

Bureau of Mining Regulation and Reclamation

GUIDANCE DOCUMENT

2021 MODIFICATION TO PROFILE 1-R PARAMETER LIST

As of 2021, the Nevada Division of Environmental Protection, Bureau of Mining Regulation and Reclamation (Division) has modified the Profile 1-R parameter list. The modification is based on the review of data from various projects and the potential to impact groundwater and surface water quality as well as cross-over with the Nevada Department of Health and Human Services, Radiation Control Program. This modification supersedes the 20 March 2018 guidance.

If the ore, waste rock, or process fluid are known or suspected to contain elevated concentrations of radionuclides, a Profile 1-R analysis will be required for some or all monitoring points, as applicable.

See Table 1 for dissolved metals (e.g., samples filtered at 0.45 micrometers [μm]), preserved, digested, and analyzed as required per method specifics.

Table 1: Profile 1-R (Filtered) Parameters

Alkalinity (as CaCO_3) Bicarbonate Total	Cadmium	Magnesium	Silver
	Calcium	Manganese	Sodium
	Chloride	Mercury	Sulfate
Aluminum	Chromium	Nitrate + Nitrite (as N)	Thallium
Antimony	Copper	Nitrogen, Total (as N)	Total Dissolved Solids
Arsenic	Fluoride	pH (± 0.1 SU)	WAD Cyanide
Barium	Iron	Potassium	Zinc
Beryllium	Lead	Selenium	–

See Table 2 for total recoverable content, unfiltered, and preserved as required per method specifics.

Table 2: Profile 1-R (Unfiltered) Parameters

Uranium	Radium 226 + Radium 228
Gross Alpha	Radium 226
Adjusted Gross Alpha *	Radium 228

*Adjusted gross alpha is gross alpha minus the uranium activity in picocuries per liter (pCi/L). Uranium activity is calculated by multiplying the concentration in milligrams per liter (mg/L) by a conversion factor of 0.67 pCi/mg.

Additional radiological analyses may be required if the following conditions are met:

1. The electrical conductivity value is $\geq 1,000$ micro-Siemens per centimeter ($\mu\text{S}/\text{cm}$), and
2. The standard deviation of the gross alpha analysis is ≥ 15 pCi/L; or,
3. The standard deviation of Radium 226+228 is ≥ 5 pCi/L.

If these conditions are met, then the sample shall also be analyzed for Thallium 230 (using the Eichrome method [ACW10- 11]).

Gross alpha shall be reported as ‘adjusted’. If the standard deviation of the gross alpha analysis is ≥ 15 pCi/L (e.g., 10 ± 75 pCi/L), re-analysis for gross alpha using the co-precipitation method (EPA

00-02), may be required. Please contact the Division for further guidance.

In addition, if uranium is ≥ 0.03 mg/L in solution or is known or suspected to be $\geq 0.05\%$ (500 mg/kg) in the ore, the Division recommends that the Permittee contact the Nevada Department of Health and Human Services, Radiation Control Program to further discuss characterization and associated potential permitting or licensing/license requirements.

The complete Profile 1-R parameter list including reference values can be found on the Division website at [Regulation Branch Guidance Documents](#).

If you have any questions regarding this notification, please contact the Division at (775) 687-9400.