APPENDIX 5B

Greenhouse Gas Assessment

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Baffin Island, Nunavut

Revised Final Report

Climate Change Assessment

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SUBMITTED TO

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TABLE OF CONTENTS

Tables

Figures

Appendices

1. CLIMATE

1.1 Introduction

RWDI AIR Inc. (RWDI) was retained by Knight Piésold Ltd. to conduct an assessment of the potential change in climate due to anthropogenic greenhouse gases for consideration in the design and operation of the Baffinland Iron Mines Corporation (Baffinland). Facilities, including transportation corridors, should be designed to withstand the current and changing climate. An understanding of weather and climate is also important in assessing the effects of the project on ambient air quality and other environmental indicators in the project area.

The purpose of this report is to provide a preliminary understanding of the potential change in climate through the review of long-term climate data from Environment Canada coupled with future climate predictions from Global Climate Models (GCM).

1.2 Methods

Global Climate Models are used to simulate potential changes in climate due to future greenhouse gas emissions, land-use changes and other driving forces. The Intergovernmental Panel on Climate Change (IPCC) has assimilated numerous emission scenarios to study the range of possible outcomes of climate on our planet. Based on the availability of model results from the most recent IPCC study (2007), scenarios A2 and B1 from the Special Report on Emissions Scenarios (SRES) were assessed. These two scenarios combined cover a wide range of potential future emissions scenarios as A2 falls above the middle of the SRES range of future emissions, and B1 falls below the middle of the range. Briefly, scenario A2 describes a more divided world characterized by high population growth and slow technological change, and scenario B1 describes an integrated and ecological friendly world characterized by low population growth and medium technological change focusing on efficiency and dematerialization. Climate predictions from these two scenarios provide a sufficient range of various possible changes in weather trends that could result from future human activity.

As with any model, GCMs are imperfect at reproducing a natural system, especially when considering the uncertainty of future emissions input into the model. Although absolute climate values from GCMs are typically not very accurate when compared to observed data, the changes in climate predicted from GCMs from a baseline period to a future period are very useful. In this assessment, GCM predicted changes in climate were applied to the observed baseline data to develop an estimate of future climate conditions. Three future time periods were considered; 2011 to 2040, 2041 to 2070, and 2071 to 2100.

1.3 Historical Climate Data

Representative baseline climate parameters specific to the Mary River Project Site (Project Site) are shown in Table 1. The climate variables presented include mean temperature, mean daily maximum/minimum temperature, precipitation, mean wind speed, average snow depth, and incident solar radiation. The Baffinland Iron Mines Corporation Updated Baseline Meteorological Assessment (Baffinland UBMA) (RWDI, 2010) prepared by RWDI includes a detailed discussion of historical climate conditions at the Project Site.

In a climate change assessment, it is ideal to determine trends over a long-term period (i.e. 30 years or more). The Baffinland meteorological stations do not contain sufficient data to determine long-term trends, therefore, climate normals from Environment Canada (EC) were used in this assessment. Data comparisons between Environment Canada (EC) stations and the Baffinland stations were made to determine the most representative EC station for each climate variable. Climate normals from 1971 to 2000 (where available) from the representative EC stations were used to develop a climate baseline, with the exception of wind speed. Since wind speed is strongly affected by local influences, and since there is typically very little variability in the average wind speeds on a year-to year basis, the short-term data sets from the Baffinland stations were used as these data are expected to be fairly representative of average long-term conditions (or at least more representative than any of the EC data sets). The mean wind speeds presented in Table 1 are taken from the Mary River Site Station from June 2005 to July 2010.

1.4 Global Climate Models

Global Climate Models were used to simulate baseline climate conditions as well as to provide an estimate of the future predicted change in climate variables. Comparison of GCM predicted baseline conditions to actual climate normals provides an estimate of accuracy of GCM behavior and its ability to simulate complex climate variables. If the GCM is successful in its replication of past weather trends, then a level of confidence is established when developing a future climate scenario based on GCM predicted changes, barring any uncertainties associated with future greenhouse gas emissions.

GCM results based on the most recent IPCC study (2007) were available from several different sources. Based on the availability of climate data, two main sources were selected: the EC Canadian Climate Change Scenarios Network (CCCSN) website (http://www.cccsn.ca), and the Pacific Climate Impacts Consortium (PCIC) website (http://pacificclimate.org). The CCCSN website provided temperature, precipitation and wind speed data, and the PCIC website provided snow depth, and incident solar radiation data. Five different time periods were assessed including two baseline periods, 1961 – 1990 and 1971 – 2000, and three future periods: 2011 – 2040 (2020s), 2041 - 2070 (2050s), and 2071 – 2100 (2080s). Where available, the more recent baseline data (1971 – 2000) was used in place of the 1961 – 1990 baseline period.

Climate data were extracted from a region covering approximately 400,000 square kilometers over the northern half of Baffin Island. The area was selected to maximize the land area and minimize the grid cells that are over the sea.

Five different GCMs were used: CGCM3T47, ECHAM50M, GFDLCM2.0, HADCM3, and NCARCCSM. Climate variables extracted from the GCMs include mean temperature, mean daily maximum/minimum temperature (where available), precipitation, mean wind speed, average snow depth (where available), and incident solar radiation. All GCM results are reported as seasonal and annual averages.

1.5 Results

1.5.1 Climate Baselines

Table 1 provides a summary of current climate conditions based on GCM results and historical climate observations from both on-site and EC weather stations. The historical climate observations were compared to the GCM predicted baseline to validate the model. The GCMs compared reasonably well with the historical climate observations. The GCM predicted precipitation and average snow depth values were within the observed ranges for the region. Annual average temperature, mean wind speed, and solar radiation were typically under-predicted by the GCMs by an average of 2.3^{o}C, 1.9 m/s, and 18 W/m^2, respectively. Since this report considers the difference between the GCM predicted baseline and the future periods and not the absolute values predicted from the GCMs, this underestimation is of little consequence.

1.5.2 GCM Future Climate Predictions

Appendix A contains detailed summaries of the GCM predicted change in climate along with predicted future seasonal and annual climate averages for the 2020s, 2050s, and 2080s, respectively. The predicted future climate data in these tables were calculated by adding the GCM predicted change to the historical climate observation data. Table 2 presents a summary of the predicted future climate, providing a range of values based on all models and both SRES scenarios.

Figures 1 through 5 provide a visual representation of the predicted change in annual mean temperature, annual daily precipitation, annual mean wind speed, annual average snow depth, and annual average solar radiation, respectively. Upper and lower ranges of predictions are presented, representing the five GCM models (CGCM3T47, ECHAM50M, GFDLCM2.0, HADCM3, and NCARCCSM) as well as the two emission scenarios (A2 and B1).

1.5.3 Long-term Temperature Trends

A discussion of temperature trends is included in the Baffinland UBMA and is summarized here. A temperature trend line is plotted for Pond Inlet in Figure 3 in the Baffinland UBMA. The trend line indicates that the annual mean temperatures have increased by about 0.07°C per year at Pond Inlet from 1975 on. As shown in Figure 1, the GCM models predict that annual mean temperature will increase between a rate of approximately 0.03°C (lower range) and 0.08°C (upper range) over the next century. The average predicted increase of 0.055°C is relatively close to that observed at Pond Inlet, thus providing a level of confidence in the GCM results.

1.5.4 Long-term Precipitation Trends

Long-term precipitation trends, based on historical data, are discussed and shown in Figure 6 of the Baffinland UBMA. Historically, annual precipitation has increased slightly, by an average of 0.24 mm every year (refer to Figure 6 of the Baffinland UBMA). Figure 2 shows the trends in average daily precipitation, indicating that over 100 years, the average daily precipitation will increase by approximately 0.05 mm (low range) to 0.35 mm (high range). These values equate to a future increase in annual precipitation of 0.18 mm (low range) to 0.35 mm (high range) per year. Given that these increases are in agreement with the historical trend of 0.24 mm/year, a level of confidence is provided in the GCM predicted precipitation trends.

1.5.5 Long-term Wind Speed Trends

Wind Speed is highly dependent on many factors including topography, pressure gradients, local weather conditions, etc. The GCM predicted change in annual mean wind speed is shown in Figure 3. The figure shows inconsistencies between the predicted trends; the upper range of predictions indicates that wind speed will increase while the lower range indicates that wind speed will decrease over the next century. However, overall wind speed is predicted to change only slightly.

As wind speed is dependent on numerous factors, the GCMs ability to accurately predict changes in wind speed for future periods is questionable.

1.5.5 Long-term Snow Depth Trends

As shown in Figure 4, annual average snow depth is predicted to remain fairly constant over the next century.

1.5.6 Long-term Solar Radiation Trends

As shown in Figure 5, annual average solar radiation is predicted to decrease over the next century by approximately 3 W/m^2 (low range) to 16 W/m^2 (high range) on an annual average. Confidence in these results is achieved through studying the relationship between precipitation and solar radiation. As precipitation increases, cloud cover also increases, leading to a decrease in solar radiation. As shown in Figures 2 and 5, the increase in precipitation seems to coincide with the decrease in solar radiation.

