



**FIRST MINING  
GOLD**



## **APPENDIX I**

### **CLIMATE CHANGE TECHNICAL SUPPORT DOCUMENTS**

- I-1 Greenhouse Gas Assessment Report
- I-2 Net Zero Strategy
- I-3 Future Climate Projections**



# **Climate Change Projections**

Springpole Gold Project

First Mining Gold Corp.

ONS2104

**Prepared by:**  
**WSP Canada Inc.**

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# Climate Change Projections Springpole Gold Project

Red Lake District, Northwest Ontario  
Project #ONS2104

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## TABLE OF CONTENTS

	<b>PAGE</b>
<b>1.0 INTRODUCTION AND PROJECT OVERVIEW</b> .....	<b>1-1</b>
<b>2.0 FUTURE CLIMATE PROJECTIONS</b> .....	<b>2-1</b>
<b>3.0 CLOSING</b> .....	<b>3-1</b>
<b>4.0 REFERENCES</b> .....	<b>4-1</b>

## LIST OF TABLES

Table 2-1: Future Climate Projections Across Emissions Scenarios and Future Periods.....	2-1
Table 2-2: Change in Future Climate Projections Across Emissions Scenarios.....	2-3

## **1.0 INTRODUCTION AND PROJECT OVERVIEW**

First Mining Gold Corp. (FMG) proposes to develop, operate and eventually decommission / close an open pit gold and silver mine and ore process plant with supporting facilities known as the Springpole Gold Project (Project). The Project is located in a remote area of northwestern Ontario, approximately 110 kilometres (km) northeast of the Municipality of Red Lake and 145 km north of the Municipality of Sioux Lookout (Figure 1-1).

An environmental assessment (EA) pursuant to the Canadian Environmental Assessment Act, 2012 (SC 2012, c. 19, s. 52) and the Ontario Environmental Assessment Act (RSO 1990, c. E.18) is required to be completed for the Project. This report is one of a series of Technical Support Documents prepared by WSP Canada Inc. (WSP) on behalf of FMG to describe the predicted environmental effects of the Project.

During the consultation process, Project-specific input from regulatory agencies and Indigenous communities was considered at key milestones of the EA process including baseline studies, alternatives, assessment approach, mitigation and monitoring where appropriate. An overview of the consultation input that was considered during the assessment in relation to this assessment will be summarized in the Environmental Impact Statement / Environmental Assessment (EIS/EA). The updated greenhouse gas assessment since the preparation of the draft EIS/EA.

## 2.0 FUTURE CLIMATE PROJECTIONS

The AR6 (IPCC 2021) represents the most current complete synthesis of information regarding climate change. The future climate projections come from publicly available statistically downscaled future climate projections based on AR6 (IPCC 2021), on a daily scale. Future climate projections can be developed for five climate scenarios called Shared Socioeconomic Pathways (SSPs) in AR6. These represent scenarios from a worst-case scenario (with the absence of climate policies and with energy demand met with carbon-based fuels; SSP5-8.5), to a scenario based on sustainable development proceeding at a reasonably high pace (SSP1-2.6).

Within Canada, the Canadian Centre for Climate Services provides a single portal for accessing data regarding projections of future climate. Most of the data available through the centre are generated by global climate models and represent projections with a resolution of tens to hundreds of square kilometres. While data at that resolution can be illustrative, it is often necessary to develop projections at a finer resolution, using techniques collectively referred to as downscaling. Downscaled climate projections for the Springpole Lake (Kenora) from ClimateData.ca (2023) were used in this assessment. Further details about these data are provided in Appendix I-3.

Climate projections are presented as changes from the 1971 to 2000 baseline period and are provided for mid-century (2041 to 2070) and end-of-century (2071 to 2100) time horizons. For each of these time horizons, climate projections were developed for SSP1-2.6, SSP2-4.5, SSP5-8.5. Table 2-1 provides current climate and climate projections. Table 2-2 provides the change in climate projections for each climate hazard, relative to the current climate.

