

**MEMORANDUM**

TO: Mr. Ron Rich

FROM: Robert S. Evans II  
Excelsior Energy Inc.

RE: Flare Design Information  
MEP I/II Air Permit Application  
OAH Docket No. 12-2500-17512-2  
MPUC Docket No. E-6472/GS-06-668

DATE: February 13, 2008

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Dear Mr. Rich:

During the Power Plant Siting Act contested case hearings on January 29, 2008 you expressed special interest in matters related to flare operations, specifically "...where [Excelsior] get[s] a number of 99 percent reduction<sup>1</sup>" for carbon monoxide destruction efficiency. Through Fluor, Excelsior has contacted John Zink Company LLC – the flare vendor – and requested that the company provide its assurance that a properly designed flare combusting syngas (with the expected characteristics provided in Table 2.6-3 of Excelsior's application for a Part 70/New Source Review Construction Authorization Permit, [the "Air Permit Application"]) could operate with a 99 percent destruction efficiency. The attached letter from Mr. Robert Schwartz of John Zink to Mr. John Ruud of Fluor Enterprises provides such assurance.

The one-hour and eight-hour average carbon monoxide emissions identified in Appendix A, Exhibit A-4 of the Air Permit Application reflect the 99 percent destruction efficiency and have been used in Excelsior's near-field ambient air quality modeling study (see page 135, Table 7.2-3 in the Air Permit Application). The modeled impacts of flare emissions on ambient carbon monoxide concentrations at the West Range Site and the comparison of such impacts to the ambient air quality standards are provided in the Air Permit Application on page 153, Table 7.7-1 (by mistake, the row showing the modeled 8-hour average ambient carbon monoxide concentration was left out of Table 7.7-1; for this averaging period, the highest predicted concentration of carbon monoxide<sup>2</sup> due to operation of Mesaba One and Mesaba Two is 329  $\mu\text{g}/\text{m}^3$ , the background concentration is 3,000  $\mu\text{g}/\text{m}^3$ ; the total impact is 3,329  $\mu\text{g}/\text{m}^3$ , and the ambient air quality standard is 10,000  $\mu\text{g}/\text{m}^3$ ). The results show that even assuming a very conservative background concentration (i.e., ambient carbon monoxide concentrations monitored at urban locations in Minneapolis/St. Paul), the predicted ambient carbon monoxide concentrations are significantly below the corresponding ambient air quality standards.

We hope this information addresses your question and concerns.

Sincerely,



Bob Evans  
V.P. Environmental Affairs

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<sup>1</sup> Mesaba Energy Project, OAH Docket No. 12-2500-17512-2, MPUC Docket No. E-6472/GS-06-668, Contested Case Hearings, Transcript of Public Hearings, Volume I, page 53, line 21.

<sup>2</sup> The highest second high concentration at any point in the modeling domain is the concentration used for assessing compliance with ambient air quality standards.

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Tulsa, Oklahoma 74121-1220  
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February 13, 2008

Fluor Corporation  
3 Polaris Way  
Aliso Viejo, CA 92698

Re: Excelsior Energy, Inc. Flare Performance

Attn: Mr. John Ruud, Director, Process Engineering

Dear Mr. Ruud:

I am Robert Schwartz, a Senior Technical Specialist with John Zink Company, LLC, a supplier of flare equipment. A prime focus of my work for the past 41 years has been the design and performance of flares and flare systems. I have been asked to opine on the projected performance of flares serving the proposed Excelsior integrated gasification combined cycle (IGCC) power plant.

I have been provided with information regarding the flares to be utilized on the Excelsior project including Table 2.6-3 of the project air quality permit application which sets forth the ranges of composition of the flared gas. The most prominent component gases are hydrogen, carbon monoxide, and carbon dioxide.

Based on my understanding of the flared gas stream, the John Zink flare burner to be utilized and my experience with flare performance, it is my opinion that the flaring efficiency (destruction of carbon monoxide and other waste gas constituents) will be 99% or greater.

Sincerely yours,



Robert Schwartz  
Senior Technical Specialist  
John Zink Company, LLC