Development of a Site-specific Standard for Selenium in Open Waters of Great Salt Lake, Utah

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The Great Salt Lake (GSL) is a unique terminal lake located adjacent to a rapidly growing metropolitan area in the western United States. The open water of the GSL is protected for its current beneficial uses through the application of a narrative criteria clause in the state water quality standards. The Utah Department of Environmental Quality (DEQ) initiated a process in 2004 to develop a site-specific numeric water quality standard for selenium for the open waters of the GSL to balance protection of the GSL's unique ecology and beneficial uses with burgeoning development. The process the DEQ initiated included the formation of a Great Salt Lake Water Quality Steering Committee and a Science Panel to identify the studies required, manage the studies and finally recommend a site-specific standard.

Great Salt Lake Water Quality Steering Committee. The DEQ established the GSL Water Quality Steering Committee (Steering Committee) to provide a forum for stakeholders to assist in guiding the process of developing numeric standards for the lake. This group consists of federal and state regulatory agencies, other public entities, conservation organizations, recreation groups, and industrial users of the lake.

Great Salt Lake Science Panel. The DEQ established the GSL Science Panel (Science Panel) to advise the DEQ and Steering Committee and provide overall technical direction and review for the program. The Science Panel is composed of 9 members representing federal and state regulatory agencies, industry and academia. The purpose of the panel is to identify data gaps in the literature, design and oversee scientific investigations to fill critical data gaps, and finally recommend a numeric water quality standard to the Steering Committee.

Studies Currently Underway. A partnership of researchers—including local and national experts from education and industry—are collaborating with the DEQ, the Steering Committee, and the Science Panel to complete the studies required to provide essential information for derivation of the site-specific standard for selenium in the open waters of GSL. The following studies are currently under way:

- Project 1A - Concentration and Effects of Selenium in Shorebirds
- Project 1B - Concentration and Effects of Selenium in California Gulls
- Project 1B, Phase II - Concentration and Effects of Selenium in Eared Grebes and Goldeneyes
- Project 2A - Preliminary Study of Concentration and Effects of Selenium in Benthic Zone of the Great Salt Lake
- Project 2B - Great Salt Lake Synoptic Survey of Selenium in Water, Seston, and Brine Shrimp
- Project 3 - Measurement of Selenium Loads to Great Salt Lake
- Project 4 - Measurement of Selenium Flux

Information from these studies will be used to "populate" the elements of a comprehensive conceptual model for the GSL to describe sources, loads, transfer factors, and concentrations of selenium in important resources of the lake (e.g., birds and their food webs), which will be used to establish the site-specific standard for selenium.