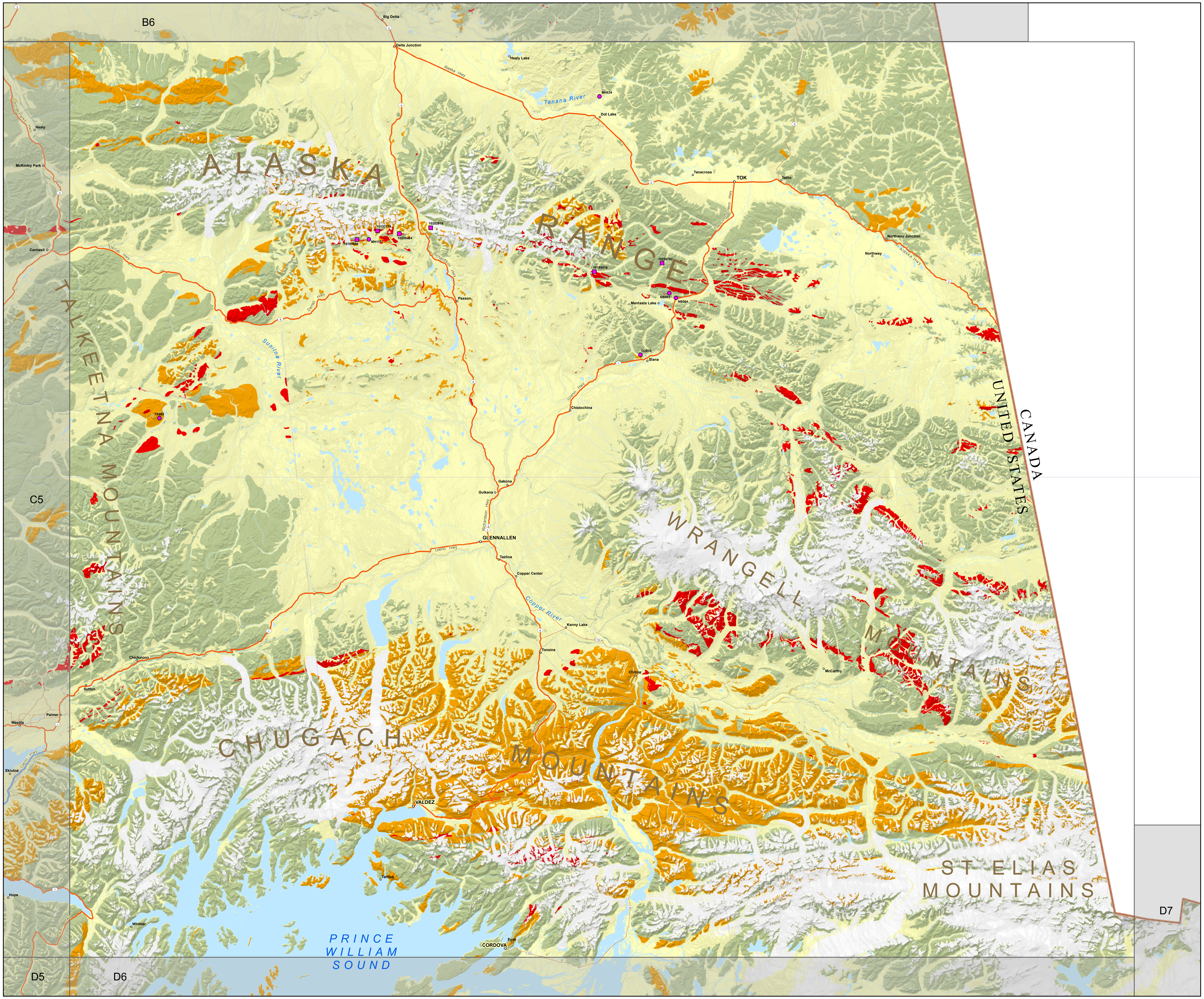
STATE OF ALASKA

MISCELLANEOUS PUBLICATION 157
Prepared for Alaska Department of
Transportation & Public Facilities
Solie and Athey, 2015
Locator index C6, page 10 of 21
Explanatory report accompanies map



EXPLANATION

As a health hazard, asbestos is usually linked with man-made building materials and renovation dust, but asbestos is also found naturally in the geologic environment. The Naturally Occurring Asbestos (NOA) task force, a part of the Alaska Department of Transportation & Public Facilities (DOT&PF), has been instrumental in developing Alaska Statutes regulating the testing and use of NOA in construction-material sources in Alaska (http://www.dot.alaska.gov/stwddes/desmaterials/noa.shtml). To better predict where NOA could occur in Alaska, DOT&PF contracted the Alaska Division of Geological & Geophysical Surveys (DGGS) to evaluate the bedrock geology of the state for NOA potential. The resulting distribution of NOA potential and occurrences is shown on this series of maps covering the state of Alaska.