1.5.7 Discussion of Uncertainty

Forecasts of climate change are inevitably imprecise due to uncertain input data and the inability of climate models to span the full range of known climate system behavior. The major uncertainty in the current climate models surrounds the assumption that the future climate system will behave in the same way that it currently does, an assumption inherent in all GCMs. Climate models are however our best available tools for predicting future climate trends as well as future climate changes through comparative simulations. Also, confidence in GCM predictions for individual climate variables can be achieved through the validation of past climate trends.

1.6 Extreme Events Analysis

Extreme weather event analysis is of particular interest in climate change assessments, however, these events, and the change in frequency of these events, are typically the most difficult to predict. A statistical method has been used to predict the change in frequency of future extreme events. This method relies on historical data to forecast trends into the future. As with any forecast, the further out the prediction, the more uncertain the result. The extreme temperature analysis is described below.

1.6.1 Extreme Temperature Analysis

The design of load bearing structures such as footings is based on freeze-thaw indices. In calculating the freeze-thaw indices, it is important to have an understanding of extreme temperature events, including return periods. A return period is the frequency with which you would expect, on average, a given maximum or minimum temperature to occur. For example, a maximum temperature of 16°C with a 2-year return period means that at that location, a 16°C temperature event can be expected to occur once every two years. Kharin et al. (2007)[1] provide an extensive analysis of temperature extremes for the IPCC AR4 SRES scenarios B1, A1B, and A2. The reference period is 1981-2000, and future scenarios were run for 2046-2065 and 2081-2100. The authors provide global maps, regional averages, and zonal averages (by latitude) of 20-year return periods. While longer return periods are desirable for many engineering applications, Kharin et al. (2007) point out that longer return periods would be associated with very large uncertainties because of the short 20-year model periods and the non-stationarity of the time series (quickly increasing temperatures over a few decades).

Table 3 shows predicted future changes of the 20-year return extreme minimum and maximum temperatures for the 2046-2065 and 2086-2100 periods. Shown are 50% inter-model ranges for the zonal averages at 70°N for the SRES A1B scenario. The ranges agree with other values that are available in Kharin et al. (2007) from contours of global maps over northern Baffin Island and regional averages for the Arctic. For the period 2046-2065, temperature predictions for A1B and A2 are very similar, because until mid-century, the higher sulfate aerosol emissions of the A2 scenario offset the additional warming from higher GHG emissions than the A1B scenario. Kharin et al. (2007) only provide the median of the

[1] Kharin, V.V., F.W. Zwiers, X. Zhang, and G.C. Hegerl, 2007: Changes in temperature and precipitation extremes in the IPCC ensemble of global coupled model simulations. J. Clim., **20**, 1419-1444.

A2 scenario, which is roughly equal to the upper limit of the A1B 50% inter-model range in 2086-2100. For the A1B scenario, the 20-year return maximum temperature in the project region is predicted to increase by about 1 to 3°C (global average 1.7°C) by 2046-2065 and by 2 to 4°C by 2086-2100. The minimum temperature is predicted to increase by about 4 to 6°C (global average 2.3°C) and 6 to 10°C, respectively.

The 20-year return maximum temperature of the 1981-2000 reference period over northern Baffin Island is predicted to occur roughly every 3 to 10 years during the period 2046-2065. This is substantially longer than the global average of 1.5 years. The 20-year return minimum temperature of the reference period 1981-2000 is predicted to occur basically never in northern Baffin Island and in global average after the mid-21st century.

It must be kept in mind that northern Baffin Island is located in a region of large modelling uncertainties. It is possible that estimates of extreme temperatures will change in future model runs with improvements in the sea-ice representation and the availability of longer observational time series for model calibration. For example, observations over the last one to two decades have shown quickly decreasing summer sea-ice over much of the Arctic, but not near Baffin Island. Over that period, the prevalent wind patterns have been driving sea-ice away from the East Siberian Sea and Chukchi Sea into the Canadian Archipelago. A change of wind patterns in association with continued warming in the Arctic could potentially expose sea water much longer and the positive albedo and moisture feedback lead to much stronger regional warming in northern Baffin Island than predicted by the IPCC AR4 model runs.

1.7 Conclusion

In summary, the GCMs predicted an increase in temperature and precipitation, no significant change in wind speed or snow depth, and a decrease in solar radiation. The frequency of extreme temperature events was also predicted to increase.

In general, GCM predictions replicated historical temperature trends fairly well, as well as historical precipitation trends. Beyond these two weather variables, the confidence in future predictions tend to decrease. As well, there is greater certainty in climate predictions for the 2025 period than for the climate predictions forecasted out 100 years.

TABLES

TABLE 1: Climate Baselines: 1971 - 2000 (unless otherwise noted)

Baseline	Global Climate Model	Season	Temperature: Mean Temperature (^oC)	Temperature: Mean Daily Maximum Temperature (^oC)	Temperature: Mean Daily Minimum Temperature (^oC)	Precipitation: Precipitation (mm/d)	Wind Speed: Mean Wind Speed (m/s)	Snow Depth: Average Snow Depth (m) [2]	Solar Radiation: Incident Solar Radiation (W/m^2) [2]
ENVIRONMENT CANADA CLIMATE NORMALS	**See Note [1]**	Winter (DJF)	-31.7	-28.1	-35.3	0.2 - 0.4	2.9	0.2 - 0.5	7
		Spring (MAM)	-20.8	-16.6	-24.8	0.3 - 0.6	3.3	0.2 - 0.6	162
		Summer (JJA)	6.4	9.6	3.1	0.9 - 1.1	4.2	0.0 - 0.1	215
		Fall (SON)	-11.7	-8.4	-14.9	0.7 - 1.0	3.7	0.1 - 0.3	39
		Annual	**-15.1**	**-11.5**	**-18.6**	**0.8 - 0.8**	**3.5**	**0.1 - 0.3**	**106**
GCM PREDICTED	**CGCM3T47**	Winter (DJF)	-36.7	-34.2	-39.3	0.3	1.8	0.3	2
		Spring (MAM)	-22.5	-17.9	-26.8	0.4	1.9	0.4	132
		Summer (JJA)	1.4	4.4	-1.6	0.9	1.7	0.1	177
		Fall (SON)	-13.0	-10.7	-15.4	0.8	1.9	0.2	20
		Annual	**-17.7**	**-14.6**	**-20.8**	**0.6**	**1.8**	**0.3**	**83**
	ECHAM5OM	Winter (DJF)	-28.8	N/A	N/A	0.5	1.5	N/A	4
		Spring (MAM)	-18.1	N/A	N/A	0.6	1.4	N/A	128
		Summer (JJA)	2.2	N/A	N/A	1.3	1.1	N/A	137
		Fall (SON)	-12.9	N/A	N/A	1.0	1.4	N/A	26
		Annual	**-14.4**	**N/A**	**N/A**	**0.8**	**1.4**	**N/A**	**74**
	GFDLCM2.0	Winter (DJF)	-34.9	N/A	N/A	0.3	1.3	N/A	5
		Spring (MAM)	-21.7	N/A	N/A	0.6	1.1	N/A	171
		Summer (JJA)	1.8	N/A	N/A	1.3	1.0	N/A	180
		Fall (SON)	-15.5	N/A	N/A	1.0	1.2	N/A	31
		Annual	**-17.6**	**N/A**	**N/A**	**0.8**	**1.1**	**N/A**	**98**
	HADCM3	Winter (DJF)	-37.2	N/A	N/A	0.4	2.4	N/A	5
		Spring (MAM)	-23.3	N/A	N/A	0.4	1.8	N/A	178
		Summer (JJA)	2.9	N/A	N/A	1.2	1.3	N/A	189
		Fall (SON)	-16.8	N/A	N/A	0.8	2.3	N/A	36
		Annual	**-18.6**	**N/A**	**N/A**	**0.7**	**2.0**	**N/A**	**102**
	NCARCCSM	Winter (DJF)	-33.1	N/A	N/A	0.4	N/A	N/A	4
		Spring (MAM)	-17.0	N/A	N/A	0.7	N/A	N/A	142
		Summer (JJA)	-0.1	N/A	N/A	1.1	N/A	N/A	149
		Fall (SON)	-13.7	N/A	N/A	1.1	N/A	N/A	26
		Annual	**-16.0**	**N/A**	**N/A**	**0.8**	**N/A**	**N/A**	**81**

Note:

[1] Mean, Maximum, and Minimum Temperature data based on Environment Canada Meterological Station Pond Inlet measurements from 1971 - 2000.
Precipitation ranges are from three Environment Canada Meterological Stations: Pond Inlet, Igloolik and Nanasivik.
Mean Wind Speed measurements taken from the Mary River site from June 2005 to July 2010.
Mean, mean daily maximum, and mean daily minimum summer temperatures at Pond Inlet from 1971 - 2000 were 4.0^oC, 7.2^oC, and 0.7^oC, respectively.
A 2.4^oC temperature correction has been applied to account for the warmer temperatures observed at the project site during the summer months.

