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FIGURE 6.1-30
 Operation Assessment - Phase 2
 Potential Acid Input (PAI) (keq/ha/year)
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Preferred Winter Road

A separate model run was completed to assess the effects of the preferred Access Road Option (i.e., the Winter Road) for connecting the Mine Development Area to the Dock and Storage Facility. Table 6.1-13 shows the overall maximum predicted concentrations of TSP, PM₁₀, PM_{2.5}, NO₂ and SO₂ which are all well below their applicable Indicator Thresholds. More specifically, the predicted overall maximum 24-hour concentration of TSP is 29.7 µg/m³ which is 25% of the Indicator Threshold of 120 µg/m³. The TSP results are also presented graphically in Figure 6.1-31. NO₂ and SO₂ concentrations are both less than 0.2% of their 1-hour, 24-hour and annual Thresholds.

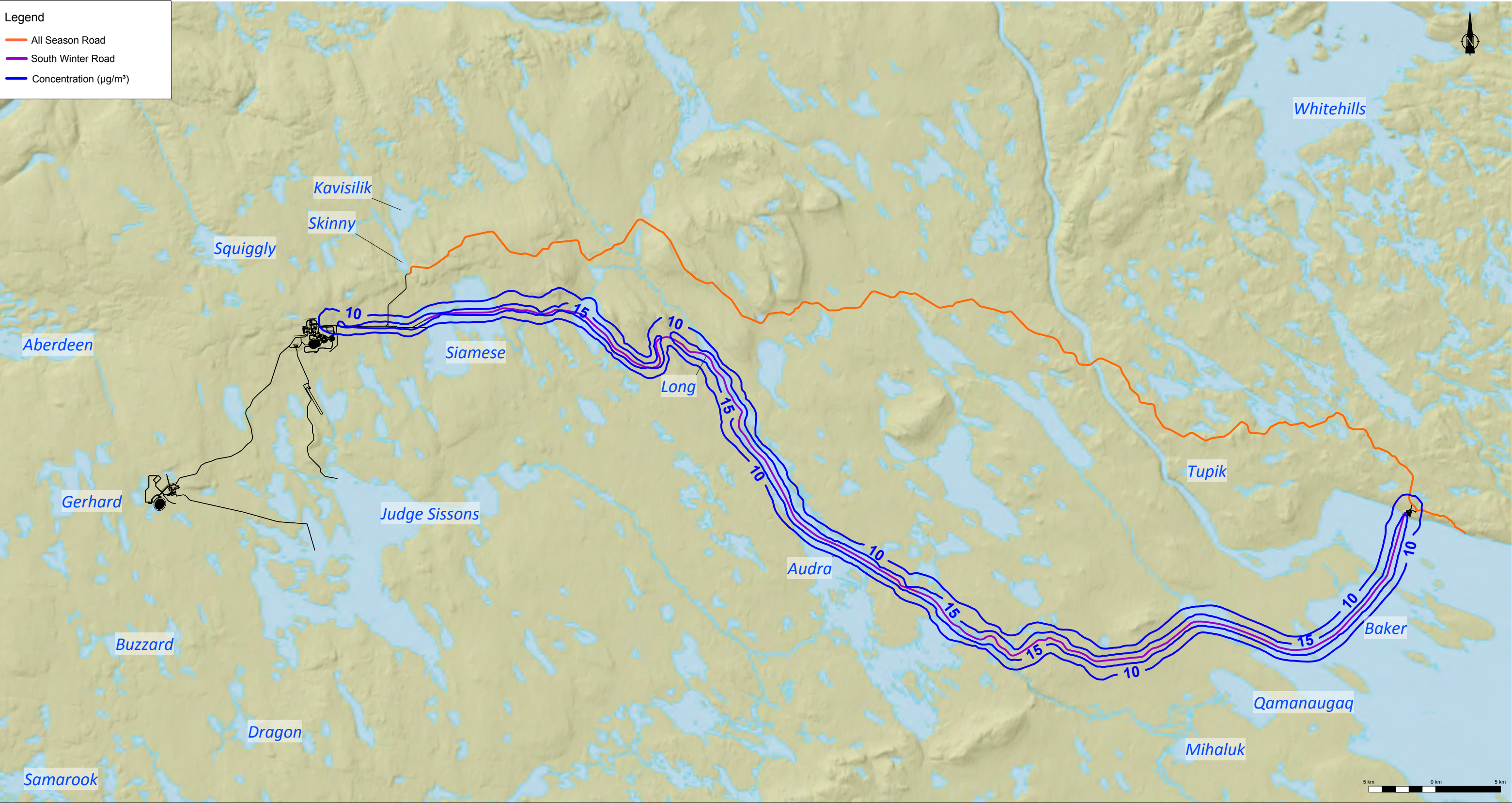
Additional plots for PM₁₀, PM_{2.5}, NO₂ and SO₂ are provided in Technical Appendix 4B – Air Dispersion Assessment.

Baker Lake Dock and Storage Facility

A separate model run was also completed to assess the effects of day-to-day operations at the Baker Lake Dock and Storage Facility. The predicted incremental concentrations of particulate (TSP, PM₁₀ and PM_{2.5}) and gaseous compounds (NO₂ and SO₂) at the receptor representing the community of Baker Lake are provided in Table 6.1-14. At this receptor location, concentrations for all constituents are well below all applicable Indicator Thresholds.

Contour plots showing the concentrations of TSP, NO₂ and SO₂ over short-term averaging periods in and around the Dock and Storage Facility are provided in Figures 6.1-32 through 6.1-36. PM₁₀ and PM_{2.5} contour plots are similar to TSP and provided in Technical Appendix 4B – Air Dispersion Assessment. Since the Facility will likely operate over a short period annually (i.e., from late July to September), predicted annual concentrations are relatively low (less than 10% of applicable criteria) and are therefore only presented in Technical Appendix 4B – Air Dispersion Assessment.

As indicated by Figures 6.1-32, 6.1-35 and 6.1-36, TSP and SO₂ concentrations are well below their applicable Thresholds surrounding the Dock and Storage Facility. In contrast, 1- and 24-hour NO₂ Indicator Thresholds are exceeded in the area surrounding the Facility, extending to about 1 km southwest of the Dock and Storage Facility over the water, which is considered to be a residual effect. Frequency plots are provided in Figure 6.1-37 (1-hour NO₂) and Figure 3.1-38 (24-hour NO₂) which show that the number of exceedances is limited.