To summarize locations of known asbestos occurrences, DGGS searched the Alaska Resource Data File (ARDF; http://ardf.wr.usgs.gov) and U.S. Geological Survey (USGS) Mineral Resource Data System (MRDS; http://mrdata.usgs.gov/mineral-resources/mrds-ak.html) for references to asbestos in Alaska. While there are certainly additional NOA occurrences in Alaska, the scope of this study did not include a comprehensive literature search. Furthermore, the locations of ARDF and MRDS occurrences have variable accuracy. Some error must be expected when comparing the point data to the geologic polygons. Locations of ARDF and MRDS asbestos occurrences were not field checked.

Naturally occurring asbestos develops in predictable geologic settings worldwide. Rock types from these settings, shown on regional U.S. Geological Survey (USGS) geologic maps of Alaska, were rated for NOA potential based on a specific set of criteria (see accompanying report, Appendix 1). Interpretation of NOA potential was based on published rock unit descriptions. The percentages of NOA-favorable rocks in each unit were not always reported, necessarily resulting in subjective interpretations for this project (for example, is the amount of amphibolite in a metamorphic unit moderate, minor, or trace?). Correlative map units on adjacent maps may be rated differently depending on how NOA-favorable lithologies (types of rocks) are described in the source publications.

This map series is intended as a guide to bedrock areas where naturally occurring asbestos might occur. Just because a map shows potential for NOA does not mean asbestos will actually be there; conversely, significant amounts of asbestos could be present in areas shown as having zero to low potential for NOA. Local geology must be examined carefully and samples need to be collected and tested to verify the actual presence or absence and amount of NOA in an area. The NOA program website (http://www.dot.alaska.gov/stwddes/desmaterials/noa.shtml) provides helpful information on testing methodology and sampling protocol. This publication was supported by funds from DOT&PF.

RELATIVE LIKELIHOOD FOR PRESENCE OF NATURALLY OCCURRING ASBESTOS

(see Appendix 1 for more detailed criteria)

Note: Not all units or symbols appear on each map sheet

🟥 HIGH TO KNOWN—Map units consisting entirely of, or containing a major amount (>50%) of, rock types known to host asbestos elsewhere in the world.

🟧 MEDIUM—Map units consisting of more than one rock type, where at least one rock type within the unit is NOA-favorable, or a unit including the types of rocks that could host NOA in areas affected by metasomatism, metamorphism, or deformation.

🟩 ZERO TO LOW—Map units containing zero to trace (<1%) amounts of highly NOA-favorable rock types, minor (1–10%) to major (>50%) amounts of low-NOA-favorable rock types, and rock types that are unfavorable for NOA.

🟨 SURFICIAL DEPOSITS—Map units, generally Quaternary (up to 2.4 million years) in age, consisting of unconsolidated surficial deposits. These units have not been evaluated for NOA potential, and could contain asbestos, depending on origin of the sediments.

🟪 UNKNOWN—Units with no identified rock type, most commonly because the areas have not been geologically mapped.

⬜ ICE—Glacial ice. Not evaluated for NOA potential.

MAP SYMBOLS

● SH009 NOA occurrence from Alaska Resource Data File, showing identification number

■ 10001174 NOA occurrence from Mineral Resource Data System, showing deposit identification number

