facility would have much of the necessary equipment and infrastructure already available, while the remainder of the building could be converted into classroom and work space. While this partnership would benefit the community economically, I believe that another partnership could be formed between Kirkland Lake Gold and The Town of Kirkland Lake to celebrate the industrial identity of the community. The development of Water Street and the Glory Holes into a network of walking and biking paths would connect the Hoist Building and N0.5 Shaft to the downtown corridor and allow the community to interact with industrial heritage and the re-emerging landscape of the Lakeshore Basin. As the Lakeshore Basin gradually fills over this four-year period, the Sports Centre will require a small addition for the added programming of water sport rentals.

Figure 8.1 Phase III Site Plan & Axonometric featuring Monitoring & Research Facility to the Sports Centre.

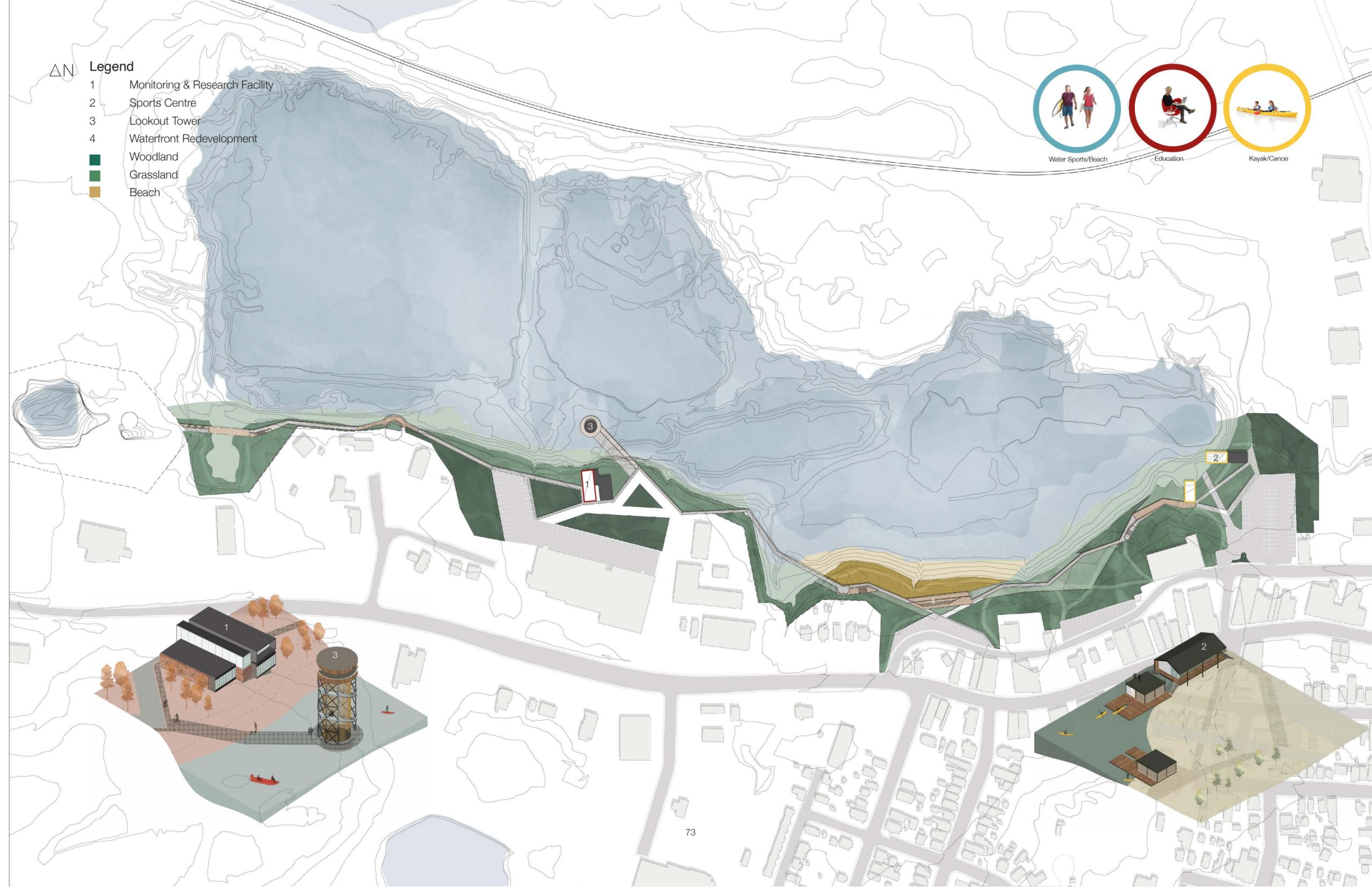




Figure 8.2 Phase III Plan of Second Floor Monitoring & Research Facility & Lookout Tower. Scale 1:325.

- Legend**
- 1 Classroom
 - 2 W/R
 - 3 Open Office
 - 4 Lounge
 - 5 Deck
 - 6 Lookout Tower



Phase III - Monitoring & Research Facility

Similar to the earlier renovation of the Hoist Building; The remainder of the existing building will be renovated through the reuse of the existing structure as a shell for the new construction. The added programming of education will require classroom space, a small library area, work space and a lounge area for the students. There will be a second floor addition to meet the required space needs, and so as not to disturb more of the landscape through a first floor addition. The new construction will utilize local materials such as cedar and recycled metal from the mine complex.

Figure 8.3 Phase III West Elevation of Lookout Tower/East Section of Monitoring & Research Facility. Scale 1:140.

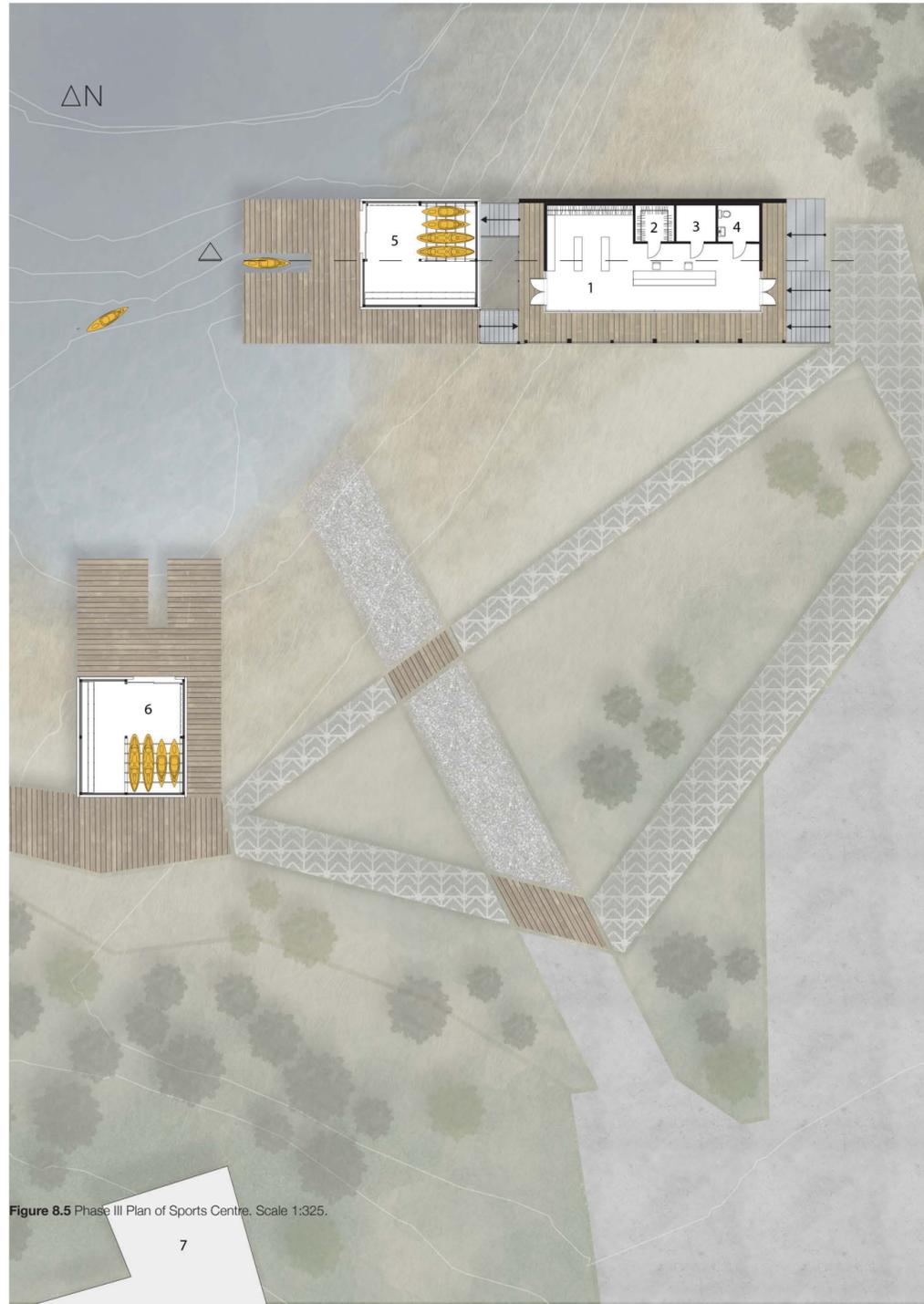


Figure 8.5 Phase III Plan of Sports Centre. Scale 1:325.

