MPUC Docket No. E-6472/GS-06-668
OAH Docket No. 12-2500-17512-2

BEFORE THE
MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS
100 Washington Square, Suite 1700
Minneapolis, Minnesota 55401-2138

FOR THE
MINNESOTA PUBLIC UTILITIES COMMISSION
127 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147

In the Matter of a Joint LEPGP Site Permit,
HVTL Route Permit and Pipeline (Partial Exemption)
Route Permit Application for the Mesaba Energy Project

PREPARED DIRECT TESTIMONY AND EXHIBITS OF

EXCELSIOR ENERGY INC., MEP-I LLC, AND MEP-II LLC

TODD P. ROYER

JANUARY 16, 2007

EXCELSIOR ENERGY, INC.

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

PREPARED DIRECT TESTIMONY OF

TODD P. ROYER

Q Please state your name, current employment position and business address.

A My name is Todd P. Royer. I am a Principal Project Manager for URS Corporation, which is one of the largest engineering and environmental consulting companies in the country. Within URS, I currently manage the air permitting environmental practice in our Louisville, Kentucky office and I direct regulatory compliance and permitting projects for power, petroleum, chemical, and other industrial clients. One of my particular areas of expertise is the air permitting of Integrated Gasification Combined Cycle (IGCC) power plants. My business address is 325 West Main Street, Suite 1200, Louisville, Kentucky 40202.

Q Would you please describe your educational and professional background.

A I received a Bachelor of Science in Chemical Engineer from Rose-Hulman Institute of Technology in Terre Haute, Indiana in 1980. I began my career working for Exxon Company, USA at an oil refinery in California. While in California, I also became a registered professional engineer. I worked at Exxon for 13 years (1980-1993) in a variety of positions including as a refinery engineer, refinery economics coordinator, and environmental supervisor. I left Exxon in 1993 and took a job in Louisville, Kentucky working as an environmental consultant for Radian Corporation which, through a series of acquisitions, has become part of what is now URS Corporation. During the last 13 plus years in consulting, I have specialized in air permitting and air regulatory compliance, and run one of URS's largest air groups in the

Midwest. My industrial air permitting clients have included electric utilities, petroleum refineries, chemical plants, and various manufacturing facilities. The bulk of my power plant work has specifically dealt with permitting IGCC facilities, although I have also permitted natural gas-fired peaking plants. In addition to my work for Excelsior's proposed Mesaba IGCC Project, I have worked on air permits for seven other existing or proposed IGCC facilities in Kentucky, Ohio, Indiana, Wisconsin, West Virginia, and Washington. I believe that I, and my Louisville-based URS air permitting staff, are the most experienced IGCC air permitting consultants in the country. My resume is appended as Exhibit ___ (TPR-1).

Q On whose behalf are you testifying?

A I am testifying on behalf of MEP-I LLC, MEP-II LLC, and Excelsior Energy Inc. (collectively "Excelsior"), the developers of the Mesaba Energy Project (the "Project").

<u>Scope and Summary</u>

Q What is the purpose of your testimony in this proceeding?

A The purpose of my testimony is to generally describe the Best Alternative Control Technology (BACT) analysis performed for the Project. I will also identify the portions of the Joint Application and Air Permit Application which I am sponsoring and on which I will be able to provide testimony.

<u>Preparation of the Joint Permit Application and Environmental Supplement</u>

Q Are you available to act as sponsor for particular sections of the Applications?

