0.3 µg/m^3 respectively are negligible, and less than 0.2 µg/m^3 at the nearest residence east of Unit 5. Therefore, fugitive dust emissions from the Brandon G.S. alone would not be sufficient to account for the high PM_{10} (and by extension, SPM) concentrations that have been measured in Brandon.

Trace Contaminants

As part of the Canada-Wide Standard (CWS) proposed by the Canadian Council of Ministers of the Environment, Manitoba Hydro's mercury stack emissions from Unit 5 would be capped, commencing in the year 2010, at 20 kg/year. Manitoba Hydro has committed to meeting this cap effective immediately, and the dispersion modelling assessment has been conducted on this basis. At this emission rate, the contribution of mercury emissions from Unit 5 to total mercury deposition in the area surrounding Unit 5 represents approximately 2-4% of the total mercury deposition, including all global sources.

For the remaining trace contaminants in the exhaust emissions (i.e., VOCs, as well as trace organics and inorganics), only hydrogen chloride(HCl), hydrogen fluoride (HF), formaldehyde, arsenic, cadmium, copper, lead, nickel, and zinc have established ambient air quality guidelines in Manitoba. The maximum predicted 24-hour average HF concentration is 1.5% of the guideline level. All other constituents are less than 0.1% of the Manitoba guideline values. Comparisons of maximum predicted concentrations for constituents with available air quality criteria from other jurisdictions indicate that all effects are less than or equal to 0.6% of criteria levels, with the exception of the 1-hour average HF concentration at 3.7% of the Alberta objective level. The potential health effects of these emissions are addressed in Appendix N (Human Health and Ecological Risk Assessment) and summarized in Section 5.4.

Greenhouse Gases (GHG)

The maximum potential GHG production from Unit 5 in any given year is 1.04 megatonnes (Mt) (assuming 100% capacity factor). However, on average, emissions will be much lower and in the past 16 years have never exceeded 0.7 Mt CO_2 (For additional details and discussion of GHG management and mitigation refer to Section 5.3.2.4 and Appendix M – Manitoba Hydro 2005 GHG Summary). Since 1990, Unit 5 has contributed less than 0.5% of Canada's total GHG emissions from electricity and heat generation and less than 0.1% of total national emissions.

Cooling Tower Emissions

The potential effect of water vapour and dissolved salt emissions from the cooling tower have a minimal impact on adjacent areas. Fogging or icing were predicted to occur off-site on approximately 1 hour per year, and thus there is only minimal effect on the nearby roads. Assuming that Unit 5 operates 100% of the time, a visible plume from the cooling tower of 500 m in length is predicted to occur up to 175 hours per year, while a plume up to 2 km in length may be visible for up to 88 hours per year. The amount of water and salt that may be deposited from the plume is negligible.

Figure 5-4 Locations of Maximum Predicted Points of Impingement (POI) Due to Unit 5 and Fugitive Dust Emissions

