Calaveras Dam Replacement Project

Fact Sheet

Naturally Occurring Asbestos

Project Summary

The San Francisco Public Utilities Commission is rebuilding Calaveras Dam, our largest local Bay Area drinking water reservoir. The existing earth fill dam is located near the active Calaveras earthquake fault. We lowered water levels in the reservoir in response to seismic concerns in 2001. The project consists of building a new zoned earth and rock fill dam immediately downstream of the existing dam. The replacement dam will have a structural height of 220-feet and is designed to accommodate a maximum credible earthquake on the Calaveras fault. The dam will have a crest length of 1,210 feet, a base thickness of 1,180 feet, and crest thickness of 80 feet. The total volume of the dam will be approximately 3.5 million cubic yards. The replacement dam will restore the original reservoir capacity of 96,850 acre-feet, or 31 billion gallons of water providing water to the 2.6 million customers in the Bay Area.

About Naturally Occurring Asbestos

Asbestos is the name given by the United States Geological Survey to a group of different fibrous minerals that occur naturally in the environment. Asbestos fibers are microscopic, do not dissolve in water or evaporate, and are resistant to heat, fire, and chemical or biological degradation. Because of these qualities, asbestos has historically been used in many commercial products, including insulation, brake linings, and roofing shingles.

Fibers can be released into the air when disturbed by human activities or by natural erosion. There are two types of asbestos fibers that occur naturally in rock formations: chrysotile and amphibole asbestos. Many scientists believe that amphibole asbestos fibers are more of a health concern than chrysotile.

Portions of the approximately 10 million cubic yards of material being moved in order to construct the replacement Calaveras Dam are composed of rock formations that contain varying levels of Naturally Occurring Asbestos. Geotechnical explorations in the area of the Calaveras Dam Replacement Project construction revealed that the Sunol Valley contains rock types, namely Franciscan Complex mélange that includes serpentinite, which is known to contain naturally occurring chrysotile asbestos. Serpentinite is the state rock of California and occurs naturally. It is common in the Sierra foothills, the Klamath Mountains, and the Coast Ranges, and found in at least 44 of California's 58 counties. Rock formations in the vicinity of the Calaveras Project site contain both chrysotile, and amphibole asbestos.

General Risks from Naturally Occurring Asbestos

Most studies regarding the risks of asbestos involve workers who were exposed to high levels of asbestos in occupational settings over long periods of time. Our understanding of risks related to exposure to Naturally Occurring Asbestos (NOA) is relatively limited. However, due to the prevalence of asbestos occurring naturally in northern California, there is the possibility that some undetermined but low level risk is always present from background concentrations of airborne Naturally Occurring Asbestos. In addition to variation in individual susceptibilities found with all such exposures, there are several factors that contribute to a person's risk of contracting an asbestos-related disease, including: 1) higher levels of asbestos fibers in the air, 2) the mineral type of fibers and the size of the fibers, 3) higher frequency of exposure, 4) longer duration of exposure, and 5) the time that elapses after the start of exposure. Asbestos fibers may remain in the lungs for a lifetime without causing health-related issues, but in some cases, asbestos fibers can damage the lungs and cause asbestos-related disease, such as asbestosis, mesothelioma, or lung cancer. These diseases do not commonly appear for 20 or more years after the start of exposure. There also are other health considerations which exacerbate the risks associated with asbestos exposure, such as smoking.

What are the health risks from the Calaveras Dam Replacement Project?

Although dust potentially containing asbestos fibers may be generated during the project, the dust mitigation measures and work management practices incorporated into project plans will keep generation of any such dust to a minimum. Moreover, the air quality monitoring program integrated with the dust control measures, will assure that asbestos-containing dust does not leave the site at concentrations sufficient to pose unacceptable risks to workers or the public.

Human disease from asbestos is most often associated with cumulative, long-term inhalation exposure to airborne asbestos and the risk of disease increases with increasing exposure concentration and exposure duration as well as time that elapses since first exposure.

We have established conservative risk-based thresholds at perimeter monitoring stations. As long as such thresholds are not exceeded on average over the six years of the project, then individuals in the area surrounding the CDRP who become exposed will experience no more than a 1 in 100,000 added risk for cancer from their exposure. Moreover, due to the assumptions built into these calculations, any actual risks will likely be even lower.

Are people in nearby houses, park districts, or communities at risk?

Federal, State, and local agencies have been grappling with this very question. At this time there is no clear answer. What complicates the issue is that asbestos is everywhere in our communities and in our environment. Serpentinite and other asbestos-containing rock formations are located throughout California, including particularly the Bay Area. These formations may also be disturbed by a broad range of activities being conducted throughout the area. It is important to note that Naturally Occurring Asbestos does not pose a health risk until it becomes airborne, and the program is designed to prevent this from occurring.