Legend

- 1 Rental Area
- 2 Storage Room
- 3 Mechanical Room
- 4 Compostable Toilet
- 5 Kayak Rental Storage
- 6 Kayak Storage for Locals
- 7 Curling Club

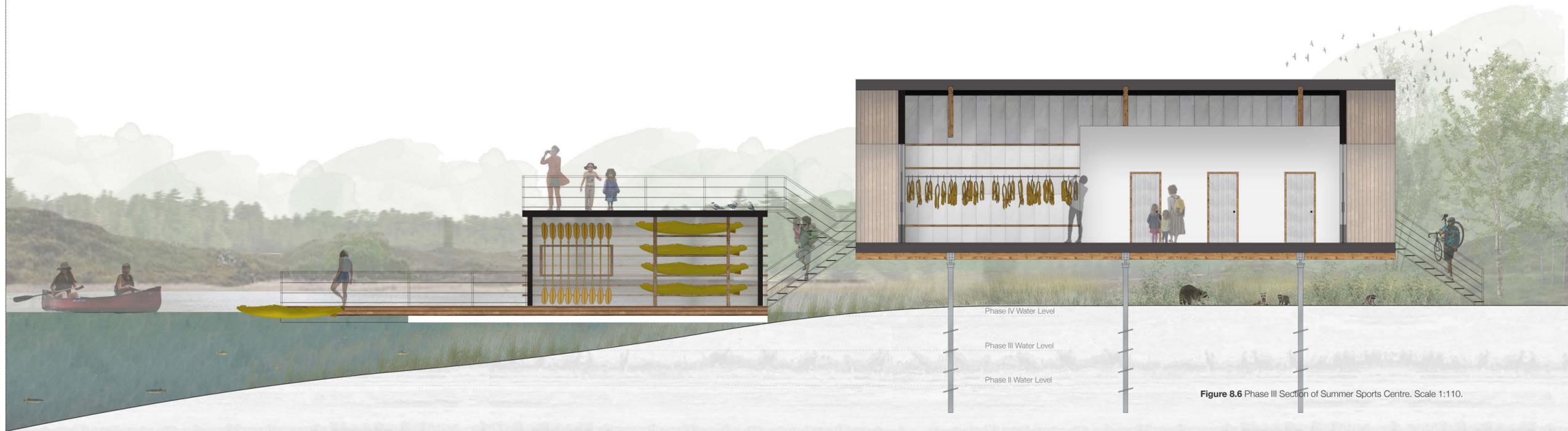


Figure 8.6 Phase III Section of Summer Sports Centre. Scale 1:110.

Phase III - Summer Sports Centre

The summer addition to the Winter Sports Centre will be utilized by local residents moving back into the downtown as the Lakeshore Basin returns as a thriving lake ecosystem. Storage and rental of kayaks and canoes will allow this aging population to live in low maintenance apartments downtown, while still being able to have the benefits of storing outdoor recreational equipment. The addition will be constructed on an Expanded Polystyrene (EPS) base, which will allow for the small building to move with the fluctuating height of the water levels. The new addition will be constructed out of local cedar and transparent corrugated plastic panels.



Figure 8.7 Interior Render of Monitoring & Research Facility Classroom.



Figure 8.8 Exterior Render of Summer Sports Centre.

Phase IV

The planning of Kirkland Lake and other single industry communities should discontinue trying to expand in terms of infrastructure and focus on projects which acknowledge that the future community will most likely be much smaller and diverse. Kirkland Lake should be strategically planning to focus on the strengthening of the downtown core, regulate the spread of commercial infrastructure, begin re-greening derelict underused land, and accentuate its unique natural qualities. A specifically unique asset which the town will be able to utilize is the potential redevelopment of the Lakeshore Basin, and in turn the strengthening of the downtown core. After the Water Street Redevelopment is completed, an essential next step will be the programmatic reorientation of buildings whose backs lined Water Street, such as the Lasalle Theatre. As there are limited rental properties in the downtown core, the Lasalle Theatre will be redeveloped into bachelor apartments for the students attending the environmental program at the Monitoring & Research Facility.

At this point in time it should be noted that the network of caved in mine shafts known as Glory Holes will also become safe for the public to access as they will be filled with water. The surrounding fencing can then be removed and the area can be connected to the Water Street Redevelopment through a network of trails.

As the lake reaches its capacity it will be reconnected to the Northern Kirkland Lake through a culvert to regulate water height. This connection will supply the lake with a population of fish making it possible for the local community to now use the lake for ice fishing. With a new population of Pike and Perch in the Lakeshore Basin, I propose that the Lookout Tower above the N0.5 Shaft will act as a Warming Station for the community to use during ice fishing season.

Figure 9.1 Phase IV Site Plan & Axonometric featuring Warming Station & Lasalle Theatre Apartment Renovation.



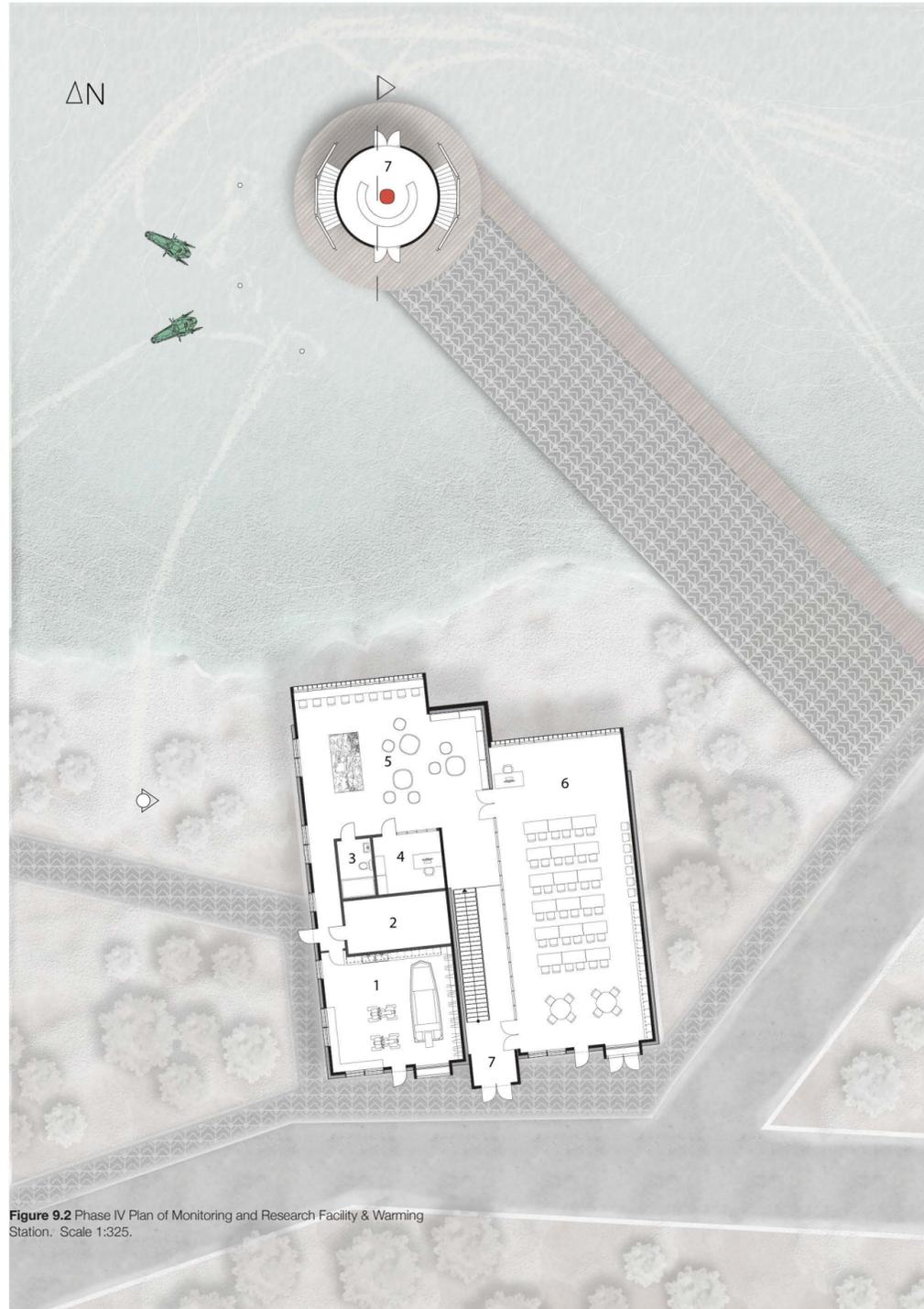


Figure 9.2 Phase IV Plan of Monitoring and Research Facility & Warming Station. Scale 1:325.