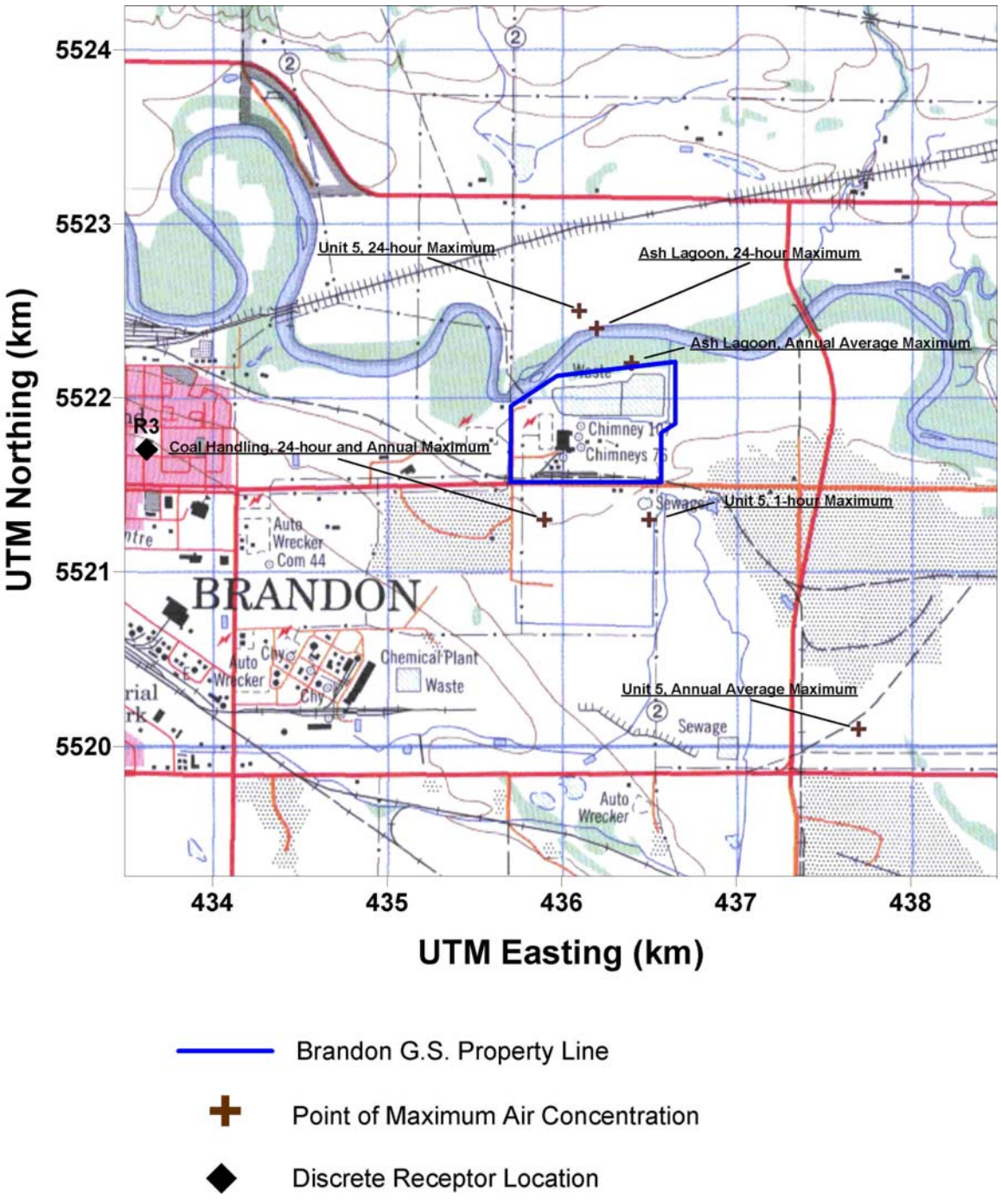

Figure 5-5 Maximum Predicted Incremental 1-hour Average NO_2 Concentrations ($\mu g/m^3$) due to Unit 5 Emissions

(Operating Scenario OS2, 100% Conversion NO to NO_2)

