Asbestos Activities

Briefing for Chuck Sutfin and
Barnes Johnson

September 27, 2006

1074362

Discussion Overview

- Asbestos Importance & National Issues
- Site Examples
- TRW Asbestos Committee
- Asbestos Site Decision Framework
- Coordination with Other Offices
- Best Practices Manual
- Asbestos Website
- Other Issues

Asbestos Importance & National Implications for EPA

- Widespread contaminant at numerous sites
  - Mining
  - Asbestos containing materials
  - Contaminants
  - Naturally occurring areas (NOA)

- Well documented disease in environmentally populations

- EPA <u>sampling</u>, <u>analytical</u>, & <u>risk assessment</u> methods have issues with respect to current needs

Environmental Sampling Issues

- Optical Air (PCM) Methods created for work settings & not well-suited for environmental sites
  - Cannot tell a cat hair from an asbestos fiber
- Bulk (PLM) Methods poor sensitivity (typically 1 %)
- **Solid media** measurements (soil, ore, insulation, dust) are extremely difficult to convert to estimations of exposure & risk
  - Disturbance of contaminated media << 1% asbestos generated high airborne exposures

Asbestos Soil Assessment 1% Memo

- Signed August 10, 2004
- 1% action-level not risk-based
  - Soils with concentrations well below 1% can often result in high exposures when disturbed
- Regions need risk-based, site-specific approaches & tools to address situations

Libby, Montana
Mixed Amphibole Community Exposure

- Widespread indoor and outdoor contamination
  - Multiple exposure pathways: soil, dust, air, attic insulation
- High prevalence of disease
  - Lung Cancer, Mesothelioma, Lung Fibrosis (scarring)
  - Non-cancer health effects not addressed by IRIS
    - RfC is being developed for the site.
- Unique asbestos mineralogy: Libby Amphibole
  - Current EPA & OSHA risk models mainly based on chrysotile

Asbestos Mineral Types
Commercial Designations

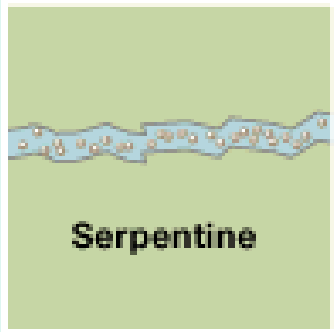
- **Serpentine**
  - Chrysotile

Comprises >90% of the asbestos used in products

- **Amphibole**
  - Amosite
  - Crocidolite
  - Anthophyllite
  - Actinolite
  - Tremolite

