

HALTON REGION HEALTH DEPARTMENT
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July 27, 2007

Mr. Ken Wong, Review Engineer
Environment Assessment and Approvals Branch of
The Ministry of the Environment
2 St. Clair Street West, Floor 12A
Toronto, Ontario, M4V 1L5

Dear Mr. Wong:

Re: Supporting Documentation for an application for Amendment to a Consolidated Certificate of Approval (Air) Roxul Inc. Tor-3 Plant Expansion in Town of Milton (Reference Number 9553-726JGC & 9093-725 RWM)

Thank you for the opportunity to submit comments for the Amendment to the Consolidated Certificate of Approval (Air) for Roxul Inc. We understand that the opportunity to submit formal comments has passed, however we wish to submit our concerns for your consideration.

Introduction

The Halton Region Health Department has reviewed three documents related to the Certificate of Approval:

- SENES Consultants Limited. Supporting Documentation for an application for Amendment to a Consolidated Certificate of Approval (Air) (March 2007);
- SENES Consultants Limited. (June 28, 2007), Memo to the Health Department re: Roxul Inc. Plant Expansion – Health Risk Assessment; and
- SENES Consultants Limited. (July 11, 2007), Memo to the Health Department re: Roxul Inc. Plant Expansion – Frequency Analysis and Annual concentration of PM_{2.5} and SO₂.

The Supporting Documentation for an application for Amendment to a Consolidated Certificate of Approval (March 2007) predicted air levels for ammonia, carbon monoxide, formaldehyde, hydrogen sulphide, nitrogen oxides, particulate matter, phenol and sulphur dioxide from the Roxul facility after the expansion of the plant. After reviewing the document, the Health Department requested additional information from the proponent related to the air levels predicted for sulphur dioxide (SO₂) and fine particulate matter (PM_{2.5}).

Air Levels of Fine Particulate Matter (PM_{2.5}) – Roxul with Expansion

The June 2007 memo, which provided more accurate estimates of SO₂ and PM_{2.5} using less conservative assumptions, reported that the Roxul facility could produce air levels of PM_{2.5} as

high as $10.6 \mu\text{g}/\text{m}^3$ in one neighbourhood in Milton on occasion. When this predicted air level is added to the estimated background air level, a maximum cumulative air level of $27.3 \mu\text{g}/\text{m}^3$ is estimated for one neighbourhood in north Milton. Because this air level exceeds the 24-hour WHO guideline for $\text{PM}_{2.5}$ of $25 \mu\text{g}/\text{m}^3$, the Health Department asked Roxul to conduct a frequency analysis to determine how frequently higher levels of $\text{PM}_{2.5}$ are expected to occur.

The July 2007 memo provided a frequency analysis for both $\text{PM}_{2.5}$ and SO_2 . The frequency analysis indicated that the plant can be an important contributor of $\text{PM}_{2.5}$. The air levels predicted for the plant were elevated, but none exceeded the WHO 24-hour guideline of $25 \mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$. When these air levels were added to the background air levels estimated for $\text{PM}_{2.5}$ however, using the 90th percentile reading, the WHO 24-hour guideline was exceeded at one site about 1% of the time. Air levels of $\text{PM}_{2.5}$ are therefore of some concern to the Health Department, especially as future development and increases in traffic further burden this airshed. However, of greater concern to the Health Department are the air levels of SO_2 associated with the plant.

Air Levels of Sulphur Dioxide (SO_2) – Roxul with Expansion

Roxul Inc. is a significant emitter of sulphur dioxide. According to the National Pollutant Release Inventory (NPRI) maintained by Environment Canada, the Roxul plant in Milton emitted approximately 365 tonnes of sulphur dioxide in 2006.

Table 1 below provides a picture of the maximum contribution of the Roxul plant to air levels of SO_2 in Milton under current operating condition, and compares them against the contribution of the expansion alone, and then with the existing and expansion air levels combined. It also includes estimates of the cumulative impacts of these air levels when added to estimated background air levels.

While the plant will be tripling its production capacity with the expansion, the air emissions will not be tripled. However, the Table does indicate that the expansion could substantially increase air levels of SO_2 in the community under certain meteorological conditions, and that it will increase the number of people impacted by air levels that exceed the WHO guideline under those conditions.

