

1 **mncoalgasplant.com**

2 **BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION**

3
4 **REBUTTAL TESTIMONY OF EDWIN (ED) ANDERSON, M.D.**

5
6 **Q: Please state your name, occupation, and business address.**

7 Edwin Anderson, M.D.
8 Grand Itasca Hospital and Clinic
9 1601 Golf Course Road
10 Grand Rapids, MN 55744
11

12 **Q: What is your education and professional background?**

13 See C.V. attached, Anderson Exhibit 1, MCGP ____, Anderson C.V.

14 **Q: On whose behalf are you testifying?**

15 **A:** I'm testifying on behalf of mncoalgasplant.com.

16 **Q: What Direct Testimony is your Rebuttal Testimony addressing?**

17 **A:** My rebuttal testimony is in response to that of Baxter Jones, Robert Evans,, and that of
18 Thomas Osteraas to the extent that he references Jones, Evans and Skurla and introduces their
19 Exhibits, particularly the ICF Report. Excelsior Exhibit ____, TLO-2. I have reviewed their
20 testimony and accompanying Exhibits in preparation for this testimony, and I have also
21 completed some independent research and study of the issues raised.

22 **Q: Beginning with the testimony of Baxter Jones, what is your primary concern?**

23 **A:** My primary concern with Mr. Jones' testimony, Mr. Evans' testimony, Mr. Osteraas' ICF
24 Report of emissions modeling, also Section IV, Subsection M of the Mesaba PPA Petition, is that
25 it presents this project as a "health benefit," specifically that the Mesaba Project provides health
26 benefits to the people of Minnesota. This is a false premise and conclusion – this plant as
27 proposed would not provide health benefits to the people of Minnesota or the country at large,
28 and instead will have a detrimental health impact, one which can be predicted in terms of

1 increased mortality and morbidity. People will be harmed by the Mesaba Project, and they will
2 require health care, and the costs of the health impacts are predictable as well.

3 The company should describe the specific increase in health risk for people in nearby
4 communities as well as individuals with co-morbidities and the elderly. In addition, the
5 company should address health impacts/risk for Native American elders with regard to the senior
6 housing facility and interpretative center planned just off Hwy 169 near the Scenic Highway.

7 **Q: And what issues do you wish to raise with respect to the testimony of Robert Evans?**

8 **A:** My concerns about the testimony of Robert Evans is similar to those I have with the
9 Jones testimony. Evans presents the Mesaba project as a "benefit," and characterizes the
10 emissions profile of the Mesaba Project as "superior" and continues that false comparison, when
11 there is no other plant or technology under consideration. Comparisons between the Mesaba
12 Project and SCPC plants are diversionary and misleading, and I object to Evans' use of this
13 technique. Evans testifies that he "was the person responsible for providing ICF the final stack
14 parameters used to characterize the Mesaba Project," and by this I believe he means that he is the
15 one who provided the taller stack measurements, which are about twice what the stack height is,
16 and about which Excelsior claims was shortened for "aesthetic considerations."

17 **Q: Let's start at the beginning – where do you find that Excelsior is claiming the project
18 provides health benefits?**

19 **A:** Excelsior has submitted testimony of Baxter Jones, in which he sponsors ICF's Final
20 Report, a part of the Excelsior Petition, entitled: Air Quality and Health Benefits Modeling:
21 Relative Benefits Derived From Operation of the MEP-I/II IGCC Power Station. See Exhibit
22 TLO-2 to the Supplemental Testimony of Thomas L. Osteraas. Throughout my testimony, I will
23 refer to specific quotations from this report. My challenge is not to the modeling procedure but to
24 the fundamental premise and approach of ICF which produces a misleading result.

25 We must be clear; there are no health benefits associated with Excelsior's Mesaba
26 Project. The primary, and a fundamental flaw, in the ICF report is that it compares Mesaba I/II

1 to a conventional SCPC plant located in central Minnesota. Jones, p. 4. In essence, this report
2 compares Mesaba's smaller 531 MW (per their application) "less dirty" coal plant in a sparsely
3 populated lake region to a larger 600 MW dirtier coal plant near a more densely populated area so
4 the baseline negative health impacts of this plant look better in comparison. However, when
5 considered independently, the emissions and the health impacts are stark.

