

KCSA Safety & Education Seminar

Louisville Marriott East, Louisville, KY

Silica & Mineral Fibers Update

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National Stone, Sand & Gravel Association

Alexandria, Virginia



NSSGA NATIONAL STONE, SAND & GRAVEL ASSOCIATION

February 21, 2018

1.45 – 2.15 PM

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Part 1: Silica—What We Know

Silica is in 75% of surface rocks; it's everywhere

- Granite 15 - 75% silica
- Limestone <1 - 20% silica
- Sandstone 50 - 99% silica
- Shale 5 - 20% silica
- Slate 15 - 40% silic
- Coal 0 - 10% silic



Silica—What We Know

Silica particles
must be
respirable size
to be a hazard
< 10 μm dia.



Silica—What We Know

Millions of workers are exposed to *respirable* silica dust



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Silica—What We Know

Silicosis and possibly lung cancer are associated with excess silica exposure.



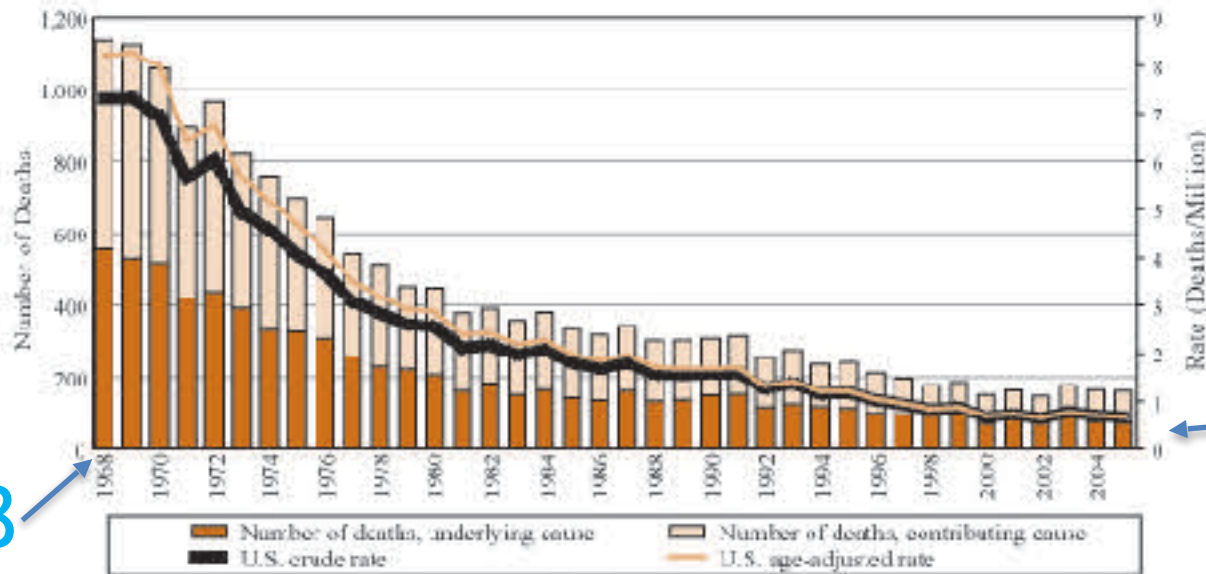
Silica—What We Know

Silicosis rates dropped >95% since 1968

RCE/No: 2008-US-01

Silicosis: Mortality

Silicosis: Number of deaths, crude and age-adjusted death rates, U.S. residents age 15 and over, 1968–2005



1968

Continues to drop 2005-15

NOTE: See selected limitations for general cautions regarding inferences based on small numbers of deaths, and see appendices for source description, methods, and EID codes.

SOURCE: National Center for Health Statistics multiple cause-of-death data. Population estimates from U.S. Census Bureau.

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OSHA Rulemaking.

NSSGA:

- 2014 Submitted formal comments to OSHA
- 2014 Testified at OSHA public hearings
- 2016 Met with White House OMB
- 2016 Sued OSHA in federal court
- 2017 Met with Secretary Acosta
- **2017 Court Rejected all NSSGA-Industry Claims**

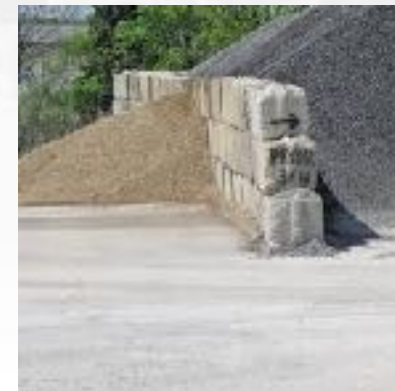


Law of the Land

Who is Covered?