A. Yes. I am sponsoring the following sections:

Joint Application

Section 7.4.1 (BACT Requirements)

Air Permit Application (attached as Appendix 5 to the Joint Permit Application)

Section 3.1 (Ambient Air Quality Standards)

Section 3.2 (Attainment Status)

Section 3.3 (New Source Review and Prevention of Significant Deterioration)

Section 3.4 (New Source Performance Standards (40 C.F.R. Part 60))

Section 3.5 (National Emission Standard for Hazardous Air Pollutants (40 C.F.R. Part 63))

Section 3.6 (Acid Rain Program (40 C.F.R. Parts 72-78))

Section 3.7 (Clean Air Interstate Rule Permit)

Section 3.8 (Compliance Assurance Monitoring (40 C.F.R. Part 64))

Section 3.9 (Chemical Accident Provisions (40 C.F.R. Part 68))

Section 5.1 (BACT Results Summary)

Section 5.2 (BACT Review Process)

Section 5.5 (Existing and Permitting IGCC Facilities)

Section 5.6 (Combustion Turbine Control Technology Review)

Section 5.7 (Tank Vent Boiler Control Technology Review)

Section 5.8 (Flare Control Technology Review)

Section 5.9 (Fugitive Equipment Leak Technology Review)

Section 5.10 (Material Handling Technology Review)

Section 5.11 (Cooling Tower Technology Review)

Section 5.12 (Diesel Engine Technology Review)

Section 5.13 (Auxiliary Boiler Technology Review)

I am qualified to address questions on these sections because of my close involvement in their development. My staff and I drafted the air permit application,

although I should highlight that some elements of the application, such as the emissions estimates and the air dispersion modeling were primarily provided by other firms (*i.e.,* the emissions by Fluor and the modeling by McVehil-Monnet Associates). However, of particular relevance to my testimony, URS, under my direction, were the primary developers of the evaluation of the Best Available Control Technology ("BACT") requirements of the Prevention of Significant Deterioration ("PSD") and most other elements of the air permit application.

Considerations in Determining Whether to Issue a Site Permit for the Project

Q What process was used to determine the Best Available Control Technologies to be applied at the Project?

A A BACT analysis was conducted for the following pollutants because the project's emissions of these pollutants exceed their respective PSD significance threshold: carbon monoxide ("CO"), nitrogen oxides ("NO_x"), sulfur dioxide ("SO_2"), particulate matter ("PM/PM_{10}"), volatile organic compounds ("VOC"), and sulfuric acid mist ("H_2SO_4").

BACT is defined in the Clean Air Act as: "an emissions limitation based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any . . . source . . . which on a case-by-case basis is determined to be achievable taking into account energy, environmental, and economic impacts and other costs." 42 U.S.C. § 7479(3).

BACT is essentially the lowest emissions rate for each pollutant that can be reasonably achieved by this particular source, determined on a project specific basis. The fact that a particular level of control has been determined to be "reasonably achievable" for one source, does not mean it is BACT for the new source being

permitted. Each project is reviewed independently, considering site specific, project specific and process specific factors. Since an IGCC facility is a very unique source type—with unique equipment, operations and exhaust properties—a BACT review for an IGCC needs to consider these unique characteristics.

The process for the Mesaba Project followed U.S. Environmental Protection Agency's ("US EPA") guidance for a "Top-Down" BACT review. In a nutshell, such a review involves identifying all potentially usable emissions control technologies, and ranking them according to their control effectiveness, starting with the most stringent control alternative. If the most stringent control is shown to be technically or economically infeasible, or if environmental impacts or other impacts of the option are severe enough to preclude its use, then the next most stringent control technology is similarly evaluated. This process continues, working down the list from most stringent to least stringent, until a control technology under consideration cannot be eliminated by technical, economic, energy, environmental, or other impacts. BACT is this most stringent control technology not eliminated.

In many cases, it was not necessary to go through all the steps of this formal "Top-Down" BACT analysis. When the proponent of a project proposes to employ the top or most stringent control alternative (*i.e.*, selects an emission limit and type of control technology that would be presumed to be BACT or more stringent than BACT), then it is not necessary to evaluate all the others.