Legend

- 1 Storage Room
- 2 Mechanical Room
- 3 Universal W/R
- 4 Office
- 5 Library
- 6 Classroom/Flex Space
- 7 Vestibule
- 8 Warming Station



Figure 9.3 Phase IV East Section of Warming Station/West Elevation of Monitoring and Research Facility. Scale 1:140.

Phase IV - Warming Station

The Warming Station will be used by the community as a communal gathering space in the winter months. For those who do not have access to an ice shack who live in the downtown it would be a highly utilized space. As a source of heat, the Warming Station will use a closed loop geothermal heat exchange system through the mine shaft that it is built above. The system will be relatively inexpensive to install, as there will be no drilling required. There would be access for the users to actually go down into the shaft to warm up and interact with an industrial artifact. The exterior will be constructed of insulated light transmitting panels to allow natural light into the space. The interior of the building will utilize the thermal mass of local quartz.

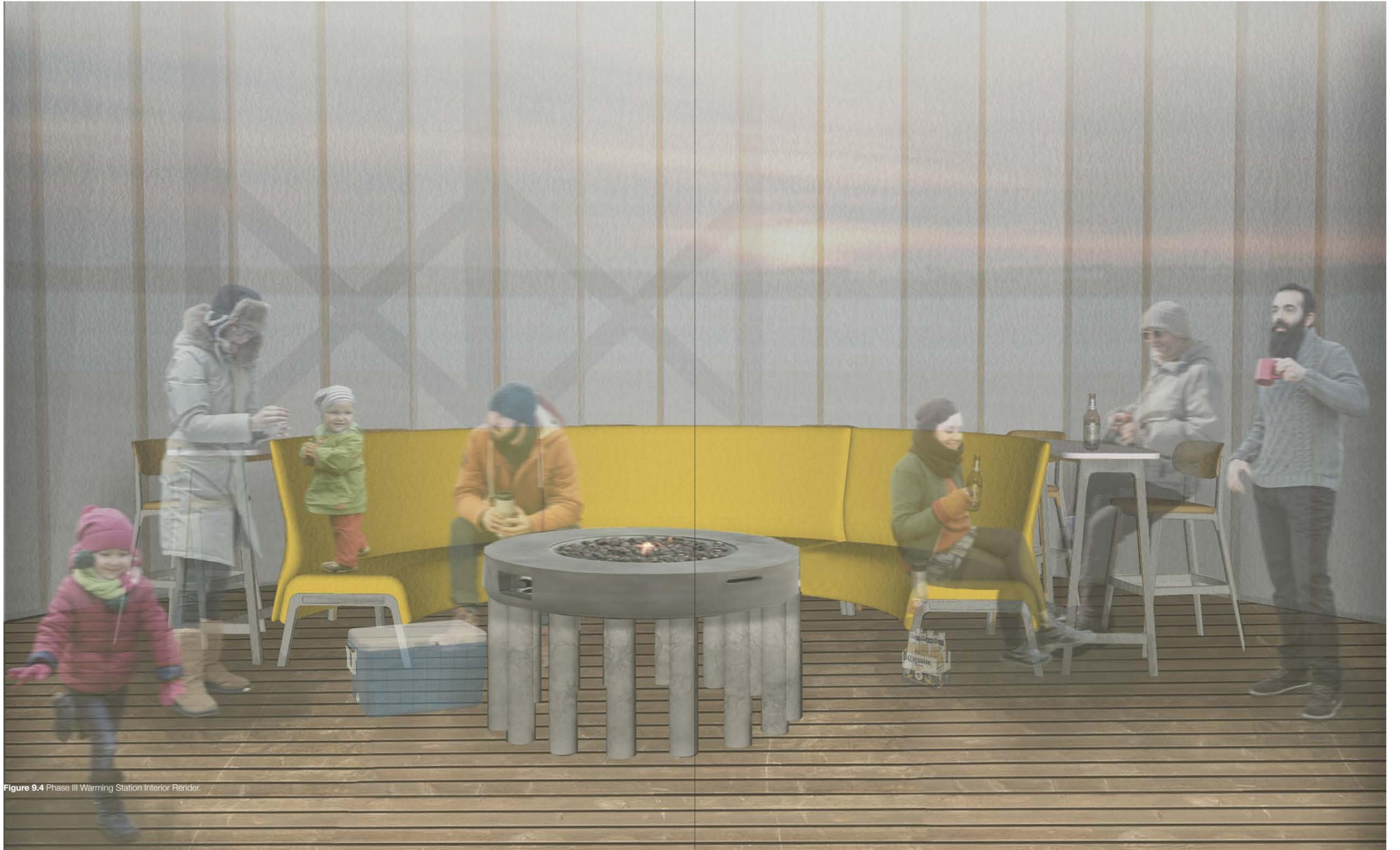


Figure 9.4 Phase III Warming Station Interior Render.



Figure 9.5 Phase IV Plan of Lasalle Theatre Apartment.

Legend

- 1 Existing Lasalle Theatre
- 2 Apartment



Figure 9.6 Phase IV East Elevation of Lasalle Theatre Apartment Scale 1:225.

Phase IV - Lasalle Theatre Apartments

Overlooking the Lakeshore Basin and in close proximity to both the Monitoring and Research Facility and the Sports Centre, the student bachelor apartments will be constructed at the North end of the Lasalle Theatre in the “back of house” portion of the building. The design will reuse the existing catwalk structure as a shell for the new construction, which will be nested within the existing construction. This will allow flexibility in design, as new plumbing and electrical can be installed throughout the building without interference from existing the Lasalle Theatre.



Figure 9.7 Phase IV Interior Render of Lasalle Apartment living space.

Phase IV - Lasalle Theatre Apartments

The access to the apartments will be located on the East side of the building to give the tenants their own exterior entrances, the current parking on the East side of the building will be moved to allow better access to the Lakeshore Basin from the downtown. The strategy of removing paved parking between the Water Street buildings should be implemented along this stretch of the downtown to better connect the street traffic to the waterfront, and to bring greenspace back into the downtown core. Most of the buildings along Water Street could adopt a similar approach by renovating any abandoned or unused spaces on the North side of their property. As an aging population, seniors living would also be a beneficial program in the area to be implemented in these spaces.



Figure 9.8 Phase IV West Section of Lasalle Theatre Apartment Scale 1:225.