– General Industry (29 CFR§1910.1053)

- Ready-Mix Concrete Facilities
- Asphalt Concrete Facilities
- Off-site Aggregate Sales Yards
- Hydraulic Fracturing
- Other Mfg.
- Etc.



– Compliance Deadline 2018

Law of the Land

Who is Covered?

– Construction Industry (29 CFR§1926.1153)

- Construction
- Demolition

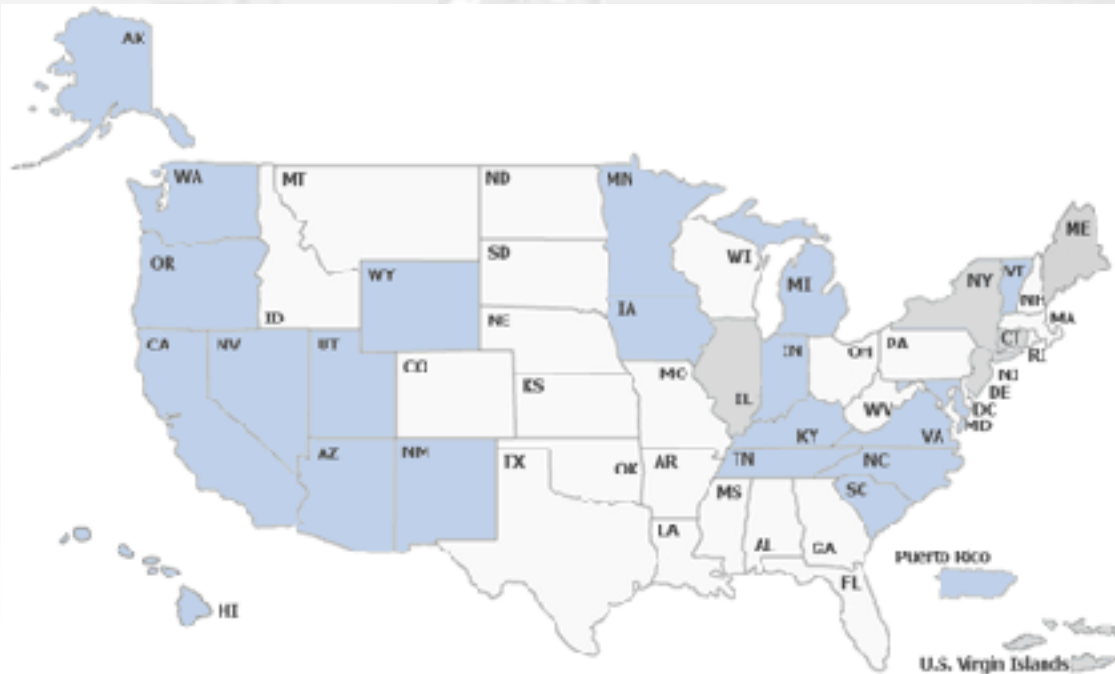
– Compliance Deadline: June 23, 2017 (Enforcement delayed until Sept. 23, 2017)



Law of the Land

Who is Covered?

– Beware in OSHA “State-Plan States”



For Example:

- KY
- VA
- NJ

Compliance Handout

OVERVIEW OF THE 2016 OSHA CRYSTALLINE SILICA STANDARD*

OBLIGATION / DESCRIPTION	GENERAL INDUSTRY (29 CFR) (e.g., Ready-Mix, Asphalt Plants, Offsite Aggregate Sales, Offsite Concrete Fabrication, etc.)			CONSTRUCTION INDUSTRY (29 CFR) (e.g., Construction, Demolition)		
	Paragraph in §1910.1053	Note	Compliance Deadline	Paragraph in §1926.1153	Note	Compliance Deadline
Read Scope and Application	(a)	Who must comply, see important exclusions.	6/23/2018	(a)		6/23/2017
Read Definitions	(b)	"Silica"; "Regulated Area"; Action Level = 25 µg/m ³ ; "ELIICP", etc.	6/25/2018	(b)	"Silica"; "Regulated Area"; Action Level = 25 µg/m ³ ; "Competent Person", "ELIICP", etc.	6/25/2017
Comply with Permissible Exposure Limits (PEL)	(c)	PEL = 50 µg/m ³ (8-hr TWA)	6/25/2018	—	Exposures generally deemed in compliance when controls in Table 1 fully implemented.	6/25/2017
Use Specified Exposure Control Methods	—			(c)	Table 1 Tasks. (Controls primarily water-based dust suppression and local exhaust ventilation)	6/25/2017
Use Alternative Exposure Control Methods				(d)	Other tasks (not in Table 1) or if Table 1 controls not fully implemented.	6/25/2017
Conduct Exposure Assessment	(d)	For exposures that are or may be ≥ AL.		(d)	For exposures that are or may be ≥ AL, if Table 2 controls not fully implemented.	6/25/2017
Establish Regulated Areas	(e)	For exposures ≥ PEL.	6/25/2018	—	See Para. (g)(9).	
Use Methods of Compliance	(f)	Engineering and work practice controls; alternate blasting, etc. for exposures ≥ PEL.	6/23/2018	(f)	Engineering and work practice controls for exp. ≥ PEL, if Table 2 controls not fully implemented.	6/23/2017
Provide Respiratory Protection	(g)	For exposures ≥ PEL. Must comply with OSHA Respiratory Protection standard.	6/25/2018	(g)	See Para. (d). Generally, for exp. ≥ PEL. Must comply with OSHA Resp. Protection standard.	6/25/2017
Conduct Housekeeping	(h)	Prohibits dry sweeping; restricts compressed air cleaning.	6/25/2018	(h)	Prohibits dry sweeping; restricts compressed air cleaning.	6/25/2017
Create Written Exposure Control Plan	(i)(2)	Description of tasks, exposure controls, housekeeping, etc.	6/25/2018	(i)	Description of tasks, exposure controls, housekeeping, etc.; requires "Competent Person."	6/25/2017
Conduct Medical Surveillance	(j)	For exposures ≥ AL 250 days/yr.	6/25/2018 PEL 6/23/2018 AL	(j)	If respirator use required ≥ 50 days/yr; see Para. (k) above.	6/25/2017
Provide Communication to Employees	(k)	MSD; labels and signs; training; must comply with OSHA Hazard Communication standard.	6/25/2018	(k)	MSD; labels and signs; training; must comply with OSHA Hazard Communication standard.	6/25/2017
Perform Recordkeeping	(l)	Keep any air monitoring data and medical surveillance records.	6/25/2018	(l)	Keep any air monitoring data and medical surveillance records.	6/25/2017
Meet Compliance Dates	(i)	Effective date of standard is 6/25/16. Employers thus have > 3 years to complete full compliance.	—	(i)	Effective date of standard is 6/25/16. Employers thus have > 1 year to complete full compliance.	6/23/2017
Methods of Sample Analysis	Appendix A	Mandatory for Laboratories	6/25/2018	Appendix A	Mandatory for Laboratories	6/25/2018
Medical Surveillance Guidelines	Appendix B	Recommended		Appendix B	Recommended	

* On April 8, 2017, OSHA administratively delayed enforcement of the Silica Construction Standard until Sept. 23, 2017.

* For information purposes only. The content of this overview are believed to be accurate, however, it is not intended to be advice and should not be relied upon as such or for compliance purposes.

What is Required?

Training & Hazard Communication

Bob: You have been overexposed to silica.



What is Required?

Written Exposure Control Plan



- Descriptions of:
- workplace tasks
 - exposures
 - exposure controls
 - training
 - housekeeping, etc.

OSHA will ask to see this plan and check to see that it's being enforced by the employer.

What is Required?

Exposure Controls

- This is the biggest difference between the Construction Standard and the General Industry Standard:
 - Construction: “Table 1” (optional)
 - General Industry: “Table 1” only for non-routine tasks

What is Required?

Exposure Controls—Table 1*

TABLE 1—SPECIFIED EXPOSURE CONTROL METHODS WHEN WORKING WITH MATERIALS CONTAINING CRYSTALLINE SILICA

Equipment/task	Engineering and work practice control methods	Required respiratory protection and minimum assigned protection factor (APF)	
		≤4 hours/shift	>4 hours/shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None.
(ii) Handheld power saws (any blade diameter).	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions: —When used outdoors —When used indoors or in an enclosed area	None APF 10	APF 10. APF 10.
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less).	For tasks performed outdoors only: Use saw equipped with commercially available dust collection system. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.	None.	None.
(iv) Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions: —When used outdoors —When used indoors or in an enclosed area	None APF 10	None. APF 10.
(v) Drivable saws	For tasks performed outdoors only: Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None.
(vi) Rig-mounted core saws or drills.	Use tool equipped with integrated water delivery system that supplies water to cutting surface. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None.
(vii) Handheld and stand-mounted	Use drill equipped with commercially available shroud or cowl with dust collection system.	None	None.

