

8.0 CONCLUSION

The five criteria set forth in the CERCLA regulations at 43 C.F.R. § 11.2 (e)(1)-(5) for proceeding with a natural resource damage assessment have been met for the Blue Ledge Mine Site. The low pH in water running through the 55,000-60,000 tons of waste rock and the mine workings indicates the release of sulfuric acid. Metal concentrations in the waters directly downstream of the Blue Ledge Mine, Joe Creek and Elliott Creek, indicate the release of cadmium, copper, and zinc. Although sediment sampling has not been conducted, the geology, geochemistry, and site conditions indicate likely sediment contamination in Joe and Elliott Creek, and maybe as far downstream as the Applegate Reservoir.

The waste left behind and the workings at the Blue Ledge Mine Site have released and continue to release hazardous substances listed under CERCLA – sulfuric acid and metals (copper, cadmium, and zinc) – typical of AMD. Water samples taken by the Forest Service document releases of hazardous substances from the Blue Ledge Mine in levels injurious to human health and aquatic resources. Exceedances of primary drinking water standards were observed for cadmium and copper and additional exceedances of secondary drinking water standards were observed for copper, iron and zinc. There have also been numerous exceedances of ALCs in Joe Creek and Elliott Creek, often concentrations were many times that of the standard.

The contaminants released from the Blue Ledge Mine are toxic to aquatic resources, such as fish and macroinvertebrates. The information collected to date indicates that this is the case downstream of Blue Ledge Mine, and survey data have shown that there are no fish in Joe Creek. Metal concentrations detected in Joe and Elliott Creeks are much higher than those found to result in adverse effects and high mortality rates in rainbow trout and other fish. In addition, metals data from Joe Creek indicate that the macroinvertebrate population in Joe Creek has been adversely impacted due to AMD releases from Blue Ledge Mine. Amphibian survey data are highly indicative of AMD effects on amphibian populations downstream of the Blue Ledge Mine. Various life stages of tailed frog (*Ascaphus truei*) and Pacific giant salamander (*Dicamptodon tenebrosus*) were found upstream of the mine in both surveys; however, no amphibians were counted at the JC4 site directly downstream of the mine and a maximum of only three was found at any site further downstream. Groundwater may also be impacted.

The Forest Service has preliminarily identified the areas in and around 1) Joe Creek, 2) Elliott Creek downstream of Joe Creek, 3) the Applegate River downstream of Elliott Creek, and 4) the Applegate Reservoir as areas where exposures to hazardous substances released from the Blue Ledge Mine can occur for the following reasons. First, it is likely that fines from the mine waste are transported via Joe Creek to Elliott Creek and to the Applegate Reservoir. Second, analyses of water samples taken in Elliott Creek upstream and downstream of the confluence with Joe Creek document that dissolved metals from the mine have been transported to Elliott Creek. Third, to the extent bioaccumulation of hazardous substances has occurred, natural resources that live in areas removed from these water-bodies could be affected. A continual source of AMD, the Blue Ledge Mine Site will continue to cause natural resource injuries.

The information used to develop this PAS provides a substantial base from which a full assessment can be performed at a reasonable cost.