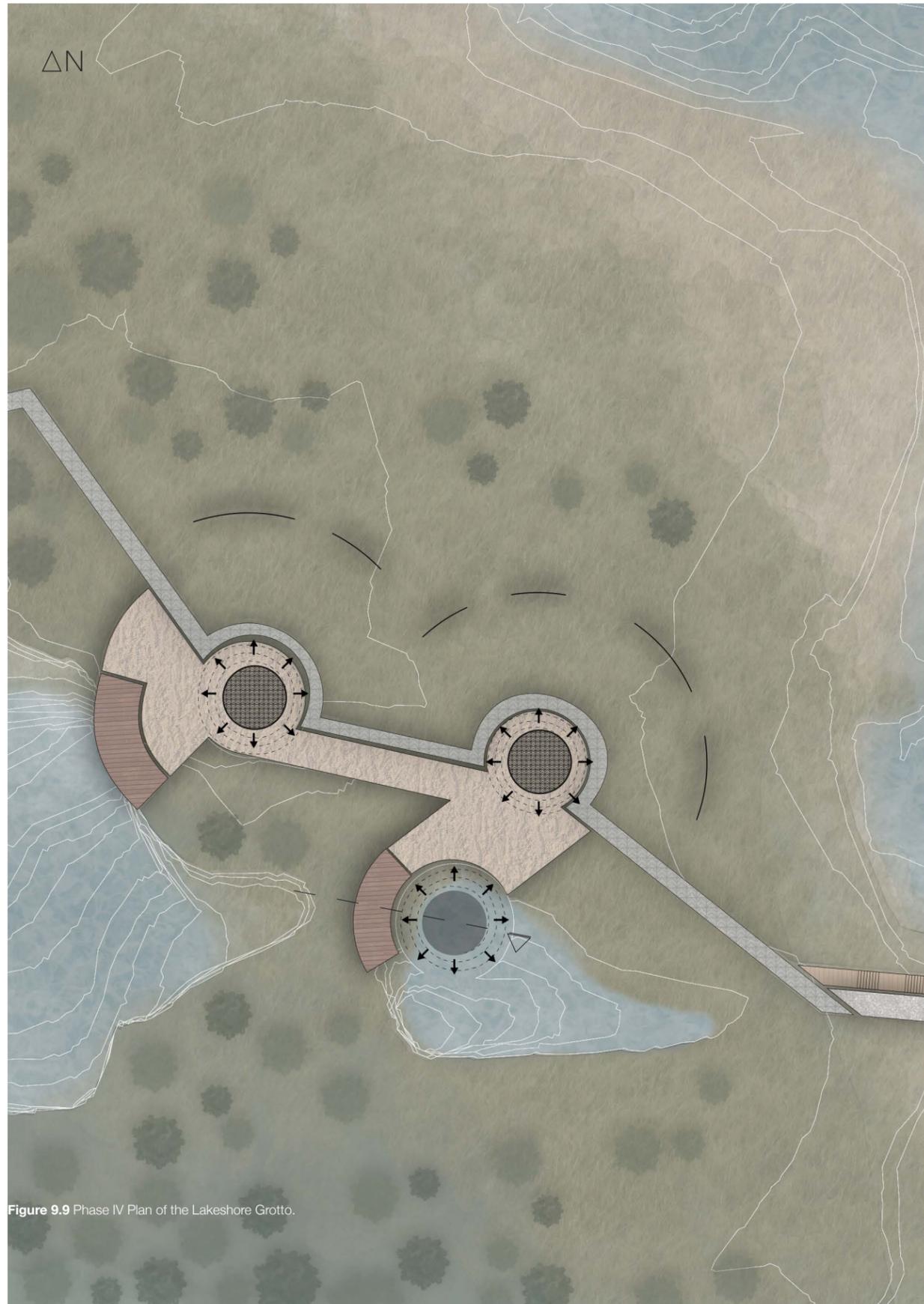


Figure 9.9 Phase IV Plan of the Lakeshore Grotto.

Phase IV - Lakeshore Grotto

Abandoned mining shafts can be found across the site. The pathway along the Lakeshore Basin follows from one shaft to the next. Some of these shafts such as the N0.5 Shaft below the Lookout Tower will be capped to stop the flow of water into them. Meanwhile some will be blocked further down to allow some water to fill into them, the mining shafts below the Glory Holes will be the latter. This intervention will allow local scuba divers and swimmers to interact with these industrial artifacts underwater. Platforms to allow a person to walk down to the shafts will be shaped in a spiral around the shafts, and as the water fills they will be submerged. Submerged as they are, a person in scuba gear could still walk the spiral path down to the shaft below.

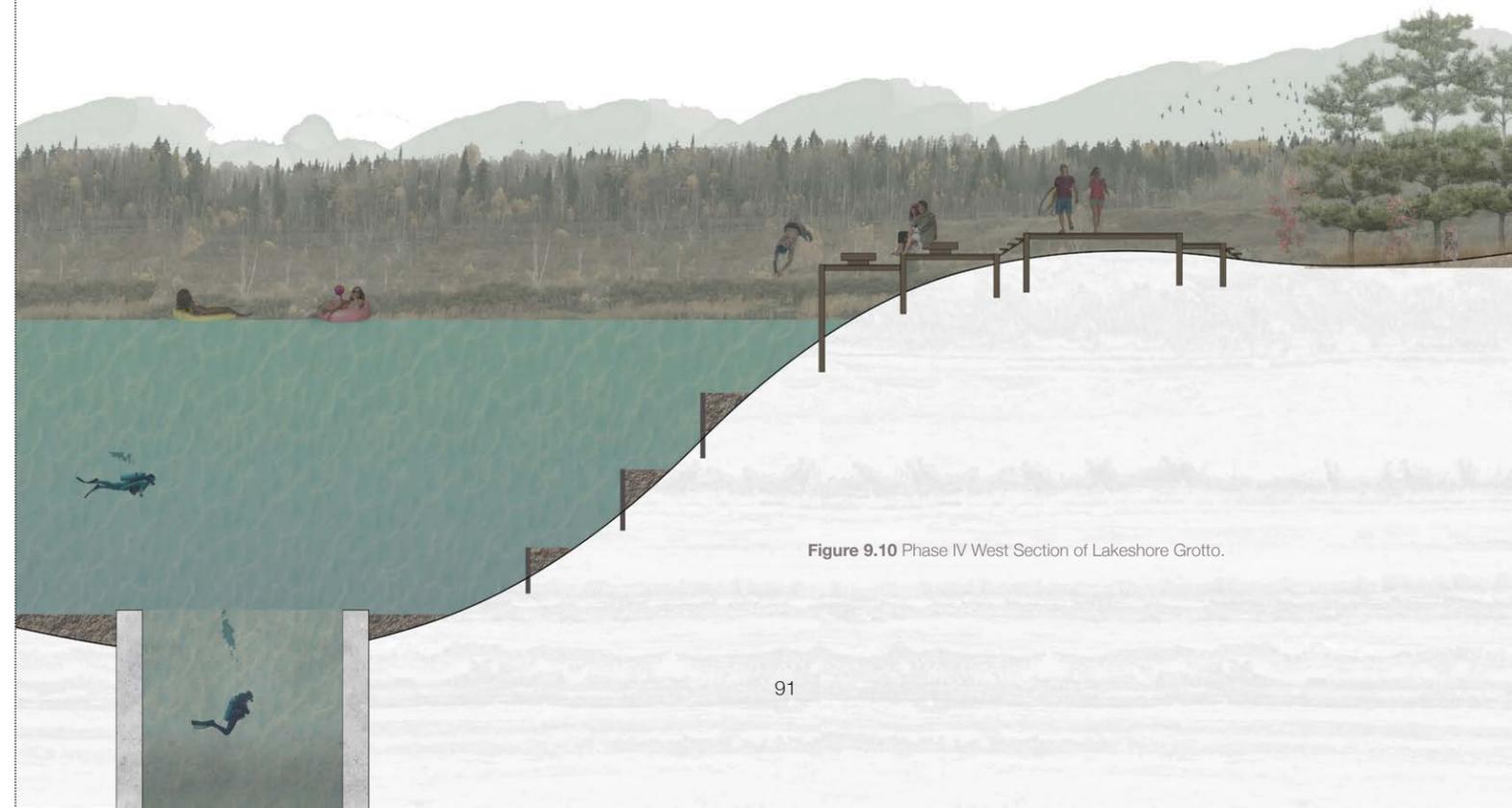


Figure 9.10 Phase IV West Section of Lakeshore Grotto.

Passive Design & Systems Integration Strategy

Passive design was a major priority within the design of all site interventions, the goal was to make the buildings as passive as possible to maintain low operating costs. One of the biggest flaws with many community projects in the North is that after construction is completed the communities struggle to keep up with operating costs.

All buildings are oriented to gain as much southern exposure as possible, keeping in mind the lower sun within the winter months. Deciduous trees such as silver poplar and white birch are used on the South side of all interventions to provide shade in the summer months and in shedding their leaves provide more light in the winter months. One of the main difficulties in siting the buildings, was that their proposed location was on the South shore of the Lakeshore Basin. This made the location of optimal window placement difficult because of the desire to maintain window openings to permit views to the Lakeshore Basin to the North and the sun to the South. The Monitoring and Research Facility utilized the openings on both the North and South sides of the building for cross ventilation, passively using Northwest winds off of the Lakeshore Basin to pass through the building.

The interior of the Warming Station utilizes the thermal mass of quartz and the existing concrete to help keep the space heated. The Warming Station exterior is constructed out of insulated light transmitting panels to allow natural light into the space. Meanwhile the building is heated with geothermal heat from a closed loop geothermal heat exchange system. Located above an open mine shaft there is no drilling required, making this a very feasible and low cost option for the building.