*Construction:
Can opt out of using Table 1, but must then *assess and control exposures* so they don't exceed the OSHA limit.

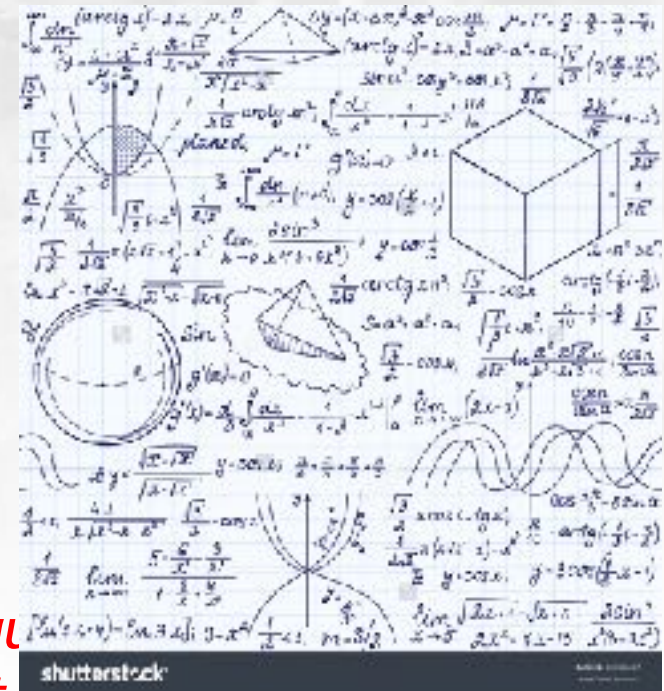
What is Required?

Exposure controls (examples; some are in Table 1)



What is Required?

Exposure Assessments (if Table 1 not used).



your workplace if they q
sample results or see significant silica dust.

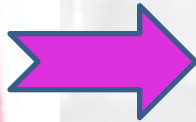
What is Required?

Comply with PEL and AL (if Table 1 not used).

- PEL (Permissible Exposure Limit) = $50 \mu\text{g}/\text{m}^3$
- AL (Action Level) = $25 \mu\text{g}/\text{m}^3$

How much is $25 \mu\text{g}/\text{m}^3$??

How much is $25 \mu\text{g}/\text{m}^3$??



$25 \mu\text{g}/\text{m}^3$ is one packet of sweetener dispersed into a volume of air equal to 24' above an entire football field.

What is Required?

Regulated Areas (where exposure > PEL)



What is Required?

Medical Surveillance (exposure \geq AL for 30d/yr)



What is Required?

Housekeeping



To keep
exposures < PEL

What is Required?

Recordkeeping



Going Beyond



At the Workplace

- **Establish your *Occupational Health Program***

– NSSGA's *OHP* is
a good place to
start
(nssga.org)



Going Beyond



At the Workplace

- **Consider a Third-Party Assessment**
(besides OSHA)



Going Beyond



At the Workplace

Regulations may not be your only concern!



Silicosis & Silica Dust Disease Lawyers



1-800-934-
National Legal



GET LEGAL HELP NOW

Call us toll-free at 1-866-447-9
or click here to receive a free
consultation about your case.