Find additional information about Naturally Occurring Asbestos Here:

U.S. Environmental Protection Agency
http://www.epa.gov/asbestos/pubs/clean.html

California Environmental Protection Agency Air Resources Board
http://www.arb.ca.gov/toxics/asbestos/asbestos.htm

California Geological Survey
http://www.conservation.ca.gov/cgs/minerals/hazardous_minerals/asbestos

Prevention of Asbestos Exposure

The SFPUC has implemented an extensive dust control and monitoring program that is designed to keep dust generation to a minimum while assuring that asbestos-containing dust does not leave the site at levels sufficient to pose unacceptable risks to individuals who may work, recreate, or reside in the vicinity of the site.

Comprehensive Dust Control

An important tool at our disposal is dust control. Naturally Occurring Asbestos (NOA) fibers are a component of dust that is generated from NOA containing areas during construction. Therefore, by carefully controlling dust emissions, we minimize NOA leaving the site as well. Real time dust monitors on site provide an important tool for construction managers to continuously monitor the efficacy of our dust control measures. Areas with NOA and haul roads are kept wet during excavation, and vehicles leaving the site are washed to prevent trackout of NOA.

We closely monitor air quality around the project site to ensure we are protecting the public and our workers at all times. The SFPUC and a team of air quality experts are working in coordination with regulatory agencies regarding the dust control program, including: San Francisco Planning and Health Departments, State of California Regional Water Quality Control Board, Bay Area Air Quality Management District (BAAQMD), and the California Occupational Safety and Health Administration (Cal/OSHA).

Background Air Monitoring

In order to establish the natural, background air quality in the area prior to construction, the SFPUC collected air quality samples from 14 stations for two and a half years, and again for three months just prior to project startup. The results of these background data show that airborne asbestos was detected intermittently at all monitoring stations. Levels ranged from non-detectable to .0164 structures per cubic centimeter. These results indicate that the levels detected are typical of background levels of asbestos found near serpentine rock formations. These levels indicated the low level presence of airborne asbestos fibers prior to any construction activity on the project.

Trigger Levels for Construction Monitoring

We have established a system for monitoring air quality at different distances from the work activities. This begins with samples collected in worker breathing zones and moving outward to samples collected in each construction area, at the perimeter of the project site, and at locations throughout the Sunol Valley (ambient stations). The perimeter locations are designed as “sentinel” stations sited to detect any potentially unacceptable concentrations of fugitive NOA from the project.

We have been working with industry experts to establish trigger levels for perimeter stations. Should levels of naturally occurring asbestos detected at these perimeter air monitoring stations exceed these trigger levels, we will modify our construction activities. We are required to implement enhanced dust control measures, including if necessary, slowing down or stopping construction activities.

The trigger levels are designed to be conservative and consistent with regulatory guidelines. As long as such thresholds are not exceeded on average over the six years of the project, than individuals in the area surrounding the CDRP who become exposed will experience no more than a 1 in 100,000 added risk for cancer from their exposure which is consistent with EPA guidance. Moreover, due to the multiple, conservative assumptions built into these calculations, any actual risks will likely be even lower.

Weather and wind monitoring

We have installed meteorological monitoring stations at all perimeter and ambient monitoring stations to provide continuous data including wind speed and direction. These data allow the SFPUC to assess local weather conditions, including wind patterns and determine how best to proceed with construction activities in a manner that minimizes potential dust generation

Air Quality Sampling

About Sampling

Air quality monitors have been strategically placed in and around the interior, perimeter, and outlying areas in and surrounding the project site. These locations are designed to detect fugitive fibers at concentrations potentially capable of posing unacceptable risks.

Using a pump with a controlled flow rate, fibers are collected on a filter that is especially designed for asbestos. The filters are then taken to an offsite independent certified laboratory where a microscopist examines the filters with an electron microscope to count the amount of fibers present in the air quality sample. The results must then be reviewed again for quality control and assurance purposes. The results are reviewed daily, and included into the project emission budget that has been established for the project.

Samples are examined using transmission electron microscopy (TEM). Electron microscopes offer a high level of magnification and sensitivity. Unlike Phase Contrast Light Microscopes, TEM allows the analyst to distinguish between asbestos and non-asbestos fibers and even to distinguish between types of asbestos. These detected concentrations are generally reported as asbestos structures per cubic centimeter of air collected (s/cc).

Results of Air Quality Sampling

We post results from our regular air quality testing on a weekly basis on our website at: www.sfwater.org/sunolvalley.
Click on “Air Monitoring Results” on right side bar.

For more information on the Calaveras Dam Replacement Project or the Naturally Occurring Asbestos Air Monitoring Program

Contact us:
24 hour-Answer Line 866-973-1476

Email us:
blauppe@sfwater.org
onunez@sfwater.org

Follow us online at:
Sfwater.org/sunolvalley

HETCH HETCHY WATER SYSTEM IMPROVEMENT PROGRAM