[2] GCM predicted baseline values are from the period 1961 - 1990.
Snow Depth ranges are from four Environment Canada Meterological Stations: Pond Inlet, Hall Beach, Clyde River, and Dewar Lakes.
Historical solar radiation data were averaged from global solar radiation measurements taken in Hall Beach from August 1970 to May 1998.

TABLE 2: Summary of Climate Forecasts

		Temperature			Precipitation	Wind	Snow Depth	Solar Radiation
	Season	Forecast Mean (°C)	Forecast Mean Daily Maximum (°C)	Forecast Mean Daily Minimum (°C)	Forecast Precipitation (mm/d)	Forecast Mean Wind Speed (m/s)	Forecast Average Snow Depth (m)	Forecast Solar Radiation (W/m^2)
2011 to 2040	Winter (DJF)	-31.9 - -27.5	-26.6 - -26.5	-33.9 - -33.6	0.2 - 0.9	2.8 - 3.1	0.2 - 0.5	7 - 7
	Spring (MAM)	-19.7 - -18.6	-15.4 - -15.3	-23.5 - -23.1	0.3 - 1.3	3.2 - 3.3	0.2 - 0.6	157 - 161
	Summer (JJA)	7.0 - 7.8	10.2 - 10.2	3.7 - 3.7	0.4 - 1.2	4.1 - 4.3	0.0 - 0.1	199 - 222
	Fall (SON)	-10.0 - -8.1	-6.5 - -6.3	-12.9 - -12.6	0.3 - 1.2	3.6 - 3.7	0.1 - 0.3	35 - 38
	Annual	**-14.1 - -12.3**	**-10.1 - -10.1**	**-17.1 - -17.1**	**0.8 - 0.9**	**3.4 - 3.5**	**0.1 - 0.3**	**100 - 106**
2041 to 2070	Winter (DJF)	-29.6 - -23.6	-24.7 - -22.9	-32.0 - -30.1	0.2 - 1.1	2.8 - 3.0	0.2 - 0.5	7 - 7
	Spring (MAM)	-18.7 - -17.0	-14.7 - -13.9	-22.6 - -21.3	0.3 - 0.8	3.1 - 3.4	0.2 - 0.6	153 - 159
	Summer (JJA)	7.1 - 8.6	10.3 - 11.2	3.9 - 4.7	0.4 - 1.4	4.1 - 4.3	0.0 - 0.1	189 - 218
	Fall (SON)	-9.0 - -5.7	-5.8 - -4.3	-12.1 - -10.1	0.6 - 1.4	3.6 - 3.8	0.1 - 0.3	32 - 37
	Annual	**-12.8 - -10.2**	**-9.3 - -8.0**	**-16.3 - -14.8**	**0.8 - 1.0**	**3.4 - 3.5**	**0.1 - 0.3**	**95 - 104**
2071 to 2100	Winter (DJF)	-27.3 - -18.2	-23.7 - -19.4	-30.9 - -26.6	0.2 - 0.7	2.8 - 3.1	0.2 - 0.5	7 - 7
	Spring (MAM)	-18.4 - -14.7	-14.5 - -12.5	-22.2 - -19.5	0.3 - 1.2	3.1 - 3.3	0.2 - 0.6	142 - 159
	Summer (JJA)	7.7 - 10.0	10.8 - 12.1	4.4 - 5.6	0.9 - 1.6	4.0 - 4.3	0.0 - 0.1	175 - 215
	Fall (SON)	-7.5 - -1.8	-4.6 - -1.9	-10.5 - -7.4	0.6 - 1.5	3.5 - 3.8	0.1 - 0.3	28 - 37
	Annual	**-12.0 - -6.9**	**-8.6 - -6.0**	**-15.4 - -12.6**	**0.9 - 1.2**	**3.4 - 3.5**	**0.1 - 0.3**	**89 - 102**

Notes: [1] Forecast Values = Historical Climate Measurements + Global Climate Model Predicted Changes.

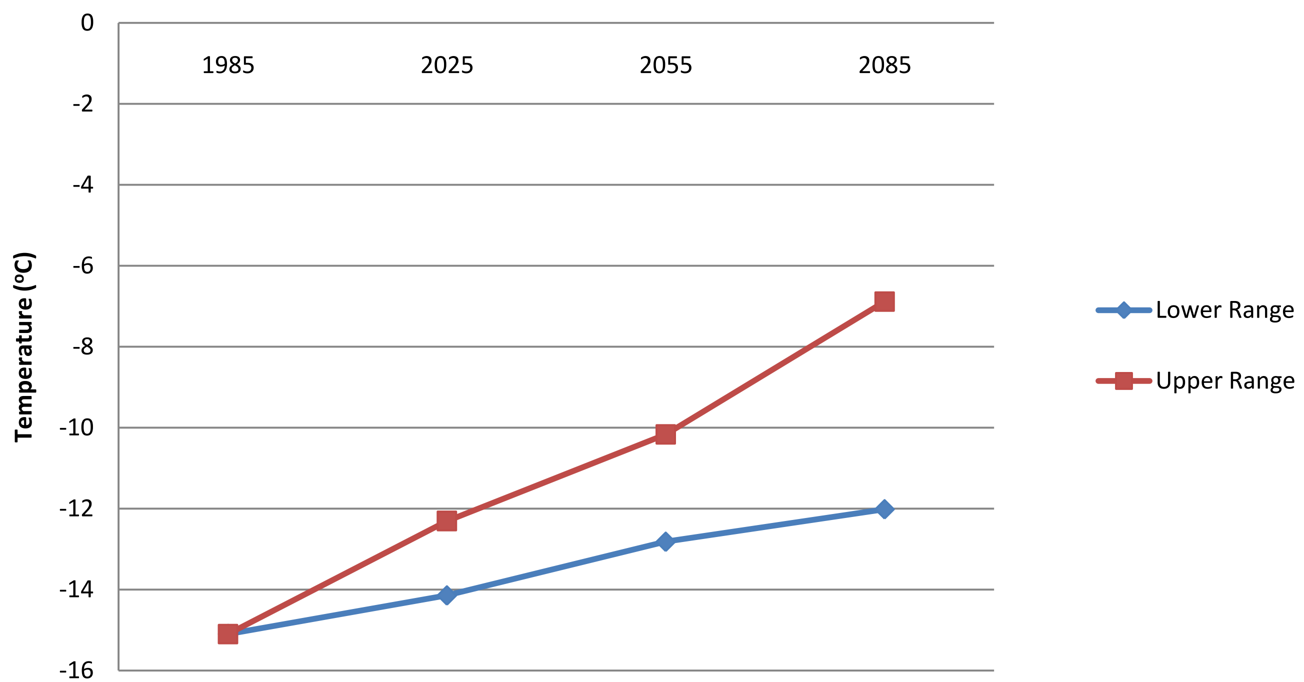
Table 3: 20-Year Return Extreme Minimum and Maximum Temperatures (in °C) Calculated from 1976-2006 Observations and Predicted Changes (in °C) for SRES A1B Emissions Scenario Relative to 1981-2000

Period	Minimum Temperature	Maximum Temperature
	Observed[1]	
1976-2006	-50.8	21.4
	Predicted Change[2]	
2046-2065	+4 to +6	+1 to +3
2081-2100	+6 to +10	+2 to +4

Notes:
[1]Values for Pond Inlet station based on a minimum least-squares best fit of a Fisher-Tippet type I distribution to annual minimum and maximum temperatures based on hourly observations.
[2]Values from figures in Kharin et al. (2007): based on 50% inter-model range of 70°N zonal averages in Figure 11 in agreement with contours over northern Baffin Island in Figure 9 (top) and the Arctic regional average in Figure 12 (top).