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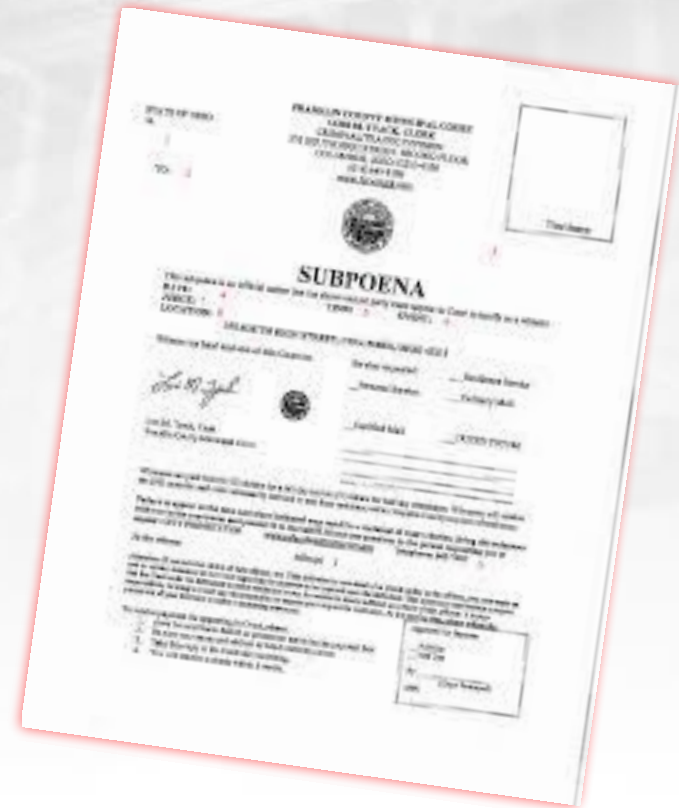
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& GRAVEL ASSOCIATION

Going Beyond



At the Workplace

- Remember, one “insurance policy” against unwarranted lawsuits is an effective *OHP*, backed up by representative data.



What Else Can Employers Do?

1. If you contract out any silica-related work:

Make sure the contractor is qualified!

You can't (always) contract out liability. Consult a qualified attorney before going forward!



What Else Can Employers Do?

2. Consider *post-offer pre-employment* medical testing for new employees.



What Else Can Employers Do?

3. Ensure your employees understand the potential consequences of withholding work-related medical information—

I hereby authorize the opinion to the employer to contain the following information, if relevant (please check all that apply):

☐ Recommendations for limitations on crystalline silica exposure

☐ Recommendation for a specialist examination

OR

☐ I do not authorize the opinion to the employer to contain anything other than recommended limitations on respirator use.

Please read and initial:

_____ I understand that if I do not authorize my employer to receive the recommendation for specialist examination, the employer will not be responsible for arranging and covering costs of a specialist examination.

Name (printed)

—*then document it.*

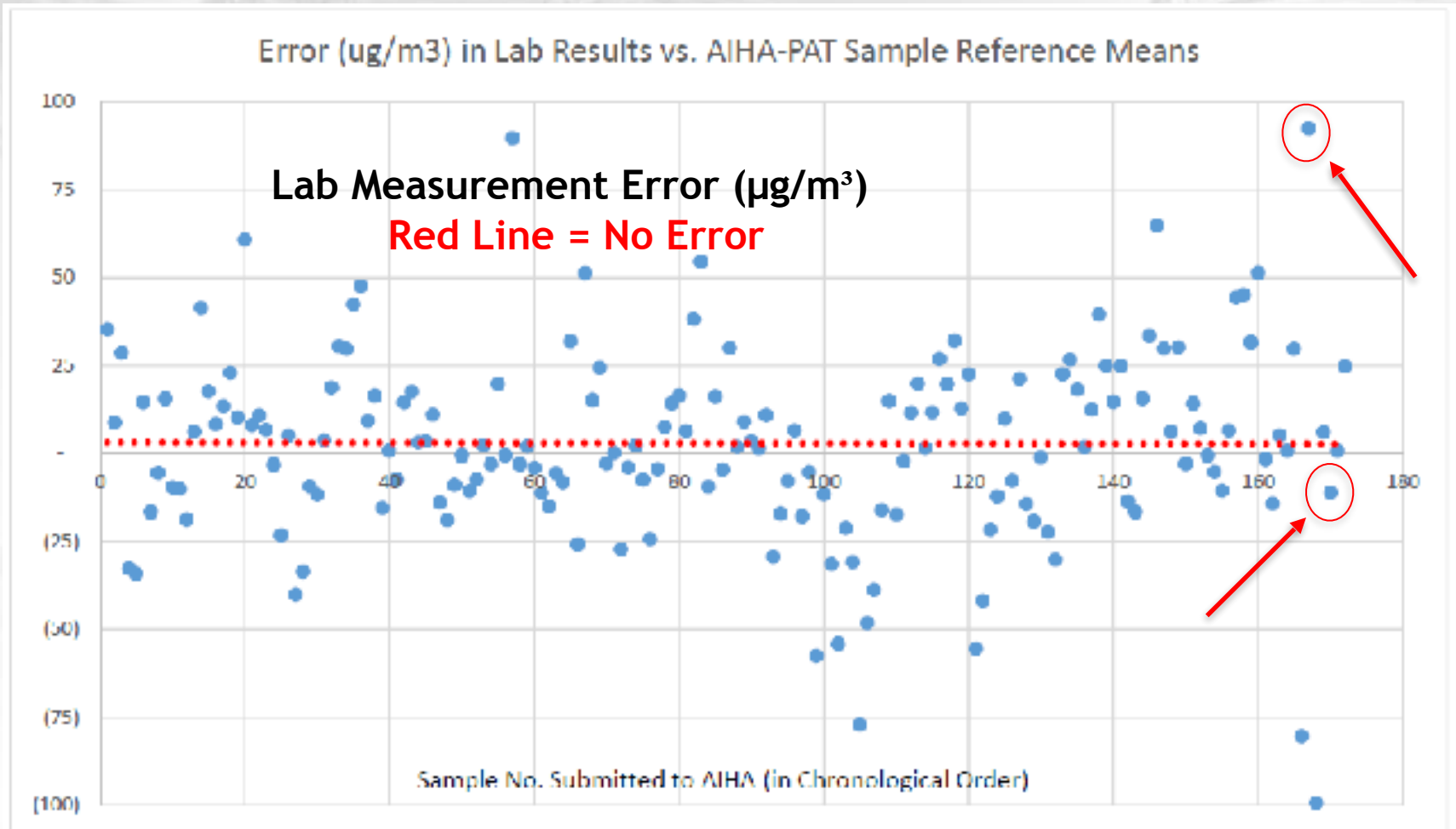
What Else Can Employers Do?