Downscaled climate projections from climatedata.ca (2023) were used in this assessment for mean temperature, extreme heat, extended cold spells, freeze-thaw cycles, mean precipitation, heavy rainfall events, and snowfall. Data for overland flooding for the area around Spingpole Lake was extracted from floodmapviewer.com (Simonovic, Mohanti, & Schardong 2023), while future trends for storms and wildfires are based on a literature review. References for this literature review are presented in Table 2-1 and Table 2-2. Quantitative changes for overland flooding and wildfire as the information available at this time.

Mean temperature, mean precipitation, extreme heat, heavy rainfall, and overland flooding show an increasing trend over the mid- and end-of-century for each SSP scenario. Extended cold spells, freeze-thaw cycles, snowfall show a decreasing trend over the same time horizons for each SSP scenario.

**Table 2-1: Future Climate Projections Across Emissions Scenarios and Future Periods**

Climate Hazard	Climate Indicator	Baseline			Mid-Century (2050s)			End-of-Century (2080s)		
		SSP1-2.6	SSP2-4.5	SSP5-8.5	SSP1-2.6	SSP2-4.5	SSP5-8.5	SSP1-2.6	SSP2-4.5	SSP5-8.5
Mean Temperature	Annual Mean Temperature (°C)	1.15	1.14	1.14	3.16	3.62	4.64	3.27	4.70	7.51
Extreme Heat	Annual Maximum Temperature (°C)	6.28	6.27	6.29	8.31	8.63	9.63	8.29	9.59	12.18
	Days with Maximum Temperature > 30°C	3.75	3.67	3.77	12.52	14.92	23.77	12.37	22.00	46.37
Extended Cold Spells	Days with Minimum Temperature < -15°C	90.40	90.87	90.57	76.77	72.42	65.90	75.95	65.73	43.15
Freeze-Thaw Cycles	Annual number of freeze-thaw cycles	57.63	57.48	57.38	54.23	52.32	50.52	53.97	51.22	46.58
Mean Precipitation	Annual Total Precipitation (millimetres; mm)	653.30	653.25	652.54	675.26	688.56	684.18	692.08	695.33	721.32
Heavy Rainfall Events	Maximum 1-Day Precipitation Amounts (mm)	26.60	26.50	26.43	27.97	28.48	29.08	28.66	28.78	30.25
	Maximum 5-Day Precipitation Amounts (mm)	51.16	50.95	50.82	53.31	54.41	54.15	54.53	54.92	57.92
	Temperature Scaling Rate	—	—	—	—	—	—	—	—	—

**Table 2-1: Future Climate Projections Across Emissions Scenarios and Future Periods**

Climate Hazard	Climate Indicator	Baseline			Mid-Century (2050s)			End-of-Century (2080s)		
		SSP1-2.6	SSP2-4.5	SSP5-8.5	SSP1-2.6	SSP2-4.5	SSP5-8.5	SSP1-2.6	SSP2-4.5	SSP5-8.5
Changes in Snowfall	Annual total snowfall (mm)	182.50	182.84	183.59	177.35	178.94	174.60	177.77	178.04	162.92
Extreme Weather Events	Storms (i.e., high wind, lightning, ice, hail)*	Ontario experiences approximately 12 tornadoes per year, typically between May and September (Government of Ontario 2023a). For the Springpole region, the near surface wind speed was estimated to be 3.2 metres per second for the 1991-2020 period (Government of Canada 2023b)			—	—	—	—	—	—
	Overland Flooding	—	Some flooding was seen near Springpole Lake in the current climate.		—	Overland floodwater depths increased near Springpole Lake in the 2050s, with larger depths seen for the SSP5-8.5 scenario.		—	Overland floodwater depths increased near Springpole Lake in the 2080s, with larger depths seen for the SSP5-8.5 scenario.	
	Wildfires*	—	—	—	—	—	—	—	—	—

**Note:**

“—” denotes where specific projection data is not available, however future trends are available and provided in Table 2-2.