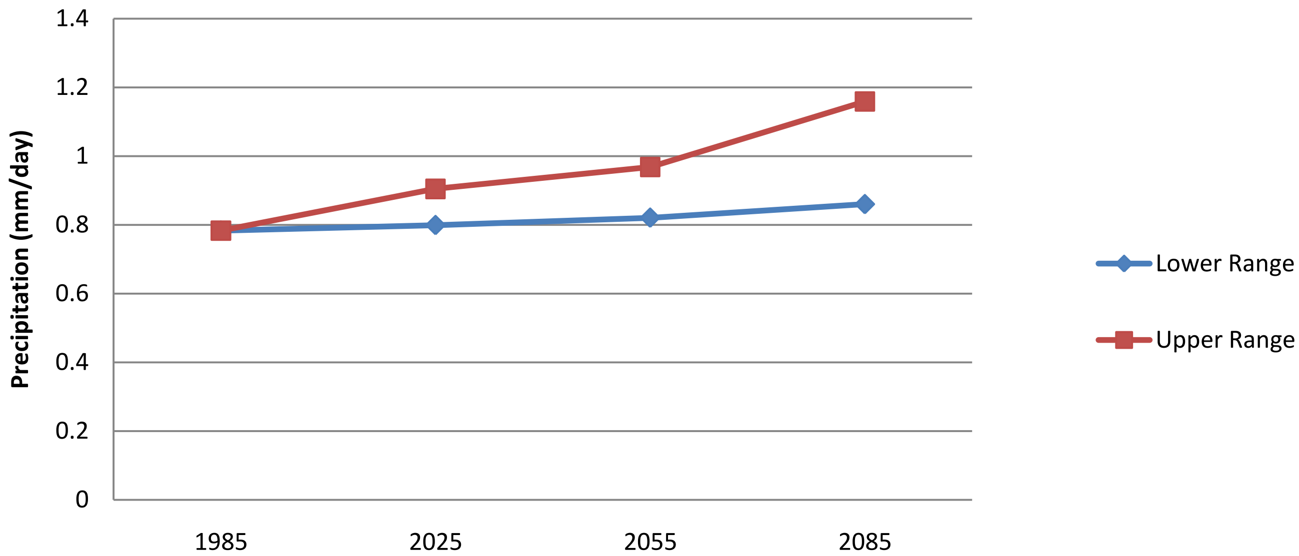
FIGURES

Predicted Annual Mean Daily Temperature

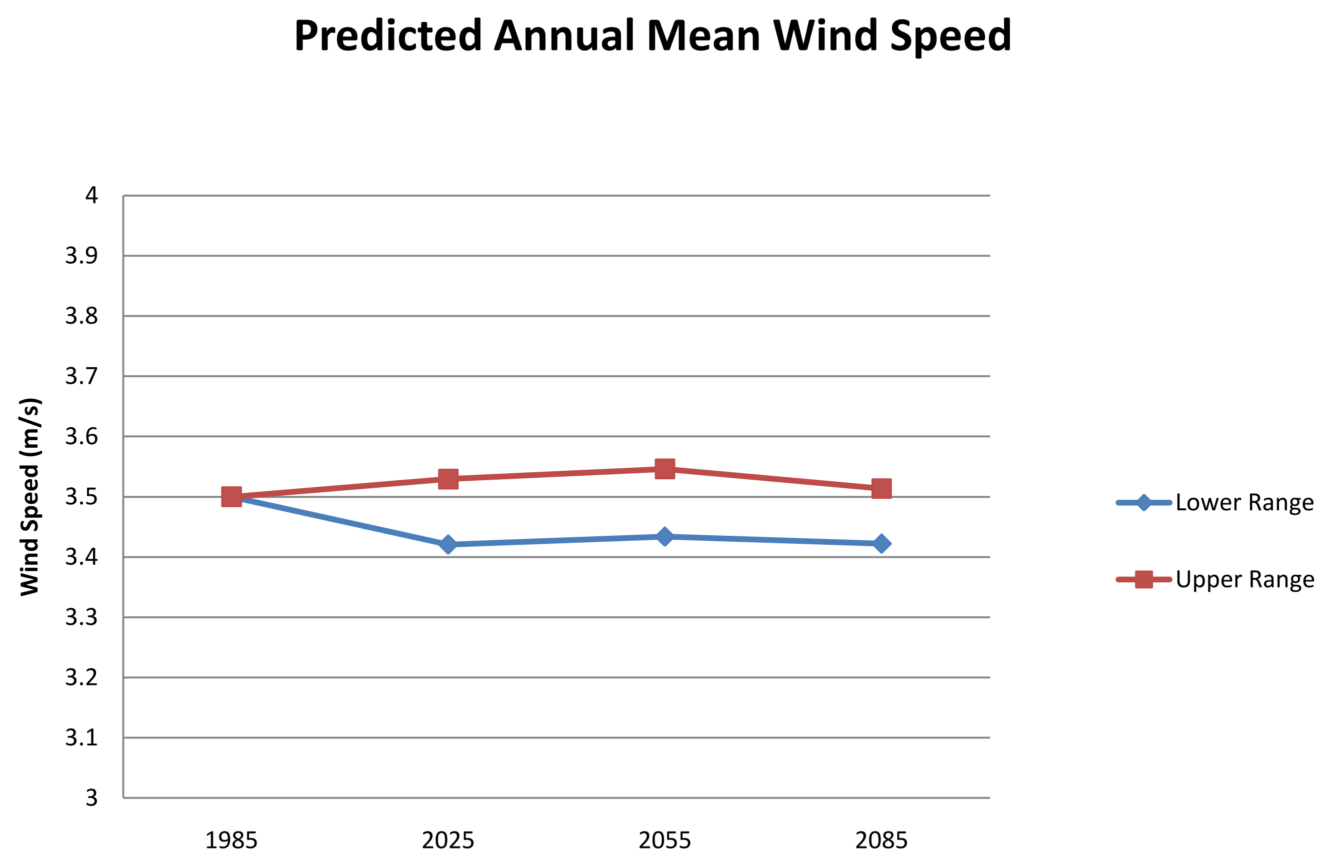


Predicted Annual Mean Daily Temperature		Figure No: 1	RWDI
Baffinland Iron Mines Corporation – North Baffin Island, Canada	Project # 0940977	Date: Nov 29, 2010	

Predicted Annual Mean Daily Precipitation

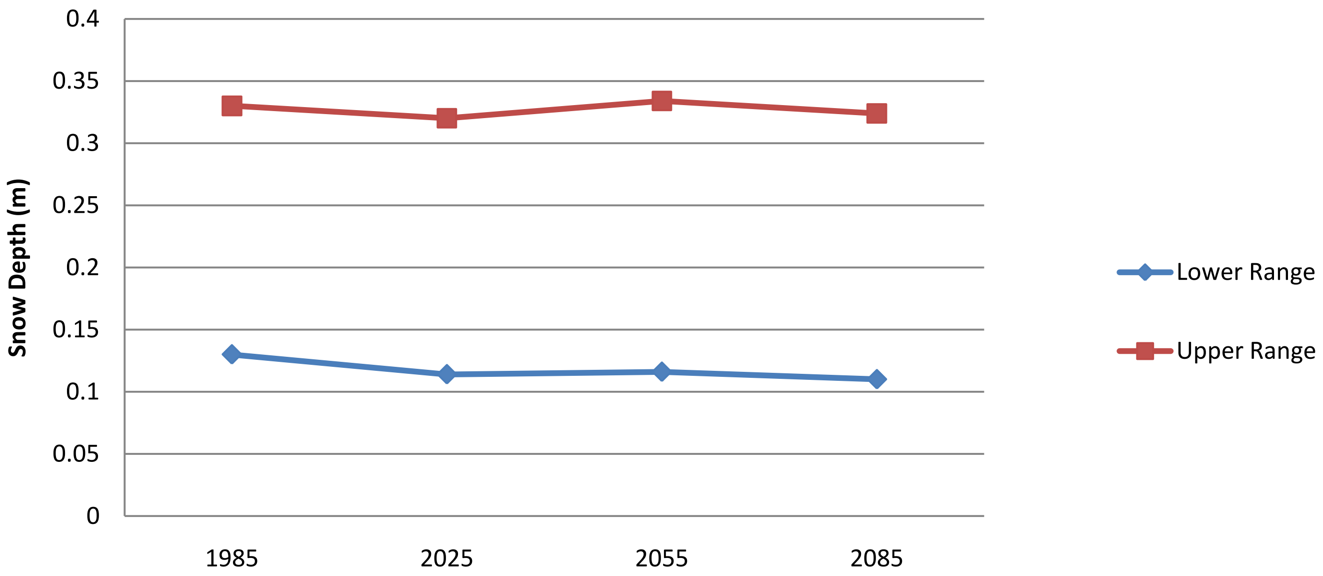


Predicted Annual Mean Daily Precipitation		Figure No: 2	RWDI
Baffinland Iron Mines Corporation – North Baffin Island, Canada	Project # 0940977	Date: Nov 29, 2010	