Potential control options were identified by researching the US EPA database, known as the RACT/BACT/LAER Clearinghouse ("RBLC"), and drawing upon previous environmental permitting for similar units, engineering experience, discussions with equipment vendors, and researching available literature. Available controls were

further evaluated based on an analysis of economic, environmental, and energy impacts. Economic impacts were obtained, where available, from published vendor quotations, US EPA's Cost Estimation Manual, US EPA's "Environmental Footprints and costs of Coal-based Integrated Gasification Combined Cycle and Pulverized Coal Technologies," Final Report (EPA – 430/R-06/006. July 2006), and other BACT-related analyses.

Q Describe the BACTs that will be applied to the Project to mitigate any adverse environmental effects of the air emissions from the Project.

A A BACT analysis was separately performed for combustion turbines, tank vent boilers, flare controls, fugitive equipment, material handling, cooling towers, diesel engines and auxiliary boilers. The BACT for each emissions source, and each regulated pollutant, was analyzed and presented in the permit application. The results of the analyses were as follows:

Equipment	Pollutant	BACT
Combustion Turbine	NO_x	Diluent injection
	CO	Good Combustion Practice("GCP")
	PM/PM_{10}	GCP, gas cleanup, use of gaseous fuels only
	SO_2	Gas cleanup using MDEA/use of clean syngas
	VOC	GCP
	H_2SO_4	Gas cleanup/use of clean syngas.
Cooling towers	PM	High efficiency drift eliminators
Tank Vent Boiler	All Pollutants	GCP and gas cleanup/use of clean syngas
Flares	All Pollutants	Good flare design and flaring only treated syngas
Auxiliary boilers	All Pollutants	Use of low NOx burners, GCP, and use of pipeline natural gas only
Emergency diesel generators and fire pumps	All Pollutants	GCP, limited hours of operation and use of very low-sulfur fuel oil

Conclusion

Q Does this conclude your testimony?

A Yes.

EXHIBITS

EXHIBIT ___ (TPR-1)

AREAS OF EXPERTISE

- Integrated Gasification Combined Cycle Power Plants (IGCC)
- Project Management of PSD/NSR and NEPA Permitting.
- Power Plants, Petrochemical and Petroleum Facilities.
- Air Regulatory Analysis, MACT/ NESHAPS rules
- Compliance Management, Project Management.

EDUCATION

B.S., 1980, Chemical Engineering, Rose-Hulman Institute of Technology, Terre Haute, IN.

REGISTRATION

P.E., Chemical Engineering, CA. Regist. No. 4129

PROFESSIONAL HISTORY

Principal Project Manager, URS Corporation, Louisville, KY, 1995-Present.

Senior Engineer, Radian Corporation, Louisville, KY, 1993-1994.

Environmental Supervisor, Exxon Company USA,

REPRESENTATIVE EXPERIENCE

Mr. Royer currently serves as a Principal Project Manager in the Louisville, Kentucky office. His responsibilities include directing regulatory compliance projects for the power, petroleum, chemical and other industries. Mr. Royer is one of the most experience air permitting experts in the country regarding IGCC plants and refineries. Mr. Royer's additional areas of experience include major project management, regulatory compliance analysis, air permitting, emissions inventory generation, waste water treating facilities operation and troubleshooting, site investigation, waste minimization and reuse analysis, and compliance auditing. He also has experience in process engineering, operations supervision, computer process control and construction management.

Air Permitting of Gasification Plants

- (2005-2006) Working for AEP on their air permitting for two integrated gasification combined cycle power plants, one in Ohio and one in West Virginia. Applications expected to be submitted summer of 2006.
- (2005-2006) Developed air permit application for an integrated Gasification combined cycle power plant proposed in Minnesota by Excelsior Energy. The application was submitted early summer 2006 and is pending with the agency.
- (2004-2005) Worked on the air permitting of modifications to the existing Wabash Energy IGCC in Terre Haute, IN. A permit application was prepared to add a new synthesis gas fired turbine at the sites. Also, a permit evaluation was performed regarding a possible addition of a process to manufacture synthetic natural gas (SNG).
- (2003-2004) Prepared a PSD air permitting of a 600 MW power plant in Wisconsin. Directed the BACT and case-by-case MACT evaluations for the project and served as an expert witness in administrative hearings during legal challenges to the project. The permit was issued in January 2004.