Libby

Curly



Straight

Libby Amphibole Composition

Based on the classification criteria of Leake et al, 1997

Winchite 85%

Richterite 10%

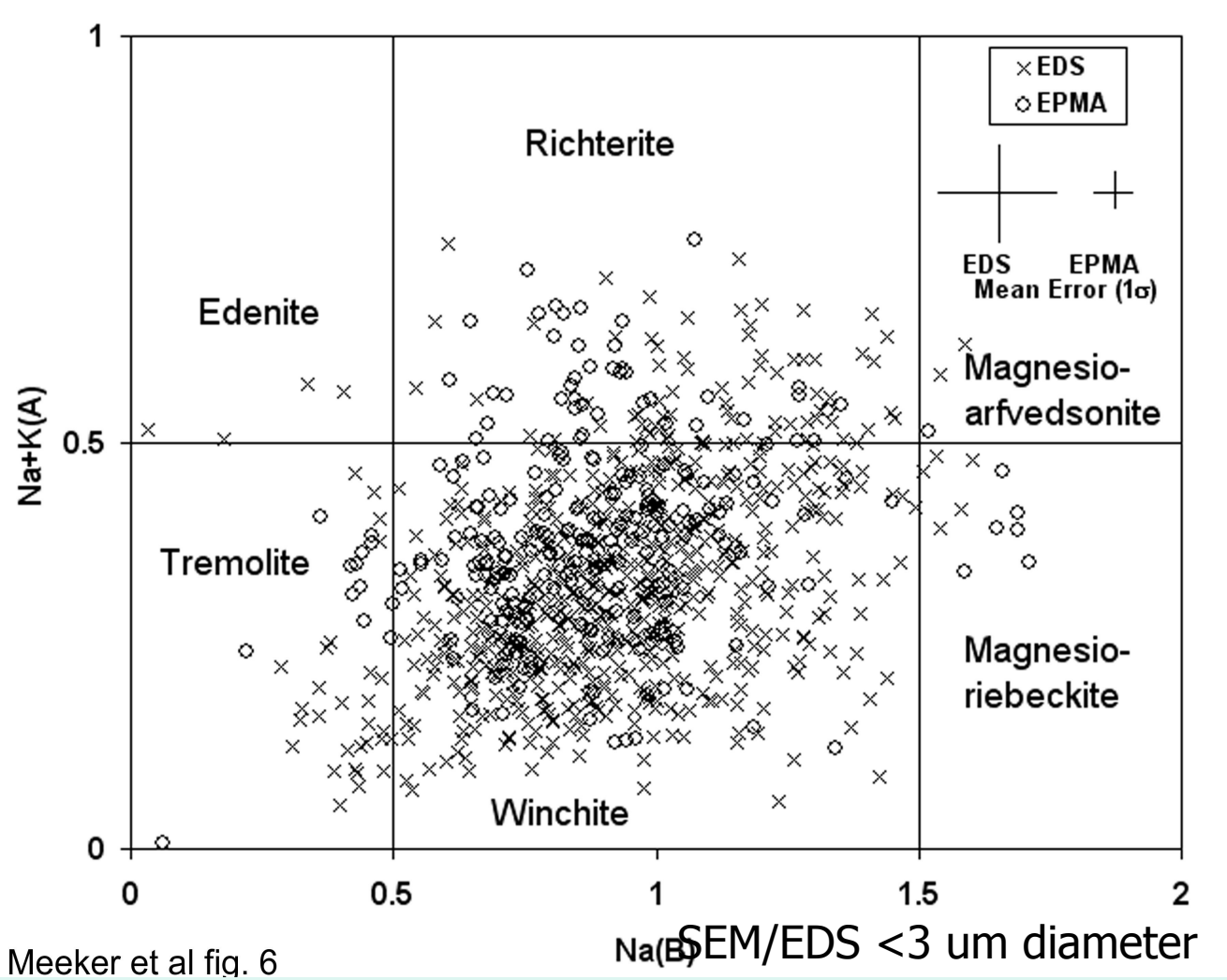
Tremolite 5 %

Classification Varies:

