

National Underground Science and Engineering Laboratory

Project Proponent

The University of Washington, acting on behalf of 100 leading scientists and their research institutions.

Project Description

To create a deep-underground site for doing basic science research in physics, astrophysics, earth sciences, geomicrobiology, and related fields. The laboratory rooms, 7400 feet underground, will be connected to the surface by two tunnels, each approximately 3 miles in length. In addition to the underground laboratory, the project includes a surface campus for detector development and data analysis, and a Visitor Experience Center for public outreach and education.

Project Requirements

- Laboratory must be at least 6000 (preferably 7000) feet underground to be free from cosmic rays and other natural radioactivity.
- Subsurface rock must be uniform and competent, suitable for large excavations.
- Location must be reasonably accessible.
- Location must allow a related surface campus for research and administration, and a Visitor Center within a reasonable distance (e.g., within 10 miles).
- Power and other services must be available at a reasonable cost.

Efforts to date

Original proposal submitted by the University of Washington to the National Science Foundation in 2001. The preferred location was the now-closed Homestake Mine in South Dakota. In selecting the preferred location several other sites were evaluated.

Homestake ownership changed in late 2001. The new owner has removed needed facilities and recently flooded the mine. Other conditions have been placed on the project, complicating the proposed site transfer.

An effort to identify alternatives began in 2003 and yielded 12 candidate sites. Each site was evaluated for geotechnical suitability. Two sites near Leavenworth—Cashmere and Cannon Mountains—were identified as outstanding candidates. Cashmere Mountain, near Icicle Creek, is the leading site because of its shorter tunneling path, greater distance from regional faults, and accessibility.

At this time, detailed geotechnical evaluations are underway and discussions have been initiated with landowners, regulatory agencies, interest groups and neighbors to assess whether the University of Washington should propose Cashmere Mountain as the laboratory site.

If a proposal is submitted and if the National Science Foundation responds favorably, steps will be taken to secure all permits, agreements, environmental review, and land acquisition. Project construction is expected to take about five years.

Project Impacts

The laboratory would be the leading facility worldwide for deep underground physics and earth science. It will contribute to graduate and undergraduate education and promote science outreach to K-12 teachers, their students, and the public.

The project construction costs are approximately \$300 million, and the yearly scientific activity would be approximately \$50 million. The lifetime of the laboratory is expected to be at least 40 years. Approximately 200 permanent or visiting faculty, postdoctoral researchers, graduate students, and support staff would work within the surface campus. Roughly two-thirds of the construction and permanent staff would come from Chelan County. The typical economic multiplier for such projects is a factor of three.

A more detailed description is available.