

FOR CONTRACT NO.: 02-3E0704

INFORMATION HANDOUT

MATERIALS INFORMATION

NATURALLY OCCURRING ASBESTOS
PRELIMINARY SITE INVESTIGATION REPORT

ROUTE: 02-SIS-96-52.6/104.8

Project No. S8475-06-43
October 10, 2002

Mr. Thomas Graves
California Department of Transportation
District 2
1657 Riverside Drive
Redding, California 96049-5415

Subject: STATE ROUTES 3, 36, 70, 96, 299 AND INTERSTATE 5
PLUMAS, SHASTA, SISKIYOU AND TRINITY COUNTIES,
CALIFORNIA
CONTRACT NO. 43A0078
TASK ORDER NO. 02-987901-YI
NATURALLY OCCURRING ASBESTOS
PRELIMINARY SITE INVESTIGATION REPORT

Dear Mr. Graves:

In accordance with Caltrans Contract No. 43A0078 and Task Order No. 02-987901-YI, Geocon Consultants, Inc. has performed an investigation of naturally occurring asbestos at the Site. The Site consists of shoulder areas of select segments of State Route 3 (SR-3), SR-36, SR-70, SR-96, SR-299 and Interstate 5 (I-5) in Plumas, Shasta, Siskiyou and Trinity Counties, California (the Sites).

The accompanying report summarizes the services performed including geologic mapping, soil sampling, and laboratory testing.

The contents of this report reflect the views of Geocon Consultants, Inc., who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

If there are any questions concerning the contents of this report, or if Geocon may be of further service, please contact the undersigned at your convenience.

Sincerely,

GEOCON CONSULTANTS, INC.

David W. Bieber, RGP, CHG, CEG
Senior Geologist

T. Nathan Manley
Staff Geologist

TNM:DWB:sd

(4) Addressee

NATURALLY OCCURRING ASBESTOS
PRELIMINARY SITE INVESTIGATION
REPORT

STATE ROUTES 3, 36, 70, 96, 299, AND
INTERSTATE 5
PLUMAS, SHASTA, SISKIYOU, AND
TRINITY COUNTIES, CALIFORNIA

PREPARED FOR

CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 2
REDDING, CALIFORNIA

TASK ORDER NO. 02-987901-YI
GEOCON PROJECT NO. S8475-06-43

OCTOBER 2002

TABLE OF CONTENTS

NATURALLY OCCURRING ASBESTOS PRELIMINARY SITE INVESTIGATION REPORT

	Page
1.0 INTRODUCTION	1
1.1 Project Description	1
1.2 General Objectives.....	1
2.0 BACKGROUND	2
2.1 Potential Naturally Occurring Asbestos Impacts.....	2
3.0 SCOPE OF SERVICES	3
3.1 Pre-Field Activities	3
3.2 Field Activities.....	3
4.1 Sampling Location Rationale.....	4
4.2 Sampling Procedures	4
4.3 Geologic Mapping	5
4.4 Laboratory Analyses	5
5.0 FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS	6
5.1 Site Geology.....	6
5.2 Soil Analytical Results	6
6.0 CONCLUSIONS AND RECOMMENDATIONS	8
6.1 Naturally-Occurring Asbestos	8
6.2 Risk to Human Health.....	8
7.0 REPORT LIMITATIONS	10

FIGURES

1a and 1b.	Vicinity Maps
2a – 2i.	Interstate 5 Geologic Strip Maps (Siskiyou and Shasta Counties)
3a – 3j.	State Route 3 Geologic Strip Maps (Siskiyou County)
4a – 4o.	State Route 3 Geologic Strip Maps (Trinity County, north sections)
5a – 5c.	State Route 3 Geologic Strip Maps (Trinity County, south sections)
6.	State Route 36 Geologic Strip Map (Trinity County)
7a – 7p.	State Route 96 Geologic Strip Maps (Siskiyou County)
8a – 8c.	State Route 299 Geologic Strip Maps (Trinity County)
9a – 9c.	State Route 70 Geologic Strip Maps (Plumas County)

TABLES

1.	Project Area Study Limits
2.	Summary of Asbestos Analytical Data and Global Positioning System Coordinates

APPENDICES

A.	Laboratory Reports and Chain-of-Custody Documentation
----	---

NATURALLY OCCURRING ASBESTOS PRELIMINARY SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This Naturally Occurring Asbestos (NOA) Preliminary Site Investigation (PSI) report for the State Route (SR) 3, SR-36, SR-70, SR-96, SR-299, and Interstate 5 (I-5) projects was prepared under Caltrans Contract No. 43A0078 and Task Order (TO) No. 02-987901-YI.