6 The Excelsior Application expects the following emissions:

7
8 **Annual Emissions: Phase I and II**

9

10 POLLUTANT	11 TONS PER YEAR
12 NOx	2,772
13 SO2	1,332
14 PM10	440
15 VOC	152

16 Excelsior also expects to emit 54 lbs of Mercury per year, based on the cited 17.92 pounds
17 annually for Phase I only. Section IV 2-8, assume double Phase II.; increased to 54 in the JPA.

18 **Q: Are the results subject to any modification?**

19 **A:** Yes. As we consider these emissions, please remember that Jones testified that there
20 were substantive changes in design and assumptions that have an impact on the results. First, the
21 megawatt rating of the plant was increased, and so the downward apportionment of ICF is no
22 longer applicable. Second, Jones discloses that the stack height inputs were those of the Wabash
23 River facility, but that "a lower assumed stack height was designed for Mesaba "for aesthetic
24 consideration." Third, Mesaba's estimate of mercury removed has decreased. Jones, Direct
25 Testimony, p. 5, l. 12-14.

26 **Q: Do these changes have an impact on the results?**

27 **A:** Yes. From a health standpoint, the decrease in stack height and decrease of mercury
28 removal means that the health impacts will increase. Although Jones notes that "we do not find
29 that the adjustment in the stack parameters and the small adjustment in projected mercury
30 removal will have any material effect on the conclusions of our overall health risk analysis."
31 Jones, Direct at 6. However, while perhaps not having a material impact on "overall" impacts,

1 the height of the stack will have an impact on where the emissions fall – the higher the stack, the
2 more distance before emissions hit the ground. Cutting the stack height means emissions fall in
3 closer proximity to the plant.

4 **Q: Why does it matter where emissions fall?**

5 A: Particulate Matter (PM) is fine particles that are directly emitted from coal-fired power
6 plants (primary PM), and is also formed as a secondary by-product from the gaseous emissions
7 from such plant (secondary PM) Chemical reactions take place to form secondary PM. Excelsior
8 states through the ICF report that, “Fine particles or aerosols are thought to pose one of the largest
9 problems for human health impacts from air pollution” ICF, Air Quality and: Health Benefits
10 Modeling Final Report 2-1. PM 10 and PM 2.5 are PM classified according to particle size in
11 microns, PM 2.5 is 2.5 microns and is thought to have biggest adverse health impact as smallest
12 particle get lodged deep in the lungs and can even cross over into the bloodstream.

13 In the case of Excelsior’s Mesaba project, the lower stack, which will distribute
14 emissions closer to the plant than if there were a taller one, will emit 440 tons per year of PM10,
15 and 1,332 tons/year of SO₂, a major source of secondary PM.

16 **Q: What are the health implications of this much PM coming out of the stack?**

17 A: Individuals will undoubtedly will be affected, potentially all of us living by the plant, but
18 especially those with asthma, Chronic Obstructive Pulmonary Disease (COPD) or
19 emphysema, chronic bronchitis, and heart disease. Children, the aged, and those with
20 compromised immune systems are at higher risk. Even the ICF Report admits that:

- 21 • Measurable effects on air quality occurs up to 70-80 km from the plant;
- 22 • There is a peak near the plant location with lesser impacts surrounding the plant in all
- 23 directions... the greatest extent of impact is to the South/Southeast;
- 24 • Areas with higher proportions of older residents will have higher estimated risks owing to
- 25 their higher ‘background’ mortality risks.

26 ICF Report, Chapter 3, Air Quality and Health Benefits Modeling.

28 **Q: Is it just that people may get sick?**

1 A: No. The ICF Report has calculated that more people will die from diseases related to PM
2 2.5 if the Mesaba project is built than would not die if the plant were not built. What disturbs me
3 most about this ICF report is that it frames these deaths as a “benefit,” stating that fewer each
4 year will die than would if a pulverized coal plant were built, and this is misleading, because
5 there is no coal plant that might be built that Mesaba is replacing, and there is no existing coal
6 plant that will be closed if Mesaba is built. This comparison is a false comparison, and is an
7 improper usage of modeling.