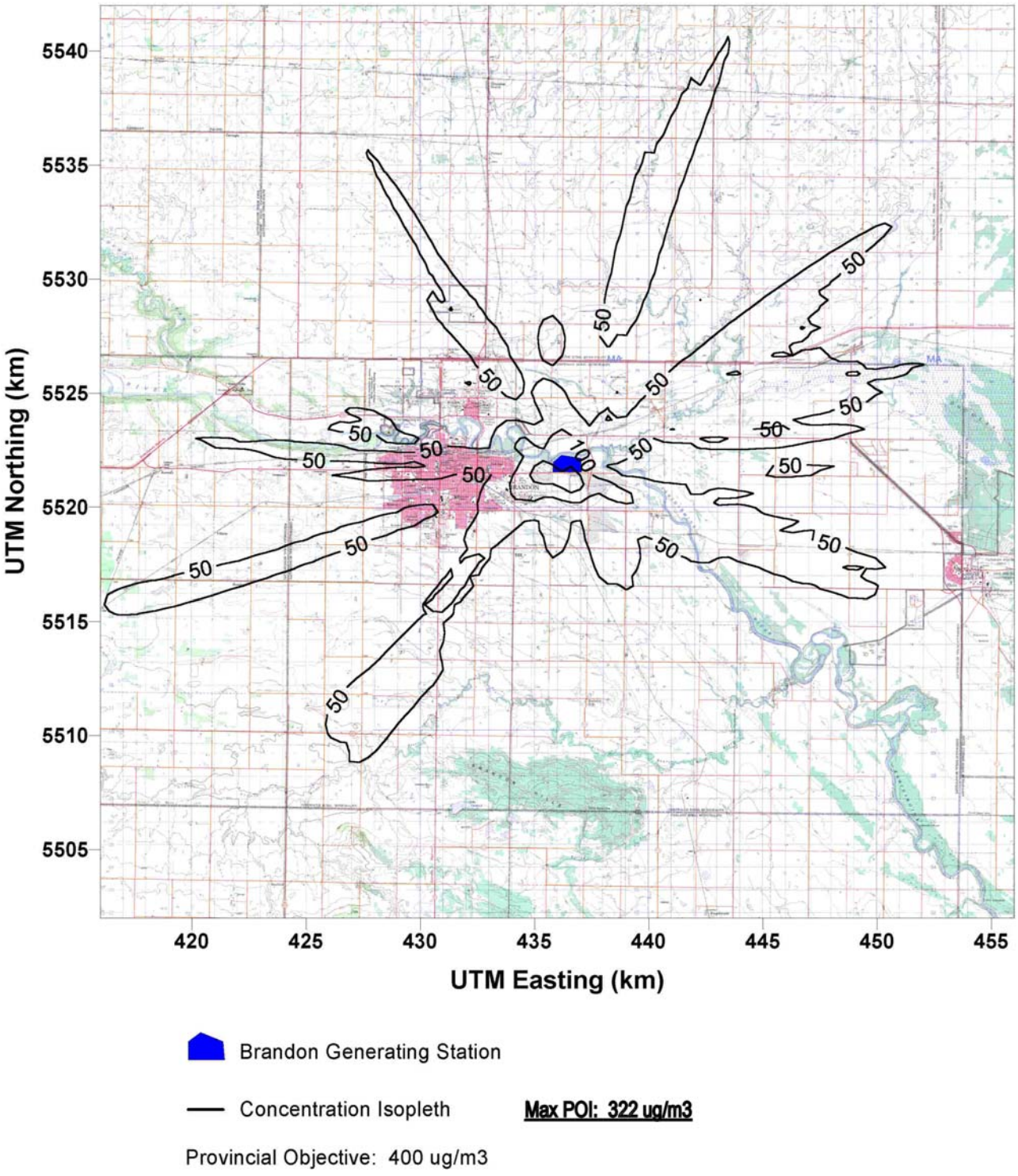

Figure 5-6 Maximum Predicted Incremental 1-hour Average NO_2 Concentrations ($\mu g/m^3$) due to Unit 5 Emissions

(Operating Scenario OS2, Janssen Method)

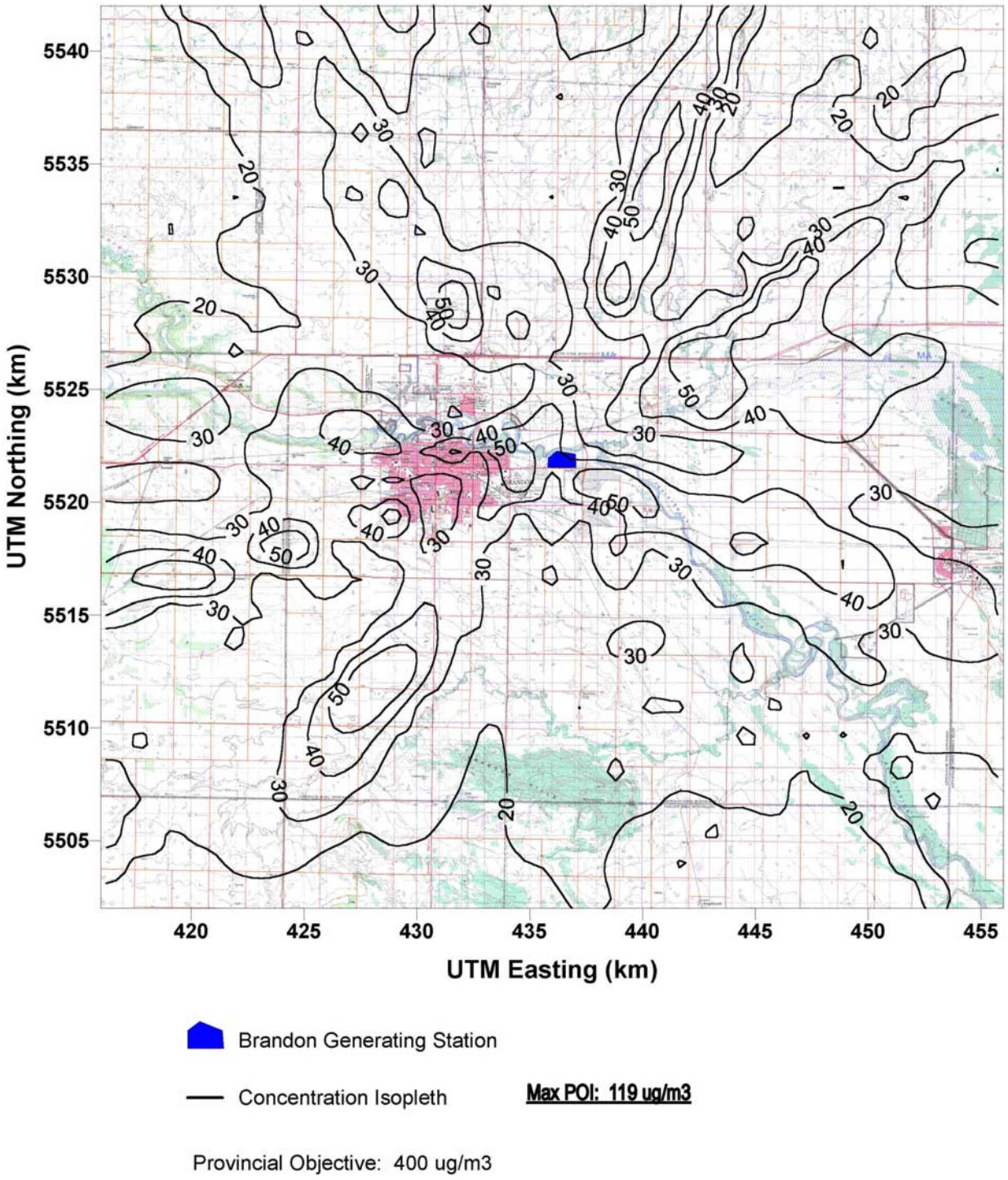

Figure 5-7 Maximum Predicted Incremental 1-hour Average NO_2 Concentrations ($\mu g/m^3$) due to Unit 5 Emissions

