Plumas National Forest Chips Fire
Natural Occurring Asbestos Report

March 2013

In August 2012 "The Chips Fire" burned over 75,000 acres on the Plumas/Lassen National Forest lands. Sections of the fire burned in serpentine rock areas which are known to produce Natural Occurring Asbestos (NOA). NOA is the term applied to the natural geologic occurrence of asbestos, commonly found in serpentine rock formations. During the Chips suppression operation a Safety Officer raised the issue of firefighter safety in NOA areas. When NOA is disturbed, becomes airborne and inhaled, these thin fibers irritate tissues and resist the body's natural defenses. Asbestos, a known carcinogen, causes cancers of the lung and the lining of internal organs, as well as asbestosis and other diseases that inhibit lung function. A geologic map of the serpentine rock areas confirmed that some dozer and hand lines were constructed in these areas. The decision was made to stop the retrieval of suppression equipment (hose, pumps, tools) in the serpentine areas.

A geologist collected soil and rock samples for testing. The samples **confirmed the presence of asbestos** but did not fully respond to the issue raised by the Safety Officer. A determination was then made to gather air borne samples and Federal Occupational and Health (FOH) was contracted to facilitate the process. Activity based air sampling was conducted by an industrial to determine which firefighting activities created a potential exposure risk. A Forest Service team simulated firefighting activities and recovered the abandoned suppression equipment. The team had been trained on NOA exposure protocols and wore respirators and contamination suits as a precaution.

Forty eight (48) airborne samples were collected from ten (10) separate locations/Forest Service workers (5 per day) and submitted for Phase Contrast Microscopy laboratory analysis. Twelve (12) bulk samples were collected and submitted for Polarized-light Microscopy laboratory analysis. Three (3) personal air samples exceeded the 26 Code of Federal Regulations 1910.1001 Worker Exposure Time Weighted Average (TWA) of 0.1 f/cc (sample #170119-A034, A039, & A044) and were reanalyzed by Transmission Electron Microscope (TEM) using a more comprehensive lab technique to differentiate the fibers collected. **Based on the asbestos fibers identified, the calculated Permissible Exposure Limit for the line workers fell below the worker exposure TWA of 0.1f/cc.** The test results also indicated that personnel working in the Chips fire areas were not exposed to dangerous levels of asbestos particles and confirm that there is no need to wear high-efficiency particulate air respirators. As a safety precaution dust mitigation tactics will continue when possible. While the Plumas National Forest does not believe personnel working on the Chips Fire area were exposed to dangerous levels of asbestos particles, worker safety in NOA areas is an evolving issue and further testing may be warranted.

WHAT WAS DONE WELL?

- The work environment on the Chips fire allowed for a safety issue to be raised that was embraced by the Forest and the Region.
- All fire operations in the serpentine rock areas were stopped until testing could be completed.
- Experts including an asbestos-trained Forest Service crew, an NOA specialist, an Industrial Hygienist and the National Institute for Occupational Safety and Health (NIOSH) were included in this issue.
- The Fire Teams, the Forest and the Region were communicating fully. This relationship resulted in the transparent resolution of the issue raised by the safety officer.

RECOMMENDATIONS/LESSONS LEARNED:

There are numerous unknown factors with NOA. While most standards and practices are based on the asbestos industry in buildings it is reasonable to **minimize fire fighter exposure to serpentine dust during suppression operations**. Therefore:

- Consider conducting air monitoring sampling to create a baseline for hazard mitigation in known serpentine rock areas.
- Use baselines to create guidelines for future work in NOA areas and include them in Job Hazard Analysis documents.
- Ensure all fire teams are briefed on Forest NOA locations.
- Prepare and distribute maps of serpentine rock areas.
- Provide dust abatement during fire operations on roads in the NOA areas.