8 The “benefit” of Mesaba Phase I is that it will result in 1.5 fewer deaths per year
9 in Minnesota and 6.4 fewer deaths per year nationally if Mesaba is built rather than the
10 nonexistent SCPC modeled for comparison. For those of us in the plume range, this is not
11 comforting. The ICF Report assumes almost doubling for Mesaba Phase II:

12 Alternative SCPC = 1.8 to 2.5 deaths per million adults

13 Mesaba I/II = 4.4 deaths per 10 million to 2.2deaths per million

14 ICF Report, p. 3-6; see also p. 3-8, p. 3-14; p. 3-19, p. 3-15. Note that there is very little
15 difference in mortality between the top end estimate by REMSAD modeling for SCPC and
16 Mesaba I/II IGCC. Though it is difficult to pin down, the ICF report does say that 10.7 deaths
17 nationally would be attributed to Mesaba I/II with 24% of those deaths in Minnesota, and that the
18 effect is more concentrated locally:

19 *It can be seen that mortality risks associated with the IGCC Power Station are both*
20 *somewhat lower and more concentrated around the facility than the estimated risks*
21 *associated with the Alternative SCPC plant.*
22

23 This is another instance where the fact that the planned stack height is 100 ft lower than originally
24 proposed, and that this incorrect stack height is used in the modeling, is important, because with
25 this lower height, the results pertaining to local impacts are not accurate – local impact is even
26 more concentrated.

27 Q: **As if that number of Mesaba attributable deaths isn’t enough, what other health**
28 **impacts are associated with the Mesaba project?**

1 A: As a Medical Doctor, one who treats those in the area who suffer from asthma, Chronic
 2 Obstructive Pulmonary Disease (COPD) or emphysema, chronic bronchitis, and heart disease,
 3 and one who lives in the community, I am distressed by the potential harm that may literally fall
 4 to my patients due to the Mesaba Project. The death rates are arguably the worst impact, but
 5 health impacts are also measured by morbidity, which are non-fatal health effects, ranging from
 6 life-impairing conditions to lesser inconveniences. Those listed in the ICF report include:

7 Morbidity = Non-Fatal Health Effects:	8 Cases/yr in Minnesota related to PM 2.5
9 Acute bronchitis	1.6
10 Non-fatal MI (heart attack)	1.9
11 Asthma exacerbation	100
12 Cough, shortness of breath and/or wheezing	
13 ER visits for asthma	1.3
14 Lower respiratory Symptoms	19
15 Minor restricted activity days	791
16 Feel sick	
17 Work loss days	18,313
18 Clinic/urgent care visits	?

19 See ICF Report, p.3-1, List of Health Endpoints, p. 3-4.

20 My clinical experience tells me that most lesser illness and symptoms can't be
 21 quantified. There is no way to collect data as most people won't seek medical care
 22 because the symptoms are annoying, yet mild.

23 All of this data detailing illness suffered, deaths, and rough estimates of cost is described
 24 in Excelsior's report as a "health benefit". This is not a benefit to any of us - it details the
 25 specific ways that we will be harmed.

26 **Q: This is a "cost docket" where the literal costs of the project are addressed, as well as**
 27 **whether the project is in the public interests. Can the costs of these health impacts be**
 28 **quantified with greater specificity?**

29 Yes. In my review of the ICF report, I found that it claims the Mesaba Project offers
 30 "Monetary Benefits associated with reductions in mortality and morbidity" based on "willingness
 31 to pay," i.e., an assessment of what different individuals would be willing to pay to avoid... the
 32 specified health effects. It found that the mean value of assigned to each death is \$5.5 million,
 33 with the bulk of costs assigned in mortality, non-fatal Myocardial Infarction and Chronic
 34

1 Bronchitis. ICF Report, p. 3-5. The ICF report is deficient in that it doesn't assign a value for
2 most of the very real morbidities listed above. It projects the following Mesaba mortality costs:

3 Minnesota = \$8.7 million per year

4 United States = \$84.9 million per year

5 Morbidity costs are estimated to be roughly 7-8% of mortality costs, but it is unclear how
6 this was determined.

7 **Q: Can you quantify costs of PM and other sorts of pollution?**

8 A: As a doctor who treats patients every day, and knows too well the high cost of health care
9 and treatment of chronic conditions caused or exacerbated, I know there are costs associated with
10 the morbidity examples in the ICF report. A recent report, *The Price of Pollution: Cost Estimates*
11 *of Environment-Related Childhood Disease in Minnesota*,¹ describes diseases and conditions
12 caused by various types of pollution and summarizes recent studies regarding the cost. Anderson
13 Exhibit 2, MCGP Exhibit ____, Schuler, Nordbye, Yamin and Ziebold, *The Price of Pollution*,
14 MCEA & IATP (July 2006). It states:

15 *The best estimate of total costs of environmentally attributable childhood*
16 *diseases in the state of Minnesota is \$1.569 billion per year, with a range of*
17 *\$1.393 to \$1.890 billion. Cost estimates for specific diseases are:*

18	<i>Childhood asthma:</i>	<i>\$30.6 million</i>
19	<i>Childhood cancers:</i>	<i>\$ 8.2 million</i>
20	<i>Lead poisoning:</i>	<i>\$1.223 billion</i>
21	<i>Birth defects:</i>	<i>\$4.5 million</i>
22	<i>Neurobehavioral disorders:</i>	<i>\$303 million</i>

23
24 Anderson Exhibit 2, MCGP ____, *The Price of Pollution*, p. 3. This report estimates an
25 annual cost-per-case, which in the case of childhood asthma, is estimated to be \$1,003.00
26 per case annually, totaling \$101,969,995 annually in Minnesota alone.

¹ Anderson Exhibit 1, MCGP Exhibit ____, Schuler, Nordbye, Yamin and Ziebold *The Price of Pollution: Cost Estimates of Environment-Related Childhood Disease in Minnesota*, MCEA and IATP (2006), online at: <http://www.environmentalobservatory.org/library.cfm?refid=88337#search=%22%22The%20Price%20of%20Pollution%22%22>

1 Excelsior claims that the Mesaba Project “reductions in fine particulate matter will yield
2 morbidity cost reductions for Minnesota residents of approximately \$1 million in 2010 for Phase I
3 and approximately \$2 million in 2012 after completion of Phase II. For example, if those 100
4 asthma cases were all childhood asthma, using the Price of Pollution cost estimates, this would
5 result in \$100,300.00 in asthma costs attributable to the Mesaba Project. Using Price of Pollution
6 cost estimates with Mesaba morbidity estimates shows that the cost of childhood asthma alone
7 equals Excelsior’s claimed “benefit” of Phase I. The Commission must consider the Mesaba
8 project from a literal “cost to Minnesotans” perspective.

9 Another study, cited in *The Price of Pollution*, has similar methodology and results.
10 *Economic costs of Diseases and Disabilities Attributable to Environmental Contaminants in*
11 *Washington State*,² considered costs of physician fees, inpatient and outpatient services,
12 laboratory services as direct costs, and considered indirect costs of school days and parental
13 wages lost, housekeeping cost and premature mortality. Anderson Exhibit 3, MCGP Exhibit
14 ____, Davies & Hauge, *Economic Costs of Diseases and Disabilities Attributable to*
15 *Environmental Contaminants*, Collaborative on Health and Environment–Washington Research
16 and Information Working Group, Seattle, WA (July 2005). Another study,³ cited by both,
17 developed a methodology, both an overall approach and disease specific. Anderson Exhibit 4,
18 MCGP Exhibit ____, Landrigan, Schechter, Lipton, Fehs & Schwartz, *Environmental Pollutants*
19 *and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead*
20 *Poisoning, Asthma, Cancer and Developmental Disabilities*, Environmental Health Perspectives
21 110(7): 721-728 (2002).