4. Thoroughly vet analytical lab (silica samples)



- **Quality of Work (most important)**
- Business reliability (important)
- Price (least important)

Analytical Labs—180 Proficiency Tests (“Blind”)



Analytical Lab Results

Half the lab
results had $>20\%$ error



1 in 8 lab
results had $>50\%$ error

Which
lab result
will you
get?

Selecting an Analytical Lab

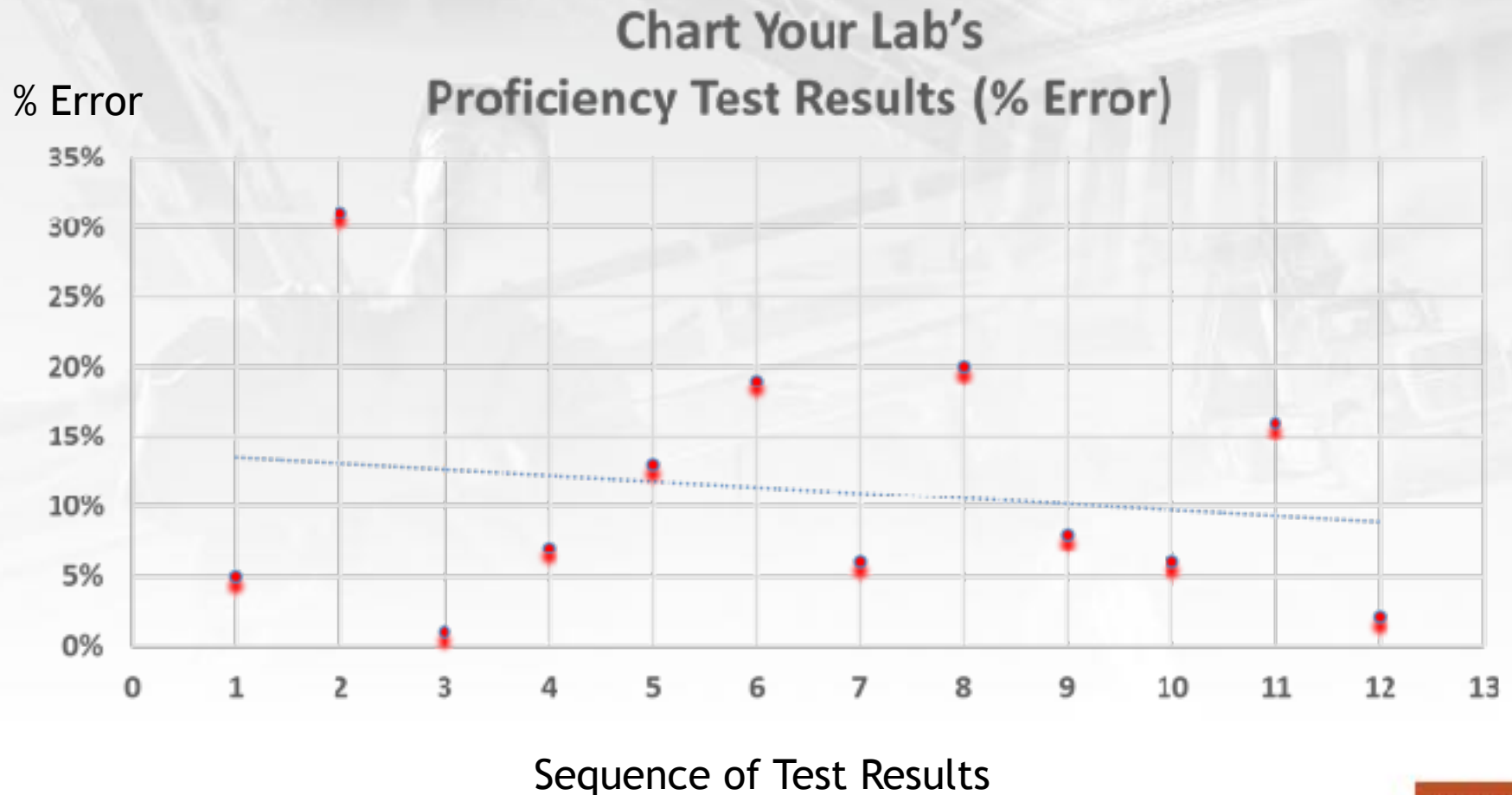
OSHA: “*There is nothing stopping a laboratory from sharing its [proficiency] data or any other information related to its accreditation . . .*”

