

Industrial Heritage in Northern Ontario: The Case Study of the Controversial Inco Superstack

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PREAMBLE

The following research presents a non-exhaustive introductory study that has been compiled for a short research paper to be completed in the framework of my second year of study at the Raymond Lemaire International Centre for Conservation (KU Leuven, Belgium).

INTRODUCTION

Industrial heritage, although now better socially recognized for its heritage value and creative adaptive re-use possibilities, does still present many unique challenges when we are faced with its preservation. The Inco Superstack, located in the greater metropolitan area of Sudbury and mining capital of the world, is an engineering, mining, and cultural landscape marvel. It is yet most definitely a unique example of a challenging and unsettling industrial heritage of northern Ontario.

The structure's intrinsic value, its direct impact on the past and present community, and its controversial standing, have recently been put into perspective following the announcement of its possible demolition by Vale's vice-president of Sudbury and UK Operations, Kelly Strong, at the Sudbury Chamber of Commerce on November 3rd, 2014.



This research will not be establishing whether or not the Inco Superstack is in fact obsolete, but will, on the other hand, hope to illustrate the community's reaction following the news, good and bad, and the obstacles faced when wanting to archive these discussions. In addition, the controversy of the structure will be considered; including its historical and environmental impacts, and certain associated conservation challenges of such a unique structure are exemplified.