**Table 2-2: Change in Future Climate Projections Across Emissions Scenarios**

Climate Hazard	Climate Indicator	Mid-Century (2041-2070)			End-of-Century (2071-2100)		
		SSP1-2.6	SSP2-4.5	SSP5-8.5	SSP1-2.6	SSP2-4.5	SSP5-8.5
Mean Temperature	Annual Mean Temperature (°C)	2.01	2.49	3.50	2.12	3.56	6.37
Extreme Heat	Annual Maximum Temperature (°C)	2.04	2.36	3.34	2.01	3.32	5.89
	Days with Maximum Temperature > 30°C	8.77	11.25	20.00	8.62	18.33	42.60
Extended Cold Spells	Days with Minimum Temperature < -15°C	-13.63	-18.45	-24.67	-14.45	-25.13	-47.42
Freeze-Thaw Cycles	Annual number of freeze-thaw cycles	-3.40	-5.17	-6.87	-3.67	-6.27	-10.80
Mean Precipitation	Annual Total Precipitation (mm)	21.97	35.31	31.64	38.78	42.08	68.78
Heavy Rainfall Events	Maximum 1-Day Precipitation Amounts (mm)	1.38	1.98	2.65	2.06	2.28	3.82
	Maximum 5-Day Precipitation Amounts (mm)	2.15	3.46	3.33	3.36	3.97	7.11
	Temperature Scaling Rate	14.70%	18.44%	26.96%	15.66%	27.61%	54.88%
Changes in Snowfall	Annual total snowfall (mm)	-5.14	-3.90	-8.99	-4.73	-4.80	-20.67
Extreme Weather Events (qualitative)	Storms (i.e., high wind, lightning, ice, hail)	No data available	Decrease in near-surface wind speeds ranging from -0.2% to -2.6% across the near-century, mid-century, and end-of-century (Government of Canada 2023b)	Decrease in near-surface wind speeds ranging from -0.5% to -1.9% across the near-century, mid-century, and end-of-century (Government of Canada 2023b)	No data available	Decrease in near-surface wind speeds ranging from -0.2% to -2.6% across the near-century, mid-century, and end-of-century (Government of Canada 2023b)	Decrease in near-surface wind speeds ranging from -0.5% to -1.9% across the near-century, mid-century, and end-of-century (Government of Canada 2023b)

**Table 2-2: Change in Future Climate Projections Across Emissions Scenarios**

Climate Hazard	Climate Indicator	Mid-Century (2041-2070)			End-of-Century (2071-2100)		
		SSP1-2.6	SSP2-4.5	SSP5-8.5	SSP1-2.6	SSP2-4.5	SSP5-8.5
	Overland Flooding	No data available	Overland floodwater depths increased near Springpole Lake in the 2050s, with larger depths seen for the SSP5-8.5 scenario.		No data available	Overland floodwater depths increased near Springpole Lake in the 2080s, with larger depths seen for the SSP5-8.5 scenario.	
	Wildfires	An increase in the frequency and intensity of high temperatures has led to an increase in conditions that increases the risk of extreme wildfire conditions (Bush, E. and Lemmen, D.S. 2019). In Ontario, observed changes in temperature, precipitation, drought, and fuel loads has caused conditions that promote wildfires (Douglas, A.G. and Pearson, D. 2022).					

**Note:**

“—” denotes where specific projection data is not available.

### **3.0 CLOSING**

This Climate Change Risk Assessment Report was prepared for FMG by WSP. The quality of information, conclusions and scheduling estimates contained here is consistent with the level of effort involved in WSP's services and based on: 1) information available at the time of preparation; 2) data supplied by outside sources; and 3) the assumptions, conditions and qualifications set forth in this report.

Yours truly,

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