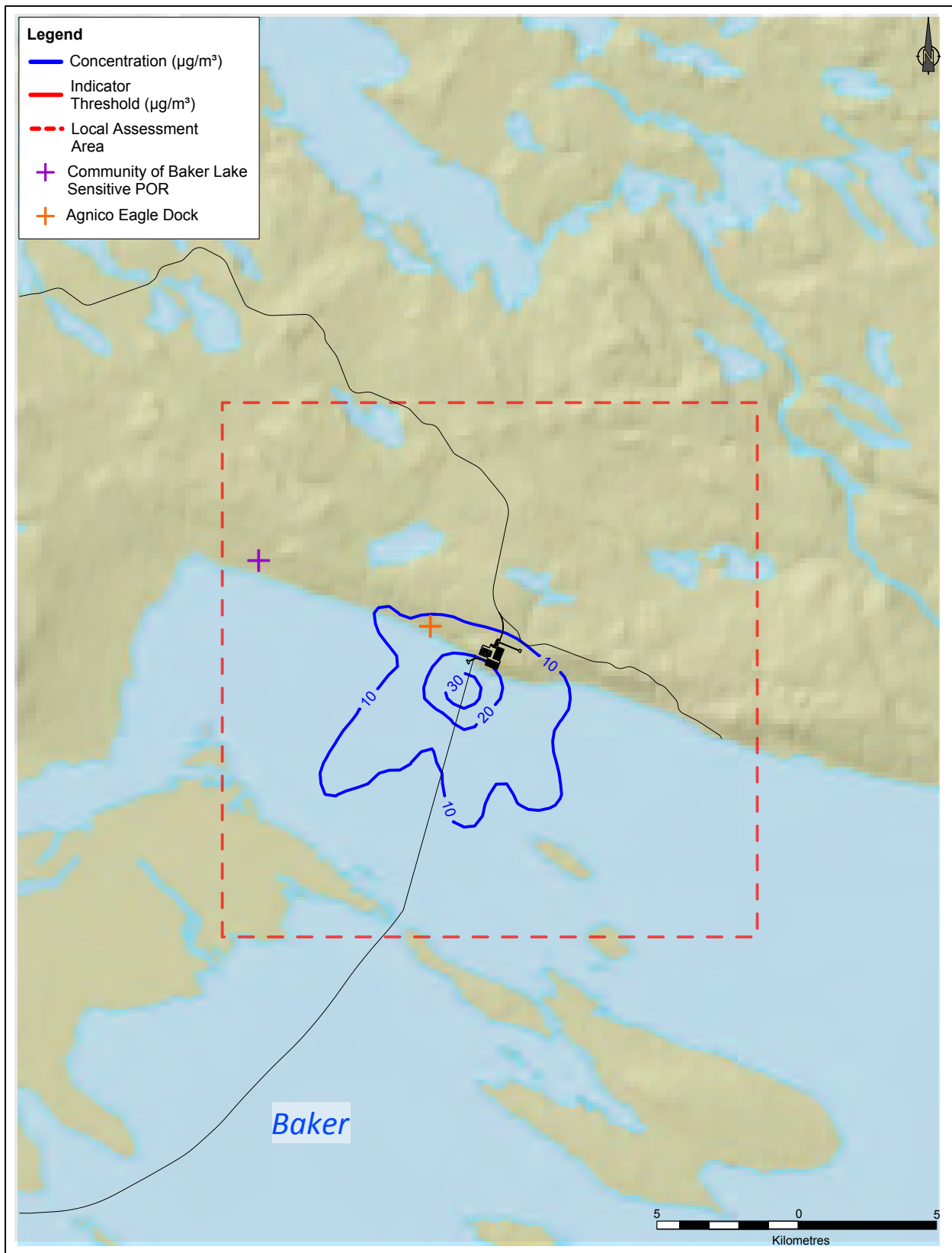
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FIGURE 6.1-31
Winter Road Option Assessment
24-hour TSP Concentration ($\mu\text{g}/\text{m}^3$)

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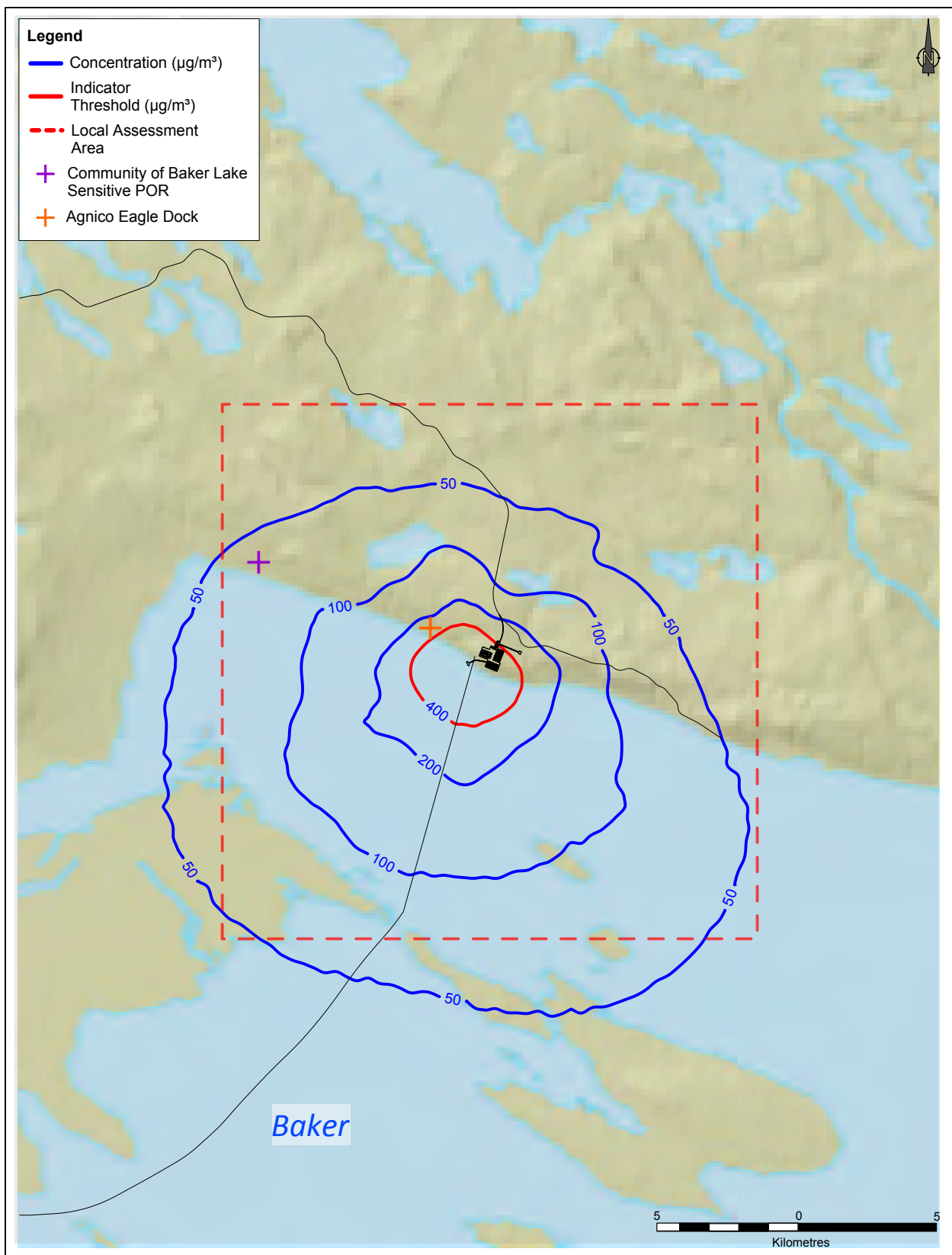


