

ATTACHMENT 9



Energy Answers International, Inc.

**Arecibo, Puerto Rico Renewable
Energy Project**

**Human Health Risk Assessment
for the Renewable Energy Power
Plant Located in Arecibo**

October 2010

Executive Summary

ARCADIS prepared this *Human Health Risk Assessment (HHRA)* on behalf of Energy Answers International (EA) for the proposed Renewable Energy Power Plant (Facility) to be located in the Municipality of Arecibo in the area of Barrio Cambalache along the north coast of Puerto Rico. The proposed Resource Recovery Facility (RRF) will combust municipal waste, and the heat generated will be used to produce electricity for the nearby population. The HHRA evaluates the potential for exposure to emissions from the two proposed combustion units at the Facility to cause adverse health effects. The HHRA is a comprehensive assessment of the potential for human health risks, as it considers both direct (i.e., inhalation) and indirect (i.e., ingestion) exposure pathways.

An overview of the risk assessment approach and summaries of the HHRA results and conclusions follow.

Approach

The HHRA was completed using approaches and methodologies that are consistent with the United States Environmental Protection Agency (USEPA) risk assessment guidance and policies. The available federal guidance for evaluating emissions from both municipal waste and hazardous waste combustion sources was consulted. However, the USEPA's final combustion guidance, *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities (HHRAP)* was the primary source of approaches, assumptions, and parameters used in the assessment. The HHRAP describes in detail the recommended approach for assessing human health risks associated with hazardous waste combustion facilities, but the methodology is applicable to municipal waste combustion risk assessments as well.

The evaluation of risks and hazards associated with constituents emitted from a combustion source requires the following:

- Identification of constituents of potential concern (COPCs) that may be emitted from the source.
- Estimation of the amount of COPCs that may be emitted from combustion units (i.e., emission rates).
- Estimation of the concentration of COPCs in ambient air based on predictive dispersion and deposition modeling.

9. Summary and Conclusions

Results of the quantitative risk assessment are summarized in the following tables:

Excess Lifetime Cancer Risks (across all pathways)							
Urban Resident		Suburban Resident		Farmer		Fisher	
Adult	Child	Adult	Child	Adult	Child	Adult	Child
9E-08	1E-07	1E-07	2E-07	3E-07	4E-07	2E-06	2E-06

Noncancer Hazard Indices (across all pathways)							
Urban Resident		Suburban Resident		Farmer		Fisher	
Adult	Child	Adult	Child	Adult	Child	Adult	Child
0.01	0.01	0.01	0.02	0.02	0.05	0.2	0.5

USEPA generally finds ELCRs between one-in-ten-thousand (1E-04) and one-in-a-million (1E-06) (or less) and noncancer hazard indices of less than 1 acceptable.

Based on the assumptions and scenarios used to evaluate potential risks and hazards associated with emissions from the proposed RRF, risks and hazards fall within or less than the acceptable range. Based on the analysis completed in this HHRA, the proposed RRF does not pose a concern for human health.