Selecting an Analytical Lab

Ask the lab for its Proficiency Test Results

- Last 3 years of the lab's test results (= 12 samples) *in writing!*
- Corresponding “Reference Means”
- Compare each test result to its “Reference Mean”

Selecting an Analytical Lab



Selecting an Analytical Lab

Going Forward:

- Send phantom blanks with your field samples
- Visit labs—with and without notice
- Ask for quarterly updates on Proficiency Tests
- If they balk, should you walk?

What's Next?

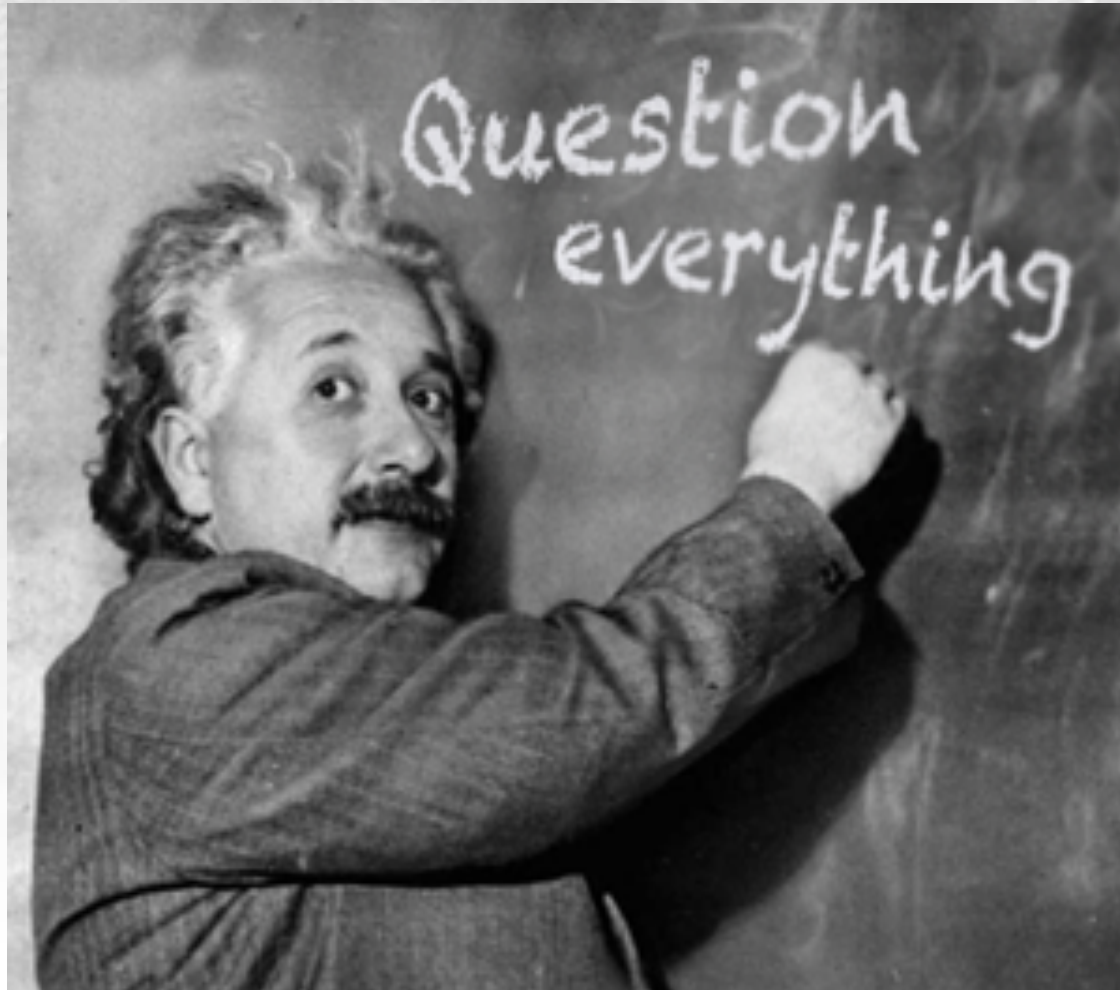
MSHA is Right Behind OSHA—Right?