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FIGURE 6.1-32
 Baker Lake Dock and Storage Facility Cumulative Assessment
 24-hour TSP Concentration ($\mu\text{g}/\text{m}^3$)
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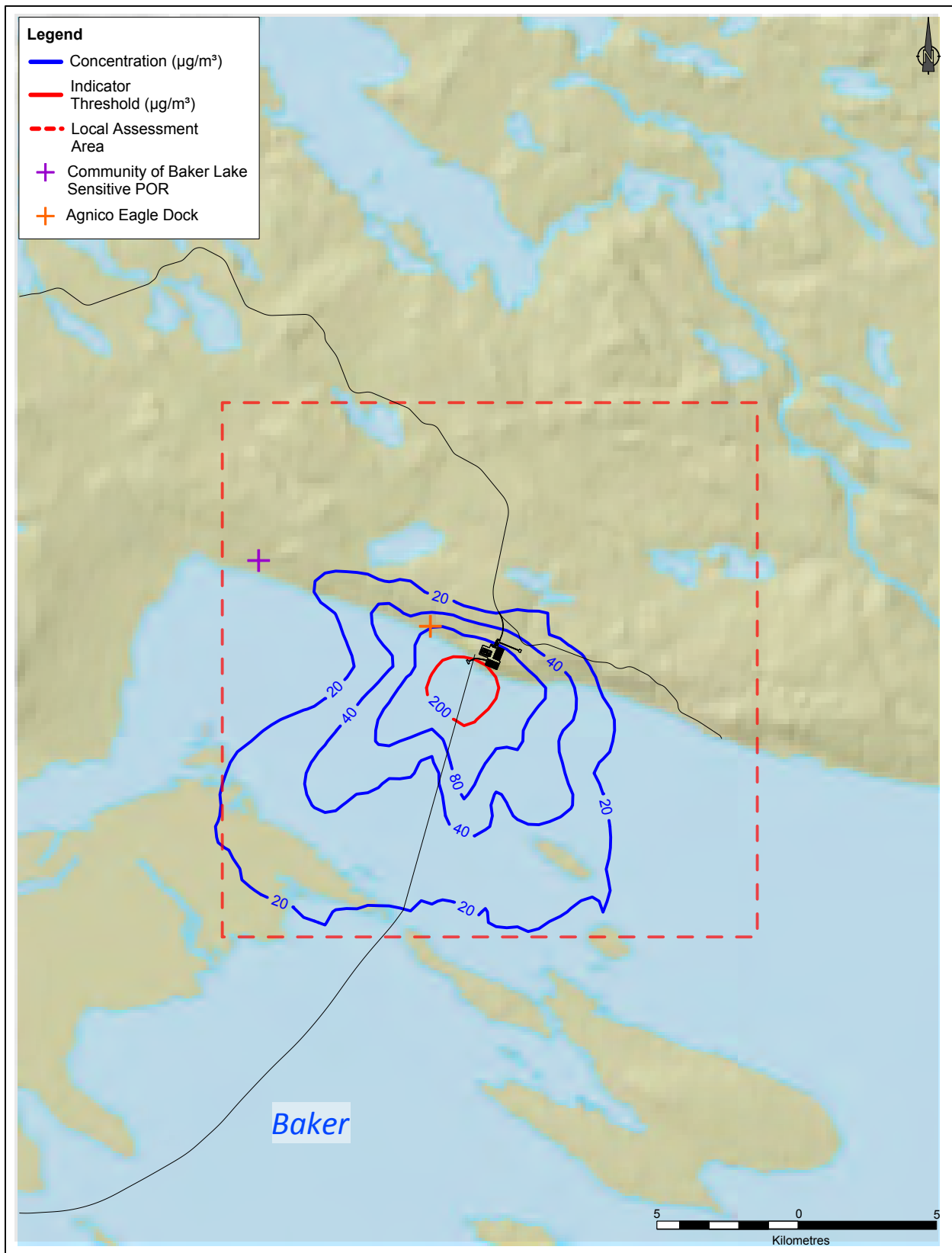