(Operating Scenario OS1, 100% Conversion NO to NO_2)

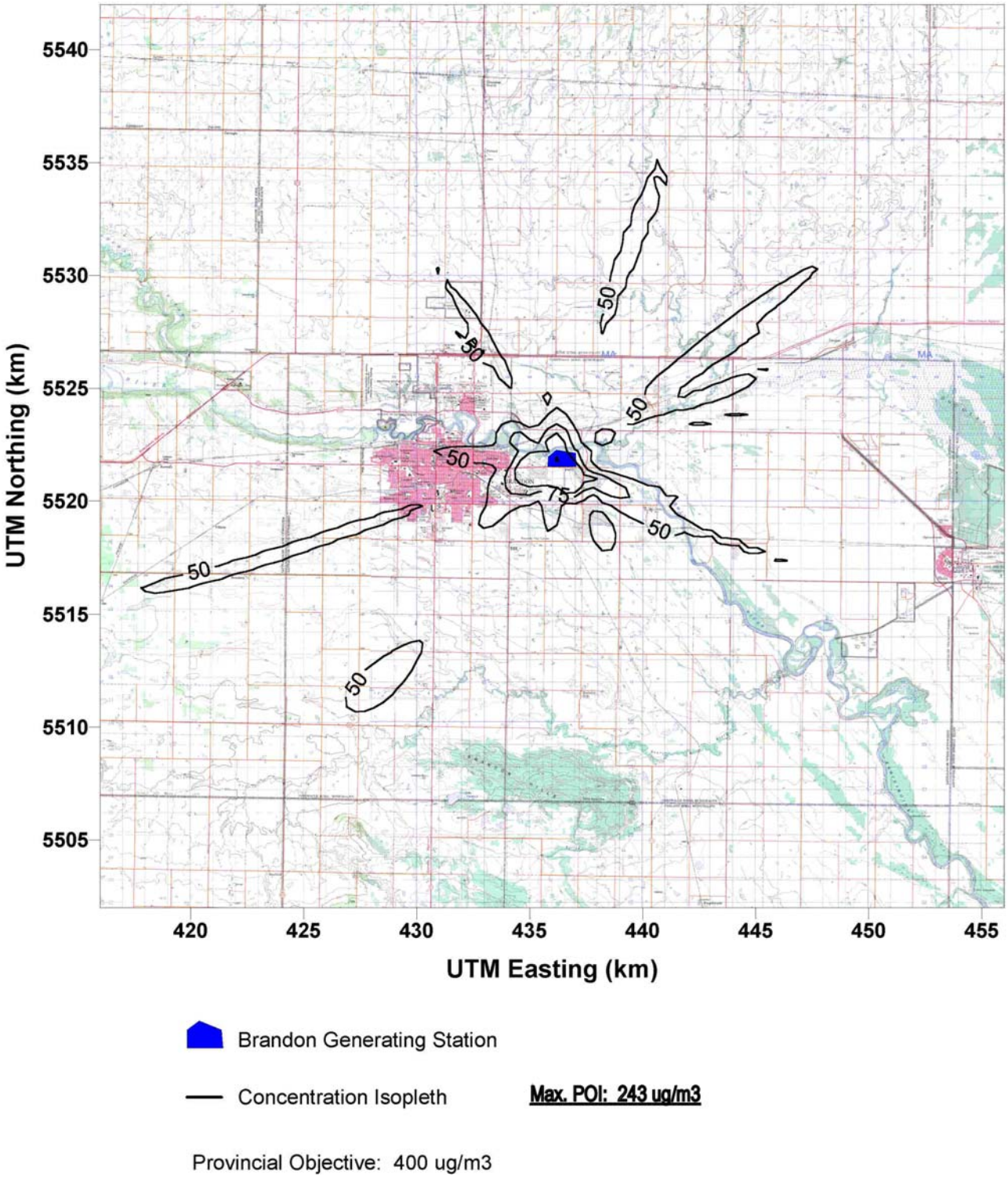

Figure 5-8 Maximum Predicted Incremental 1-hour Average NO_2 Concentrations ($\mu g/m^3$) due to Unit 5 Emissions

(Operating Scenario OS1, Janssen Method)