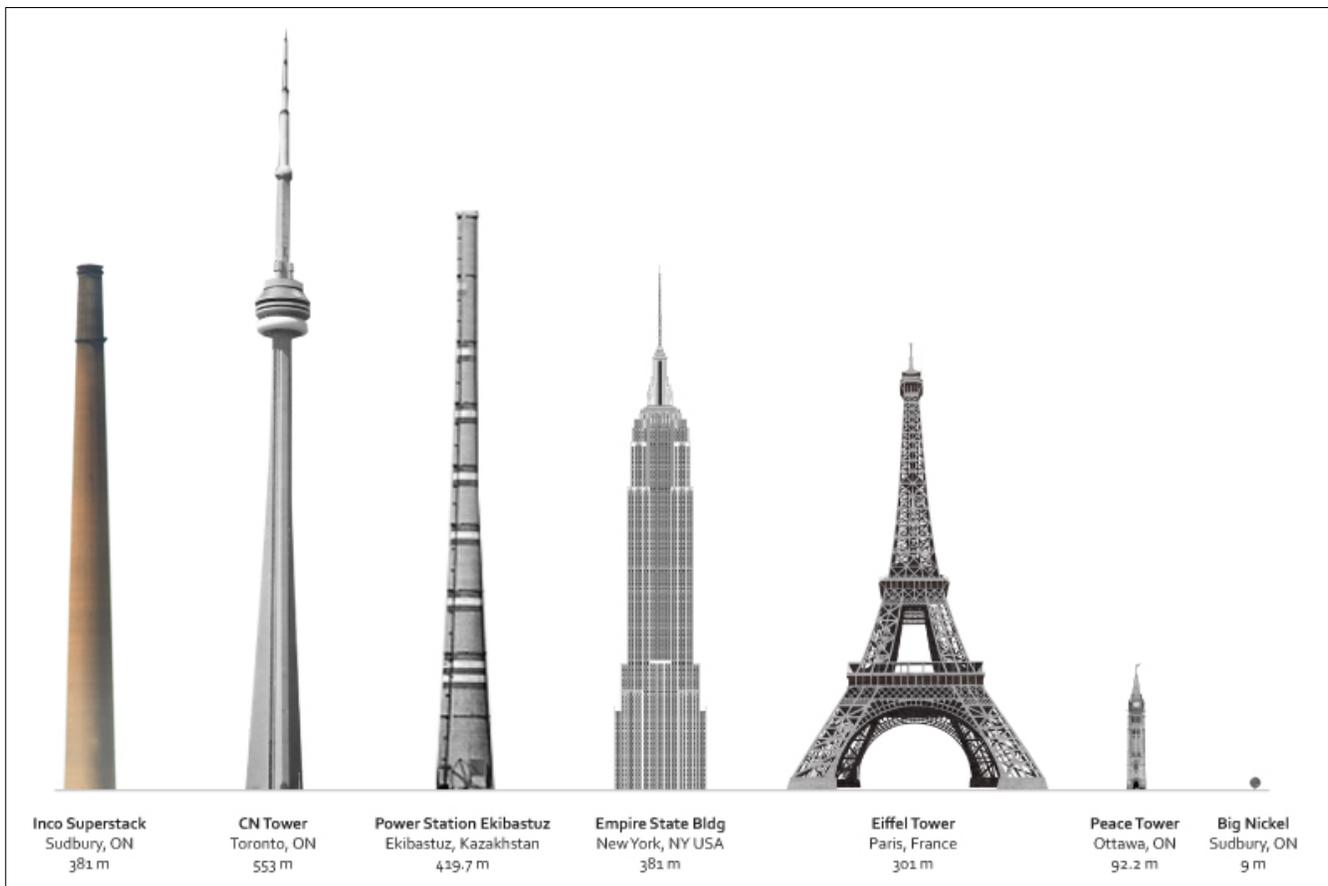
UNDERSTANDING THE CHANGING LANDSCAPE

The Inco Superstack is part of a larger complex, the Copper Cliff smelter. The smelter is however no longer run by Inco, as the company was purchased by the Brazilian mining company, Vale, in 2006. In total, Vale has six mines, a mill, a smelter and a refinery in Sudbury, making it one of the largest integrated mining operations in the world.ⁱ

The metropolitan area of Sudbury, with a population of approximately 165,500 residents,ⁱⁱ has been an important mining centre in northern Ontario for over 100 years. The nature of the area's economy has drastically defined the natural and built landscapes, and prompted a series of necessary environmental efforts in the past 50 years to counter

the region's near-total loss of native vegetation.

One of these environmental efforts includes the construction of the 381 meter or 1,250 feet high Inco superstack in 1970-1972. It was resolved that a taller chimney be built to divert sulphur dioxide (SO₂) emissions from Inco Ltd.'s nickel smelter in Copper Cliff, away from Sudbury. The superstack is the second highest free-standing structure in Canada, behind the CN Tower, and the second highest chimney in the world. Shadowing Sudbury's iconic 9 meter high Big Nickel, the superstack presents a uniquely immense preservation challenge.



BRIEF MINING HISTORY OF SUDBURY

The city of Sudbury and ‘moonscape’ have often been synonymous. This expression most likely comes from the arrival of Apollo 16’s astronauts in Sudbury for training in 1971, before heading out for their mission to the moon. Although the general conception was that they chose Sudbury for the region’s terrain resembling that of the moonscape, the astronauts were in fact there for the region’s rich geological character.ⁱⁱⁱ Sudbury was struck by a 10 km diameter meteorite 1.85 billion years ago, as suggested by geological evidence,^{iv} which impacted the region’s bountiful resources of nickel, copper, platinum and other metals, enabling the area to become the leading mining centre it is today.^v

The discovery of mineral resources in the region was first made in 1883, during the construction of the Canadian Pacific Railway. This immense discovery was located in what is now called the discovery site, approximately 5 km northwest of the historic city centre of Sudbury.^{vi} The Murray Mine was established at the discovery outcrop that same year, and many more iron-rich ores were quickly discovered once prospectors flocked to the area. Development and the mining industry were quick to surge in the region. Three years following the establishment of Murray Mine, the Copper Cliff Mine started operations in 1886 and led its first smelting operation in 1888.^{vii} In 1893, just a decade following the first finding, the now well-established town was renamed Sudbury and served an important commercial and transport node to surrounding mining communities.^{viii} As the region of Sudbury was producing 80% of the world’s nickel by 1910^{ix}, it comes as no surprise that the area’s landscape was quickly and drastically altered by the region’s resource extraction demands and economic surge.

The changes were so drastic that rocks were charcoal-colour stained from the acid rain and sulphur dioxide emitted from the mining processes. Vegetation was stripped, the landscape left barren without anything able to grow, and lakes acidified, causing extensive damage to ecosystems.

SOARING TO NEW HEIGHTS

Although sulphur dioxide isn’t the only harmful emission caused as a result of smelting nickel, it was quickly realized that it was the most impactful in its volume and component of acid rain. Sulphur dioxide clouds were a common sight and a clear health hazard for inhabitants and workers.