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FIGURE 6.1-33
 Baker Lake Dock and Storage Facility Cumulative Assessment
 1-hour NO_2 Concentration ($\mu\text{g}/\text{m}^3$)
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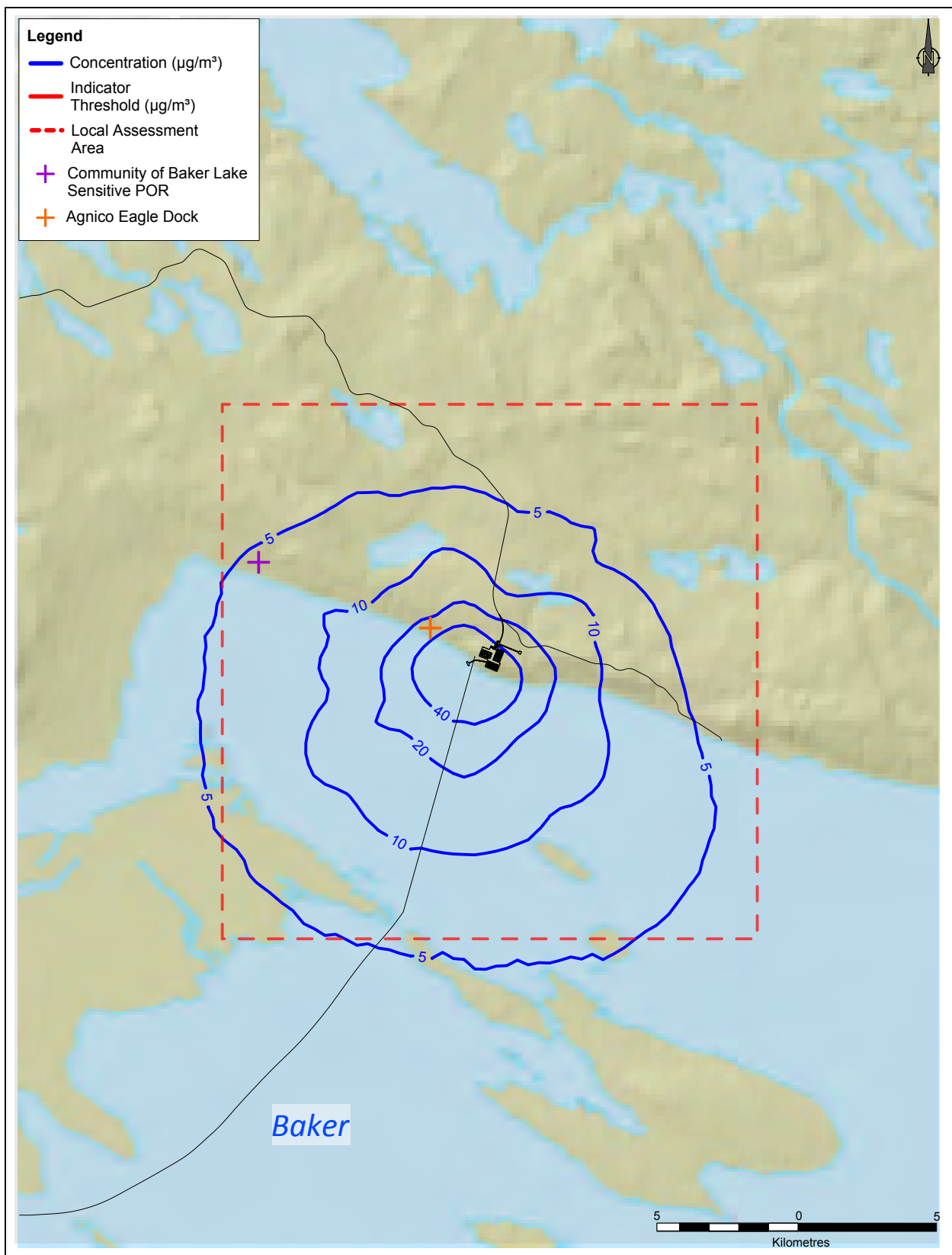


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FIGURE 6.1-34
 Baker Lake Dock and Storage Facility Cumulative Assessment
 24-hour NO_2 Concentration ($\mu\text{g}/\text{m}^3$)
 ENVIRONMENTAL IMPACT STATEMENT
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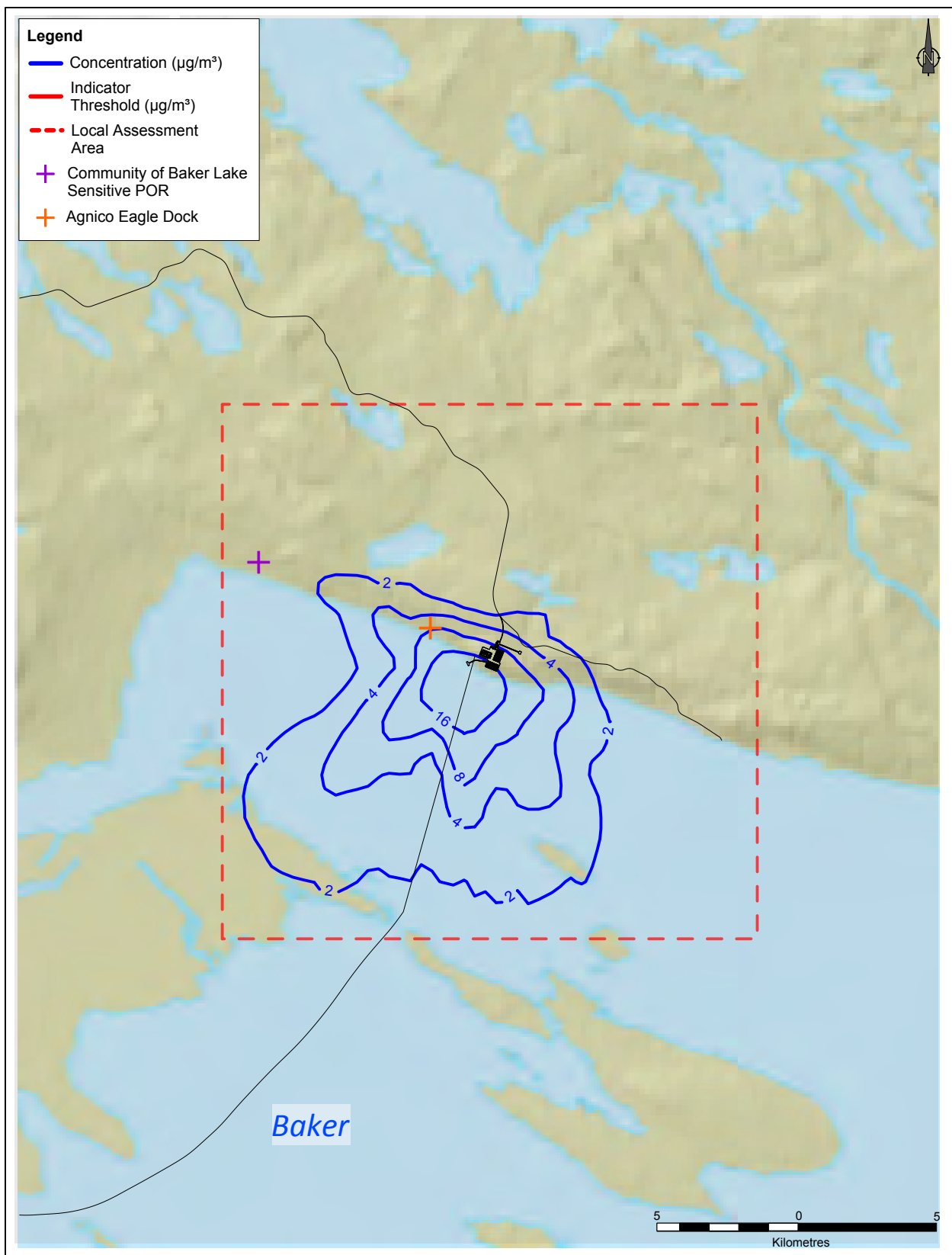