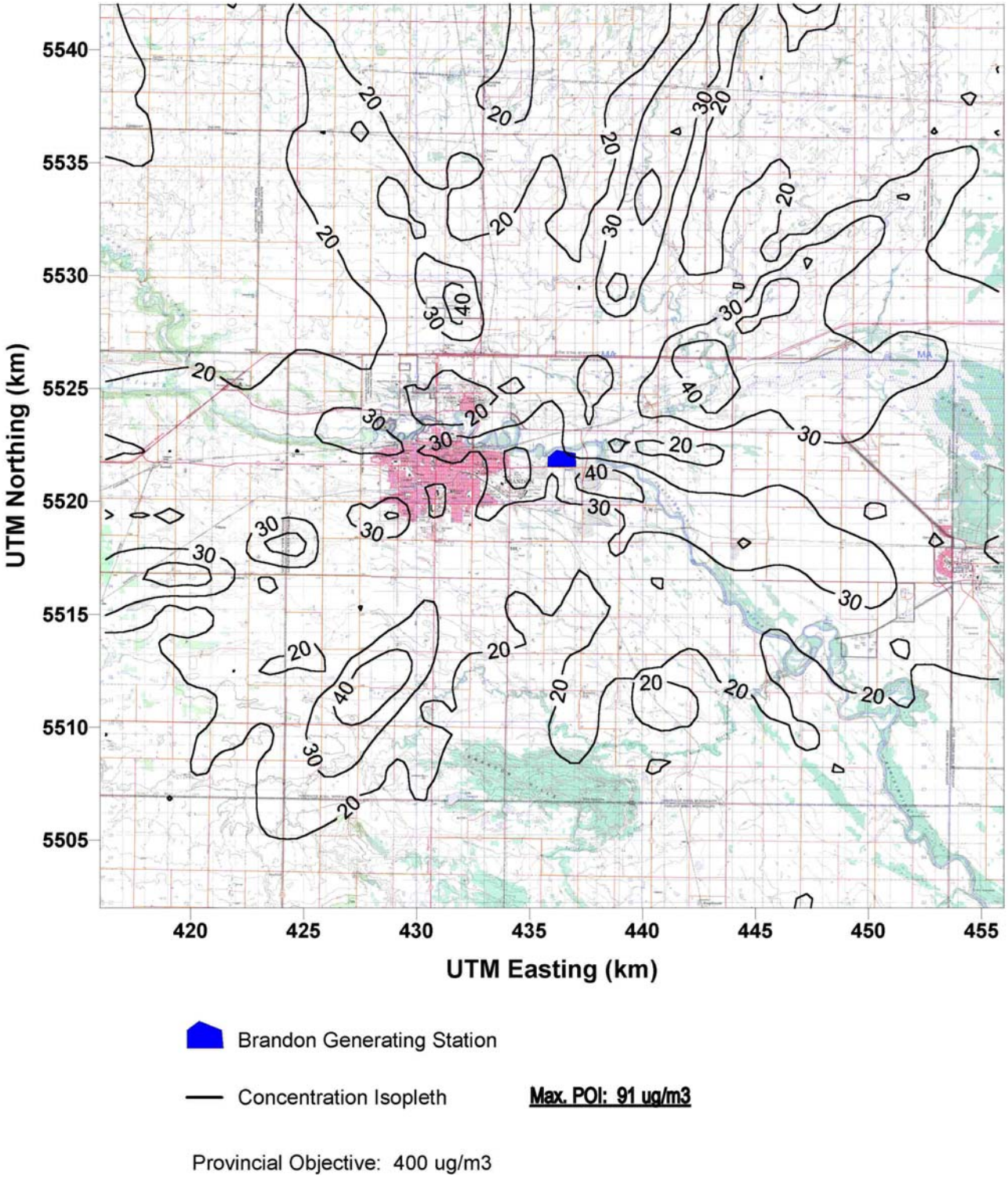

Figure 5-9 Maximum Predicted Incremental 24-hour Average NO_2 Concentrations (µg/m^3) due to Unit 5 Emissions

(Operating Scenario OS2, 100% Conversion NO to NO_2)