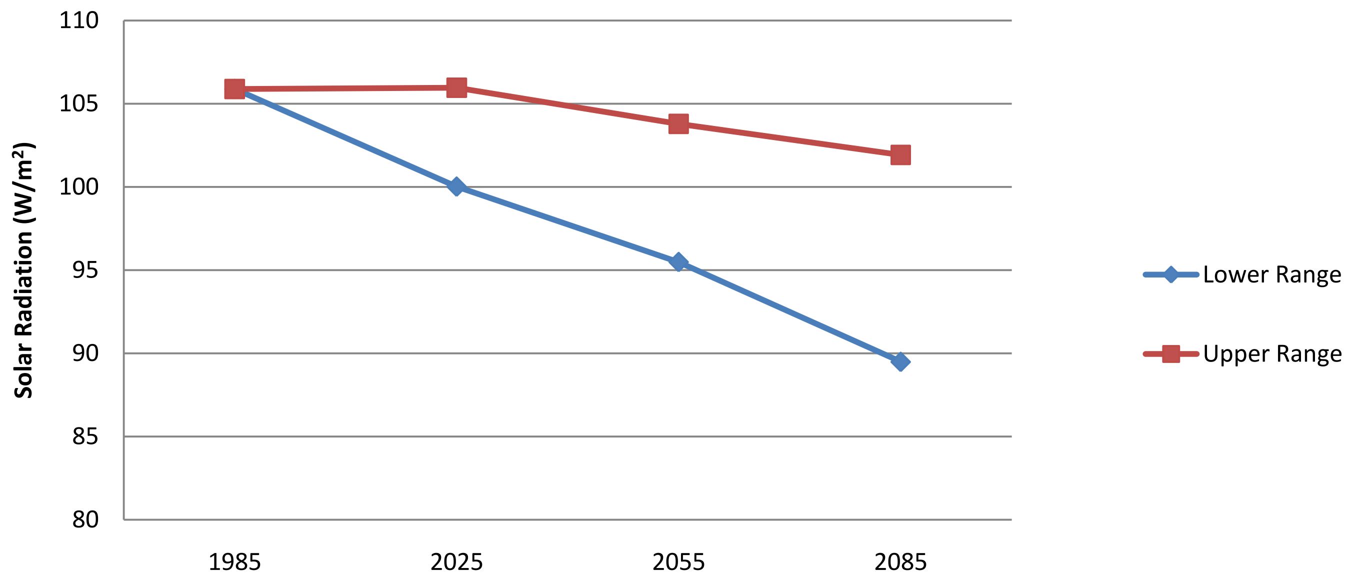
Predicted Annual Mean Wind Speed		Figure No: 3	RWDI
Baffinland Iron Mines Corporation – North Baffin Island, Canada	Project # 0940977	Date: Nov 29, 2010	

Predicted Annual Average Snow Depth



Predicted Annual Average Snow Depth Baffinland Iron Mines Corporation – North Baffin Island, Canada	Project # 0940977	Figure No: 4 Date: Nov 29, 2010	RWDI

Predicted Annual Average Solar Radiation



Predicted Annual Average Solar Radiation		Figure No: 5	RWDI
Baffinland Iron Mines Corporation – North Baffin Island, Canada	Project # 0940977	Date: Nov 29, 2010	

APPENDIX A

Appendix A: Climate Forecasts (2011 - 2040)

Scenario	Model	Season	Temperature						Precipitation		Wind		Snow Depth		Solar Radiation	
			Mean		Mean Daily Max		Mean Daily Min									
			GCM Predicted Change (^oC)	Forecast Mean (^oC)	GCM Predicted Change (^oC)	Forecast Mean Daily Maximum (^oC)	GCM Predicted Change (^oC)	Forecast Mean Daily Minimum (^oC)	GCM Predicted Change (mm/d)	Forecast Precipitation (mm/d)	GCM Predicted Change (m/s)	Forecast Mean Wind Speed (m/s)	GCM Predicted Change (m)	Forecast Average Snow Depth (m)	GCM Predicted Change (W/m^2)	Forecast Solar Radiation (W/m^2)
A2	CGCM3T47	Winter (DJF)	1.7	-30.1	1.6	-26.5	1.7	-33.6	0.01	0.2 - 0.5	-0.05	2.9	-0.01	0.2 - 0.5	-0.1	7
		Spring (MAM)	1.3	-19.5	1.2	-15.4	1.3	-23.5	0.03	0.3 - 0.6	-0.03	3.3	0.00	0.2 - 0.6	-1.2	161
		Summer (JJA)	0.6	7.0	0.6	10.2	0.6	3.7	-0.02	0.9 - 1.1	-0.13	4.1	-0.03	0.0 - 0.1	-5.8	210
		Fall (SON)	2.2	-9.5	2.1	-6.3	2.3	-12.6	0.06	0.7 - 1.1	-0.05	3.7	-0.03	0.1 - 0.2	-0.9	38
		Annual	**1.5**	**-13.6**	**1.4**	**-10.1**	**1.5**	**-17.1**	**0.03**	**0.8 - 0.8**	**-0.06**	**3.4**	**-0.02**	**0.1 - 0.3**	**-2.0**	**104**
	ECHAM5OM	Winter (DJF)	-0.2	-31.9	N/A	N/A	N/A	N/A	-0.02	0.2 - 0.4	0.14	3.0	N/A	N/A - N/A	0.1	7
		Spring (MAM)	1.6	-19.2	N/A	N/A	N/A	N/A	0.07	0.4 - 0.7	-0.09	3.2	N/A	N/A - N/A	-5.0	157
		Summer (JJA)	0.7	7.1	N/A	N/A	N/A	N/A	-0.03	0.9 - 1.1	-0.02	4.2	N/A	N/A - N/A	0.1	215
		Fall (SON)	1.7	-10.0	N/A	N/A	N/A	N/A	0.11	0.8 - 1.1	-0.01	3.7	N/A	N/A - N/A	-1.3	37
		Annual	**1.0**	**-14.1**	**N/A**	**N/A**	**N/A**	**N/A**	**0.03**	**0.8 - 0.8**	**0.01**	**3.5**	**N/A**	**N/A - N/A**	**-1.6**	**104**
	GFDLCM2.0	Winter (DJF)	0.8	-30.9	N/A	N/A	N/A	N/A	0.00	0.2 - 0.4	0.04	2.9	N/A	N/A - N/A	0.0	7
		Spring (MAM)	1.8	-19.0	N/A	N/A	N/A	N/A	0.04	0.4 - 0.6	0.03	3.3	N/A	N/A - N/A	-4.4	158
		Summer (JJA)	0.7	7.1	N/A	N/A	N/A	N/A	0.00	0.9 - 1.1	-0.01	4.2	N/A	N/A - N/A	-10.6	205
		Fall (SON)	1.9	-9.9	N/A	N/A	N/A	N/A	0.03	0.7 - 1.1	0.05	3.7	N/A	N/A - N/A	-1.0	38
		Annual	**1.3**	**-13.8**	**N/A**	**N/A**	**N/A**	**N/A**	**0.02**	**0.8 - 0.8**	**0.03**	**3.5**	**N/A**	**N/A - N/A**	**-4.0**	**102**
	HADCM3	Winter (DJF)	N/A	N/A	N/A	N/A	N/A	N/A	0.42	0.6 - 0.9	-0.14	2.8	N/A	N/A - N/A	0.0	7
		Spring (MAM)	N/A	N/A	N/A	N/A	N/A	N/A	0.70	1.0 - 1.3	-0.12	3.2	N/A	N/A - N/A	-2.6	160
		Summer (JJA)	N/A	N/A	N/A	N/A	N/A	N/A	-0.49	0.4 - 0.6	0.05	4.2	N/A	N/A - N/A	-8.9	206
		Fall (SON)	N/A	N/A	N/A	N/A	N/A	N/A	-0.37	0.3 - 0.7	-0.10	3.6	N/A	N/A - N/A	-1.7	37