² Anderson Exhibit 2, MCGP Exhibit ____, Davies K, Hauge D. *Economic Costs of Diseases and Disabilities Attributable to Environmental Contaminants in Washington State*. Collaborative on Health and Environment–Washington Research and Information Working Group, Seattle, WA (July 2005). Available on line at:
<http://washington.chenw.org/pdfs/EnvironmentalCosts.pdf#search=%22%22Economic%20costs%20of%20diseases%20and%20disabilities%20attributable%20to%20environmental%22%22>

³ Anderson Exhibit 3, MCGP Exhibit ____, Landrigan, Schechter, Lipton, Fehs & Schwartz, *Environmental Pollutants and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead Poisoning, Asthma, Cancer and Developmental Disabilities*, Environmental Health Perspectives 110(7): 721-728 (2002).

1 I've discussed the *Price of Pollution* report with Dr. Christine Ziebold, one of the
2 authors, and after our discussion, and review of the other studies, it is my opinion that the
3 mortality and morbidity costs associated with the Mesaba Project are higher than presented.
4 There are any number of methods to calculate the cost of the pollution of the Mesaba Project,
5 whether by the above methodology or another, and to date, this has not been done. Instead,
6 Excelsior touts its project as a "health benefit," which it is not. The Commission must, through
7 this cost docket, address these predictable and quantifiable costs as part of the costs considered,
8 and must address these detrimental health impacts in its determination of whether this project is
9 in the public interest.

10 **Q: So far you've been talking about cost generally and Particulate Matter costs. Are there**
11 **other types of emissions that you're concerned about?**

12 **A:** Yes. I'm very concerned about mercury emissions, because coal plants are the primary
13 source of mercury found in our waters. Mercury is a primary cause of neurobehavioral disorders,
14 and it takes very little mercury to have a detrimental impact. As a northern Minnesota angler,
15 who is also a doctor, I carefully monitor my family's fish consumption. I regularly caution my
16 patients about the dangers of eating fish from our lakes. This is a tragedy, and it will only be
17 made worse by the Mesaba Project. We will not benefit in any way, because mercury emissions
18 will go up, not down.

19 In Jones' testimony, Excelsior claims that "the Excelsior IGCC Power Station, as
20 compared with the Alternative SCPC Plant, will yield reductions in (i) total mercury deposited to
21 soils and surface waters, (ii) the expected geographical areas subject to specified levels of
22 mercury deposition, (iii) the total human population within impacted areas, (iv) the number of
23 women of childbearing age within impacted areas, (v) the number and surface areas of lakes
24 within impacted areas, and (vi) the estimated annual harvest of selected fish species within
25 impacted areas. The reduced mercury deposition associated with the IGC Plant is expected to
26 contribute to the overall health benefits of that Plant compared with the Alternative SCPC Plant."

1 Jones, Direct, p 7. Again, there is no real alternative being considered, and due to the Mesaba
2 Project, there will be a net gain of mercury.

3 **Q: Why is mercury from an IGCC plant a problem?**

4 A: Any mercury from any source is a problem, but the ICF report notes that the "EPA
5 determined that there was a plausible link between emissions of mercury from utilities and other
6 anthropogenic sources and adverse effects to human health and the environment (*Mercury Study
7 Report to Congress, EPA, 1997*).” ICF Report, p. 4-1. It goes on to state that “Most non-
8 occupational exposure to mercury occurs via consumption of fish contaminated with methyl
9 mercury.” Id.

10 **STATE-WIDE FISH CONSUMPTION SAFE EATING GUIDELINES**

Type of Fish	Child-bearing age and children	General
Walleye > 20 inches N. Pike > 30 inches	Do not eat	1 meal/week
Walleye < 20 inches N. Pike < 30 inches	1 meal/month	1 meal/week
Sunfish/Crappie/Perch	1 meal/week	No limit

22 ICF report, p. 4-8.

24 **Q: Who may be affected by mercury?**

25 A: Children and developing fetus are most vulnerable, but anyone who eats f could be fish
26 regularly could be harmed. Specific to Mesaba, there are 7,780 Minnesota women of child-
27 bearing age in the mercury deposition impact zone. Also in that zone are 720 lakes with over 340
28 square km of area would be affected by Mesaba Phase I. 487,000 fish are harvested annually in
29 the mercury impact zone. It’s important to note that nearby waters are already mercury impaired,
30 including the Mississippi River and Swan River. Anderson Exhibit 5, MCGP Exhibit ___ MPCA
31 Impaired Waters List (Map)(2006).⁴ The ICF report modeling shows that dry deposition of

⁴ MPCA Impaired Waters maps are available on line: <http://www.pca.state.mn.us/water/tmdl/index.html#maps>

1 mercury is above the highest level measured at several points very near the site proposed for the
2 Mesaba Project. ICF Report, Exhibit 2-13.