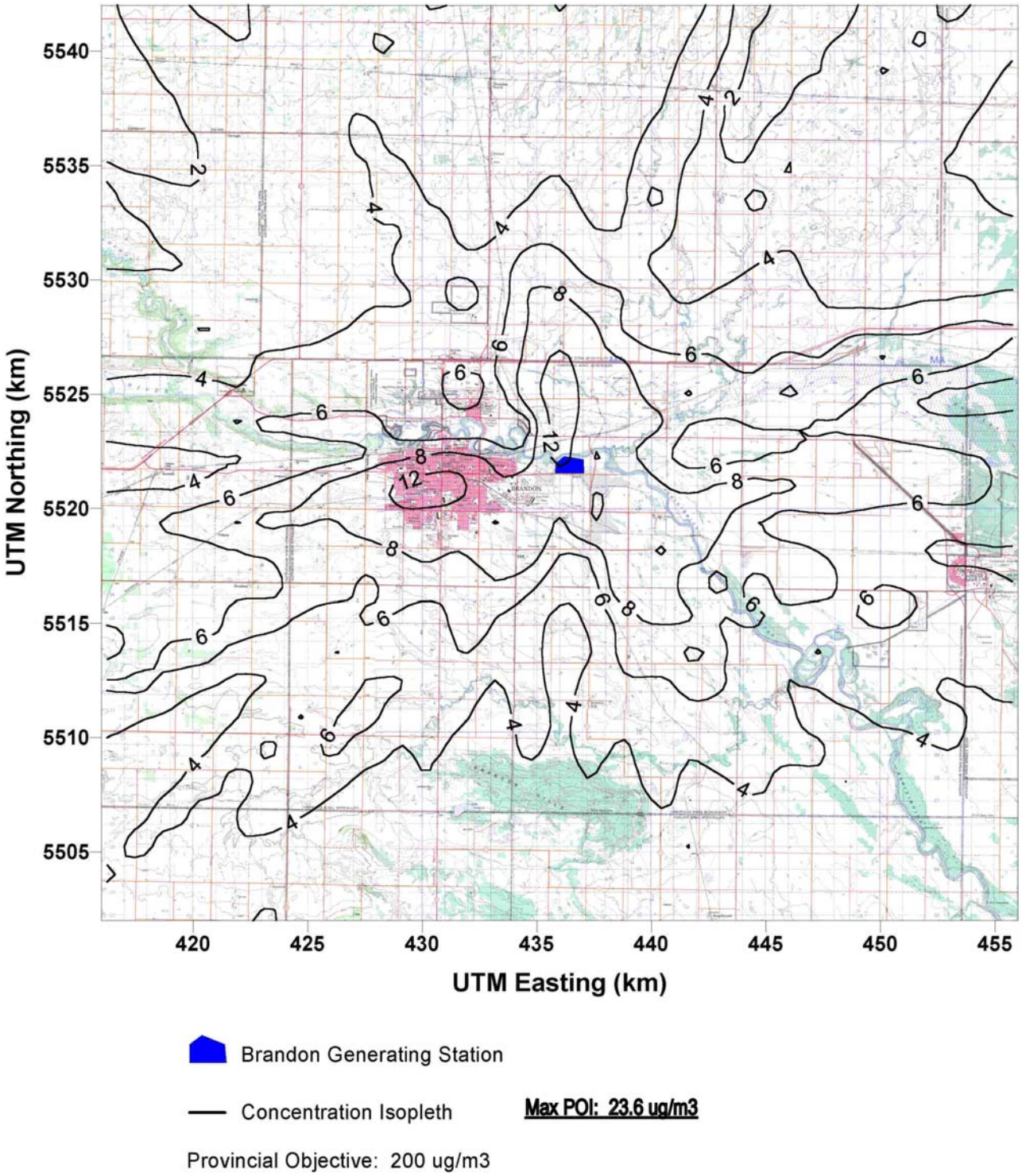

Figure 5-10 Maximum Predicted Incremental 24-hour Average NO_2 Concentrations (µg/m^3) due to Unit 5 Emissions

(Operating Scenario OS2, Janssen Method)

