1.3 Emery Creek Subwatershed

General Description

- **Total area :** 103.97km^2
- **Drainage**: Originates in Falconbridge township and flows east to converge with the Wanapitei River north of Highway 17.
- **Topography:** Characterized by rocky terrain, with a maximum elevation of 356.5 m.a.s.l., a mean elevation of 291.8 m.a.s.l. and a mean slope of 4.6%.
- **Geology:**
  - **Bedrock Geology:** Precambrian bedrock of the Huronian Province is the main formation with Sudbury Igneous Complex underlying in the northwest extent of the subwatershed.
  - **Quaternary Geology:** Mainly exposed or thinly covered bedrock. In the northwest and southeast of the subwatershed, areas of till and glaciofluvial outwash deposits are observed, made up of gravels and sands.
- **Soil:** Surface substrates are mainly stable bedrock, with a large area of gravelly sandy loam along the east and small pockets of both sand and clay loam.
- **Groundwater:** The Source Protection Plan has identified Highly Vulnerable Aquifers along the west side of the subwatershed. A large Significant Groundwater Recharge Area is present along the northwest of the subwatershed.
- **Land cover:**
  - Forest covers an area of 61.5 km^2, 59.2 % of the subwatershed.
  - Wetlands cover an area of 17.71 km^2, 17.0% of the subwatershed.
  - Exposed bedrock covers an area of 13.82 km^2, 13.3% of the subwatershed.
  - Lakes cover an area of 1.88 km^2, 1.8% of the subwatershed.
- **Land Use Type:**
  - **Zoning:** Most of this subwatershed (94.4%) is covered by the City of Greater Sudbury's Zoning By-law. Of that area, 56.61km^2 (57.7%) is rural, 37.75km^2 (38.5%) is industrial and 3.74km^2 (3.8%) is Open Space.

Indigenous Communities and Traditional Territories

- The entirety of this subwatershed falls within the Wahnapitae First Nations traditional territory and the Robinson-Huron Treaty Area #9.
- This area also falls within the traditional territory of the Atikameksheng Anishnawbek First Nation.

Development Pressure

Overall: Low – Aside from future development or expansion of the existing mining operation, access to any of the rural areas is limited by private land ownership on the west site. Development is not expected to increase in the foreseeable future.

- **Settlement Area:** There are no areas identified as 'Settlement Areas' based on the City of Greater Sudbury's Official Plan.
- **Municipal Wastewater Facilities:** There are no municipal wastewater facilities within this subwatershed.
- **Forestry:** Located within the Sudbury Forest Management Area. There are no areas identified for harvest in the 2020-2030 Forest Management Plan. Historically, extensive forest harvest activities are known to have occurred in the area during the mid nineteenth century.
- **Aggregate:** There are currently 29 active and 1 inactive aggregate operations.
- **Mining:**
    - The Glencore Smelter Complex is located within the subwatershed.
    - No active exploration reported within the last year (February 2023-January 2024).
    - No active mining plans/permits are registered within this subwatershed.
    - Historically, there were 3 producing mines in operation between 1929 abd 1990: Falconbridge Mine, East Falconbridge Mine and Norduna Mine, all extracting copper and nickel as their primary commodities. A mill and concentration facility also operated on the Smelter Property between 1932 and 1988.

Recreational Use

- Blueberry picking (add to other SWs), hunting, trapping, and snowmobiling are known to occur within the conservation reserve to the north. Evidence of Crown land camping has been observed.
- There is an official snowmobile trail that fall within portions of this subwatershed along the east and west boundaries.

Water use

- There are currently 3 active Permits to Take Water within this subwatershed, held by Sudbury INO – Glencore and William Day.

Notable Waterbodies

- None

Previously Identified Issues

- Historically, impacts from mining practices and smelter emissions have negatively impacted water quality and ecological features (soils, flora) of this subwatershed.

Natural Hazard Identification and Regulation

Hazards and features regulated by Conservation Sudbury include flood and erosion hazards, wetlands, unstable soils, rivers, streams, creeks, and small inland lakes. More on these regulations can be found in the Conservation Authorities Act, O. Reg. 686/21 that addresses the risks of natural hazards.