Figure 10.1 Passive Design Sections featuring passive solar and ventilation strategies in summer and winter.



Construction & Materiality Strategy

In a single industry community, the concept of building becomes questioned in terms of what the lifecycle of a building will look like through its entirety. Potentially in the years to come Kirkland Lake will be facing a tremendous shift in industry and population which will leave behind an abundance of abandoned buildings. This thinking is the basis behind both the programming of this project and the building strategy, which opts for small and flexible interventions across the site, using local materials and reusing as much existing infrastructure as possible.

The Monitoring and Research Facility meets these goals by being constructed within the existing Hoist Building on the site, which will act as a shell nesting new construction, which will have its own wall, floor and roof assemblies within the footprint of the existing building. This will allow flexibility in design and the expansion process, as new plumbing and electrical systems can be installed throughout the building without interference from existing Hoist Building. This strategy of building within existing structures is used throughout all the phases of the site; The Winter Sports Centre is built by being nested within the Storage Shelter and the Lasalle Apartments are built by being nested within the "back-of-house" portion of the Lasalle Theatre.

As the site is constantly evolving throughout the different phases of the project, particular attention was given to how the site interventions would meet the ground. For areas where there may be possible fluctuations in the height of water such as the Storage Shelter/Winter Sports Centre, helical piles were used to allow the building to sit high above the ground and to allow for animals to pass under once the site was remediated. Other interventions which floated on the

water were constructed on Expanded Polystyrene (EPS) bases to allow for the small structures to move with the changing height of the water.

The Material Strategy throughout the project as a whole was to use local materials from the forestry industry for the initial interventions paired with the existing materials on the site such as brick and concrete, and then to use recycled materials such as corrugated metal and metal grates from the mine after it closes. Quartz which is a common mineral in the area was also proposed on the interior of some of the buildings to be used for its thermal mass properties.

Material Palette

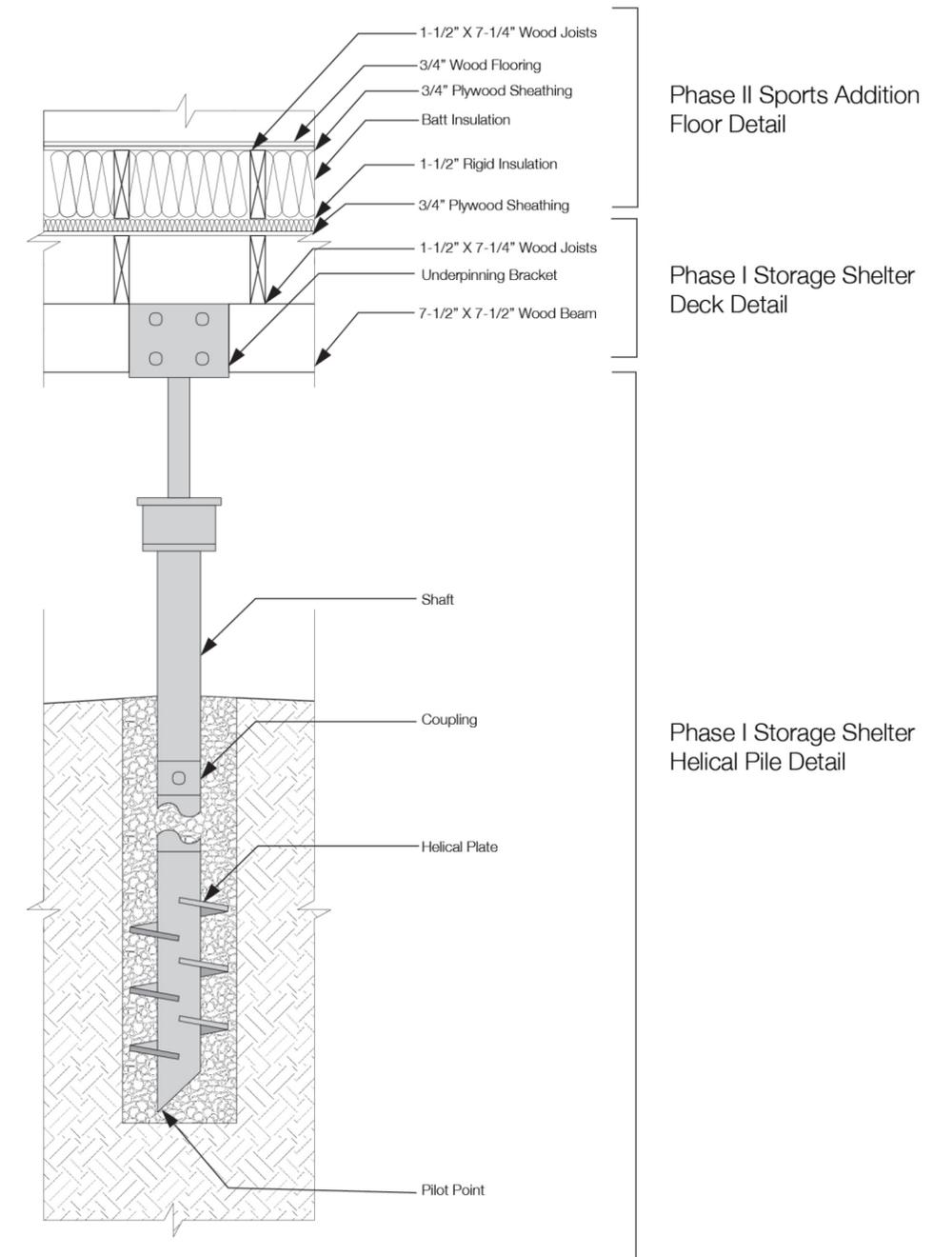


Figure 10.2 Material Palette and Helical Pile Detail.

Remediation & Habitat Strategy

Currently the Closure Plan outlines the use of Cat-tails (*Typha*) to be used throughout the site, Cattails are a long wetland reed which can be found in the surrounding landscape. Cattails are commonly used in wetland remediation because their phytoextraction properties allow them to absorb metal through their root systems. I propose that in addition to the use of Cattails, the list of vegetation in figure 10.3 should also be planted. The vegetation chosen here also has the capacity to be effective phytoextractors and can be found throughout Northeastern Ontario. This list of species will not only give the site more variety, but also will become a source of nutrients for local pollinating species (bees etc.). This will start to create a chain of ecological habitats for other animals.

