



Bringing a scenic landscape back to life

Once desolate environment now thriving under CH2M HILL's care

For more than 100 years, one of the most hazardous and complex waste sites in the nation was also in danger of becoming one of the most inhospitable places for plant and animal life in the United States. Now, however, trees, shrubs, and grasses are flourishing and wildlife has returned to the once desolate Bunker Hill Superfund Site in northern Idaho's Silver Valley.

Since 1997, CH2M HILL has managed the Bunker Hill Hillside Revegetation Project, which comprises nearly 1,100 acres of barren hillsides. The Bunker Hill Superfund Site was once home to extensive lead and zinc mining operations, which began in the late 1800s. Since then, logging for mine timbers, wildfire and smelting activities resulted in the loss of the hillside's topsoil and contamination of the valley with heavy metals, threatening public health and creating a desolate, barren landscape.

The CH2M HILL team, led by Tim White, began by working closely with the U.S. Environmental Protection Agency and project stakeholders to develop consensus-based goals, objectives and performance standards for the project during a series of four workshops.

"Since restoration projects can take many directions, this was critical to project success in that it virtually eliminated conflicts between stakeholders as the project evolved," White said.

The technical challenges facing the project were substantial.

"We needed an approach that would address several competing factors. First was the remote location with its steep, acidic and rocky slopes; slopes exceeded 1,000 feet in length in many areas," White said. "Since most of the project area lacked roads, mobilization costs were very high and we had the added constraint of having to reduce material quantities to keep costs under control. We also saw the need to integrate advanced GIS/GPS mapping techniques to keep this complicated site management project on track and to provide a foundation for long-term O&M (operations and maintenance)."

Site characterization studies, combined with on-site trials that tested a variety of plant species and soil amendments,

led to the development of restoration prescription options that literally saved the client millions of dollars over alternative approaches suggested by others.

Early on, the team recognized that site amendments, such as limestone to adjust soil pH levels, had the potential to stimulate the growth of hundreds of thousands of previously planted but stunted tree seedlings. White said that bunchgrass species, instead of sod-forming grasses, were used to reduce competition with these stunted tree seedlings and increase soil moisture levels while stabilizing actively eroding hill slopes.

In addition, a hydrated lime product was applied along with a tackifier (an adhesive substance) and mulch to adhere to the steep hill slopes. Working closely with the Army Corps of Engineers, the team determined that ultimately, hundreds of tons of restoration mixtures were needed in the project. These mixtures were applied with Sikorsky S-64 air crane helicopters—the first time this technology was ever attempted at this scale.

The target plant cover for the hillsides was 50 percent or greater overall. Operational hydro-seeding resulted in an average of more than 61 percent plant cover after two growing seasons. Currently, this cover has increased to over 65 percent with much of the remaining area consisting of rock outcrops and talus slopes. Streams once muddy from sediment now meet state water quality standards for turbidity more than 97 percent of the time. ^{UN}

Environmental awards and rewards

With roots strongly established in the area, the team now has another reason to celebrate. The pioneering revegetation project recently received a National Engineering Excellence Honor Award from the American Council of Engineering Companies. Out of 175 national finalists for the awards, only 24 were chosen for this honor, often considered the "Academy Awards" of the engineering profession.

"Although I have more than a few years left in my career, I believe that the Hillside project will be the highlight for me—the success of that project is due to the technical expertise, management abilities and incredible teamwork of the folks from CH2M HILL," said Caim Grandinetti, EPA's unit manager of the Coeur d'Alene Basin.

Greater success, however, is seen across the northern Silver Valley hillsides. Once stunted trees are now showing annual height increments of up to two feet and greater. Existing vegetation is producing new seed and new seedlings are emerging—giving hope that the ecosystem has regained its ability to naturally sustain itself into the future. Fungi—important to the recycling of plant nutrients from dead leaves, twigs, and roots—have reappeared. Native plant species are also reappearing, and wildlife is returning to the hillsides. And for the first time in more than a century, the landscape has a scenic value that will revitalize the area's tourism and economic prospects.

Before

During

After