The air quality and landscape devastation could no longer be ignored. The reduction of SO₂ in the region can be attributed to both changing mining practices, with the company shifting from open roastbeds to more complex systems, and the construction of the superstack in 1970-1972.

As a result of the stack, SO₂ emissions from the Copper Cliff smelter were decreased to 600 kt in 1990 in comparison to an alarming 2,000 kt (kilotonnes) in 1970.^x

Although the superstack did very little in terms of solving the problem of emissions, the diffusion of SO₂ enabled the city to embark on an environmental renewal project to re-establish ecosystems in the area, including by planting more than 12 million trees planted since. The United Nations Local Government Honors Award presented at the 1992 Earth Summit in Rio de Janeiro for the city’s Land Reclamation Program.^{xi}

THE AER PROJECT

The latest initiative on the part of Vale has been the AER Project, or the Atmospheric Emissions Reduction Project. The \$1 billion initiative is once again tackling the issue of SO₂ emissions from the smelter and hopes to finally render emissions negligible. This will have been possible with a huge retrofit of facilities to house 4 new converters, the first of which was installed in 2012, to capture emissions currently going up the stack. Emissions are caught long before nearing the stack by what is essentially a vacuum the size of a hockey arena, and diverted to a newly built gas cleaning plant and acid plant where it is converted to sulphuric acid to be sold.^{xii} SO₂ emissions from the stack are expected to be as low as 20 kt per year with the completed implementation of the AER Project in 2016.^{xiii}

If sulphur dioxide emissions from the superstack are confirmed as negligible by Vale, upon approval of the Ministry of Environment, the chimney will be declared redundant and the structure likely dismantled and replaced with a smaller chimney, more fitting of Vale's new facility investments and emission projections. Cost of rehabilitation and maintenance of the 43-year-old structure would seem to be a predominant issue in the matter. The company anticipated making a decision on the fate of the chimney by early this year.

THE COMMUNITY'S PERSPECTIVES

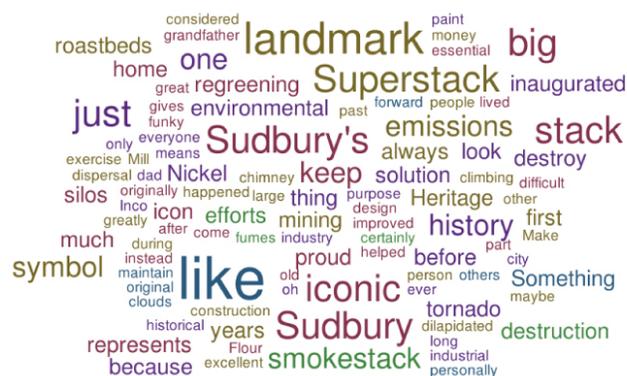
The Inco superstack is disconcerting, upsetting—yet at the same time, it is an impressive landmark. It has been considered by the community to be a necessary evil of the Sudbury's mining past; a reminder of the near complete disaster of the area's natural landscape; a beacon of hope toward changing tides in mining practices; and a cultural

landmark. With such varying opinions, it is no surprise that the news of its potential demolition stirred quite some emotions and debate amongst the community.

The community's colourful response truly is what inspired me to take on this research project. For the purpose of this research, I have defined the community as any individual with interest, public bodies, conservation experts, stakeholders, etc. It is impossible to only consider the community as those residing in the Sudbury region exclusively since, although residents or past residents of Sudbury may have most directly felt the environmental and visual impact of the superstack, pollution knows no boundaries and the structure's construction has affected us all.

Representing the sentiments made by the community is another problem on its own. How to quickly share conversations with you here today, how to archive comments made via social media, and how to ensure that the entire community's population is represented, including various generations and access to social media means and resources.

Tools at our disposal, such as the website [Building Stories](#), could prove a fantastic way of archiving individuals' stories, yet does not enable us to capture social media comments already made.