- **Floodplain mapping:** Currently, there is no floodplain mapping for this area.
    - In the absence of floodplain mapping, flood hazards are estimated based on site conditions. Typically, the extent of the flood hazard is estimated at 1.2 m above the bankfull elevation or high-water elevation.
- **Erosion hazard mapping:** Currently, erosion hazards are evaluated based on the general guidance from the MNRF for confined and unconfined systems.

Water Control Structures:

- No known water control structures within this subwatershed.

Drinking Water Source Protection

- To the north, Municipal Wells #5, 6 and 7 from the 'Falconbridge Drinking Water System' have Wellhead Protection Areas that are partially located in this subwatershed.
- This subwatershed is also located within the headwaters of the Wanapitei River Water intake, a municipal drinking water source. As such, all watercourses within this subwatershed and the lands immediately around them are classified as Intake Protection Zone 3 as the water ultimately drains towards the Wanapitei River drinking water intake.

Water Quality Indicators

Surface water:

- Historically, effluent from the town of Falconbridge and mine drainage from Falconbridge Mine and Falconbridge East Mines drained to Emery Creek. Consequently, the creek was heavily polluted with heavy metals resulting in an impoverished creek fauna. By the late 1970s, copper and nickel were still 10-times higher than recommended levels. Conductivity and total solids were also high (NDCA Watershed Inventory, 1980).
- More recently, metal concentrations are still above Provincial Water Quality Objectives, but are nowhere near historic concentrations, with conductivity levels more typical of an unimpacted area. High iron concentrations are still observed, but this is attributed to its prevalence in rock forming minerals found naturally in the area.

Groundwater: The Falconbridge Wells aquifer, which falls within the Emery Creek subwatershed is classified as non-GUDI and has good water quality. There have been elevated levels of sodium identified in the treated water of one of the three municipal wells. (CGS Water and Wastewater Master Plan – Existing Systems, 2017).

Significant Features

- The MacLennan Esker Forest Conservation Reserve occupies an area of 3.65km^2 in the north.
- Wildlife Values:
    - There are 7 moose related wildlife value areas, covering a total area of 0.18 km^2.

- There are no ANSI ecological areas of interest.
- Several kettle lakes exist south of the community of Skead in the vicinity of the Sudbury Airport. Though this area is not a designated significant area, it is locally recognized as an important natural heritage feature of the area.

Management and Stewardship

- **Wahnapitae First Nation** and **Atikameksheng Anishnawbek First Nation:** Their traditional territories include the area within this subwatershed. They are land holders of the area and, as such, are significant stewards of the land.
- **Glencore:** Because of their operations on the land, the company must complete regular environmental monitoring to comply with provincial and federal regulations. They also complete internal environmental monitoring and management work on their owned properties.
- **City of Greater Sudbury Regreening Program and VETAC**: The CGS's regreening program has completed regreening work on 27.8 km^2 (26.8%) of the subwatershed.
- **Ministry of Environment, Conservation and Parks:** Provincial Parks and Conservation Reserves are managed by MECP.

Data available

- **Provincial Water Quality Monitoring:** Conservation Sudbury, in partnership with the Ministry of Environment, Conservation and Parks, has collected surface water quality data on Emery Creek on-and-off since 1968, and consistently since 2007.
- **Glencore:** As part of their regulatory requirements, Glencore has collected air, surface and groundwater quality data as well as information on natural heritage features (fish, benthic invertebrates, wildlife, etc.)