3 **Q: What are the health impacts of exposure to Mercury?**

4 A: The health impacts of mercury are subtle but extensive. From "The Price of
5 Pollution," I quote:

6 Using estimates of the impacts of IQ reduction due to methyl mercury exposure
7 and its consequent reduction in adult productivity, this study found a nationwide
8 impact of \$8.7 billion per year. Of this, \$1.3 billion were attributable to mercury
9 pollution from coal-fired power plants. (In 2004\$, this cost would be \$9.54
10 billion nationwide and \$1.43 billion for coal-fired power plants.) A subsequent
11 study by Transane estimated the costs related to increases in mental retardation
12 attributable to mercury pollution at \$2 billion per year, \$239 million of which are
13 attributable to coal-fired power plants.... Based on Minnesota's proportion of
14 new births (1.78 percent), the state's share of costs for neurodevelopmental
15 effects and mental retardation is estimated at \$208.8 million in 2004\$, with about
16 \$30 million attributable to coal-fired power plants alone.

17
18 Anderson Exhibit 2, MCGP ____, *The Price of Pollution*, p. 4. Facing costs and impacts to
19 human health of this magnitude, the Mesaba Project cannot be fairly characterized as a benefit
20 when it contributes to pollution. Human health effects from chronic exposure of the developing
21 fetus to mercury are:

22 Human nervous system toxicity
23 Mental retardation
24 Growth deformity
25 Seizures/Epilepsy
26 Blindness
27 Deafness
28 Severely delayed development

29
30 Human Health Effects of Mercury from chronic exposure as infants or small children:

31
32 Impaired reflexes
33 Delayed motor development
34 Impaired attention
35 Impaired memory
36 Impaired language

37
38 These impacts are from higher dose chronic exposure, but not highly toxic poisoning
39 exposure. Human Health Effects from high level mercury exposure in adults:

40 poisoning symptoms/very high exposure can cause:

1 paresthesias- burning or prickling sensation in skin
2 fatigue
3 vision and hearing impairments
4 ataxia (loss of muscle control)
5 abnormal heart rhythms and irregular pulse
6 coma
7 death
8

9 The ICF report notes that “Recent research has indicated that low-level chronic exposure to
10 methyl-mercury via fish consumption may be linked with a higher risk of serious cardiovascular
11 impacts in men, including MI, coronary artery disease, and other cardiovascular disease.”
12 Further, “low level mercury exposure may lead to heart attack, stroke, and hardening of the
13 arteries especially in adult males.” ICF Report, p. A-6.

14 **Q: Are there mercury related issues you believe should be addressed?**

15 A: Yes, there are. Although this list is incomplete, at the very least, Excelsior should
16 provide a clear, detailed analysis of how lakes in this impact zone will be affected by additional
17 mercury deposition; provide details and analysis of this plant’s mercury speciation and clearly
18 chart/graph the local lake impact over time given emissions of elemental mercury, methyl-
19 mercury, and secondary methylation of elemental mercury; provide information regarding which
20 of these 720 lakes have been tested and how many have fish consumption advisories for mercury;
21 estimate the public’s adverse health risk given increasing and cumulative mercury concentrations
22 of the Mesaba Project over time; and provide details of health risk analysis for women of
23 childbearing age who live in this mercury impact zone.

24 **Q: As a doctor, are you satisfied with the scope and results of the ICF Report?**

25 A: No, I do not think this report sufficiently addresses health hazards associated with
26 operation of the Mesaba Project. Prevention is the key when looking at health impacts – as a
27 doctor, I am relatively powerless to address the systemic and chronic health problems caused by
28 pollution when a patient presents in the emergency room or in my clinic. I am concerned that the
29 severity and extensive impacts of mercury exposure are downplayed in the report. I am also

1 concerned because the impacts of nitrogen oxides, which contribute to fine PM and which play a
2 role in formation of ground level ozone, has not been addressed.

