
The proposed use could unreasonably affect the natural stream environment

If the State Engineer has reason to believe that an application to appropriate water will unreasonably affect the natural stream environment, the application will not be approved or rejected until the matter is investigated. Utah Code Ann. §73-3-8 (1) (b) (i).

The water application states that the appropriated water “may be 100% depleted.” This statement does not indicate what kind of cooling system the nuclear power plant will use, and the effects on the natural stream environment depend upon the type of cooling system chosen.

If the proposed nuclear plant is designed with a once-through cooling system, where water is diverted through the nuclear plant’s cooling system and then discharged back into the river, the following impacts would be expected:

- Entrainment of small aquatic life that are sucked into a plant’s cooling system, “including eggs, yolk-sac larvae, post-yolk-sac larvae, and some juveniles”—that can be killed through scalding or being pulverized (see Appendix A for entrainment mortality estimates from Indian Point nuclear reactor on the Hudson River in New York).
- Impingement of larger aquatic organisms that become trapped at water intake points.
- Significant thermal pollution, with water exiting the cooling system up to 30° F warmer than when it entered; significant impact to the ecology of the river, including plants and fish, will result.
- Potential impacts on endangered Colorado River Upper-Basin fish, including the Colorado pikeminnow, razorback sucker, bonytail, and humpback chub, from thermal impacts, thermal shocks associated with stopping and starting the nuclear power plant, and entrainment and impingement.
- Significantly reduced streamflow between the point of extraction and the point of return, which could in turn lead to reduced numbers and diversity of fish and other aquatic life.

If the proposed nuclear plant has a closed-loop cooling system, using cooling towers, the following impacts could be expected:

- Significant consumption of water, leading to lower streamflows; lower streamflows can mean warmer water, increased competition among fish for fewer resources, reduced suitable fish habitat, less side channel habitat where fish may seek refuge from larger predators, and reduced reproductive success.
- Because the chemistry of the water within the cooling system must be maintained, water must be routinely discharged from the system; this water typically contains high salt concentration and solids, and this could further impact the natural stream environment.
- Entrainment and impingement of aquatic life, though on a smaller scale than with once-through cooling systems.

The applicant should state what kind of cooling system the nuclear power plant will use and then discuss how the impacts to the natural stream environment will be mitigated or eliminated. If the applicant does not disclose this information, the State Engineer should investigate the matter, as directed by statute.

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