1.1 Project Description

The project areas consist of highway segments within the Caltrans District 2 region that intersect mapped bodies of ultramafic rock, which may potentially contain NOA. Caltrans defined the study limits along both shoulders of SR-3, SR-36, SR-70, SR-96, SR-299, and I-5 in Plumas, Shasta, Siskiyou, and Trinity Counties, California. Two additional areas, one each on SR-3 and SR-299, were identified by Geocon, and sampled after consultation with Caltrans personnel. The approximate project study limits are depicted on the Vicinity Maps, Figures 1a and 1b. The designated limits for each of the highway segments are listed by county, highway, and post mile (PM) markers on Table 1.

The highway segments designated for study lie in mountainous regions of northern California. Roadcuts along these highways are prone to rockfall and landslide, requiring frequent clearing of the roadway and shoulder areas by Caltrans maintenance crews. The maintenance activities occasionally require excavation and re-grading of onsite soils and rock debris, and can involve significant disturbance of dust.

1.2 General Objectives

The objective of the subject TO was to assess surface soils situated at the toe ultramafic (also called ultrabasic) and serpentine rock masses along the roadway within the project study areas, for the presence of NOA. The scope of work requested by Caltrans included the collection of up to 180 soil samples for analytical testing. Caltrans may utilize the investigative results as part of a separate environmental document. The investigative results may be further used by Caltrans to determine the potential impacts to human health and safety, and environmental effects (aerial or hydrological) related to the disturbance of NOA containing materials.

2.0 BACKGROUND

2.1 Potential Naturally Occurring Asbestos Impacts

Some native soils within the project limits contain weathered serpentine and ultramafic rock. As defined in current California Air Resources Board (CARB) rules, serpentine material refers to any material that contains at least 10 percent serpentine, and asbestos-containing serpentine refers to serpentine materials with an asbestos content greater than 5 percent as determined by CARB Test Method 435 (CARB 435). The use of serpentine material for road surfacing is prohibited in California by Title 17 of the California Code of Regulations (CCR) Section 94147, unless the material has been tested and determined to have an asbestos content of 0.25 percent or less. Materials found to contain asbestos in excess of 0.25 percent are considered to be designated waste if transported offsite, requiring disposal at a landfill facility designated to accept asbestos waste. Alternatively, asbestos-containing materials may be reused onsite if buried beneath a minimum six inches of soil.

The CARB has mitigation practices for construction, grading, quarrying, and surface mining operations that contain natural occurrences of asbestos outlined in Title 17, Section 93105. NOA primarily poses a health hazard when it becomes an airborne particulate. The construction/maintenance activities mentioned above could disturb NOA laden debris and soil, thereby potentially creating an airborne hazard. With NOA potentially becoming airborne during these activities, mitigation practices can reduce the risk of exposure to NOA. These practices include wetting the materials being disturbed and wearing approved HEPA asbestos masks during construction activities.

Similar methods are outlined in the CARB's Title 17, Section 93106 for airborne asbestos in road surfacing applications. Using road material with 0.25% asbestos material is not permitted. A wet surface or sealant is recommended to minimize disturbance of the asbestos material.

3.0 SCOPE OF SERVICES

The following scope of services as requested by Caltrans under TO No. 02-987901-YI was performed.