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FIGURE 6.1-35
 Baker Lake Dock and Storage Facility Cumulative Assessment
 1-hour SO_2 Concentration ($\mu\text{g}/\text{m}^3$)
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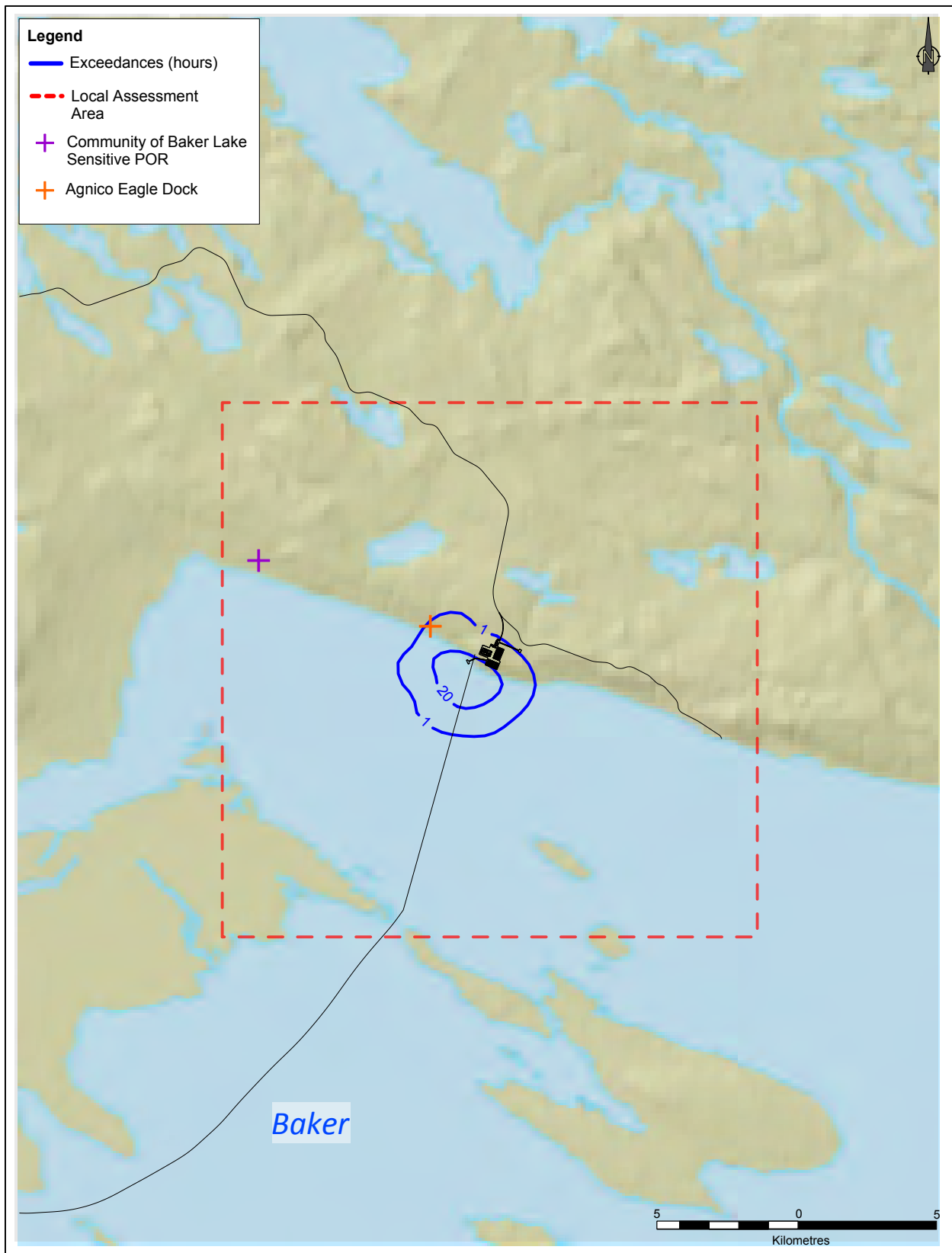


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FIGURE 6.1-36
 Baker Lake Dock and Storage Facility Cumulative Assessment
 24-hour SO_2 Concentration ($\mu\text{g}/\text{m}^3$)
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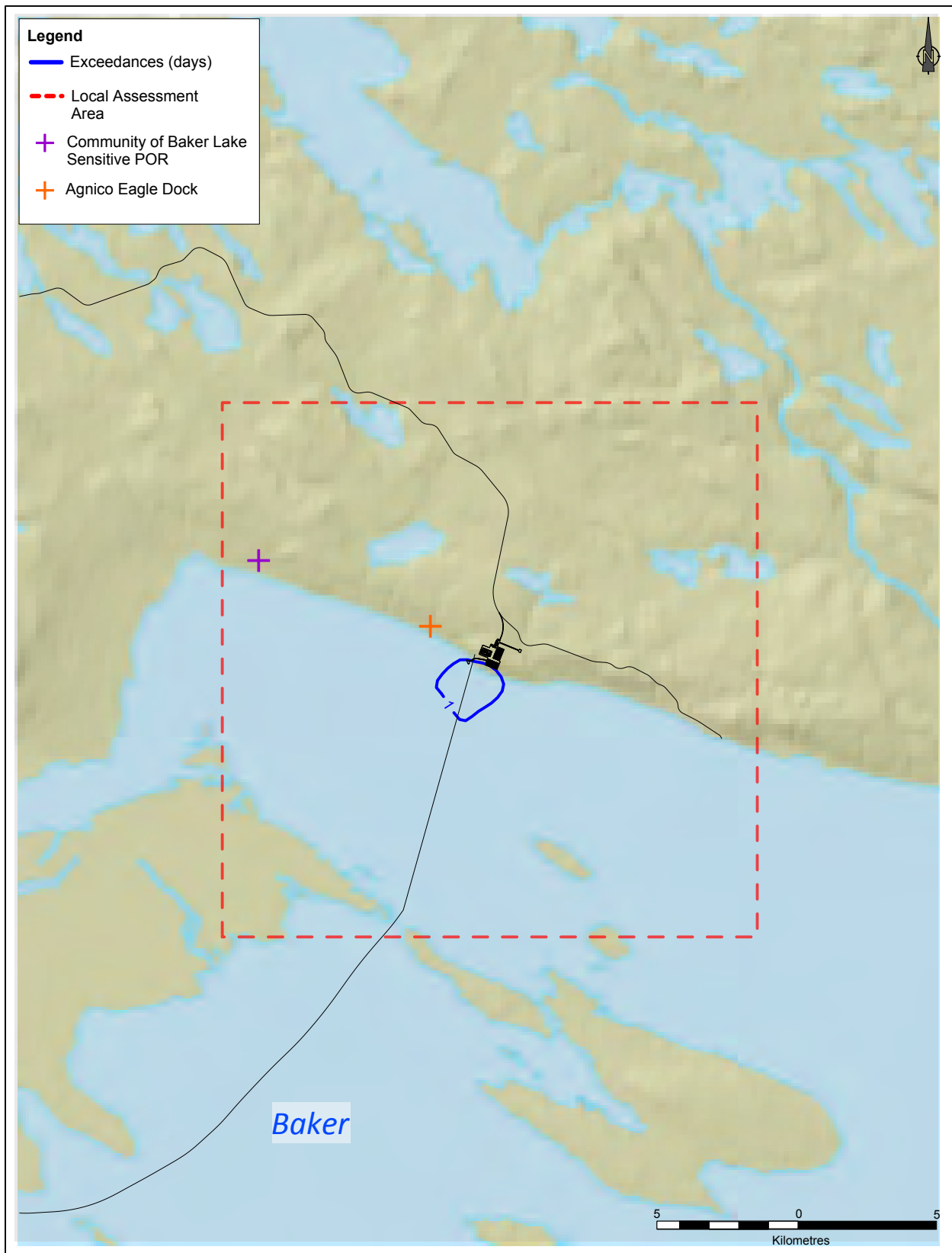