Table 1: Maximum 24-Hour Air Levels of Sulphur Dioxide (SO₂), Cumulative Concentrations, Normal Operating Scenario (µg/m³)

Receptor ID	Maximum Predicted 24-Hour SO ₂ µg/m ³			Average 90 th Percentile Background µg/m ³	Maximum Current Facility & Background µg/m ³	Maximum Expansion Only & Background µg/m ³	Maximum Combined Plant & Background µg/m ³	WHO 24-hour µg/m ³
	Current Facility Only	Plant Expansion Only	Combined					
R1	15.1	10.5	22.3	12.9	27.0	23.4	35.2	20 Interim (125)
R2	5.5	5.9	7.5		18.4	18.8	20.4	
R3	23.2	9.5	27.2		36.1	22.4	40.1	
R4	10.2	7.4	15.5		23.1	20.3	28.4	
R5	7.3	5.5	11.7		20.2	28.4	24.6	
R6	8.6	5.5	14.1		21.5	28.4	27.0	

Notes: 1. Numbers in bold approach or exceed the WHO.

2. Data in Table 1 compiled from Senes June 28th (Table 6) and July 11/07 (Table 1) reports + background levels

While the air levels of SO₂ predicted for Roxul alone after the expansion are all well below the Ministry of the Environment (MOE) criterion of 265 µg/m³, the frequency analysis demonstrates that the Roxul facility will produce air levels of SO₂ that exceed the World Health Organization's (WHO) 24-hour guideline in two locations in Milton. In one of these locations, the WHO guideline could be exceeded 2% of the time (i.e., about 7 seven days each year) (see Table 2 below).

Table 2: 24-Hour Air Levels of Sulphur Dioxide (SO₂), Estimated for Roxul Plant with Expansion under Normal Operating Scenarios (µg/m³)

Receptor ID	Maximum SO ₂ µg/m ³	SO ₂ Concentrations Roxul Plant Alone									WHO 24-hour µg/m ³	Average 90 th Percentile Back-ground µg/m ³
		Percentile Readings µg/m ³										
		99 th	98 th	95 th	90 th	80 th	70 th	50 th	30 th	10 th		
R1	22.3	16.0	14.4	11.2	8.8	5.0	3.0	0.7	0.3	0.3	20 Interim (125)	12.9*
R2	7.5	3.6	3.0	2.2	1.3	0.4	0.1	0.03	0.01	0.01		
R3	27.2	22.3	20.4	16.3	12.4	7.0	3.5	0.8	0.3	0.3		
R4	15.5	11.9	10.6	7.1	4.8	2.3	1.1	0.3	0.1	0.1		
R5	11.7	7.3	5.9	4.3	2.5	0.8	0.2	0.1	0.05	0.05		
R6	14.1	5.4	4.4	3.1	2.3	2.3	0.8	0.1	0.1	0.1		

Note: 1. Numbers in bold exceed the WHO guideline

2. Data in Table 2 compiled from Senes Consultants Limited July 2007 report

When the air levels predicted for Roxul after the expansion are added to the background air levels estimated for the community, air levels of SO₂ exceed the WHO guideline in almost all six locations in Milton, with those exceedances occurring almost 20% of the time (i.e. about 73 days per year) in one location (see Table 3). It is important to note however, that Roxul's contribution

to those cumulative air levels is not insignificant. At receptor 3 for example, where it appears that air levels of SO₂ could exceed the WHO guideline almost 20% of the time, the Roxul plant could be responsible for 35% of the SO₂ in the air (see Table 3). In this situation, the background air levels have been estimated by the consultant (SENES) using the average of the 90th percentile reading from the four MOE monitoring stations located in Oakville, Burlington, Guelph and Mississauga. In other words, the background air levels in this particular location could be higher or lower than the estimates provided.