Supporting Documents

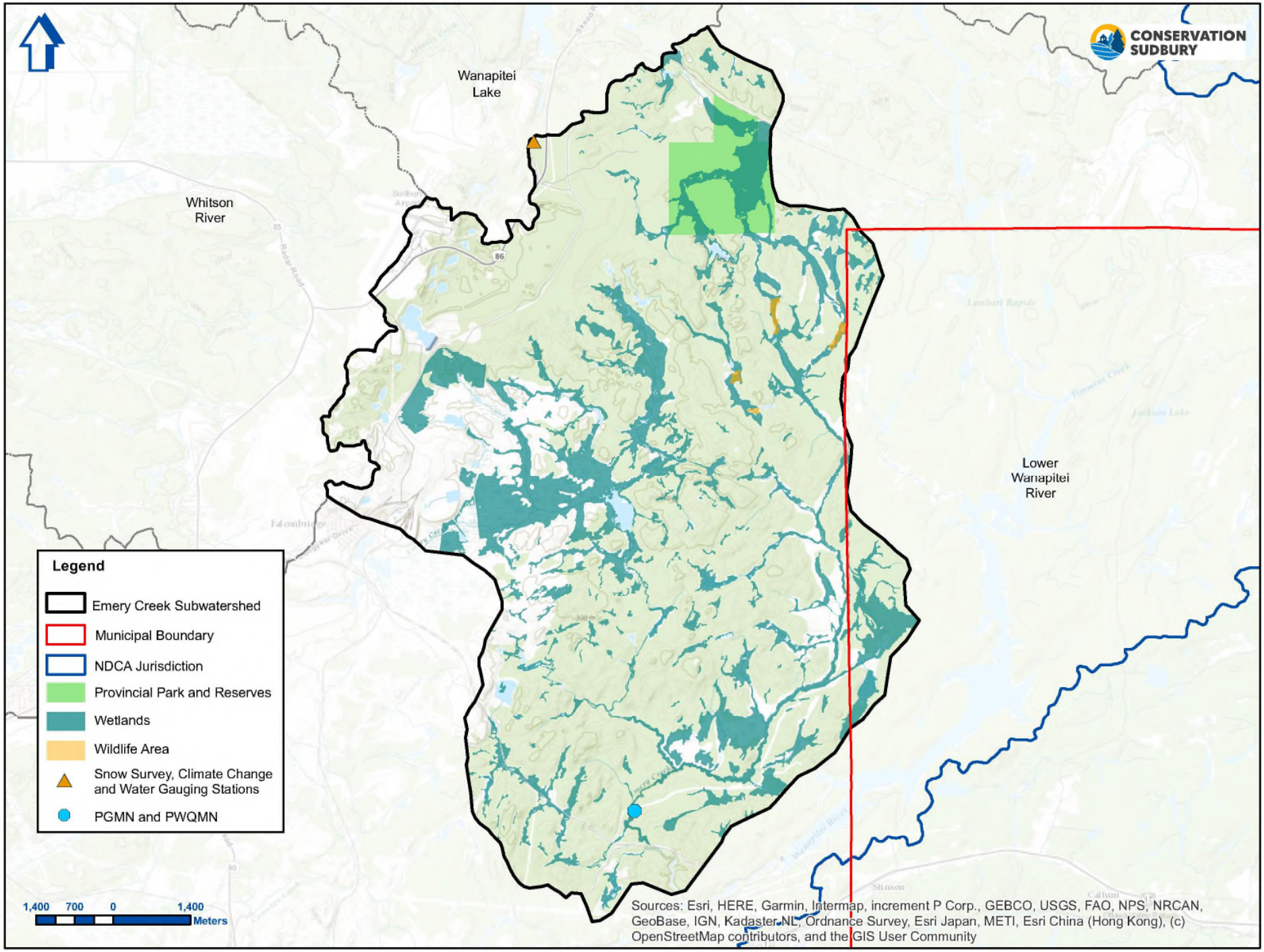
City of Greater Sudbury, **Water and Wastewater Master Plan – Existing Water Systems,** 2017.

Conservation Sudbury, **Greater Sudbury Source Protection Area - Assessment Report**, September 2, 2014.

OMNR**, MacLennan Esker Forest Conservation Reserve**, 2004

Nickel District Conservation Authority**, NDCA Watershed Inventory**, September 1980.

Ontario Water Resource Commission, **Biological Survey of the Streams, and Lakes of the Sudbury Area**, 1968.


CONSERVATION SUDBURY
Wanapitei Lake
Whitson River
Lower Wanapitei River
Legend
Emery Creek Subwatershed
Municipal Boundary
NDCA Jurisdiction
Provincial Park and Reserves
Wetlands
Wildlife Area
Snow Survey, Climate Change and Water Gauging Stations
PGMN and PWQMN
1,400 700 0 1,400
Meters
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community