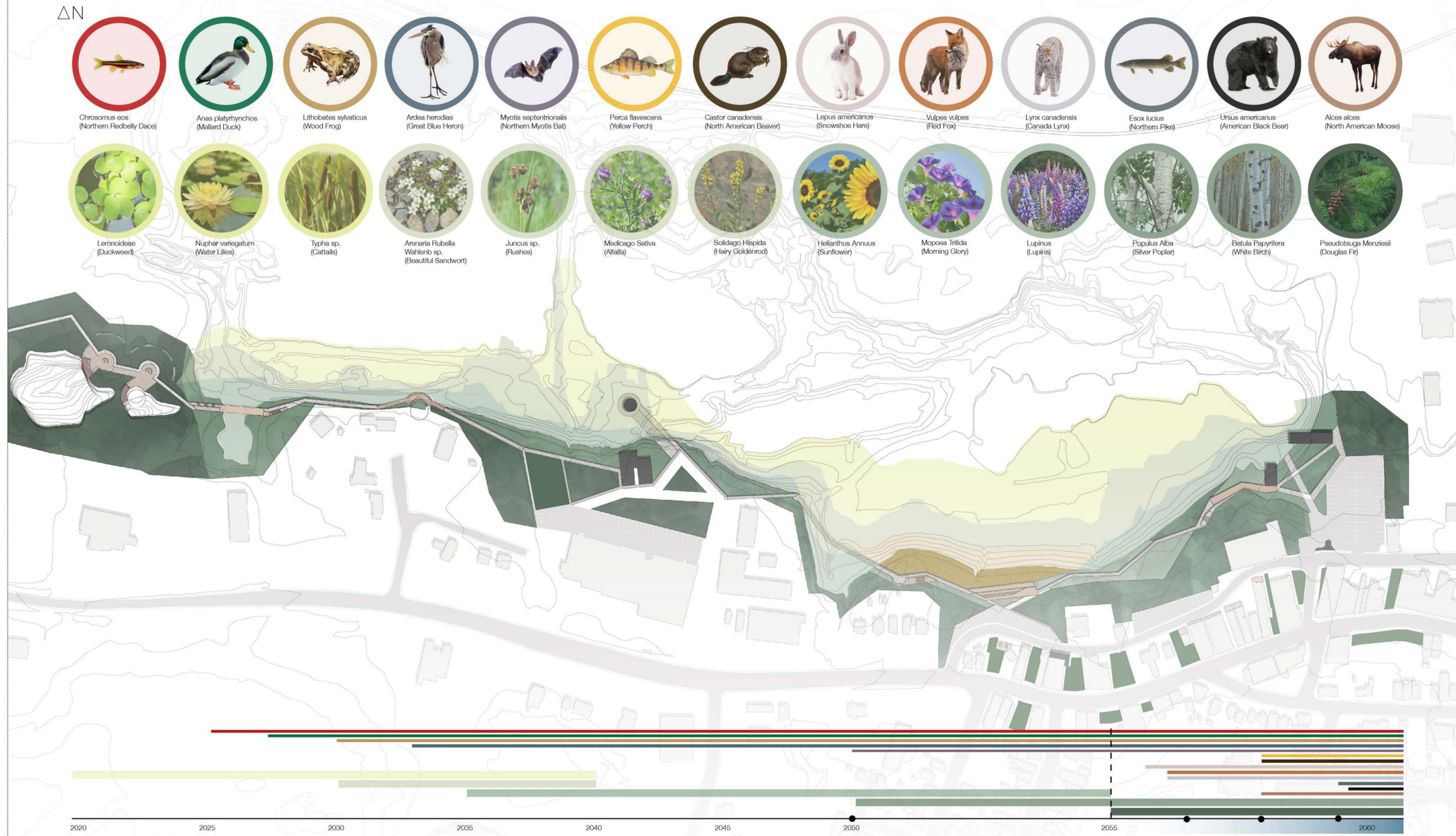


Figure 10.3 Remediation and Habitat Site Plan.

Remediation & Habitat Strategy

As the fencing around the Lakeshore Basin will stay until midway through Phase I of the project, the main focus of the initial remediation of the site will include vegetation to support species of birds, small amphibians and rodents which can pass either above or through the fencing. Duckweed, water lilies, cattails and sandwort will be used along the remaining mining tailings to extract the remaining harmful minerals from the water and soil.

Midway through Phase I, the fencing around the Lakeshore Basin will be removed as the site becomes remediated. The initial focus of the project in terms of landscape remediation will be to bring different species of animals back into the area. Various species of wildflowers and grasses will be planted across the site to attract snowshoe hares into the Lakeshore Basin, which in turn will attract various predators such as fox and lynx. Simultaneously, silver poplar and white birch will be planted across the site. Eventually as the water returns to the Lakeshore Basin, these plant species will become resources for the local beaver population for building their homes.

Throughout Phases II-IV not only will the return of the water generate the return of the beaver population, it will also bring perch and pike from the upstream lake which will connect to the Lakeshore Basin. The water and marshy areas will also attract moose to the area, as they feed on aquatic plants such as water lilies.

Figure 10.4 Remediation and Habitat Vignettes.

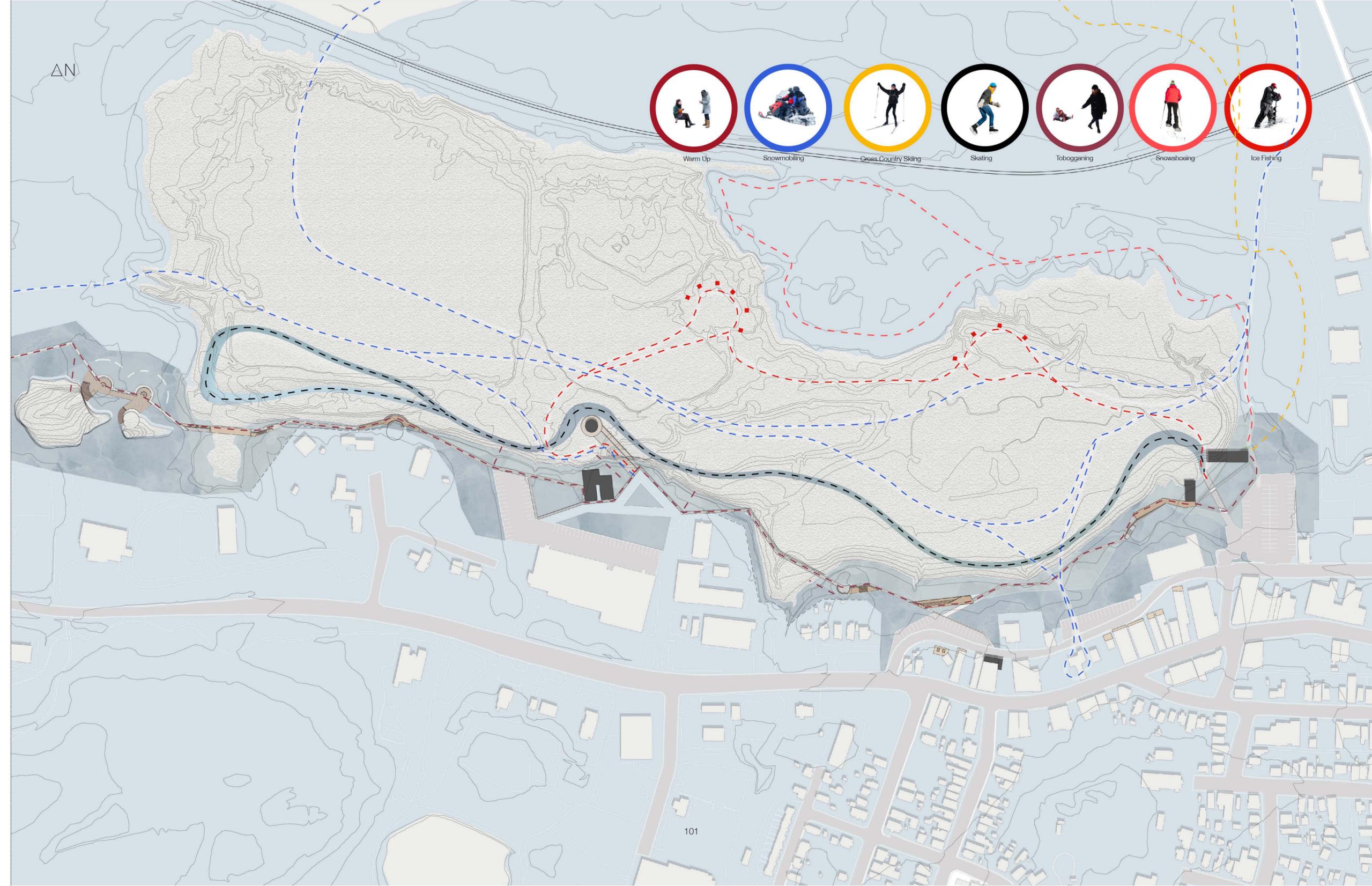


Winter Site Strategy

Located in Northeastern Ontario there are both difficult realities and benefits of living in a cold and sometimes harsh climate. My design seeks to celebrate the unique hibernal traits of Kirkland Lake by designing for popular winter activities such as snowmobiling, snowshoeing, cross country skiing and ice fishing through various site interventions. The Warming Station will allow those who do not have access to an ice shack (ice hut) to still participate in the local fish derbies and provide a meeting point for winter activity.

As a Northern community, finding programming which will get more people in the community active during the winter months is essential to the life of the community. Meanwhile, the Sports Centre located next to the existing curling club will create a hub for winter sports. The connection to the network of trails will allow the community to either take the skate path or a snowshoeing trail to visit the Lakeshore Grotto to have a bonfire. With the removal of the fencing around the Lakeshore Basin, the downtown will now also be more accessible to snowmobilers who are a major source of tourism within the area.

Figure 10.5 Winter Site Plan.



Site Possibilities

While this project proposes a variety of different programming and buildings across the site, the possibilities for the Lakeshore Basin do not end with what has been proposed here. I leave this as an open-ended project with a multitude of possibilities, the following pages briefly explore other potential programming across the site. The first proposed interventions are geared towards embracing a changing landscape through land art, heavy equipment use, the creation of pathways and the underwater exploration of the site. Before the Lakeshore Basin is fully remediated or begins to fill with water there is opportunity for the site to be transformed, as the site has already been highly impacted by the mining industry it holds opportunities which a green site would not have. The following interventions would be geared towards the healing of community and the landscape, as the population of Kirkland Lake both shrinks and ages, these possibilities are geared more towards a small aging population which lives and interacts with the healing site through the implementation of therapeutic programming such as saunas and thermal hot springs.