		Annual	**1.8**	**-13.3**	**N/A**	**N/A**	**N/A**	**N/A**	**0.06**	**0.8 - 0.8**	**-0.08**	**3.4**	**N/A**	**N/A - N/A**	**-3.3**	**103**
	NCARCCSM	Winter (DJF)	4.2	-27.5	N/A	N/A	N/A	N/A	0.08	0.3 - 0.5	N/A	N/A	-0.01	0.2 - 0.5	-0.1	7
		Spring (MAM)	2.0	-18.8	N/A	N/A	N/A	N/A	0.06	0.4 - 0.7	N/A	N/A	0.00	0.2 - 0.6	-3.7	158
		Summer (JJA)	1.3	7.7	N/A	N/A	N/A	N/A	0.15	1.1 - 1.2	N/A	N/A	-0.02	0.0 - 0.1	-15.9	199
		Fall (SON)	3.6	-8.1	N/A	N/A	N/A	N/A	0.21	0.9 - 1.2	N/A	N/A	-0.02	0.1 - 0.3	-3.6	35
		Annual	**2.8**	**-12.3**	**N/A**	**N/A**	**N/A**	**N/A**	**0.12**	**0.9 - 0.9**	**N/A**	**N/A**	**-0.01**	**0.1 - 0.3**	**-5.9**	**100**
B1	CGCM3T47	Winter (DJF)	1.5	-30.3	1.5	-26.6	1.4	-33.9	0.00	0.2 - 0.4	0.24	3.1	0.00	0.2 - 0.5	-0.1	7
		Spring (MAM)	1.5	-19.3	1.3	-15.3	1.6	-23.1	0.17	0.5 - 0.8	-0.07	3.2	0.01	0.2 - 0.6	-2.8	159
		Summer (JJA)	0.6	7.0	0.6	10.2	0.6	3.7	0.15	1.1 - 1.2	-0.12	4.1	-0.03	0.0 - 0.1	-5.6	210
		Fall (SON)	2.0	-9.7	1.9	-6.5	2.1	-12.9	-0.11	0.6 - 0.9	0.03	3.7	-0.02	0.1 - 0.2	-1.1	38
		Annual	**1.4**	**-13.7**	**1.4**	**-10.1**	**1.5**	**-17.1**	**0.05**	**0.8 - 0.8**	**0.02**	**3.5**	**-0.01**	**0.1 - 0.3**	**-2.4**	**103**
	ECHAM5OM	Winter (DJF)	1.1	-30.6	N/A	N/A	N/A	N/A	0.00	0.2 - 0.4	0.08	3.0	N/A	N/A - N/A	0.0	7
		Spring (MAM)	1.0	-19.7	N/A	N/A	N/A	N/A	0.09	0.4 - 0.7	-0.02	3.3	N/A	N/A - N/A	-5.2	157
		Summer (JJA)	0.8	7.2	N/A	N/A	N/A	N/A	-0.04	0.9 - 1.0	-0.01	4.2	N/A	N/A - N/A	6.4	222
		Fall (SON)	2.2	-9.5	N/A	N/A	N/A	N/A	0.17	0.8 - 1.2	-0.04	3.7	N/A	N/A - N/A	-0.9	38
		Annual	**1.3**	**-13.8**	**N/A**	**N/A**	**N/A**	**N/A**	**0.06**	**0.8 - 0.8**	**0.00**	**3.5**	**N/A**	**N/A - N/A**	**0.1**	**106**
	GFDLCM2.0	Winter (DJF)	1.5	-30.2	N/A	N/A	N/A	N/A	0.05	0.3 - 0.5	-0.04	2.9	N/A	N/A - N/A	0.0	7
		Spring (MAM)	2.1	-18.6	N/A	N/A	N/A	N/A	0.01	0.3 - 0.6	-0.12	3.2	N/A	N/A - N/A	-4.6	158
		Summer (JJA)	1.0	7.4	N/A	N/A	N/A	N/A	-0.05	0.9 - 1.0	0.09	4.3	N/A	N/A - N/A	-4.4	211
		Fall (SON)	2.4	-9.3	N/A	N/A	N/A	N/A	0.06	0.7 - 1.1	0.04	3.7	N/A	N/A - N/A	-0.8	38
		Annual	**1.8**	**-13.3**	**N/A**	**N/A**	**N/A**	**N/A**	**0.02**	**0.8 - 0.8**	**-0.01**	**3.5**	**N/A**	**N/A - N/A**	**-2.5**	**103**
	HADCM3	Winter (DJF)	2.0	-29.7	N/A	N/A	N/A	N/A	0.04	0.2 - 0.5	-0.08	2.8	N/A	N/A - N/A	0.0	7
		Spring (MAM)	2.0	-18.7	N/A	N/A	N/A	N/A	0.09	0.4 - 0.7	-0.13	3.2	N/A	N/A - N/A	-4.9	157
		Summer (JJA)	1.4	7.8	N/A	N/A	N/A	N/A	0.05	1.0 - 1.1	0.04	4.2	N/A	N/A - N/A	-5.0	210
		Fall (SON)	1.7	-10.0	N/A	N/A	N/A	N/A	0.00	0.7 - 1.0	-0.02	3.7	N/A	N/A - N/A	-1.0	38
		Annual	**1.8**	**-13.3**	**N/A**	**N/A**	**N/A**	**N/A**	**0.04**	**0.8 - 0.8**	**-0.05**	**3.5**	**N/A**	**N/A - N/A**	**-2.7**	**103**
	NCARCCSM	Winter (DJF)	3.1	-28.7	N/A	N/A	N/A	N/A	0.08	0.3 - 0.5	N/A	N/A	-0.01	0.2 - 0.5	0.0	7
		Spring (MAM)	1.4	-19.4	N/A	N/A	N/A	N/A	0.04	0.3 - 0.6	N/A	N/A	0.00	0.2 - 0.6	-3.7	158
		Summer (JJA)	0.9	7.3	N/A	N/A	N/A	N/A	0.14	1.1 - 1.2	N/A	N/A	-0.02	0.0 - 0.1	-14.9	201
		Fall (SON)	2.3	-9.4	N/A	N/A	N/A	N/A	0.12	0.8 - 1.2	N/A	N/A	-0.01	0.1 - 0.3	-3.5	35
		Annual	**1.9**	**-13.2**	**N/A**	**N/A**	**N/A**	**N/A**	**0.09**	**0.9 - 0.9**	**N/A**	**N/A**	**-0.01**	**0.1 - 0.3**	**-5.6**	**100**