○ Cities or regional population centers

○ Towns

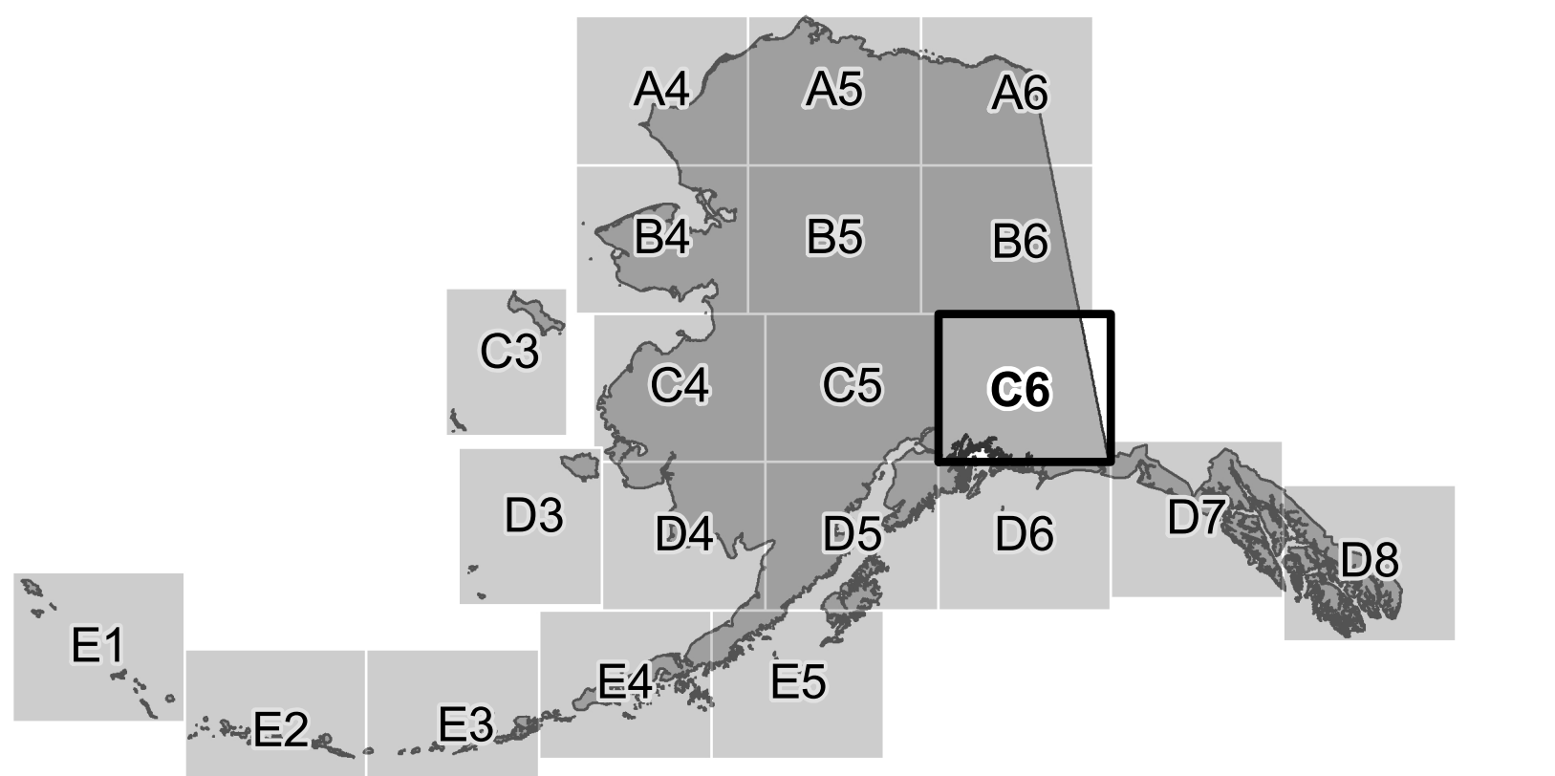
═ Limited Access Road

— Major Road

━ Highway

— Stream or River

Major Lakes



PAGE LOCATOR MAP

Fine-grained Triassic(?) microgabbroic rock with orthopyroxene, clinopyroxene, and interstitial plagioclase. Ultramafic rock is altered by epidote stringers and fractures filled with chlorite and pyrrhotite. Although this rock does not contain visible asbestiform minerals, it has the right chemistry to form them given the correct metamorphic conditions. Photo collected during 2014 DGGS mapping in the Talkeetna Mountains C-4 Quadrangle (photograph taken 07/21/2014 by L. K. Freeman).

Chrysotile in serpentinite (UAMES 34964) collected from Cosmos Creek, Cosmos Hills area, Kobuk District, Alaska, by Eskil Anderson. Occurrence likely corresponds to Alaska Resource Data File number AR011. Image courtesy of the University of Alaska Museum Earth Sciences Department.

Outcrop of serpentinite with a vein of chrysotile on the south side of Champion Creek (tributary of the North Fork of the Fortymile River, Eagle Quadrangle, Alaska; MRDS Deposit ID 10282332). Discovery of this outcrop led to the Champion Creek asbestos prospect drilled in 1981 on Doyon land. Photograph taken by Bob Rogers, summer 1980 (scanned slide photo). Image courtesy of Doyon, Limited.

Chrysotile (UAMES 34962) collected from Dahl Creek, Cosmos Hills area, Kobuk District, Alaska, by Eskil Anderson. There are several asbestos occurrences on Dahl Creek: ARDF numbers AR016, SH002, and SH003. Image courtesy of the University of Alaska Museum Earth Sciences Department.

Tremolite collected from a marble unit near Fairbanks, Alaska (photograph taken 10/01/2014 by J.E. Athey).

Serpentinite with thin asbestos vein. Sample collected from between the villages of Manley Hot Springs and Tanana in the Tanana A-3 Quadrangle, Alaska, by P.A.C. Burns. Photo taken by D.N. Solie. Approximate location 65.131332°, -151.024601° (WGS84).

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PRELIMINARY EVALUATION OF BEDROCK POTENTIAL FOR NATURALLY OCCURRING ASBESTOS IN ALASKA

by

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2015

SCALE 1:500 000

10 5 0 10 20 30 40 50 MILES

10 5 0 10 20 30 40 50 60 70 KILOMETERS

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Topographic base map from:
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Projection:
Alaska Albers
Datum:
North American Datum of 1983
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