REVISED CUMULATIVE LEVELS AND EFFECTS ANALYSIS

FOR

Abbott Northwestern Hospital

REPORT

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September 2012

Project No. 103-81295

aq5-32a

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EXECUTIVE SUMMARY

This analysis is required by Minnesota Statute § 116.07, Subd 4a and requires that cumulative impacts be considered before the Minnesota Pollution Control Agency can issue a permit. Abbott Northwestern is submitting an air permit application and is located in the geographic area described by the statute. The information presented and discussions in this analysis satisfy the requirements of the statute.

This report, dated September 2012, supersedes the report dated March 2012 and incorporates additional information the MPCA provided.

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Definitions

Abbott	Abbott Northwestern Hospital
AERA	Air Emission Risk Analysis
Air Dispersion Modeling Concentration Analysis	Standalone report discussing ambient air quality modeling
Allina	Allina Health System (parent company that owns Abbott)
Analysis	Cumulative Levels and Effects Analysis
CL&E	Cumulative Levels and Effects
CO	Carbon Monoxide
EPA	United States Environmental Protection Agency
Facility	Abbott Northwestern Hospital and the 10th Avenue Lab Facility
Golder	Golder Associates Inc.
MPCA	Minnesota Pollution Control Agency
MNRiskS	MPCA Risk Assessment Model
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
Process Document	Process Document for Minnesota Statute 116.07 Subd 4a, version 1.0
Reference Document	Reference Document for Minnesota Statute 116.07 Subd 4a, Sept. 2011
SIL	Significant Impact Level
SIR	Significant Impact Radius
Statute	Minnesota Statute 116.07 Subdivision 4a
Study Area	Defined by the Statute as the outer limit which must be considered in the Analysis
TAC	Toxic Air Contaminate
WIMN	What's in My Neighborhood

2.3 Criteria Pollutant Modeling/Air Toxics Modeling AERA Forms

The Analysis requires criteria pollutant modeling and air toxics modeling as well as the completion of the MPCA AERA forms. Although both criteria modeling and air toxics modeling use the same dispersion model, the standards for each process have different purposes. The criteria pollutant concentrations must meet the National Ambient Air Quality Standards (NAAQS), which are set by the U.S. EPA. Compliance with the NAAQS is required by any facility that has an air permit; however typically a compliance demonstration using a dispersion model is not required for non-Title V permits in Minnesota (such as this Facility). Air toxics modeling is conducted to estimate the human risk associated with the air toxics emissions. The estimated risks are calculated based on state guidelines for inhalation toxicity values. There are no federal standards, state air toxics rules, or any other requirements that apply to this situation to conduct such a study. The criteria pollutant and air toxics analyses have been separated in this text since the purposes and related regulatory requirements of the two analyses differ. The differences can be explained partially by the table below.

TABLE 2.3 : DIFFERENCES BETWEEN CRITERIA POLLUTANT AND AIR TOXICS REQUIREMENTS

Criteria pollutants	Air toxics
• Have national and/or state standards	• Have state guidelines
• Enforceable	• Less enforceable
• More confidence in health numbers/more data	• Less confidence in health numbers/less data
• Include PM2.5, NO_2 , PM10, SO_2 , CO, O_3, lead	• Includes non-criteria pollutants

The criteria pollutant modeling analysis is submitted as a separate report. The criteria pollutant modeling analysis shows that the Facility does not cause or contribute to an exceedance of the NAAQS and therefore is protective of human health and welfare. A summary of these modeled concentrations is discussed in Section 3.1.

The air toxics analysis follows the AERA process established by the MPCA. The AERA process is typically only required for a facility that emits greater than 250 tpy of criteria pollutants and some other specific categories such as coal fired power plants.

The AERA process involves completing a series of MPCA forms. These forms are included in Appendix B. A more detailed discussion of the AERA analysis is in Section 3.2.

2.4 CL&E Scoping

The size of the Study Area considered in the Analysis is defined by the air modeling results. The Study Area is the larger of the following areas:

acute risk, the hazard index would be below 10% of the threshold and no further analysis would be required. In addition, NO_2 modeled concentrations show compliance with the NAAQS and are therefore protective of human health.

Because the total acute risk hazard index is less than 1.0, the acute impacts from this Facility are protective of human health. Additionally, the Facility meets the federal 1-hr NO_2 NAAQS, which suggests that the emission of NO_2 is protective of human health. See the Air Dispersion Modeling Concentration Analysis for details on NAAQS modeling.

3.4 Quantitative Discussion on Facility Contribution to Background

Section 3.1 states that the modeled impacts from NO_2 and PM2.5 exceed the screening levels identified in the Process Document.

NAAQS are established by the EPA to protect human health (primary standards) and the environment (secondary standards). The results from the analysis are presented in Table 3.4A.

Aggregate exposures below a HI of 1.0 will likely not result in adverse noncancer health effects over a lifetime of exposure. However, an HI greater than 1.0 does not necessarily suggest a likelihood of adverse effects. Furthermore, the HI cannot be translated to a probability that adverse effects will occur, and is not likely to be proportional to risk. A respiratory HI greater than 1.0 can be best described as indicating that a potential may exist for adverse irritation to the respiratory system.

An elevated acute hazard index can affect the olfactory/respiratory health endpoint and contribute to asthma episodes. The olfactory/respiratory health endpoint and asthma are further discussed in Section 4.3.6.4.

Emissions from motor vehicles are more likely to have a greater contribution to the nitrogen dioxide concentrations than point sources such as those at the Facility. Because the Study Area is near several heavily traveled roads, including Interstate 35W, Lake Street, and Chicago Avenue, acute risk from nitrogen dioxide is expected to be elevated when compared to a location in a rural area.

The changes proposed to the Facility will not significantly affect traffic density in the area. The switching of fuel in GP001 boilers will not affect traffic density because it is not creating significant number of new jobs. The expansion of the laboratory will employ approximately 400 people, however the vast majority of those jobs already existed in labs at the Hospital and are simply being relocated to the new location. Therefore, there is a net increase of approximately 19 jobs due to the proposed changes. Assuming that all of the new jobs will commute to work in their own vehicles, this will result in an increase of no more than 19 vehicles per day. Table 4.3 and Figure 4.3 show measured traffic densities near the study area in 2005.

Minneapolis City ordinance (Title 3 Article 1) specifies that vehicles may not idle for more than 5 minutes in any 60 minute period except for a 30 minute period if the vehicle is waiting to load or unload. There are some instances when vehicles are exempt from this ordinance such as during cold weather to operate heaters to prevent a safety or health emergency. The Facility accepts numerous deliveries by truck and is subject to this ordinance. It is unlikely that delivery trucks would exceed times specified in this ordinance; however in certain weather situations it is possible.