Benicia, CA, 1987-1993.

Refinery Economics Coordinator, Exxon Company USA, Benicia, CA, 1984-1986.

Refining Engineer, Exxon Company USA, Benicia, CA, 1980-1984.

- (1998-2002) Managed all environmental permitting activities associated with the grass roots development of two 590 MW integrated gasification combined cycle (IGCC) power plants, one plant located in Kentucky and one in Ohio. Developed PSD permit application for these unique projects which co-feed coal and municipal solid waste. Developed emissions factors, determined best available control technology, and sorted through applicable waste rules for this unique project. Project also included generation of Environmental Information Volume in support of a NEPA review. Air permits were issued for both projects.

- (2001) Co-author of paper "Siting a Coal-Based IGCC: The Environmental Permit Process" presented at the Gasification Technology 2001 conference.

Refinery Air Permitting

- (2005-2006) Managed URS's role as BP's lead environmental permitting consultant for approximately $2 Billion of heavy crude oil conversion investment at BP's three northern US refineries (Ohio, Washington, Indiana). Worked with BP and BP's engineering and other "incumbent" consulting service providers at all three refineries to obtain the needed air, water, and waste permits for these projects which include crude unit modifications, new cokers, new hydrogen units, hydrofiners, etc.

- (2003-2004) Obtained the air permit for an Ohio refinery's modifications to meet low sulfur fuel (Tier II) requirements. This "Clean Fuels Project" involved over $300 million of upgrades including additional desulfurization and hydrogen production facilities

- (1997-1998) Managed the permit application and environmental assessment for a major Midwest refinery's conversion to heavy crude. The project included $250 million of construction including new cokers, new sulfur recovery units, new amine systems, and numerous other changes. Successful permitting against a tight schedule included negotiations and meetings with regional and US

EPA and avoidance of PSD.

- Involved in permitting of the integration of a several refinery units in the permit of an adjacent chemical plant. The shutdown of the majority of the refinery processes and acquisition of its remaining assets by the chemical plant triggered several regulatory and permit sensitivities. The project addressed modification of permits for both the refinery and the chemical plant.

- Held the position of Environmental Supervisor for a mid-size California refinery for 3 years. In this position was responsible for all permit application development and permit condition negotiations for the refinery. Applications included addition of a co-gen facility, new tankage, new heat exchange equipment, new waste water treating facilities, miscellaneous piping modifications and other minor sources.

- Supervised the development of a health risk assessment for a large petroleum refinery. Work involved detailed dispersion modeling of all air emission points, and acute and chronic health risk exposure evaluation for the surrounding community.

Other Permitting and Siting Projects

- Performing siting evaluation of potential power plant sites in Kentucky. Utility requested evaluation of entire western portion of state for potential sites as well as evaluation of site feasibility of expanding generation at one of their existing plants. Final evaluation will include comparison of siting feasibility at over a dozen specific sites.

- Managed PSD air permit for a simple cycle combustion turbine power plant in Kentucky and including evaluating site suitability for power plant development.

- Directed the site feasibility evaluations of several sites in Ohio for suitability for power plant development.

- Developed PSD permit application for a major chemical plant expansion. Project included BACT analysis, netting, modeling, ambient air quality analysis, etc.

- Prepared the PSD permit application and BACT analysis for an expanded refrigerant manufacturing process involving ozone depleting substances (ODS).

- Directed permitting efforts for multiple projects for glass manufacturer. Also analyzed industrial hygiene and property damage concerns related to hydrogen fluoride emissions. Engineered improvement to the ventilation and scrubbing system to address the concerns.

- Supervised generation of the SARA 313 emissions inventory for several facilities including analysis of emissions reduction potential.