Mineralogists vs

Regulatory /Commercial

Approaches & Definitions

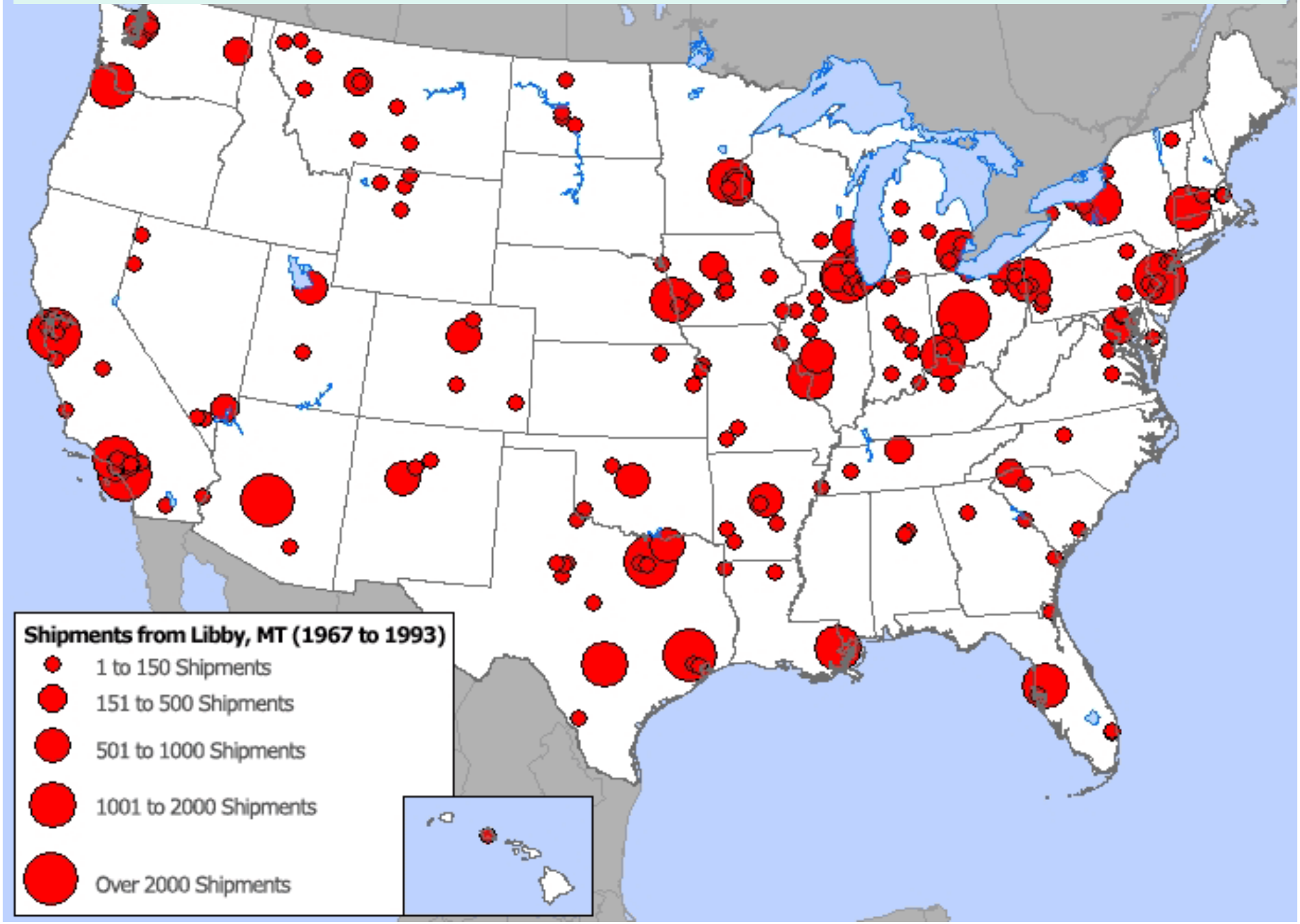


Meeker et al fig. 6

SEM/EDS <3 um diameter

Meeker et al, 2003, The composition and morphology of amphiboles from the Rainy Creek complex, near Libby, Montana. American Mineralogist.

Ore Transported to over 300 Processing Plants Nationwide



Vermiculite Attic Insulation

Insulation made from Libby ore

How Many Homes?

- EPA has no information prior to Grace.
- Estimates range between 10 - 35 million homes.
- EPA, ATSDR, & NIOSH issued national warnings in 2003.

Clear Creek Management Area Site & Superfund Site, California

- Former chrysotile asbestos mine
  - 50,000 acres recreational area now
- Recreational exposure to ATV and dirt bike riders, including children
  - High recreational exposures
- Risk Assessment issues
  - Childhood exposures
  - Shorter-term exposure concerns (> OSHA PEL)

Clear Creek Management Area

North Ridge Estates, Oregon

- Neighborhood built over former military base where ACM (asbestos-containing material) was buried following demolition of base
  - ACM comes to surface with normal weathering, construction, or residential activity
  - Predominately chrysotile
- ABS used to assess for soil to air pathway for a variety of likely exposure scenarios
  - Child playing in soil
  - Mechanical weed trimming
  - Rototilling

El Dorado County in California
Naturally Occurring Asbestos (NOA)

- Naturally occurring tremolite asbestos on surface
  - Neither a Superfund nor RCRA site
  - Asbestos release from soil deposits due to weathering and activities.
  - Majority of asbestos is **amphibole**
    - Cleavage fragment conundrum

- Issues:
  - Childhood exposure to amphiboles
  - Short-term ongoing exposures

- Many counties in California are impacted by NOA
  - Almost 50 of 58 counties

El Dorado, CA

Figure 5-9 Community Park Children's Playground
Activity-Based Outdoor Air Sampling Activity Areas
Typical and Aggresive Activity Scenarios

Quincy Smelter, Michigan

TRW- Asbestos Committee OSWER

- Develop new technical approaches for hazardous waste sites containing asbestos
- Provide site consultation in support of regional requests
- Identify research needs to address data gaps relevant to asbestos site assessment activities

TRW Members: EPA wide membership

- **Liaison:** Jim Konz-OSRTI
- **Co-Chairs:** Mark Maddaloni (R2), Aubrey Miller (R8), Arnold Den (R9)

- **All Regions** except Region 3

- **ERT**
- **ASB**
- **OECA**
- **OSWER**
- **ORD**
- **OEM**
- **OAQPS**
- **OPPTS**
- **ATSDR**

Coordination with Other Offices

- ORD, OPPTS, USGS, Regions, ATSDR, OSHA, MSHA, NIST
- SPC Asbestos Subcommittee and RAF Asbestos Technical Panel
- Research underway
  - Cancer/Non-Cancer health effects (IRIS)
  - Releasability
  - Standard methods for sampling & analysis

TRW Major Activities

- **Site Assessment Approaches & Standardization**
  - Sampling procedures
    - Activity Based Scenarios (ABS)
  - Analytical tools
    - Identification of asbestos
    - Improved & standardized approaches for evaluation & QA

- **Input to EPA Risk Assessment**
  - Focus on site needs
  - OSWER Interim Cancer Risk Model

Decision Tree Framework

Asbestos Framework

09/14/06 – Draft
Do not Cite or Quote

Purpose

Site Characterization

Qualitative Screening

Quantitative Evaluation

Remedial Decision

Step 1: Review historical and current project data. Does site contain ACM or asbestos; is site expected to have asbestos based on current/prior activities or is site located within or near NOA deposits?.