3 **Q: What are your concerns about the Mesaba Project and ozone?**

4 The health impacts of ozone are well documented. Exposure to high levels of ozone
5 leads respiratory infections and inflammation. On high ozone days, there is a marked increase in
6 hospital admissions and Emergency Room visits for treatment of asthma and other respiratory
7 illness. See “EPA National Air Quality and Emission Trends Report” and Minnesota
8 Department of Health informational website.⁵ On hot sunny days, the MN Department of Health
9 states that ozone concentrations can rise to unhealthy levels, and ozone transport can cause
10 elevated ozone levels in rural areas. Given this, and that the Mesaba Project will only add more,
11 how can this be reasonably characterized as a benefit?

12 My concern about ozone is based in the chemistry of ozone formation, that it forms from
13 nitrogen oxide (NO_x) and Volatile Organic Compounds (VOC) in the presence of light and heat,
14 and as above, the Mesaba Project will generate 2,772 tons of NO_x annually, and 152 tons of VOC
15 annually. This puts us all at risk.

16 Elevated Ozone levels:

- 17 • aggravate asthma
- 18 • make you more susceptible to respiratory infections
- 19 • cause throat irritation
- 20 • make you cough more frequently
- 21 • cause chest pain
- 22 • cause shortness of breath

23
24 Fully one third of healthy adults are sensitive to effects of ozone. If you exercise outside you
25 increase your risk. Children spend more time playing outside in summer when levels are likely to
26 be higher have an even higher risk because children are smaller, breathe faster, and run more so

⁵ Minnesota Dept. of Health maintains a page on ozone, with links for additional information and research, at:
<http://www.health.state.mn.us/divs/ch/air/ozone.htm>

1 are more susceptible to the effects of ozone. Children are more likely to develop asthma and be
2 hospitalized for asthma when exposed to ozone.

3 **Q: Are there other cost related concerns that Excelsior should address and that the**
4 **Commission should consider in its cost evaluation and public interest**
5 **determination?**

6
7 **A:** Yes. Although this does not satisfy all my questions and concerns, I believe the
8 company should at least make the following specific additions to the ICF Report for
9 Commission consideration:

- 10 1. Regarding expected morbidities, provide the range expected for these morbidities in a
11 given year, and adjust for seasonal variation.
- 12 2. Give the expected number and range of clinic or urgent care visits, and factor this in to
13 projected costs both to the State, and to local health care facilities and for specific local
14 health insurance plans such as Itasca Medical Care (IM Care).
- 15 3. Explain the apparent discrepancy between low numbers of minor respiratory illness,
16 significant number of minor restricted activity days, and the seemingly out of proportion
17 number of work loss days.
- 18 4. Describe and quantify the cost of the predicted 18,000 lost work days to the average
19 family affected, as well as the affect on employers needing to cover for sick workers. In
20 simple monetary terms, if \$20 per hour workers lose 18,000 days of work, that is
21 \$2,880,000 cost to the families in lost wages, and another \$2,880,000 to replace those
22 workers for that time at the same wage (without any benefit or sick time adjustment).

23
24 Further, Excelsior and the Commission should address air quality modeling and adverse
25 health consequences, both local and regional, with regard to secondary particulates, and provide
26 similar analysis of secondary particulate matter health impacts for the general population,
27 individuals with co-morbidities, and the elderly.

28 Regarding risk, Excelsior should estimate the increase in risk for developing
29 childhood asthma and associated costs; estimate risk and associated costs attributable to ozone
30 exposure for people with co-morbidities, including children, individuals with lung disease, and
31 the elderly; including average risk as well as increased risk on hot, sunny days; and estimate the
32 health risk for healthy individuals and children exercising outdoors on hot sunny days and all
33 associated costs.

34 **Q: Does this conclude your testimony?**

35 **A:** Yes, it does.