Land Art Charrette

Local artists could be invited to begin to morph and change the landscape through land art, leaving their own artifacts across the site to age and interact with this changing landscape. This could manifest itself, by initiatives such as a land art design charrette which would take place once a year, eventually being submerged once the Lakeshore Basin begins to fill with water. There is a similar international garden festival which has installations in Reford Gardens⁶⁶, Québec which the charrette could model itself off of.



66 "International Garden Festival: Reford Gardens." International Garden Festival | Reford Gardens. Accessed April 29, 2020. <https://www.internationalgardenfestival.com/>.

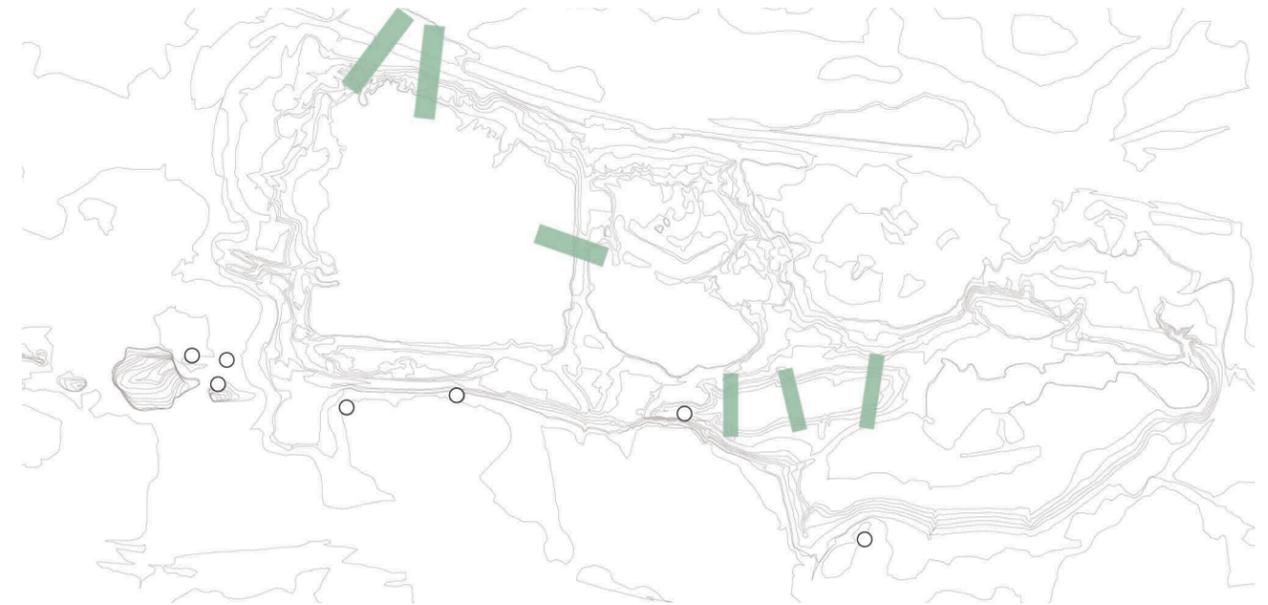


Figure 10.6 Land Art Charrette Vignette & Site Plan.

Heavy Equipment Park

The site could also be utilized for recreational heavy equipment use, allowing the community to actually shape the Lakeshore Basin itself. This programming would go hand in hand with the Land Art Charrette as a transformed landscape, but would be utilized for the spring, summer and fall months when the ground is not frozen.



Figure 10.7 Heavy Equipment Park Vignette & Site Plan.

Extreme Sports Park

The ultimate goal of reshaping the Lakeshore Basin is to bring it to a state that can be utilized by the community through different forms of programming, as the site is transformed over the years different pathways emerge through the Land Art and Heavy Equipment use. These pathways will be used for local extreme sports enthusiasts such as dirt biking, four-wheeling, snowmobiling and mountain biking. Local races and events for these sports could be hosted here as well.

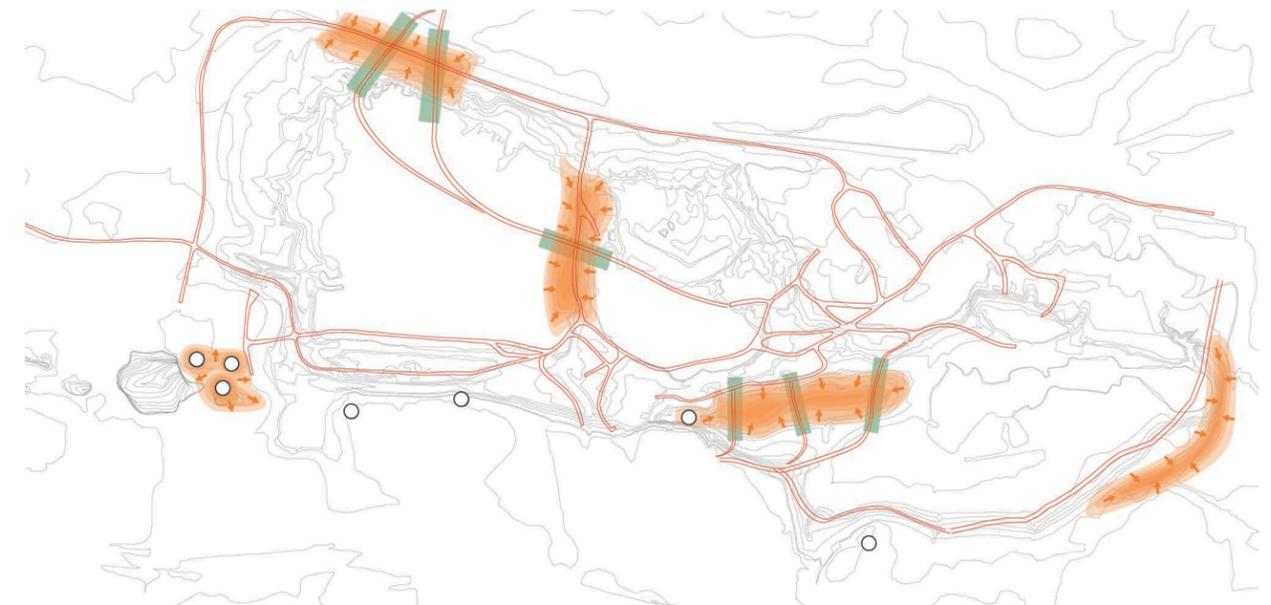


Figure 10.8 Extreme Sports Park Vignette & Site Plan.

Scuba Diving Exploration

As the Lakeshore Basin begins to fill, an opportunity emerges for the exploration of the site through a new form of programming, scuba diving. With a new Sports Centre on the East end of the site, scuba gear rental could be another program added to their rentals. The transformations over the years from Land Art, Heavy Equipment and the network of paths could be explored underwater. The berms from the Heavy Equipment Activity could allow a scuba diver to walk in and out of the water in the middle of the lake, and the culverts and other artifacts left on the land would be like the industrial shipwrecks of the Lakeshore Basin.