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FIGURE 6.1-37
 Baker Lake Dock and Storage Facility Cumulative Assessment
 Exceedances of 1-hour NO₂ Indicator Threshold (hours)
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FIGURE 6.1-38

Baker Lake Dock and Storage Facility Cumulative Assessment
Exceedances of 24-hour NO₂ Indicator Threshold (days)

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Final Closure

The predicted annual concentrations of various COPCs for the final closure phase of the Project are presented in Table 6.1-15. Contour plots for TSP, uranium and radon are also presented in Figures 6.1-39 through Figure 6.1-41. Annual concentrations for metals are shown in Table 6.1-16. Contour plots for the remaining COPCs are provided in Technical Appendix 4B – Air Dispersion Assessment.

As can be seen in both the tables and figures, all COPCs were well below applicable criteria during the final closure phase. Compared to the operational phases, TSP and uranium concentrations are much lower during closure; however, the radon concentrations predicted at the POR during closure are of the same order of magnitude (Accommodation Complex and Baker Lake POR) or higher (Judge Sissons Cabin POR) than radon levels predicted during the operational phase of the Project. This is due to the increase in the amount of exposed surface area of special waste and the fact that covered TMFs during closure have increased radon emissions compared to unconsolidated and water covered TMFs during operations. This is reflected in the emission rates summaries provided in Appendix 4B which show that the radon emissions from the Kiggavik mine site during operations are in the same order of magnitude as final closure emissions for reasons noted above. Therefore, it can be expected that concentrations would also be of the same magnitude. Also note that the source configuration has changed between operations and final closure. For example, special waste has been moved from the special waste stock pile and back filled into open pits and TMFs at the Kiggavik mine site. This change in proximity of special waste relative to the Judge Sissons Lake Cabin has caused the increase in radon concentration relative to operations.

6.1.4.4 Post-Closure

The only COPC assessed for post-closure was radon, since all closure activities were assumed to have been completed, and all TMFs charged and covered. The incremental annual radon concentrations predicted at the sensitive POR during post-closure are presented in Table 6.1-17 and the contour plot is provided in Figure 6.1-42. As can be seen in both table and figure, the predicted incremental radon concentrations are well below the annual Threshold of 60 Bq/m³ within the LAA and RAA.

Table 6.1-13 Overall Maximum Dust and Gaseous COPC Concentrations Predicted for the Preferred Winter Road Option

Access Road Option	Overall Maximum Concentration (µg/m³)											
	TSP		PM ₁₀		PM _{2.5}		NO ₂			SO ₂		
	24-hr Maximum	Annual	24-hr Maximum	Annual	24-hr Maximum	Annual	1-hr Maximum	24-hr Maximum	Annual	1-hr Maximum	24-hr Maximum	Annual
Winter Road	29.7	4.3	8.1	1.9	0.9	0.7	3.5E-01	2.6E-01	1.5E-02	3.0E-02	2.3E-02	1.3E-03
Background Concentration (µgm³)	6.8	2.9	3.4	1.5	1.7	0.7	-	-	-	-	-	-
Indicator Threshold (µg/m³)	120	60	50	-	27	8.8	400	200	100	450	150	30
NOTES: Concentrations of TSP, PM ₁₀ and PM _{2.5} include background concentrations.												

Table 6.1-14 Dock and Storage Facility Dust and Gaseous Concentrations Predicted at the Community of Baker Lake

Receptor	UTM Coordinates (m)		Maximum Concentration (µg/m³)										
			TSP		PM ₁₀	PM _{2.5}		NO ₂			SO ₂		
	Easting	Northing	24-hour Maximum	Annual	24-hour Maximum	24-hour Maximum	Annual	1-hour Maximum	24-hour Maximum	Annual	1-hour Maximum	24-hour Maximum	Annual
Community of Baker Lake	644179	7135840	7.7	2.9	4.3	2.5	60.6	59.9	11.7	0.2	5.5	1.1	0.02
Background Concentration (µg/m³)			6.8	2.9	3.4	1.7	0.7	-	-	-	-	-	-
Indicator Threshold (µg/m³)			120	60	50	27	8.8	400	200	100	450	150	30
NOTES: Concentrations of TSP, PM ₁₀ and PM _{2.5} include background concentrations.													

