

## **IMPINGEMENT & ENTRAINMENT STUDIES** **Connecticut Resource Recovery Authority** **CRRA Facility** **Hartford, CT**

The CRRA facility is a 68.5 MW refuse burning station located on the Connecticut River in Hartford. The plant currently uses two cooling water intakes to service the active generating units. Kleinschmidt was contracted to conduct biological studies, including a one-year investigation of impingement and entrainment monitoring as well as source water ichthyoplankton sampling in the Connecticut River. Historically impingement studies had been conducted at the site. However, new entrainment and impingement data reflective of current conditions in the Connecticut River were warranted to estimate current I&E impacts.



The entrainment and source water ichthyoplankton study commenced in March 2006. Entrainment samples were collected by tapping off of the existing cooling water intake pipes and redirecting the flow into a plankton net suspended in a 1,000 liter plastic tank.

Source water ichthyoplankton sampling was conducted by towing a 1-meter diameter, 3-meters long conical plankton net from a boat in a stepwise oblique pattern, with equal sampling time on the surface, mid-depth and near-bottom of the water column. The plankton samples were preserved with a formalin solution and processed at Kleinschmidt's Connecticut office. All fish larvae and eggs were removed from the samples with the aid of a dissecting microscope, identified to the lowest practical taxonomic category, and enumerated.

Impingement sampling at the CRRA facility began in January 2006. Impinged organisms were removed from the traveling screens approximately every twelve hours during each 24-hour sampling event. All fish were identified to the lowest possible taxon, enumerated and measured. In addition, Kleinschmidt conducted studies to determine the potential impacts due to re-impingement at the site. The studies were conducted in the late spring and early fall of 2007.

Upon the culmination of biological studies, data were analyzed to generate an estimation of I&E impacts as a result of station operation. Kleinschmidt was selected because of its extensive experience in the Connecticut River spanning over 30 years of ecological research.

Following the I&E studies, Kleinschmidt performed a detailed evaluation of alternative technologies and operational measures available for reducing I&E impacts. Recirculation concepts, as well as technology upgrades for use with the existing once-through cooling systems were investigated. Each option included a feasibility analysis as well as an estimate of potential I&E impact reduction.

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