I have attempted to capture reactions made by the community to share with you today by means of a word cloud. Sources of comments include social media reactions and comments of online news. Although this enables a portrait to be quickly painted, it does prove a problematic approach due to a selective source of commentary, as well an inability to interpret tones within the comments and popular words with unknown connotations. For example, a comment stating that a 'landmark' should not be saved, could provide positivity when reading 'landmark' isolated, within the word cloud. It does however give you a quick glimpse of the stories shared about the environment, history, and impact of the stack on Sudbury's residents, such as accounts of fathers and grandfathers being atop the structure during its construction in 1970 while a 10 minute wind storm, or tornado, blew in at 100 mph. Thankfully no one was hurt on the superstack, and the stories have lived on.

PRESERVATION PROJECTS

To my knowledge, there have been no community-led initiatives to nominate the superstack for designation, or dialogues between the community, the city, and Vale about the protection of the superstack and possible future uses.

Although the superstack could be designated under the Ontario Heritage Act, designation of historic sites is not a popular process in Sudbury, a city with a total of 7 designated properties in the downtown core and little to no related funding.

Protection of mining landscapes is not unheard-of, however, as recent examples include the Cobalt Mining district National Historic Site in northern Ontario, designated in 2001, and the Cornwall and

West Devon mining landscape of England designated a World Heritage Site in 2006.

The Copper Cliff smelter is a particular site when considering the conservation of the stack, since it is both inaccessible to the public and only viewable from a point at a safe distance from the actual smelter property. The viewpoint must however be impressive as it holds a 4-star review on Trip Advisor!

Being located on the site of a smelter, operable so long as there are productive mines in that region, the conservation of the site is very difficultly linked to that of landscape reclamation of inoperable or abandoned mines.

CONCLUSION

The superstack is not isolated in its conservation and maintenance challenges. I was glad to find a *Factory Chimneys and Collective Memory* steering group as part of the Funded *European Industrial and Technical Heritage Year*, and look forward to any discussions and tools published as a result.

Whether or not the superstack becomes a remnant of Sudbury's mining past, it is a symbol of the region's economic growth and the constantly changing mining practices that have made the mining centre an example of best practices and environmental sensibility. The superstack is an important element of the unique cultural landscape and industrial heritage of Sudbury, and should merit preservation on its strong associations and ties to the community and sense of place.

It would be nice to see the large mining company become involved in the residents' well-being, not

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only from a health and safety mandate, but to participate in discussions about what culturally distinguishes the community, and listen to the creative ideas the community might have for this unique and challenging structure. These are simply

two examples of what I hope are many creative ways to use the structure's height and make the incomparable view accessible to the public.

ⁱ *Our Business – Sudbury*, Vale Mining.

<http://www.vale.com/canada/en/business/mining/nickel/vale-canada/sudbury/pages/default.aspx>

ⁱⁱ *Population of Census Metropolitan Areas*, Statistics Canada.

<http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo05a-eng.htm>

ⁱⁱⁱ *Selling the Moon – Part II*, Under the Influence with Terry O'Reilly, CBC Radio,

<http://www.cbc.ca/radio/undertheinfluence/selling-the-moon-part-ii-1.2937359>

^{iv} "Discovery Site of Sudbury Mining Camp, Sudbury," *Science North*, http://www.sciencenorth.ca/dynamic-earth/geotours/sudbury/05_discovery_mining-camp_e.pdf

^v Ibid.

^{vi} Ibid.

^{vii} Ibid.

^{viii} *Downtown Sudbury Master Plan: Background Analysis* (May 2011), The City of Sudbury, p. 2

^{ix} "Discovery Site of Sudbury Mining Camp, Sudbury," *Science North* http://www.sciencenorth.ca/dynamic-earth/geotours/sudbury/05_discovery_mining-camp_e.pdf

^x Steve May, "Superstack Removal Symbolic of Mining Industry's Green Efforts," *The Sudbury Star* (November 15, 2014), <http://www.republicofmining.com/2014/11/15/superstack-removal-symbolic-of-mining-industrys-green-efforts-by-steve-may-sudbury-star-novmeber-15-2014/>

^{xi} *Awards*, Greater Sudbury,

<http://www.greatersudbury.ca/living/environmental-initiatives/regreening-program/awards/>

^{xii} "Vale's Clean AER Project Marks Major Milestone with Delivery of First New Converter," Vale Media Release (September 20, 2012),

http://www.valecleanaer.com/media/19741/clean_aer_converter_delivery_release_-_sept_20_12.pdf

^{xiii} Ibid.