No → NFA

Yes ↓

Step 2: Releasability Consideration. Evaluate data to determine whether asbestos at the site presents a threat of release. Sampling may be needed.

Note: If exposure to asbestos in indoor air is a concern, Agency and/or OSWER indoor policies may apply.

No → NFA

Yes ↓

Step 3: Evaluation and Sampling. Evaluate site data and, if necessary, perform appropriate sampling to determine if asbestos is present. Also, assess if a human exposure pathway is present and complete?

*Appropriate sampling may include ABS or other methods.

No → NFA

Yes ↓

Step 4 – Risk Management Decision Point (see text for options)

Outdoor
(may proceed directly to Step 7 – see text)

Step 5 – Additional Sampling

Step 6 – Risk Management Decision Point

No → NFA

Yes ↓

Step 7 – Remediate or implement institutional controls

Indoor
(may proceed directly to Step 9 or 10 – see text)

Step 8 –Additional Sampling

Step 9 – Risk Management Decision Point

No → NFA

Yes ↓

Step 10 – Remediate or implement institutional controls

Asbestos Decision Framework

- Is asbestos present ?
- Is a pathway present?
- Is there a threat of release ? (removal ?)
  - If so,

    Appropriate Site Assessment & Sampling

    - ABS, Air & Soil monitoring

Quantitative Risk Assessment

- Screening level results not sufficient for quantitative risk assessment.
- Conduct comprehensive sampling including ABS & other relevant approaches
- Full exposure pathway assessments better support risk assessment & site decisions

Select Exposure Scenarios Based on Land Use

Residential Indoors	Vacuuming	Dusting	Children playing	
	Sweeping	Shaking or beating carpets	Remodeling	Removing carpet
Residential Outdoors	Children playing	Walking	Pushing stroller	Gardening
	Lawn mowing	Leaf blowing	Weed whacking	Rototilling
Commercial/ Industrial	Case by case basis			
Agricultural	Planting	Tree trimming	Hand harvesting	
	Tilling/plowing	Mechanical harvesting		
Recreational	Hiking	Jogging	Biking	
	ATV	Motorcycles	Off-road vehicles	
Excavation/ Remediation	Clearing brush	Surveying	Installing Geotextile	Paving
	Leveling/scraping	Loading trucks	Hauling	Excavating

Site Management Decisions

Based on screening or more extensive assessments

- Risk Assessment (as indicated)
- Remediation
- Removal
- Public Communication (e.g. NOA)

Asbestos Website

Addressing Asbestos at Superfund Sites, Superfund, US EPA - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://www.epa.gov/superfund/programs/asbestos/ Go Links

U.S. Environmental Protection Agency

Superfund

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EPA Home > Superfund > Programs > Addressing Asbestos at Superfund Sites

Sites
Programs
Regions & Partners
Community Involvement
Human Health & Ecological Risk
Laws, Policies & Guidances
Information Sources
About Superfund
Conferences
Superfund En Español

Superfund For Kids!

Addressing Asbestos at Superfund Sites

Asbestos is the name given to a number of naturally occurring fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. Asbestos is used in many commercial products, including insulation, brake linings, and roofing shingles. Past practices have led to environmental contamination and subsequent action under the Superfund (CERCLA) program, for example:

- Libby Asbestos Response, EPA Region 8 - Internet materials related to EPA's investigation and clean up of the Libby Asbestos site in Northwest Montana.
- Agency for Toxic Substances and Disease Registry (ATSDR) activities at Libby, Montana EXIT Disclaimer

Asbestos Topics:

Policy and Guidance
Technical Assistance
Health Effects
Naturally Occurring Asbestos

Policy and Guidance

You will need Adobe Acrobat Reader, available as a free download, to view the file below. See EPA's PDF page to learn more about PDF, and for a link to the free Acrobat Reader.

- Clarifying Cleanup Goals and Identification of New Assessment Tools for Evaluating Asbestos at Superfund Cleanups [PDF 199K, 4 pages] OSWER 9345.4-05
  The purpose of this memo is twofold. The first purpose is to clarify that Regions should develop risk-based, site-specific action levels to determine if response actions should be taken when materials containing less than 1 percent asbestos (including chrysotile and amphibole asbestos) are found on a site. Regions should not assume that materials containing less than 1 percent asbestos do not pose an unreasonable risk to human health. The second purpose is to outline some activities underway to assist in the evaluation of asbestos risks at Superfund sites

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http://www.epa.gov/region8/superfund/libby/ Trusted sites

start James Konz - I... Addressing Asb... Charge Questi... Microsoft Excel Sutfin_Johnson... 8:57 AM

Other Issues

- Not part of CLP
- Libby Sister Sites
- Indoor dust
- Five Year Review