3.1 Pre-Field Activities

- A pre-work Task Order Meeting was conducted on June 26, 2002. The Caltrans contract manager, Thomas Graves, and Geocon representatives, David Bieber and Nathan Manley conducted the meeting to discuss the scope of work and work areas. The Site Visit Checklist, Completion Schedule, and Notice to Proceed were subsequently executed by Mr. Graves and Mr. Bieber.
- Prepared a Workplan dated June 25, 2002, which describes the requested scope of services and quality assurance/quality control (QA/QC) sampling and laboratory procedures.
- Prepared a Health and Safety Plan dated June 21, 2002 to provide guidelines on the use of personal protective equipment during the field activities.
- Retained the services of EMSL Analytical Inc. (EMSL), a Caltrans approved and California-certified analytical laboratory located in Milpitas, California to perform the asbestos analysis of soil samples.

3.2 Field Activities

The field activities included the collection of 125 soil, rock, and colluvial debris samples, and geologic mapping of the lithology visible from the roadway within the Caltrans designated project study limits. Sampling and geologic mapping activities were conducted on July 29 through August 2 and on August 8, 2002. Details of the field activities are presented below.

4.0 INVESTIGATIVE METHODS

4.1 Sampling Location Rationale

Caltrans designated the general soil sampling areas along SR-3, SR-36, SR-70, SR-96, SR-299 and I-5 with individual sample locations chosen in the field by the Geocon field supervisor. Sample locations were selected based on lithology, accessibility, and grade of serpentinization of rock outcrops. Most sample locations were chosen based on their increased probability for asbestos content (i.e. higher-grade serpentinization of the host rock). Additional consideration was given to serpentinized rock outcrops and road cuts where significant amounts of colluvial debris might accumulate and require clearance by roadway maintenance crews. In those areas where there were no obvious sample points, samples were collected at more accessible locations every 0.5 to 1.0 miles.

Additional sampling areas not originally designated in the TO were mapped and sampled (at request of the Caltrans contract manager) in the field as they were encountered.

4.2 Sampling Procedures

The latitude/longitude coordinates of the sample locations were recorded with a global positioning system (GPS) receiver along with a tape recorder and field book marking the sample number and mile post marker. Many other mile post markers were recorded with GPS to provide good reference for mapping the sample locations and surrounding geology. A subjective grade of serpentinization on a scale of 0 to 3 (0 being no serpentinization evident, 1 being slight, 2 being moderate, and 3 being high grade/complete serpentinization) was assigned to samples at each location and to outcrops mapped along the roadway within the Caltrans designated study limits. This qualitative classification system rated the perceived degree of serpentinization for a given rock sample or outcrop. Serpentinized rocks of higher metamorphic grade generally exhibit a greater probability of containing NOA. Other types of suspect metamorphic and ultramafic rocks that have not undergone any serpentinization may contain amphibole asbestos minerals. Talc schist is such a suspect rock that may contain associated amphibole asbestos.

Samples obtained during field activities consisted of dry particulate materials and were sampled using a stainless steel trowel and/or rock hammer. Samples at each location were obtained from colluvial and slope-wash accumulations at the base of road cuts and outcrops approximately 20 feet from the road cut edge. Dry decontamination procedures were used to cleanse the sampling equipment between each sample location to prevent cross-contamination by sampled materials.

The soil samples were placed in separate Zip-Lock® bags and stored in boxes pending delivery to EMSL. Each sample bag was marked with a sample identification number and was labeled according to the county, highway number, sample number, date, and time reference for that sample location. Two soil samples and one rock hand sample was taken from each designated location. One set of the soil samples was shipped to EMSL for asbestos content analysis under standard chain-of-custody

procedures. The other soil sample set and rock hand specimens were archived at Geocon. The sampling locations are depicted on the Geologic Strip Maps, Figures 2 through 9. The GPS coordinates of each soil sample location, cross-referenced by mile post marker and figure number are presented on Table 2.

4.3 Geologic Mapping

Mapping of the geology immediately adjacent to the roadway within the Caltrans designated study limits (and those areas observed to contain serpentinized materials) was conducted concurrently with sampling activities. Over 80 miles of roadway were mapped on a reconnaissance level with geologic and topographic observations recorded on audio tape correlated to mile post markers and sample locations. The recorded observations were subsequently reviewed in the office and a representation of the geologic conditions encountered was drawn on a series of base maps prepared for the project. GPS coordinates of mile post markers and sample points were used to integrate the observational data with the base maps. Regional geologic maps were reviewed and used to further refine the mapping to address areas where the underlying lithology could not be observed due to colluvial debris or vegetation. The regional geologic/lithologic descriptors were applied to the geologic strip maps to allow for better correlation of data. The geologic strip maps showing regional lithology, local serpentinized outcrops and sample locations are shown as Figures 2 through 9, with individual sections assigned a letter designation.

