

Why Releases from Pumpback Wells Need to be Cleaned Up Steps Necessary to Remediate

Pumpback systems are used to remove contaminated water from the local aquifer. Once removed the groundwater system can rebound, replacing the affected water with clean natural groundwater, assuming the source of the contaminant has been removed. However, it can take years to pump out all the water contaminated by an older mine site that was built long before mining regulations were promulgated in 1989.

If a pumpback well has an equipment failure, contaminated water can flow across the ground, seep into the soil, or concentrate at the surface. BMRR has been asked repeatedly over the years why a release from a pumpback well needs to be cleaned up if the water below the spill is already contaminated. Here is why:

- Nevada Administrative Code (NAC) 445A.424 states, in part, “A facility, regardless of size or type, may not degrade the waters of the State to the extent that: (a) The quality of surface water is lowered below that allowed by NRS 445A.565.”
- Regardless of whether the release occurs over groundwater already impacted by mining, the release must be remediated per regulation, the Water Pollution Control Permit (WPCP) requirements, and the Permittee’s Emergency Response Plan, if one exists.
- The standard for remediation needs to be the background soil that is away from the plume area and unaffected by previous releases. In other words, the affected soil must be cleaned up until confirmatory samples show the same Meteoric Water Mobility Procedure (MWMP) Profile I results as the background.
- Areas affected by previous releases of pumpback water need to be either scraped up or an “A-K” analysis per NAC 445A.227 performed on them. A determination of magnitude and extent of the affected area(s) must be included. Even with the existence of an “A-K” analysis, the Permittee may be required to clean up the mine-impacted soil at final closure of the mine.
- An “A-K” may be performed but only with empirical results (via attenuation data) demonstrating that contaminated water will not mobilize constituents in the soil and further degrade waters of the State. Contaminants in the soil may be evapo-concentrated and pose a greater risk to the groundwater below. The goal is to not allow these higher concentrations of concerning constituents to seep back down into the groundwater.
- If the water table has been successfully remediated and the soil above is still contaminated, then this defeats the purpose of pumpback system.

The steps necessary to remediate this type of release are not complicated:

1. The Permittee needs to take background soil samples relatively distant from the pumpback system in areas that are free from the effects of past releases but are still in the same

geologic zone of the pumpback wellfield. These are background samples that should reflect no impact by the mining operation.

2. The Permittee will provide a plume area map depicting the locations of all the wells (pumpback and monitoring) as well as an estimation of the groundwater plume location and geometry. There is software on the market that simplifies this process.
 - a. The polygon for the release should be on this map and its relation to the larger plume. Was this release within the known extent of the plume?
3. After remediation has been completed, the Permittee will provide a follow-up report keeping in mind the requirements specified in the WPCP, Part II.B, and the facility's individual Emergency Response Plan, if one exists.

Contact water is groundwater that has come into contact with underground mining activity and equipment. It may be contaminated with hydrocarbons or be exposed to acid-generating rock. It too is considered to be contaminated and must be treated and handled as appropriate.

All releases of pumpback or contact water must be addressed in a similar manner. Dewatering water may be addressed differently depending on the area in which it was released and whether or not it contains any contaminants. Profile I analyses will assist in making that determination.