

Kennecott Utah Copper's Position on Setting a Selenium Standard for Great Salt Lake

Kennecott Utah Copper Corporation is an industry representative to the Great Salt Lake Water Quality Steering Committee, which is considering a numeric selenium standard for Great Salt Lake. Kennecott takes the following positions regarding the development of a selenium standard and the regulation of selenium-containing wastewater to Great Salt Lake. This position is based on:

- collective recommendations and individual opinions from a Science Panel convened by the Committee,
- the body of technical work generated under the direction of the Science Panel,
- public comments received by the Steering Committee, and
- Kennecott's more than decade-long evaluation of selenium in aquatic environments.

Kennecott commends the process for setting a selenium standard for Great Salt Lake

Kennecott commends and fully supports the process implemented by the Utah Division of Water Quality to formulate a selenium standard for Great Salt Lake using sound science coupled with a transparent and broadly-based stakeholder process. Kennecott is supportive of the broader initiative, which has been long-championed by the conservation community, to establish numeric, rather than narrative, water quality criteria for the lake.

Kennecott urges the Steering Committee, Division of Water Quality, and Utah Water Quality Board give all due weight to the full findings and recommendations of the Science Panel.

Kennecott celebrates current favorable conditions at Great Salt Lake

One of the most important outcomes of the research work sponsored by the Science Panel is the confirmation that current conditions at Great Salt Lake relative to selenium are highly favorable to lake-dependant biota. Specifically,

- There has been little accumulation of selenium in the water column despite thousands of years of natural inputs and more than a century of anthropogenic inputs; it is striking that the selenium concentration in the lake is lower than its natural tributaries.
- Brine shrimp and brine flies, the avian dietary items in the lake, have selenium concentrations below the avian dietary threshold (EC10) discussed by the Science Panel.
- Eggs from birds utilizing lake dietary food sources are well below all possible protective thresholds recommended by the Science Panel; no egg hatchability or teratogenic effects have been observed.

Kennecott joins with others who celebrate this good news about the Great Salt Lake ecosystem. Kennecott supports protection of beneficial uses of Great Salt Lake through balanced regulation Kennecott recognizes the important multiple beneficial uses of the lake including ecological habitat, recreation, brine shrimp cyst harvest, and mineral extraction; Kennecott fully supports due protection and promotion of these uses. The lake also meets an important community and industrial need as a receiver of wastewater discharge from permitted facilities. While it is important that regulations be written to protect these beneficial uses, it is equally important that such regulations do not impose undue treatment requirements on dischargers to achieve effluent quality levels that provide no real or measurable ecological or other benefit to Great Salt Lake.

Kennecott supports adoption of a bird egg based water quality standard

Kennecott supports the Science Panel's recommendation that the selenium water quality standard for Great Salt Lake be based on bird egg selenium levels. Kennecott believes this is appropriate because it:

- establishes a protective criterion at a higher trophic level and recognizes the importance of avian species,
- protects the most sensitive ecological endpoint, and
- recognizes the considerable uncertainty in modeling the relationship between water, diet, and bird eggs.

Kennecott supports the use of the mallard toxicity curve while recognizing the conservative nature of the mallard data as compared to birds that use Great Salt Lake

Kennecott supports the Science Panel recommendation that the tissue-based selenium standard for Great Salt Lake be based on laboratory dose-response studies conducted on mallard ducks. Mallard is the most sensitive bird species for which selenium toxicological information has been published. However, use of these toxicological data may be overly conservative, because mallard do not utilize Great Salt Lake food sources. Moreover, the use of laboratory dose-response data show a higher transfer of selenium to egg than has been observed in field studies. Nevertheless, use of the mallard toxicity data should result in a greater level of protection for all birds using Great Salt Lake.

Kennecott does not object to using the mallard EC10 recognizing there are multiple layers of conservatism in that value

Kennecott believes that use of the mallard EC10 for egg hatchability will ensure protection of the Great Salt Lake ecosystem. This value, 12.5 mg/Kg, is nearly identical with the no-observed effects concentration (NOEC) determined in a chronic mallard feeding study (11.3 mg/Kg).

- Use of the NOEC or EC10 is more conservative than the draft national approach for establishing a selenium aquatic life tissue-based criterion, where a 20% effects concentration (EC20) is the basis for that criterion. Kennecott believes the use of an EC20 would also protect the existing and beneficial uses of Great Salt Lake, but has long utilized the EC10 in its ecological risk assessment studies, in order to assure due protection of ecological resources.
- The use of a value that is equivalent to the NOEC is appealing because it reflects the concept of not allowing effects to occur to bird populations.

- The NOEC has been utilized in deriving wildlife protection criteria for the Great Lakes
- The use of the NOEC and/or EC10 values for aquatic-dependent species is consistent with the approach being used in other countries for risk assessments of metals.

Kennecott supports adoption of an adaptive management approach to regulating selenium-containing discharges to Great Salt Lake and believes a tiered assessment and permit implementation methodology will need to be developed by the Division of Water Quality (with public comment) after standard promulgation

Kennecott supports an adaptive management approach to implementing a selenium water quality standard for Great Salt Lake that incorporates the tiered monitoring, assessment, and management recommendation from the Science Panel. Kennecott's view of the adaptive management approach includes:

- Maintaining current selenium limits (either as concentration or mass) in permitted discharges to Great Salt Lake, as these have been demonstrated to be well within the assimilative capacity of the lake.
- Allowing new discharges subject to anti-degradation requirements in Division of Water Quality rules.
- Requiring annual discharger-funded monitoring of water and brine shrimp in Great Salt Lake, in addition to routine effluent monitoring required by discharge permits.
- Application of appropriate statistical methods to understand natural variability in lake selenium concentrations and identify trends.
- Adoption of a tiered, conservative assessment methodology consistent with the Science Panel recommendations for water and brine shrimp monitoring obligations that would trigger additional monitoring in response to upward trends.
- Post-standard development by the Division of Water Quality (with public comment) of a permit implementation methodology based on the water and brine shrimp monitoring results

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