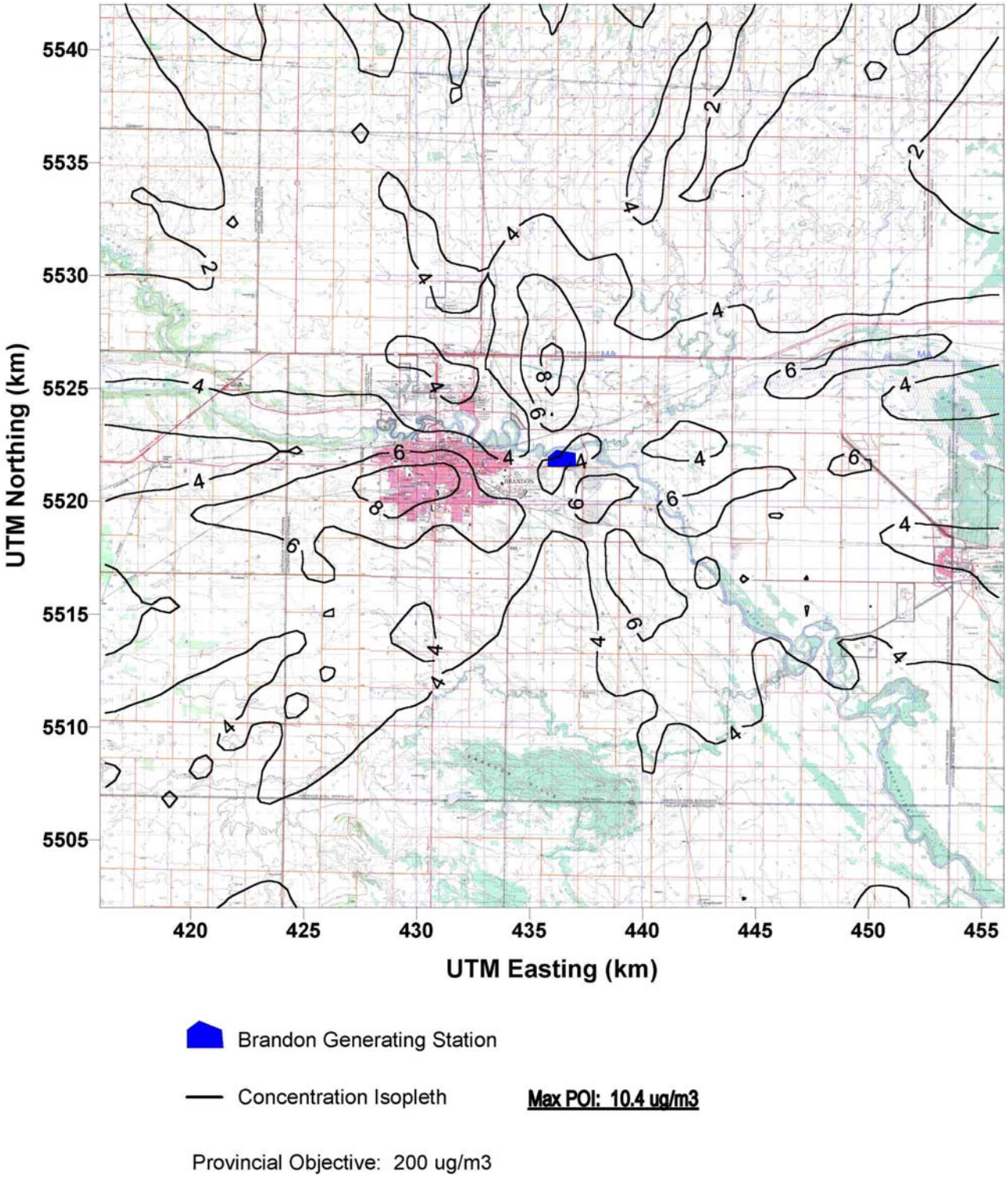

Figure 5-11 Maximum Predicted Incremental 24-hour Average NO_2 Concentrations (µg/m^3) due to Unit 5 Emissions

(Operating Scenario OS1, 100% Conversion NO to NO_2)