Table 6.1-15 Annual COPC Concentrations during Final Closure

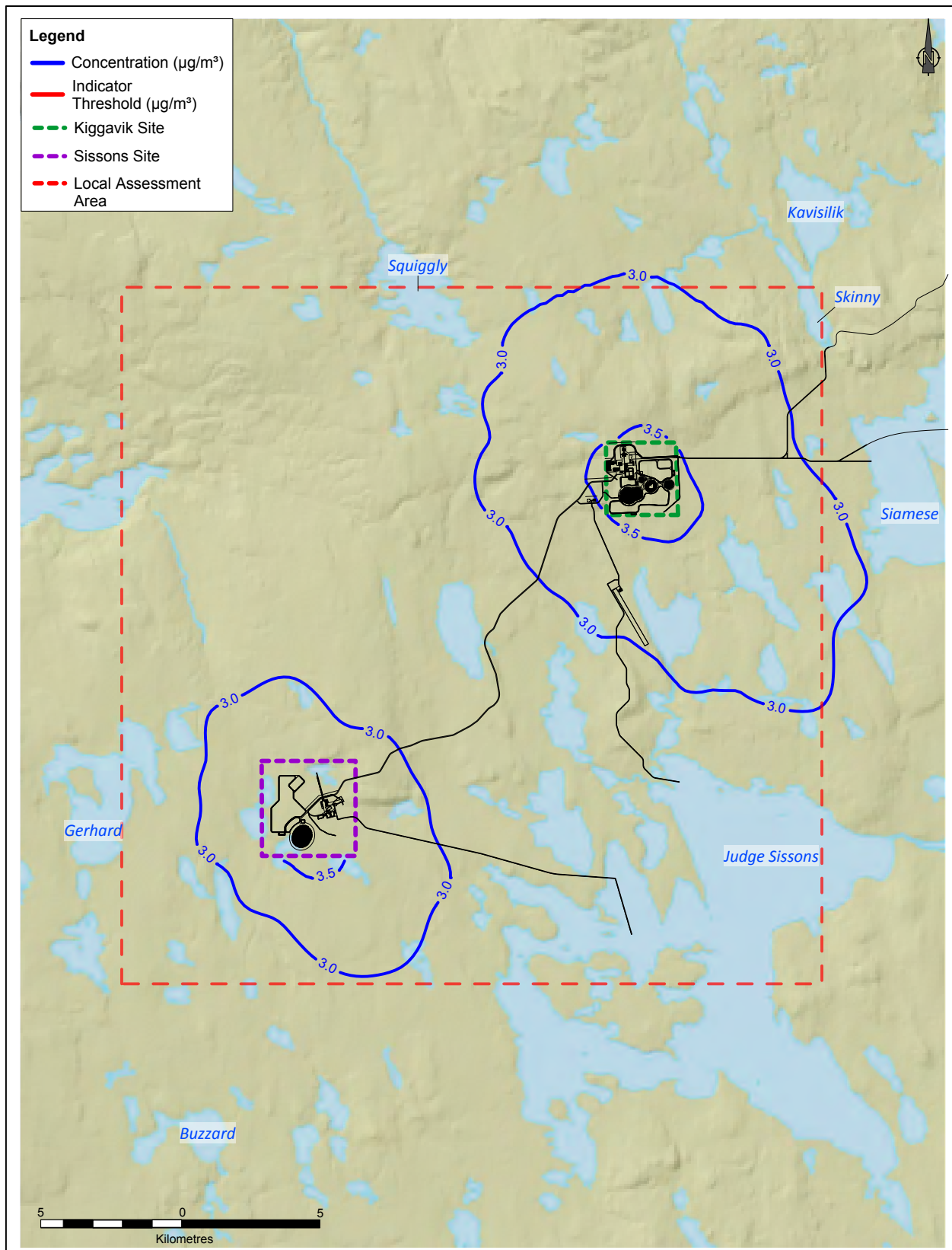
Receptor Name	UTM Coordinates (m)		Annual Concentration (µg/m³)								
	Easting	Northing	TSP	PM ₁₀	PM _{2.5}	Uranium	NO ₂	SO ₂	Radon (Bq/m³)	Pb-210 (Bq/m³)	Po-210 (Bq/m³)
Accommodation Complex	564900	7148433	4.0	2.2	1.1	9.9E-06	6.4	3.0E-02	6.4	8.2E-06	8.2E-06
Community of Baker Lake	644179	7135840	2.9	1.5	0.7	9.9E-06	0.01	0.0E+00	0.01	1.3E-08	1.3E-08
Judge Sissons Lake Cabin	566550	7137729	3.0	1.5	0.7	9.9E-06	0.4	0.0E+00	0.4	4.8E-07	4.8E-07
Background Concentration (µg/m³)			2.9	1.5	0.7	9.9E-06	-	-	-	1.29E-04	5.40E-05
Indicator Threshold (µg/m³)			60	-	8.8	0.03	100	30	60 (Bq/m³)	0.0021 (Bq/m³)	0.0028 (Bq/m³)
NOTES: Concentrations of TSP, PM ₁₀ , PM _{2.5} , Uranium, Pb-210 and Po-210 include background concentrations.											

Table 6.1-16 Predicted Annual Metal Concentrations during Final Closure

Receptor Name	UTM Coordinates (m)		Annual Concentration (µg/m³)									
	Easting	Northing	As	Cd	Cr	Co	Cu	Pb	Mo	Ni	Se	Zn
Accommodation Complex	564900	7148433	1.2E-04	6.0E-05	2.7E-04	5.1E-05	1.5E-02	1.1E-03	2.5E-04	1.7E-04	2.0E-04	4.6E-03
Community of Baker Lake	644179	7135840	1.2E-04	6.0E-05	2.2E-04	4.0E-05	1.5E-02	1.1E-03	2.4E-04	1.5E-04	2.0E-04	4.5E-03
Judge Sissons Lake Cabin	566550	7137729	1.2E-04	6.0E-05	2.2E-04	4.1E-05	1.5E-02	1.1E-03	2.4E-04	1.5E-04	2.0E-04	4.5E-03
Background Concentration (µg/m³)			1.2E-04	6.0E-05	2.2E-04	4.0E-05	1.5E-02	1.1E-03	2.4E-04	1.5E-04	2.0E-04	4.5E-03
Indicator Threshold (µg/m³)			0.06	0.005	0.3	0.02	9.6	0.10	23	0.4	1.9	23
NOTES: Concentrations include background concentrations.												

Table 6.1-17 Predicted Incremental Annual Radon Concentrations during Post-Closure

Receptor Name	UTM Coordinates (m)		Radon (Bq/m³)
	Easting	Northing	Annual Concentration
Accommodation Complex	564900	7148433	1.1E+00
Community of Baker Lake	644179	7135840	3.2E-03
Judge Sissons Lake Cabin	566550	7137729	8.7E-02
Indicator Threshold (Bq/m³)			60