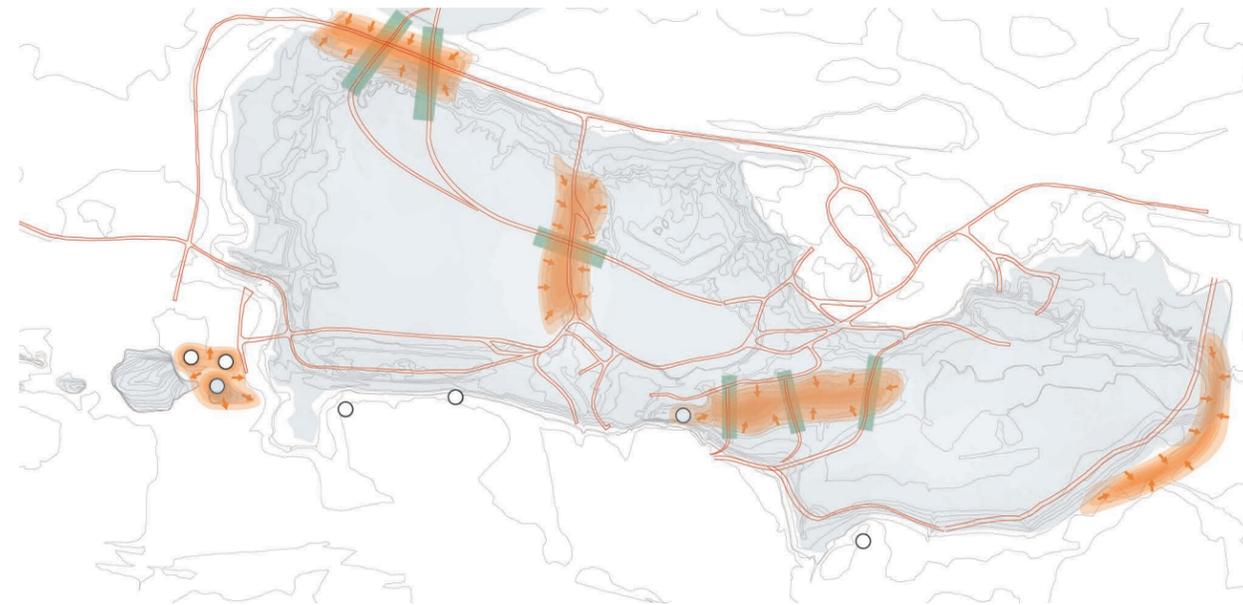
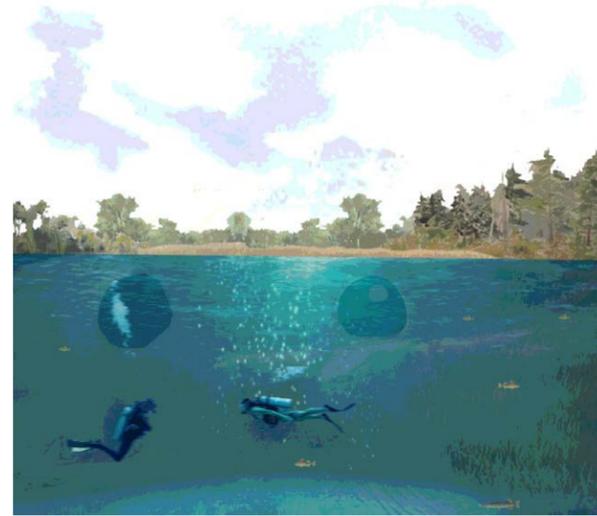


Figure 10.9 Scuba Diving Exploration Vignette & Site Plan.

Public Sauna

With a high demographic of the population having Finnish heritage, Saunas are commonly found throughout Kirkland Lake. There is currently only one small public sauna in the area located at the local community centre. The implementation of public saunas throughout the site would celebrate this heritage and be highly utilized by the community.



Figure 10.10 Public Sauna Vignette & Site Plan.

Floating Public Sauna

With the potential for the Lakeshore Basin to fill with water, we must keep in mind with all interventions that this will be a changing landscape, outfitting the saunas across the site to be able to float would allow them to become floating saunas as the Lakeshore Basin fills. The optimal location is on the North shore in the bays which will form in the lake, this will allow optimal sun exposure and less harsh wind conditions.

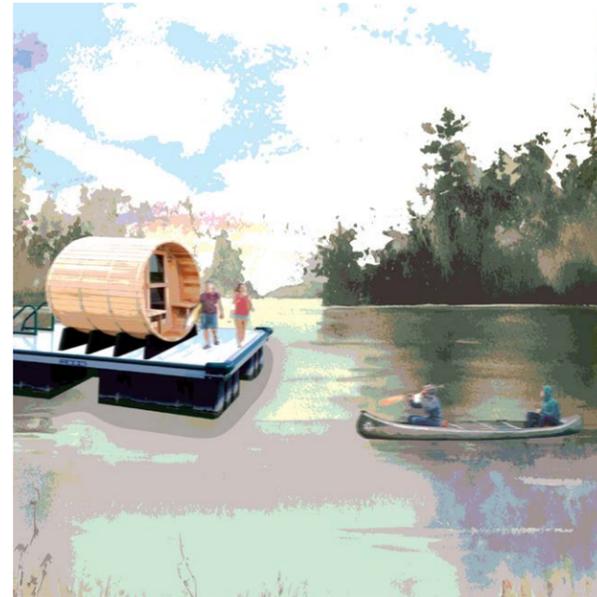


Figure 10.11 Floating Public Sauna Vignette & Site Plan.

Thermal Hot Spring

With heat constantly rising from the underground network of shafts below, the Glory Holes of the Lakeshore Grotto hold a mysterious potential of becoming Thermal Hot Springs as they fill with water. This would become a winter hot spot for locals to use as a thermal bath.

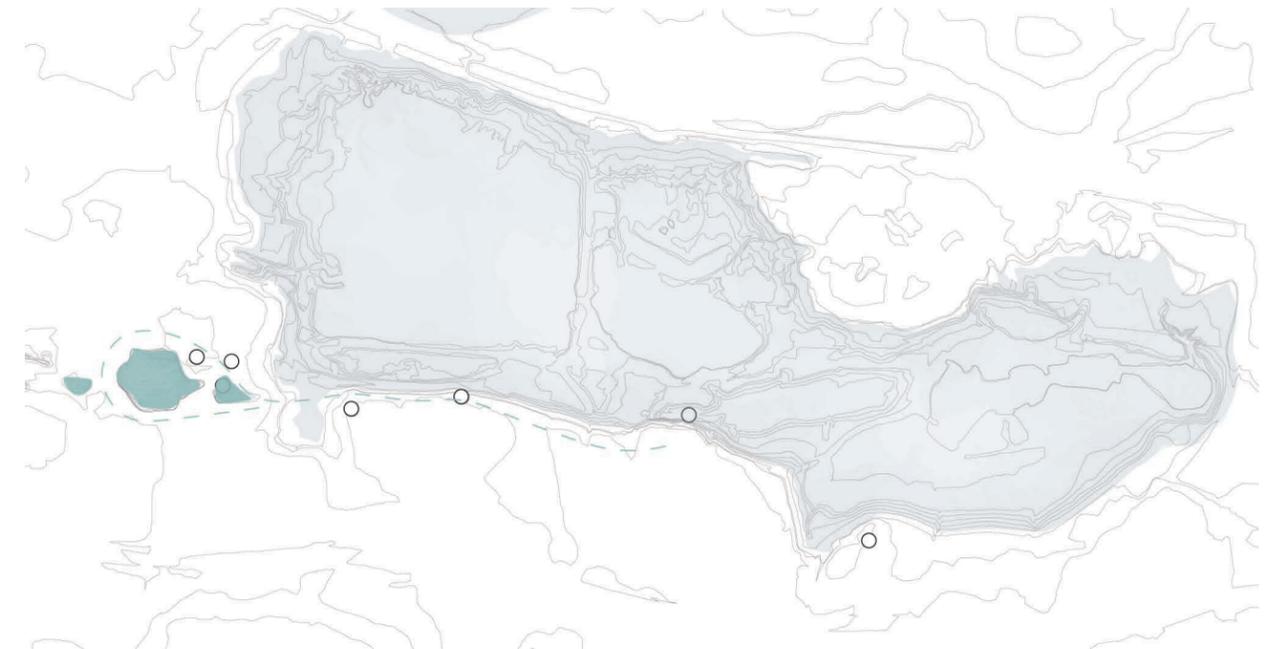


Figure 10.12 Thermal Hot Spring Vignette & Site Plan.

Conclusion

This body of work is a testament that the tremendous changes single industry communities are going to face should be addressed through a transdisciplinary approach. One which uses design to engage localities of economy, sociology and the environment. When it comes to single industry communities design might have limitations on its own, but it can open up conversations about the difficult issues our communities are struggling with. The remediation of industrial sites is not exclusively a design issue. Rather, it is an issue which requires many different stakeholders and disciplines to be accomplished successfully. Design allows industrial sites, such as the Lakeshore Basin to become inhabited landscapes which bring life to communities such as Kirkland Lake. Through design this project attempts to connect large scale community planning with the environmental management of the landscape to bring forth modestly scaled interventions which benefit the community and the environment.

This project accepts the harsh realities of single industry communities, rather than opposing de-industrialization by forcing economic growth, the project seeks to explore the notion of de-growth as a mechanism for transition. This is demonstrated by dialing back built infrastructure and instead focusing on community oriented buildings and re-establishing natural ecosystems.

Throughout this process it has been critical to acknowledge that remediation and de-growth are processes which change slowly over time, and should be planned as temporal landscapes, transforming and re-shaping throughout the years. Traces of the past are left across the site as reminders of an industrial past which embraces the unique characteristics which industry leaves behind.

Kirkland Lake and the Lakeshore Basin are places scarred by industry, but I hope that this project shows the potential for how they may transform and become inhabited throughout time. Having always been a part of this community, I hope that this work can be used to help the Kirkland Lake community plan for a future which acknowledges the ecological balance of the surrounding landscape, while planning for the lived experience of those who choose to call this place home.

Thank You

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