World Health Organization (WHO) Guideline

The Health Department compared the air levels of SO₂ against the WHO 24-hour guideline because the WHO guideline reflects the current health literature related to SO₂. The WHO guideline was updated on the basis of a few new epidemiological studies: a study in China which demonstrated a substantial reduction in childhood respiratory disease and premature deaths among all ages within a very short period of time after sulphur levels in fuels were reduced (Hedley et al., 2002; WHO, 2005); a time-series study conducted in Hong Kong and London in which the researchers were unable to demonstrate a threshold effect within the range of 4 and 40 µg/m³ (Wong et al, 2002; WHO, 2005); and a Canadian study which found an association between daily air levels of SO₂ and daily mortality in 12 Canadian cities when the air levels in those cities averaged only 5 µg/m³ (Burnett et al, 2004)(WHO, 2005). Overall, health effects caused by exposure to high levels of SO₂ include breathing problems, respiratory illness, and the worsening of respiratory and cardiovascular disease. People with asthma, chronic lung disease or heart disease are the most sensitive to SO₂ (MOE, 2006)

Table 3: 24-Hour Sulphur Dioxide (SO₂) (µg/m³), Cumulative Concentrations, Normal Operating Scenario (µg/m³)

Receptor ID	Maximum SO ₂ Cumulative	SO ₂ Concentrations Background plus Roxul Percentile Readings									WHO 24-hour µg/m ³	Average 90 th Percentile Back-ground µg/m ³
		99 th	98 th	95 th	90 th	80 th	70 th	50 th	30 th	10 th		
R1	35.3	28.9	27.3	24.1	23.7	17.9	15.9	13.6	13.2	13.2	20 Interim (125)	12.9
R2	19.7	16.5	15.9	15.1	14.2	13.3	13.0	12.93	12.9	12.9		
R3	40.1	35.2	33.3	29.2	25.2	19.9	16.4	13.7	13.2	13.2		
R4	28.4	24.8	23.5	20.0	17.7	15.2	14.0	13.2	13.0	13.0		
R5	24.6	20.2	18.8	17.2	15.4	13.7	13.1	13.0	12.9	12.9		
R6	27.0	18.3	17.3	16.2	15.2	15.2	13.7	13.0	13.0	13.0		

Note: 1. Numbers in bold approach or exceed the WHO.

2. Data in table 3 compiled from Senes June 2007 (Table 6) and July 2007 (Table 1) + average 90th %-ile background level

Conclusion

The Roxul facility has a significant impact on air quality in northern Milton. It is currently a significant contributor of air emissions in the community. In addition to further contributing to the air levels of PM_{2.5}, the expansion of the plant is likely to produce air levels of SO₂ that exceed the health-based guideline established by the WHO. When the plant's contribution is

added to the estimated background levels of SO₂ in the community, it is expected that air levels of SO₂ will exceed the WHO guideline in at least one neighbourhood in Milton about 20% of the time. This is a cause for concern for the Halton Region Health Department.

We ask the MOE consider placing conditions on the Certificate of Approval that would:

- Require the company to directly monitor its impact on air quality in the community with one or more monitoring devices located on the property boundary to clarify the actual levels of air pollutants in the vicinity; and
- Establish a community advisory committee to identify ways in which the facility's impact on air quality might be reduced and/or off-set over time.

The Halton Region Health Department's comments are respectfully submitted for your consideration for Roxul Inc.'s application for amendment to a Consolidated Certificate of Approval. Questions about these comments should be directed to Kim Perrotta, Senior Policy Analyst, at 905-825-6000 ext. 7943 or Jacinth Miller, Environmental Health Specialist, at extension 7811.

Sincerely,

Robert M. Nosal, MD, FRCPC
Commissioner and Medical Officer of Health

Copy to: Brent Jorgensen, Vice President, Operations, Roxul Inc.
Jack Silva, Factory Manager Roxul Inc.
A. Raymond, Planner, Town of Milton
Anne Gariscsak, Planning Technician, Planning and Public Works, Halton Region

Sources:

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2. Hedley, A.J. et al. (2002) Cardiorespiratory and all-cause mortality after restrictions on sulphur content of fuel in Hong Kong: an intervention study. *Lancet*, **360**: 1646-1652 (Abstract)
3. Ontario Ministry of the Environment, (MOE) (2006). Air Quality in Ontario 2005 Report.
4. SENES Consultants Limited. (March 2007) Supporting Documentation for an application for Amendment to a Consolidated Certificate of Approval (Air).
5. SENES Consultants Limited. (June 28, 2007), Memo to health department re: Roxul Inc. Plant Expansion – Health Risk Assessment; and

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7. World Health Organization (WHO) (2005). *WHO air quality guidelines update 2005: Report on a working group meeting*. Bonn Germany October 18-20, 2005.
8. Wong C. M. et al, A tale of two cities; effects of air pollution on hospital admissions in Hong Kong and London compared. *Environmental Health Perspectives*. **110**: 67-77 (2002).