4.4 Laboratory Analyses

A total of 125 sets of samples were collected within the project study limits from which a split was submitted to EMSL for asbestos fiber analysis by polarized light microscopy (PLM) under standard 10-day turn-around time (TAT). The soil samples were processed by crushing and analyzed utilizing California CARB Test Method 435.

Prior to submitting the soil samples to the laboratory, the chain-of-custody documentation was reviewed for accuracy and completeness. Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix A.

5.0 FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS

5.1 Site Geology

Materials encountered during the collection of the samples generally consisted of rock, and silty or sandy colluvial debris with numerous rock fragments and slivers. In some locations, the samples collected were predominantly composed of well weathered, decomposed ultramafic rock and oxidized soils. The soils and colluvial materials were derived from the slopes and outcrops above the roadway. The lithology of the rocks encountered in the sample locations was primarily of ultramafic or meta-volcanic origin. Alteration of ultramafic rocks varied from partial to complete serpentinization with significant weathering in undisturbed topography. Other areas of meta-sedimentary, igneous extrusive and igneous intrusive rocks were encountered and mapped within the project study limits. Most of the Caltrans designated study areas contained sections prone to rockfall and landslides, requiring extensive effort in road maintenance, clearing and possible road widening.

5.2 Soil Analytical Results

One hundred and twenty five sample sets were collected from the designated pullouts adjacent to the north and southbound shoulders of SR-3, SR-36, SR-70, SR-96, SR-299 and I-5 and submitted for asbestos analysis by CARB 435.

Laboratory analysis reported asbestos as chrysotile, tremolite or actinolite in 60 of the 125 samples analyzed, at values between 0.25% and 20.00% content. Fifty-six of those 60 samples contained asbestos as chrysotile. One of the 60 samples (SIS96-S8) was reported to contain tremolite and actinolite totaling 0.50% content, and three samples (SIS96-S12, S15 and S20) were reported to contain tremolite at values ranging from 1.50 to 1.75%. Thirty-six samples were reported to contain asbestos as actinolite or chrysotile at values less than 0.25%. Of those 36 samples, asbestos was reported as actinolite in one sample (TRI3-S40), as a mixture of actinolite and chrysotile in one sample (I5-S20), and as tremolite in one sample (I5-S12).

Each highway segment mapped and sampled but two had reportable asbestos present in a portion of the samples collected. NOA was not detected in the samples collected from the segments of SR299 in the vicinity of Oregon Mountain summit or near milepost 64.0. On I-5 segment, only three samples contained NOA at values of 0.25% or more. The samples with the highest reported NOA content (up to 20.00%) were obtained along segments of SR-3 in the southern and northern portions of Trinity County where 34 of the 40 samples contained detectable amounts of NOA. NOA content ranged from less than 0.25% to 15.00% in the nine samples collected from SR-70 in Plumas County. Twenty-two of the 25 samples collected along SR-3 in Siskiyou County contained NOA at levels that ranged from less than 0.25% to 6.50%. A Summary of Asbestos Analytical Data and Global Positioning System Coordinates is presented on Table 2. Sample locations and local geology are depicted on the geologic strip maps, Figures 2 through 9.

Reproductions of the laboratory reports and chain-of-custody documentation are presented in Appendix A.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Naturally-Occurring Asbestos

The following conclusions and recommendations are based on the site investigation results and the proposed reuse and/or offsite disposal of excavated material generated from the Site.

Naturally occurring asbestos is a State of California regulated substance. Excavated materials exceeding the CARB regulatory limit of 0.25% NOA content cannot be used as, or in such a way that it could fall under the definition of surfacing material as defined by the CARB Rules. Asbestos was reported in 96 of the 125 samples obtained during the field investigation along sections of the highways mapped. Sixty of the 96 samples contained asbestos at values exceeding 0.25% and of these ten contained asbestos in excess of 5% (meeting the CARB definition for asbestos containing serpentine).