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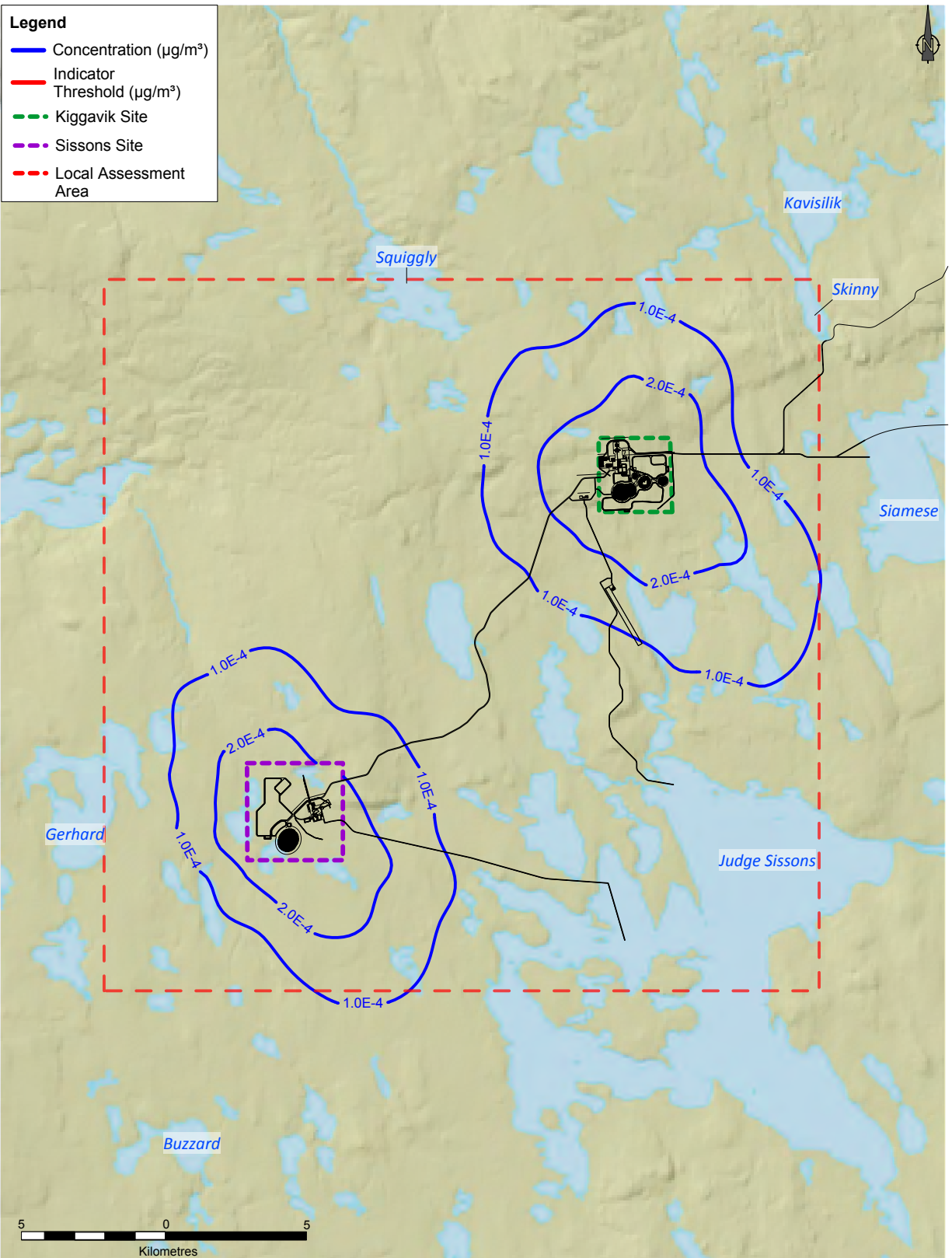
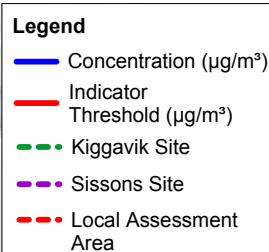
FIGURE 6.1-39

Final Closure Assessment
Annual TSP Concentration ($\mu\text{g}/\text{m}^3$)

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FIGURE 6.1-40

Final Closure Assessment

Annual Uranium (U) Concentration ($\mu\text{g}/\text{m}^3$)

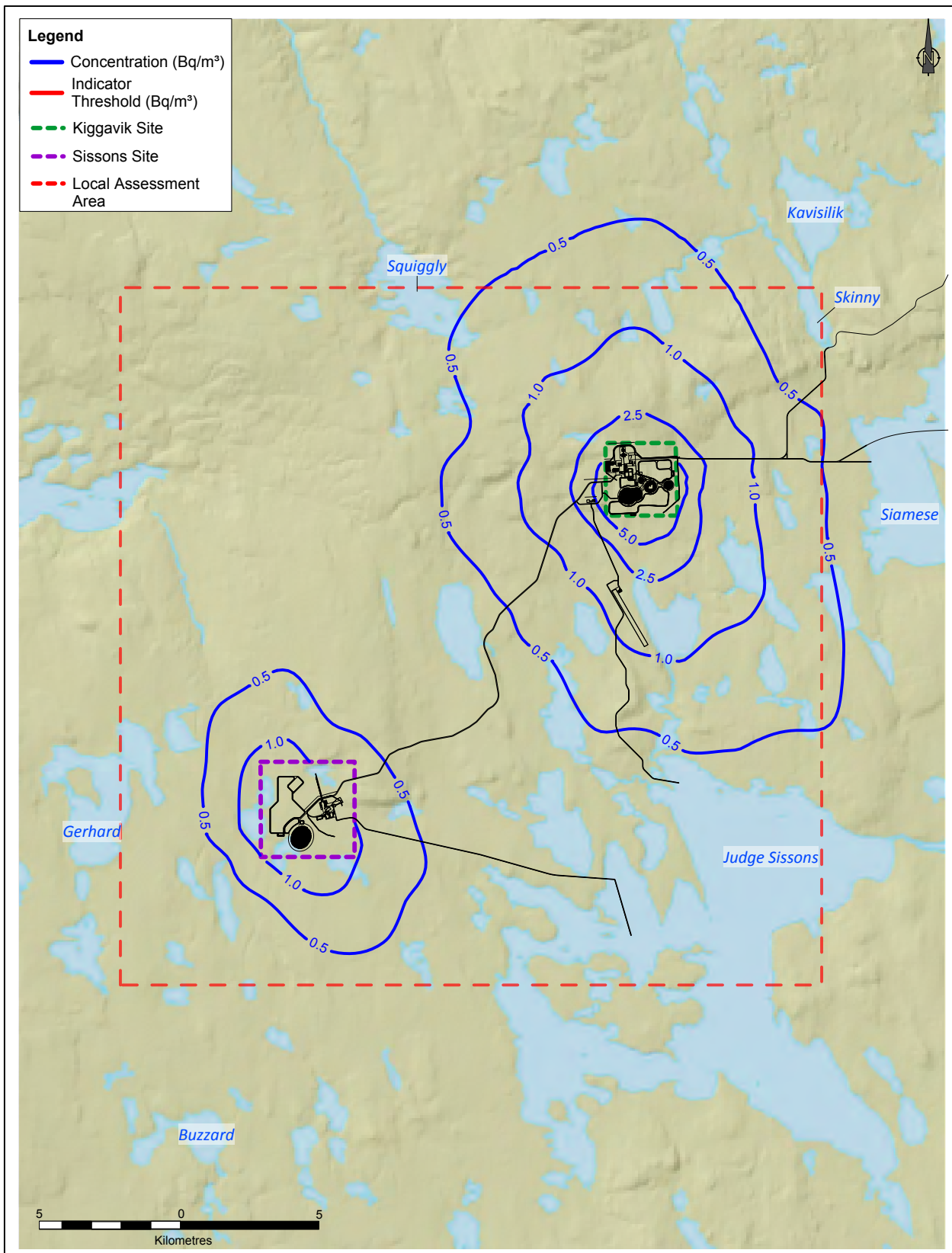
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FIGURE 6.1-41

Final Closure Assessment
Incremental Annual Radon Concentration (Bq/m³)

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