Notes: [1] Forecast Values = Historical Climate Measurements + Global Climate Model Predicted Changes.

Appendix A: Climate Forecasts (2041 - 2070)

Scenario	Model	Season	Temperature: Mean: GCM Predicted Change (°C)	Temperature: Mean: Forecast Mean (°C)	Temperature: Mean Daily Max: GCM Predicted Change (°C)	Temperature: Mean Daily Max: Forecast Mean Daily Maximum (°C)	Temperature: Mean Daily Min: GCM Predicted Change (°C)	Temperature: Mean Daily Min: Forecast Mean Daily Minimum (°C)	Precipitation: GCM Predicted Change (mm/d)	Precipitation: Forecast Precipitation (mm/d)	Wind: GCM Predicted Change (m/s)	Wind: Forecast Mean Wind Speed (m/s)	Snow Depth: GCM Predicted Change (m)	Snow Depth: Forecast Average Snow Depth (m)	Solar Radiation: GCM Predicted Change (W/m^2)	Solar Radiation: Forecast Solar Radiation (W/m^2)
A2	CGCM3T47	Winter (DJF)	5.2	-26.5	5.2	-22.9	5.2	-30.1	0.09	0.3 - 0.5	0.07	3.0	0.01	0.2 - 0.5	-0.2	7
		Spring (MAM)	3.1	-17.6	2.8	-13.9	3.4	-21.3	0.09	0.4 - 0.7	-0.10	3.2	0.02	0.2 - 0.6	-5.1	157
		Summer (JJA)	1.5	7.9	1.6	11.2	1.6	4.7	0.09	1.0 - 1.2	-0.13	4.1	-0.04	0.0 - 0.1	-11.1	204
		Fall (SON)	4.5	-7.2	4.2	-4.3	4.8	-10.1	0.13	0.8 - 1.2	0.15	3.8	-0.03	0.1 - 0.2	-1.8	37
		Annual	**3.7**	**-11.4**	**3.5**	**-8.0**	**3.8**	**-14.8**	**0.11**	**0.9 - 0.9**	**0.00**	**3.5**	**-0.01**	**0.1 - 0.3**	**-4.6**	**101**
	ECHAM5OM	Winter (DJF)	2.9	-28.8	N/A	N/A	N/A	N/A	0.01	0.2 - 0.4	0.14	3.0	N/A	N/A - N/A	0.0	7
		Spring (MAM)	2.5	-18.3	N/A	N/A	N/A	N/A	0.07	0.4 - 0.7	0.06	3.4	N/A	N/A - N/A	-9.7	153
		Summer (JJA)	1.8	8.2	N/A	N/A	N/A	N/A	-0.06	0.8 - 1.0	0.08	4.3	N/A	N/A - N/A	-0.6	215
		Fall (SON)	4.1	-7.6	N/A	N/A	N/A	N/A	0.21	0.9 - 1.2	-0.08	3.6	N/A	N/A - N/A	-3.2	35
		Annual	**2.9**	**-12.2**	**N/A**	**N/A**	**N/A**	**N/A**	**0.06**	**0.8 - 0.8**	**0.05**	**3.5**	**N/A**	**N/A - N/A**	**-3.4**	**102**
	GFDLCM2.0	Winter (DJF)	3.7	-28.0	N/A	N/A	N/A	N/A	0.10	0.3 - 0.5	-0.05	2.8	N/A	N/A - N/A	-0.1	7
		Spring (MAM)	3.7	-17.0	N/A	N/A	N/A	N/A	0.02	0.3 - 0.6	-0.08	3.2	N/A	N/A - N/A	-9.3	153
		Summer (JJA)	1.4	7.8	N/A	N/A	N/A	N/A	0.07	1.0 - 1.2	-0.09	4.1	N/A	N/A - N/A	-21.4	194
		Fall (SON)	4.6	-7.1	N/A	N/A	N/A	N/A	0.06	0.7 - 1.1	0.03	3.7	N/A	N/A - N/A	-1.5	37
		Annual	**3.4**	**-11.7**	**N/A**	**N/A**	**N/A**	**N/A**	**0.06**	**0.8 - 0.8**	**-0.04**	**3.5**	**N/A**	**N/A - N/A**	**-8.1**	**98**
	HADCM3	Winter (DJF)	N/A	N/A	N/A	N/A	N/A	N/A	0.61	0.8 - 1.1	0.07	3.0	N/A	N/A - N/A	-0.1	7
		Spring (MAM)	N/A	N/A	N/A	N/A	N/A	N/A	0.10	0.4 - 0.7	-0.09	3.2	N/A	N/A - N/A	-7.0	155
		Summer (JJA)	N/A	N/A	N/A	N/A	N/A	N/A	-0.55	0.4 - 0.5	0.04	4.2	N/A	N/A - N/A	-15.0	200
		Fall (SON)	N/A	N/A	N/A	N/A	N/A	N/A	0.38	1.0 - 1.4	-0.05	3.6	N/A	N/A - N/A	-3.8	35
		Annual	**3.9**	**-11.2**	**N/A**	**N/A**	**N/A**	**N/A**	**0.13**	**0.9 - 0.9**	**-0.01**	**3.5**	**N/A**	**N/A - N/A**	**-6.5**	**99**
	NCARCCSM	Winter (DJF)	8.1	-23.6	N/A	N/A	N/A	N/A	0.18	0.4 - 0.6	N/A	N/A	0.00	0.2 - 0.5	-0.3	7
		Spring (MAM)	3.5	-17.3	N/A	N/A	N/A	N/A	0.08	0.4 - 0.7	N/A	N/A	0.00	0.2 - 0.6	-8.0	154
		Summer (JJA)	2.0	8.4	N/A	N/A	N/A	N/A	0.24	1.2 - 1.3	N/A	N/A	-0.03	0.0 - 0.1	-26.3	189
		Fall (SON)	6.1	-5.7	N/A	N/A	N/A	N/A	0.24	0.9 - 1.3	N/A	N/A	-0.02	0.1 - 0.2	-6.7	32
		Annual	**4.9**	**-10.2**	**N/A**	**N/A**	**N/A**	**N/A**	**0.19**	**1.0 - 1.0**	**N/A**	**N/A**	**-0.01**	**0.1 - 0.3**	**-10.4**	**95**
B1	CGCM3T47	Winter (DJF)	3.4	-28.3	3.5	-24.7	3.3	-32.0	0.02	0.2 - 0.5	0.08	3.0	0.02	0.2 - 0.5	-0.2	7
		Spring (MAM)	2.1	-18.7	1.9	-14.7	2.2	-22.6	0.15	0.5 - 0.8	-0.17	3.1	0.03	0.2 - 0.6	-3.3	159
		Summer (JJA)	0.7	7.1	0.7	10.3	0.8	3.9	0.17	1.1 - 1.3	0.00	4.2	-0.03	0.0 - 0.1	-9.1	206
		Fall (SON)	2.8	-9.0	2.6	-5.8	2.8	-12.1	-0.06	0.6 - 1.0	0.00	3.7	-0.01	0.1 - 0.3	-1.5	37
		Annual	**2.3**	**-12.8**	**2.2**	**-9.3**	**2.3**	**-16.3**	**0.07**	**0.9 - 0.9**	**-0.02**	**3.5**	**0.00**	**0.1 - 0.3**	**-3.5**	**102**
	ECHAM5OM	Winter (DJF)	2.1	-29.6	N/A	N/A	N/A	N/A	0.04	0.2 - 0.5	0.06	3.0	N/A	N/A - N/A	0.1	7
		Spring (MAM)	2.4	-18.4	N/A	N/A	N/A	N/A	0.03	0.3 - 0.6	0.06	3.4	N/A	N/A - N/A	-8.4	154
		Summer (JJA)	2.1	8.5	N/A	N/A	N/A	N/A	-0.05	0.9 - 1.0	-0.11	4.1	N/A	N/A - N/A	2.7	218
		Fall (SON)	3.3	-8.4	N/A	N/A	N/A	N/A	0.12	0.8 - 1.2	0.03	3.7	N/A	N/A - N/A	-2.7	36
		Annual	**2.5**	**-12.6**	**N/A**	**N/A**	**N/A**	**N/A**	**0.04**	**0.8 - 0.8**	**0.01**	**3.5**	**N/A**	**N/A - N/A**	**-2.1**	**104**
	GFDLCM2.0	Winter (DJF)	3.4	-28.3	N/A	N/A	N/A	N/A	0.09	0.3 - 0.5	0.00	2.9	N/A	N/A - N/A	-0.1	7
		Spring (MAM)	3.5	-17.3	N/A	N/A	N/A	N/A	0.10	0.4 - 0.7	0.00	3.3	N/A	N/A - N/A	-5.9	156
		Summer (JJA)	1.0	7.4	N/A	N/A	N/A	N/A	0.17	1.1 - 1.3	0.00	4.2	N/A	N/A - N/A	-17.4	198
		Fall (SON)	3.9	-7.9	N/A	N/A	N/A	N/A	0.09	0.8 - 1.1	0.07	3.8	N/A	N/A - N/A	-1.6	37
		Annual	**3.0**	**-12.1**	**N/A**	**N/A**	**N/A**	**N/A**	**0.12**	**0.9 - 0.9**	**0.02**	**3.5**	**N/A**	**N/A - N/A**	**-6.3**	**100**
	HADCM3	Winter (DJF)	3.4	-28.4	N/A	N/A	N/A	N/A	0.07	0.3 - 0.5	-0.07	2.8	N/A	N/A - N/A	-0.1	7
		Spring (MAM)	2.6	-18.2	N/A	N/A	N/A	N/A	0.10	0.4 - 0.7	-0.10	3.2	N/A	N/A - N/A	-5.8	156
		Summer (JJA)	2.2	8.6	N/A	N/A	N/A	N/A	0.10	1.0 - 1.2	0.03	4.2	N/A	N/A - N/A	-9.5	206
		Fall (SON)	3.3	-8.4	N/A	N/A	N/A	N/A	0.10	0.8 - 1.1	-0.12	3.6	N/A	N/A - N/A	-2.5	36
		Annual	**2.9**	**-12.2**	**N/A**	**N/A**	**N/A**	**N/A**	**0.09**	**0.9 - 0.9**	**-0.07**	**3.4**	**N/A**	**N/A - N/A**	**-4.5**	**101**
	NCARCCSM	Winter (DJF)	4.6	-27.1	N/A	N/A	N/A	N/A	0.08	0.3 - 0.5	N/A	N/A	0.00	0.2 - 0.5	-0.1	7
		Spring (MAM)	2.5	-18.3	N/A	N/A	N/A	N/A	0.09	0.4 - 0.7	N/A	N/A	0.00	0.2 - 0.6	-5.0	157
		Summer (JJA)	1.3	7.7	N/A	N/A	N/A	N/A	0.28	1.2 - 1.4	N/A	N/A	-0.03	0.0 - 0.1	-18.9	196
		Fall (SON)	4.3	-7.4	N/A	N/A	N/A	N/A	0.23	0.9 - 1.3	N/A	N/A	-0.02	0.1 - 0.3	-5.0	34
		Annual	**3.2**	**-11.9**	**N/A**	**N/A**	**N/A**	**N/A**	**0.17**	**1.0 - 1.0**	**N/A**	**N/A**	**-0.01**	**0.1 - 0.3**	**-7.3**	**99**

Notes: [1] Forecast Values = Historical Climate Measurements + Global Climate Model Predicted Changes.

Appendix A: Climate Forecasts (2071 - 2100)