The asbestos content of surface materials sampled at 60 of the 125 locations within the project study limits are in excess of the CARB limit of 0.25% for surfacing materials. As such, these materials are not suitable for reuse within the Caltrans project boundaries as surfacing materials but may be used as fill materials provided they are buried beneath a minimum of six inches of clean material. Furthermore, construction/maintenance activities involving these asbestos-containing materials may fall under regulatory jurisdiction of the California Division of the Occupational Safety and Health Administration (Cal-OSHA) under Title 8 Section 5208 of the California Code of Regulations (CCR). Mitigation measures during construction/maintenance activities should be utilized to minimize releases to air (dust control) and surface waters (stormwater discharge). Asbestos containing soils reused within the Caltrans right-of-way should be placed in the deepest fills.

Under the revised CARB Rule, offsite disposal of the material requires asbestos content notification. Facility-specific landfill acceptance criteria should be determined for asbestos containing soil materials.

6.2 Risk to Human Health

Currently, regulatory exposure limits and health hazard data is not available for naturally occurring asbestos in soils. Federal regulations governing asbestos define it as the asbestiform variety of the amphibole minerals actinolite, amosite, anthophyllite, crocidolite, and tremolite, and the asbestiform variety of serpentine, chrysotile. Asbestos fibers occurring in industrial materials are considered by the National Institute for Occupational Safety and Health (NIOSH) as potential occupational carcinogens. Prudence is recommended, therefore, in dealing with soils containing naturally occurring asbestos. Engineering controls such as wet suppression should be utilized to minimize aerial dispersion of NOA fibers in planned work areas during excavation or road maintenance activities. Under Title 8 Section 5208 of the CCR, disturbance of asbestos containing materials requires wet working methods and possible respiratory protection and air monitoring. The excavation

contractor should contact Cal-OSHA to establish the appropriate regulatory protocol and actions necessary for excavation and/or disturbance of asbestos containing soils at the Site.

7.0 REPORT LIMITATIONS

This report has been prepared exclusively for Caltrans. The information contained herein is only valid as of the date of the report, and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

TABLE 1
 PROJECT AREA STUDY LIMITS
 DISTRICT 2 NATURALLY OCCURRING ASBESTOS SITE INVESTIGATION

Highway Route	Beginning County	Beginning Post Mile	Ending County	Ending Post Mile	Total Miles/Kilometers
3	Trinity	L2.300	Trinity	L3.500	1.2 / 1.93
3	Trinity	45.983	Trinity	46.583	0.6 / 0.96
3	Trinity	48.883	Trinity	50.083	1.2 / 1.93
3	Trinity	52.483	Trinity	55.383	2.9 / 4.66
3	Trinity	66.083	Siskiyou	6.608	25.6 / 41.20
3	Siskiyou	11.508	Siskiyou	12.608	1.1 / 1.77
3	Siskiyou	37.408	Siskiyou	43.608	6.2 / 9.98
5	Shasta	R53.797	Siskiyou	0.900	14.1 / 22.69
36	Trinity	R34.602	Trinity	R34.902	0.3 / 0.48
70	Plumas	18.300	Plumas	22.600	4.3 / 6.92
96	Siskiyou	22.654	Siskiyou	31.054	8.4 / 13.52
96	Siskiyou	34.254	Siskiyou	39.454	5.2 / 8.37
96	Siskiyou	52.542	Siskiyou	53.742	0.2 / 0.32
96	Siskiyou	58.642	Siskiyou	59.042	0.4 / 0.64
96	Siskiyou	63.842	Siskiyou	67.042	3.2 / 5.15
96	Siskiyou	75.342	Siskiyou	75.742	0.4 / 0.64
96	Siskiyou	88.436	Siskiyou	91.836	3.4 / 5.47
299	Trinity	56.422	Trinity	57.222	0.8 / 1.29
299	Trinity	64.316	Trinity	64.916	0.6 / 1.97