

Mercury Emissions

Mercury and other emissions from power plants have been studied extensively by the United States Environmental Protection Agency (EPA). In fact, through the federal Clean Air Act amendments of 1990, Congress required EPA to conduct a thorough study of air emissions, including mercury, from power plants. EPA completed the study and concluded the following regarding mercury emissions:

- “Mercury in the air is a global problem. While fossil fuel-fired power plants are the largest remaining source of human-generated mercury emissions in the United States, they contribute only a small amount (about 1 percent) of total annual mercury emissions worldwide.”*
- “Recent estimates of annual total global mercury emissions from all sources -- both natural and human-generated -- range from roughly 4,400 to 7,500 tons per year. Human-caused U.S. mercury emissions are estimated to account for roughly 3 percent of the global total, and U.S. coal-fired power plants are estimated to account for only about 1 percent.”*
- “The United States is leading an effort within the United Nations Environment Programme to create a program that would establish partnerships designed to help developing countries reduce mercury emissions.”*
- “EPA has conducted extensive analyses on mercury emissions from coal-fired power plants and subsequent regional patterns of deposition to U.S. waters. Those analyses conclude that regional transport of mercury emission from coal-fired power plants in the U.S. is responsible for very little of the mercury in U.S. waters.”*
- “U.S. coal-fired power plants emit mercury in three different forms: oxidized mercury (likely to deposit within the U.S.); elemental mercury, which travels hundreds and thousands of miles before depositing to land and water; and mercury that is in particulate form.”*
- “[A]tmospheric mercury falls to Earth through rain, snow and dry deposition and enters lakes, rivers and estuaries. Once there, it can transform into, methylmercury, and can build up in fish tissue” and “Americans are exposed to methylmercury primarily by eating contaminated fish.” *

* All quotes are from EPA’s webpage found at <http://www.epa.gov/air/mercuryrule/basic.htm>

Las Brisas Energy Center

The Las Brisas main boiler technology is inherently lower in mercury emissions than other more conventional boiler designs. Circulating Fluidized Bed (CFB) boilers have a lower exhaust or flue gas temperature. This lower temperature causes mercury compounds to condense in the exhaust stream and allows potential mercury emissions to be captured by several emission control devices that will be “downstream” of the main boilers.

As a general matter, mercury can be emitted in flue gas in either a gaseous or particulate form. The reduced CFB flue gas temperature (described above) will result, through

condensation, in a greater proportion of mercury in particle form and less mercury as a gas. The scrubber emission control system will also serve to condense mercury compounds and, together, these features of the Las Brisas design will considerably enhance mercury collection by the fabric filter particulate control. Mercury in the particulate form is removed very efficiently (upwards of 99%) by the fabric filter control (sometimes referred to as a “baghouse”) proposed by Las Brisas.

Finally, while a fabric filter will serve to absorb some of the gaseous elemental mercury, Las Brisas is not stopping with this method of control and is proposing the most aggressive method of mercury control commercially available. The proposed activated carbon injection system (ACI) will deliver powdered activated carbon into the flue gas to absorb the gaseous or vaporized mercury fraction. After the carbon adsorbs the gaseous mercury from the flue gas, it is captured by the highly efficient fabric filter with the other particulate matter.

Las Brisas Emissions Modeling

While there is no federal or state ambient air quality standard established for mercury, the Texas Commission on Environmental Quality (TCEQ) has established an Effects Screening Level (ESL) for mercury that is utilized in evaluating any potential impact for a proposed facility. TCEQ explains that “ESLs, expressed in terms of microgram per cubic meter ($\mu\text{g}/\text{m}^3$) or parts per billion by volume (ppbv) in air, are used to evaluate potential for effects to occur as a result of exposure to concentrations of constituents in the air” and “ESLs are based on data concerning health effects, odor/nuisance potential, and effects on vegetation.” TCEQ does establish ESLs as ambient air quality standards but, according to the agency protocols, “if predicted or measured airborne levels of a constituent [such as mercury] do not exceed the screening level, adverse health or welfare would not be expected to result” and “[i]f ambient levels of constituents in air exceed the screening level, it does not necessarily indicate a problem, but a more in-depth review is conducted.”

Las Brisas preliminary air dispersion modeling, at the emission rates proposed in the permit application indicates that mercury emissions from the project will be less than 1% of the ESL. Thus, mercury emissions from the project will not even approach the ambient concentration considered by the TCEQ to warrant a closer review.