Scenario	Model	Season	Temperature						Precipitation		Wind		Snow Depth		Solar Radiation	
			Mean		Mean Daily Max		Mean Daily Min									
			GCM Predicted Change (°C)	Forecast Mean (°C)	GCM Predicted Change (°C)	Forecast Mean Daily Maximum (°C)	GCM Predicted Change (°C)	Forecast Mean Daily Minimum (°C)	GCM Predicted Change (mm/d)	Forecast Precipitation (mm/d)	GCM Predicted Change (m/s)	Forecast Mean Wind Speed (m/s)	GCM Predicted Change (m)	Forecast Average Snow Depth (m)	GCM Predicted Change (W/m^2)	Forecast Solar Radiation (W/m^2)
A2	CGCM3T47	Winter (DJF)	8.7	-23.0	8.7	-19.4	8.6	-26.6	0.16	0.4 - 0.6	0.15	3.1	0.02	0.2 - 0.5	-0.4	7
		Spring (MAM)	4.8	-16.0	4.1	-12.5	5.2	-19.5	0.14	0.4 - 0.7	-0.12	3.2	0.05	0.3 - 0.6	-7.6	155
		Summer (JJA)	2.4	8.8	2.5	12.1	2.5	5.6	0.16	1.1 - 1.2	0.00	4.2	-0.06	0.0 - 0.1	-18.5	197
		Fall (SON)	7.1	-4.6	6.6	-1.9	7.6	-7.4	0.28	0.9 - 1.3	-0.17	3.5	-0.04	0.1 - 0.2	-2.4	36
		Annual	**5.8**	**-9.3**	**5.5**	**-6.0**	**6.0**	**-12.6**	**0.18**	**1.0 - 1.0**	**-0.03**	**3.5**	**-0.01**	**0.1 - 0.3**	**-7.3**	**99**
	ECHAM5OM	Winter (DJF)	7.8	-23.9	N/A	N/A	N/A	N/A	0.16	0.4 - 0.6	0.11	3.0	N/A	N/A - N/A	-0.2	7
		Spring (MAM)	5.4	-15.3	N/A	N/A	N/A	N/A	0.27	0.6 - 0.9	0.03	3.3	N/A	N/A - N/A	-20.3	142
		Summer (JJA)	3.6	10.0	N/A	N/A	N/A	N/A	-0.03	0.9 - 1.0	-0.01	4.2	N/A	N/A - N/A	-0.8	215
		Fall (SON)	7.3	-4.4	N/A	N/A	N/A	N/A	0.44	1.1 - 1.5	-0.18	3.5	N/A	N/A - N/A	-6.3	32
		Annual	**6.1**	**-9.0**	**N/A**	**N/A**	**N/A**	**N/A**	**0.21**	**1.0 - 1.0**	**-0.01**	**3.5**	**N/A**	**N/A - N/A**	**-6.9**	**99**
	GFDLCM2.0	Winter (DJF)	6.8	-24.9	N/A	N/A	N/A	N/A	0.16	0.4 - 0.6	0.00	2.9	N/A	N/A - N/A	-0.3	7
		Spring (MAM)	5.7	-15.1	N/A	N/A	N/A	N/A	0.10	0.4 - 0.7	-0.04	3.3	N/A	N/A - N/A	-14.6	148
		Summer (JJA)	2.1	8.5	N/A	N/A	N/A	N/A	0.04	0.9 - 1.1	0.02	4.2	N/A	N/A - N/A	-37.1	178
		Fall (SON)	6.5	-5.3	N/A	N/A	N/A	N/A	0.16	0.8 - 1.2	0.07	3.8	N/A	N/A - N/A	-3.6	35
		Annual	**5.3**	**-9.8**	**N/A**	**N/A**	**N/A**	**N/A**	**0.12**	**0.9 - 0.9**	**0.01**	**3.5**	**N/A**	**N/A - N/A**	**-14.0**	**92**
	HADCM3	Winter (DJF)	N/A	N/A	N/A	N/A	N/A	N/A	0.23	0.4 - 0.7	-0.04	2.9	N/A	N/A - N/A	-0.2	7
		Spring (MAM)	N/A	N/A	N/A	N/A	N/A	N/A	0.65	1.0 - 1.2	-0.17	3.1	N/A	N/A - N/A	-13.4	149
		Summer (JJA)	N/A	N/A	N/A	N/A	N/A	N/A	0.13	1.0 - 1.2	0.07	4.3	N/A	N/A - N/A	-15.9	199
		Fall (SON)	N/A	N/A	N/A	N/A	N/A	N/A	-0.06	0.6 - 1.0	-0.13	3.6	N/A	N/A - N/A	-7.3	31
		Annual	**6.6**	**-8.5**	**N/A**	**N/A**	**N/A**	**N/A**	**0.24**	**1.0 - 1.0**	**-0.07**	**3.4**	**N/A**	**N/A - N/A**	**-9.2**	**97**
	NCARCCSM	Winter (DJF)	13.5	-18.2	N/A	N/A	N/A	N/A	0.31	0.5 - 0.7	N/A	N/A	0.00	0.2 - 0.5	-0.4	7
		Spring (MAM)	6.1	-14.7	N/A	N/A	N/A	N/A	0.14	0.4 - 0.7	N/A	N/A	0.01	0.2 - 0.6	-14.0	148
		Summer (JJA)	3.3	9.7	N/A	N/A	N/A	N/A	0.55	1.5 - 1.6	N/A	N/A	-0.05	0.0 - 0.1	-40.2	175
		Fall (SON)	9.9	-1.8	N/A	N/A	N/A	N/A	0.51	1.2 - 1.5	N/A	N/A	-0.03	0.1 - 0.2	-10.5	28
		Annual	**8.2**	**-6.9**	**N/A**	**N/A**	**N/A**	**N/A**	**0.38**	**1.2 - 1.2**	**N/A**	**N/A**	**-0.02**	**0.1 - 0.3**	**-16.4**	**89**
B1	CGCM3T47	Winter (DJF)	4.4	-27.3	4.5	-23.7	4.4	-30.9	0.03	0.2 - 0.5	0.17	3.1	0.01	0.2 - 0.5	-0.2	7
		Spring (MAM)	2.4	-18.4	2.1	-14.5	2.5	-22.2	0.17	0.5 - 0.8	-0.02	3.3	0.01	0.2 - 0.6	-3.6	159
		Summer (JJA)	1.3	7.7	1.2	10.8	1.3	4.4	0.20	1.1 - 1.3	-0.20	4.0	-0.04	0.0 - 0.1	-11.8	204
		Fall (SON)	4.2	-7.5	3.9	-4.6	4.4	-10.5	-0.10	0.6 - 0.9	0.04	3.7	-0.03	0.1 - 0.2	-1.6	37
		Annual	**3.1**	**-12.0**	**2.9**	**-8.6**	**3.2**	**-15.4**	**0.08**	**0.9 - 0.9**	**0.00**	**3.5**	**-0.01**	**0.1 - 0.3**	**-4.3**	**102**
	ECHAM5OM	Winter (DJF)	4.5	-27.2	N/A	N/A	N/A	N/A	0.04	0.2 - 0.5	0.15	3.0	N/A	N/A - N/A	0.0	7
		Spring (MAM)	3.8	-17.0	N/A	N/A	N/A	N/A	0.16	0.5 - 0.8	-0.02	3.3	N/A	N/A - N/A	-11.5	151
		Summer (JJA)	2.2	8.6	N/A	N/A	N/A	N/A	0.04	0.9 - 1.1	-0.04	4.2	N/A	N/A - N/A	-0.3	215
		Fall (SON)	5.1	-6.6	N/A	N/A	N/A	N/A	0.35	1.0 - 1.4	-0.12	3.6	N/A	N/A - N/A	-3.9	35
		Annual	**3.9**	**-11.2**	**N/A**	**N/A**	**N/A**	**N/A**	**0.15**	**0.9 - 0.9**	**-0.01**	**3.5**	**N/A**	**N/A - N/A**	**-4.0**	**102**
	GFDLCM2.0	Winter (DJF)	4.9	-26.9	N/A	N/A	N/A	N/A	0.11	0.3 - 0.5	-0.04	2.9	N/A	N/A - N/A	-0.2	7
		Spring (MAM)	4.4	-16.3	N/A	N/A	N/A	N/A	0.13	0.4 - 0.7	-0.09	3.2	N/A	N/A - N/A	-9.9	152
		Summer (JJA)	1.6	8.0	N/A	N/A	N/A	N/A	0.14	1.0 - 1.2	0.07	4.3	N/A	N/A - N/A	-24.7	191
		Fall (SON)	5.7	-6.0	N/A	N/A	N/A	N/A	0.15	0.8 - 1.2	0.09	3.8	N/A	N/A - N/A	-2.7	36
		Annual	**4.2**	**-10.9**	**N/A**	**N/A**	**N/A**	**N/A**	**0.13**	**0.9 - 0.9**	**0.01**	**3.5**	**N/A**	**N/A - N/A**	**-9.4**	**96**
	HADCM3	Winter (DJF)	5.0	-26.8	N/A	N/A	N/A	N/A	0.10	0.3 - 0.5	-0.07	2.8	N/A	N/A - N/A	-0.1	7
		Spring (MAM)	4.1	-16.7	N/A	N/A	N/A	N/A	0.19	0.5 - 0.8	-0.20	3.1	N/A	N/A - N/A	-9.7	152
		Summer (JJA)	2.5	8.9	N/A	N/A	N/A	N/A	0.15	1.1 - 1.2	0.02	4.2	N/A	N/A - N/A	-13.5	202
		Fall (SON)	4.3	-7.4	N/A	N/A	N/A	N/A	0.13	0.8 - 1.2	-0.07	3.6	N/A	N/A - N/A	-4.8	34
		Annual	**4.0**	**-11.1**	**N/A**	**N/A**	**N/A**	**N/A**	**0.14**	**0.9 - 0.9**	**-0.08**	**3.4**	**N/A**	**N/A - N/A**	**-7.0**	**99**
	NCARCCSM	Winter (DJF)	5.6	-26.1	N/A	N/A	N/A	N/A	0.13	0.3 - 0.6	N/A	N/A	0.00	0.2 - 0.5	-0.2	7
		Spring (MAM)	2.7	-18.1	N/A	N/A	N/A	N/A	0.03	0.3 - 0.6	N/A	N/A	0.00	0.2 - 0.6	-7.0	155
		Summer (JJA)	1.6	8.0	N/A	N/A	N/A	N/A	0.18	1.1 - 1.3	N/A	N/A	-0.03	0.0 - 0.1	-21.2	194
		Fall (SON)	4.8	-6.9	N/A	N/A	N/A	N/A	0.25	0.9 - 1.3	N/A	N/A	-0.02	0.1 - 0.3	-5.3	33
		Annual	**3.7**	**-11.4**	**N/A**	**N/A**	**N/A**	**N/A**	**0.15**	**0.9 - 0.9**	**N/A**	**N/A**	**-0.01**	**0.1 - 0.3**	**-8.5**	**97**

Notes: [1] Forecast Values = Historical Climate Measurements + Global Climate Model Predicted Changes.