- Supervised the development of a health risk assessment for a large petroleum refinery. Work involved detailed dispersion modeling of all air emission points, and acute and chronic health risk exposure evaluation for the surrounding community.

- Participated in project definition and technology selection to retrofit petroleum refinery sources with NOx controls. Sources included gas turbines, fired heaters and boilers, and a large CO fired furnace.

- Developed permit application for "Clean Fuels Project" for large refinery involving over $300 million upgrade to desulphurization and hydrogen production facilities at the refinery.

Regulatory Compliance

- Analyzed and developed improvements to the Environmental Management systems of a refinery and two chemical plants. Improvements included generation of compliance task notebooks documenting plant personnel responsibilities and procedures

- Served as Project Manager for the Title V permit application development for four major oil refineries and two petrochemical plants including SOCMI/HON compliance planning, and two power plants.

- Directed a seven person, week long Phase I due diligence

audit and compliance assessment of a petroleum refinery. Served as the audit's the air regulatory expert and supervised the activities of other auditors investigating waste, water, remeditation, health and safety aspects of the operations. Assisted prospective buyer evaluate environmental and compliance liabilities and negotiate transaction terms.

- Conducted several projects evaluating NSPS QQQ applicability to various changes to refinery processes and waste water drainage systems.

- Directed the Title V permit application development of several petroleum distribution tankage and loading terminals for a Midwest company.

- Directed multiple compliance assessments for various manufacturers and process industry clients covering air, water and waste regulatory compliance. Work involved reviewing all applicable regulations and permit conditions, identification of compliance issues, and action plan development and follow-up.

- Developed an operational plan to prepare a paper products manufacturer for a potential EPA multi-media audit.

- Developed detailed action plans for a petroleum refinery for compliance with new air, water and waste regulations. Also, lobbied with regulators regarding development of regulations. Major regulatory compliance projects included Benzene Waste NESHAPS, Primary Sludge Rule, NSPS for Municipal Waste Combustors, Toxicity Characterization Rule (for Benzene wastewater) and NOx BARCT.

- Developed hazardous release reporting procedures for a petroleum refinery. Responsible for notification and follow-up with all agencies in large spill situations. Served as Government Liaison for major oil company's west coast oil spill response team.

Waste Water Treating

- Supervised the operation of a petroleum refinery Waste

Water Treating facility and Sulfur Recovery Unit. Developed detailed operating procedures to improve operational practices.

- Directed a Toxicity Identification Evaluation (TIE) for isolation of toxic component of a Refinery waste water stream to improve compliance with acute and chronic aquatic toxicity standards.

- Developed a plan and helped kick off a joint oil company research effort to develop a new technology for removal of selenium from a refinery's waste water stream.

- Investigated and identified cause of poor clarifier settling in a refinery activated sludge biological treatment unit. Resolution of the problem debottlenecked unit capacity.

- Advised engineering designers on a major revamp of the primary treatment portion of a refinery waste water treating facility. Redesign included modification of the use of earthen impoundments to avoid hazardous waste storage jurisdiction and installation of state-of-the-art solids and oil removal facilities.

Environmental Information Technology

- Directed several projects implementing or expanding the application of Environmental Relational Databases at refineries and chemical plants. Projects include use of PlantWare from Essential Technologies.

- Conducted detailed needs assessments for two large petrochemical facilities to evaluate environmental data handling activities and select appropriate software applications.

Site Investigation

- Supervised a groundwater and soil quality site investigation for a petroleum refinery facility including installation of about 100 groundwater wells, data collection, analysis, and recommendations.

Waste Minimization

- Supervised the development of a detailed waste minimization management plan for a petroleum refinery. This involved investigation and quantification of all generated wastes, evaluation of source reduction possibilities, and evaluation of recycle and reuse options. Major waste streams included waste water treating sludges, off-spec sulfur, spent chemical solutions and spent catalyst.