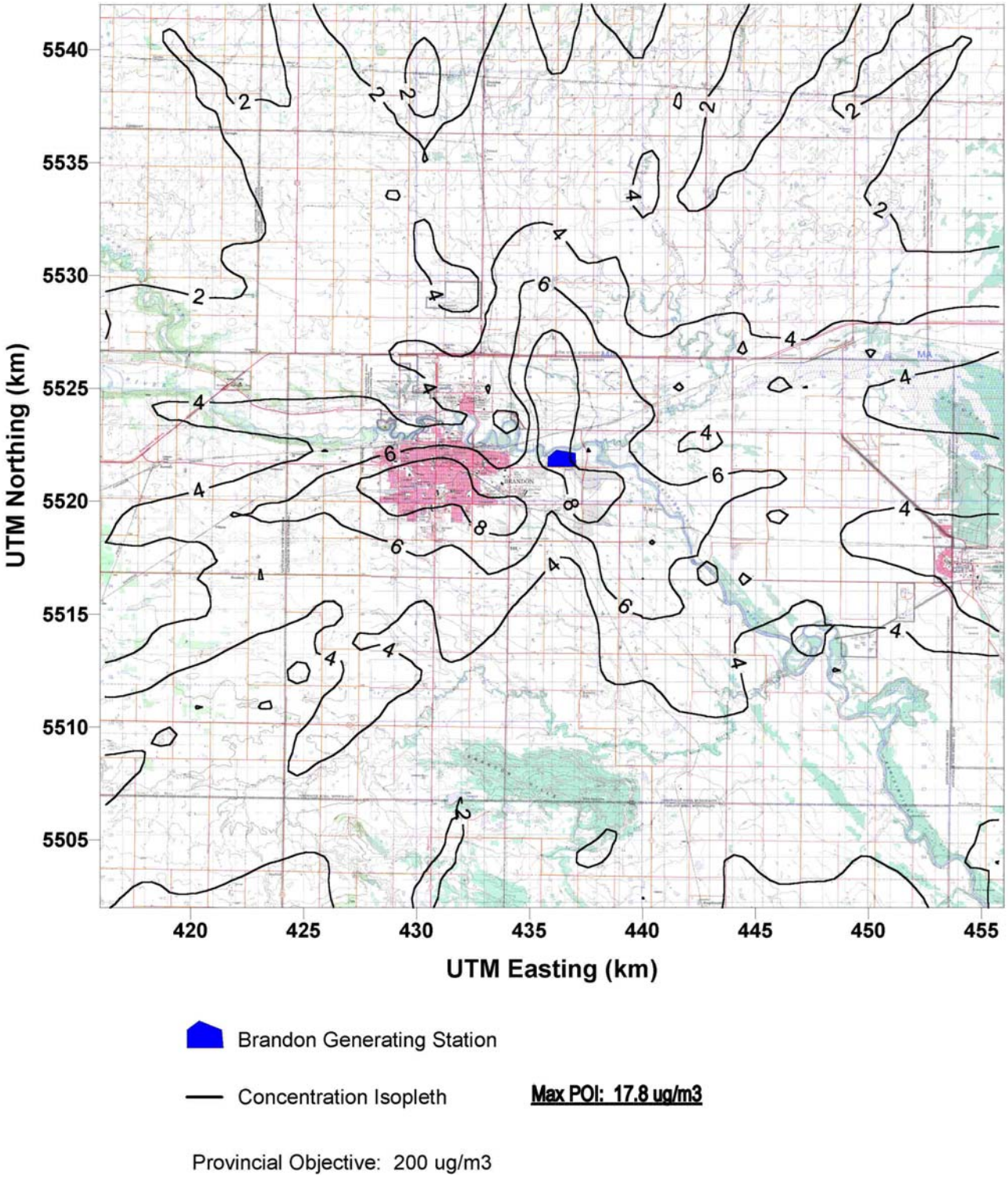

Figure 5-12 Maximum Predicted Incremental 24-hour Average NO_2 Concentrations (µg/m^3) due to Unit 5 Emissions

(Operating Scenario OS1, Janssen Method)

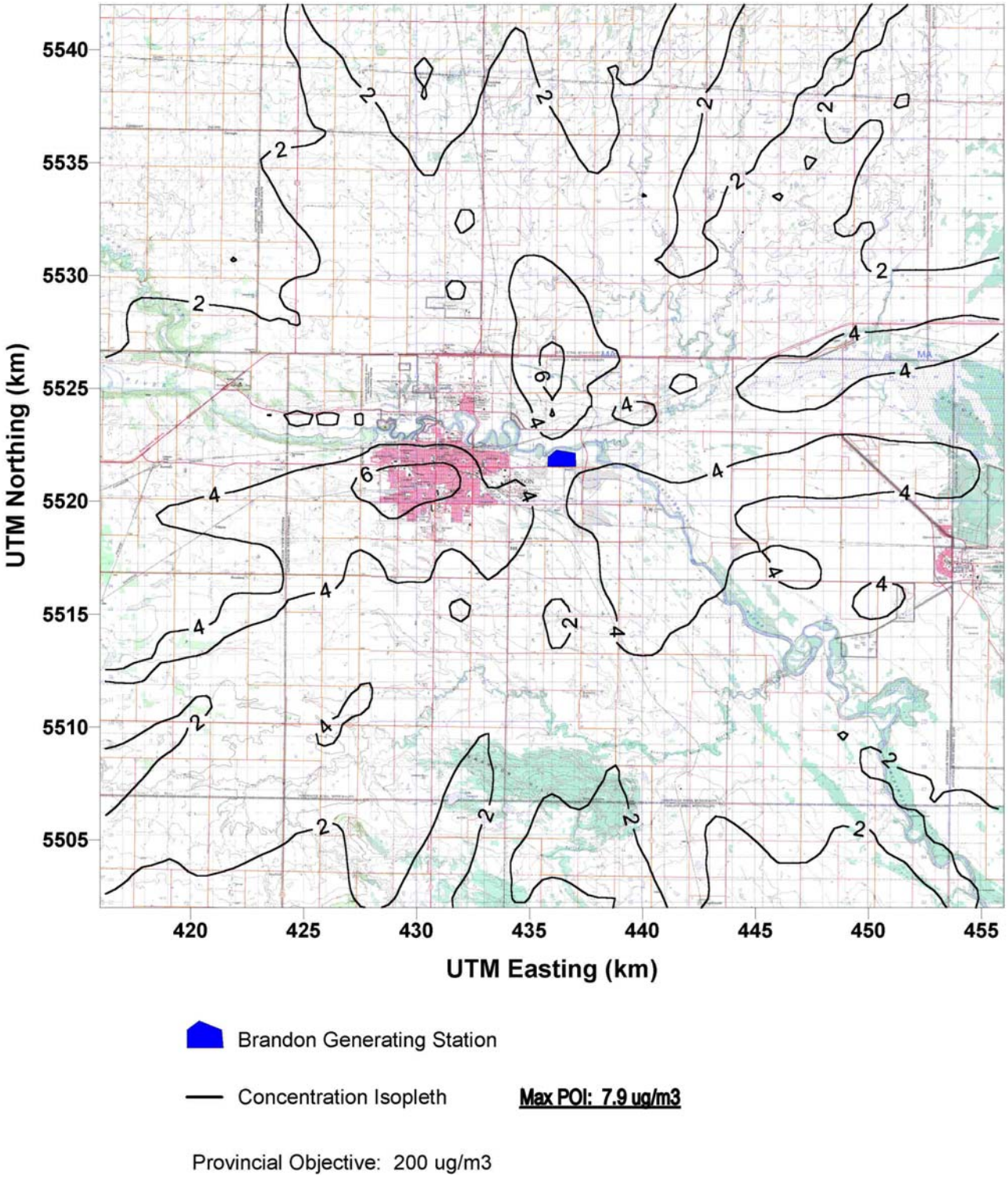

Figure 5-13 Maximum Predicted Incremental 1-hour Average NO_2 Concentrations ($\mu g/m^3$) Due to Combined Emissions from Unit 5 and Units 6&7

(Operating Scenario OS2, 100% Conversion NO to NO_2)