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Questions?



Part 2

Mineral Fibers Update

This is about Asbestos



So, What's the Issue?

Two Issues, actually:

1. NOA (Naturally Occurring Asbestos);
2. Certain common rocks that are NOT asbestos--but are routinely *misidentified* as asbestos
(aka “fake asbestos”)

First Issue—NOA

There may be traces of real asbestos in some rocks and soils.

That is, NOA may exist as a natural impurity.

NOA

Clark County, NV

Soil Mineralogy

Naturally Occurring Asbestos: Potential for Human Exposure, Southern Nevada, USA

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Amphibole asbestos minerals are known human carcinogens, and many regulations have been developed to limit occupational exposure. These minerals can also occur in the natural environment, where they may be more difficult to control. We applied a diverse set of analytical methods including scanning electron microscopy/energy dispersive spectroscopy, electron probe analysis, x-ray diffraction, and field-emission scanning electron microscopy to rock, soil, and dust samples and to particles attached to clothing samples and cars. We found naturally occurring fibrous actinolite, a regulated amphibole asbestos mineral, in rock, soil, and dust that can be transported by wind, water, cars, or on clothing after outdoor recreational activities.

Fibrous amphiboles are several phyllos in southern Nevada and alluvial fans emanating from asbestos-containing bedrock. The morphology of the amphibole fibers is similar to amphibole fibers found at a vermiculite site at Libby, MT. We found that the morphometry of the amphibole fibers in the study area did not substantially change when the rock weathered into soil, and particles were eroded and carried by wind and/or water and finally settled and accumulated on other surfaces. Because large populations in Boulder City, Las Vegas are located only a few kilometers, sometimes even of meters, downwind from the sources, and because most of



Fig. 10. Natural and anthropogenically produced dust (a) - dust from asbestos-containing material from the rock, the McCullough mine is elevated by dust, the dust generated by a car on a dirt road in the McCullough Range.

Soil Science Society of America Journal

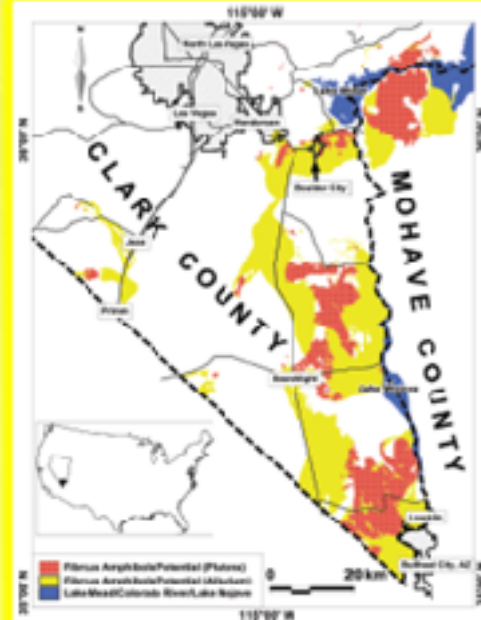


Fig. 1. Predicted potential occurrences of fibrous amphibole in Clark County, NV.

LAS VEGAS SUN

Asbestos proves to be a microscopic road block near Boulder City

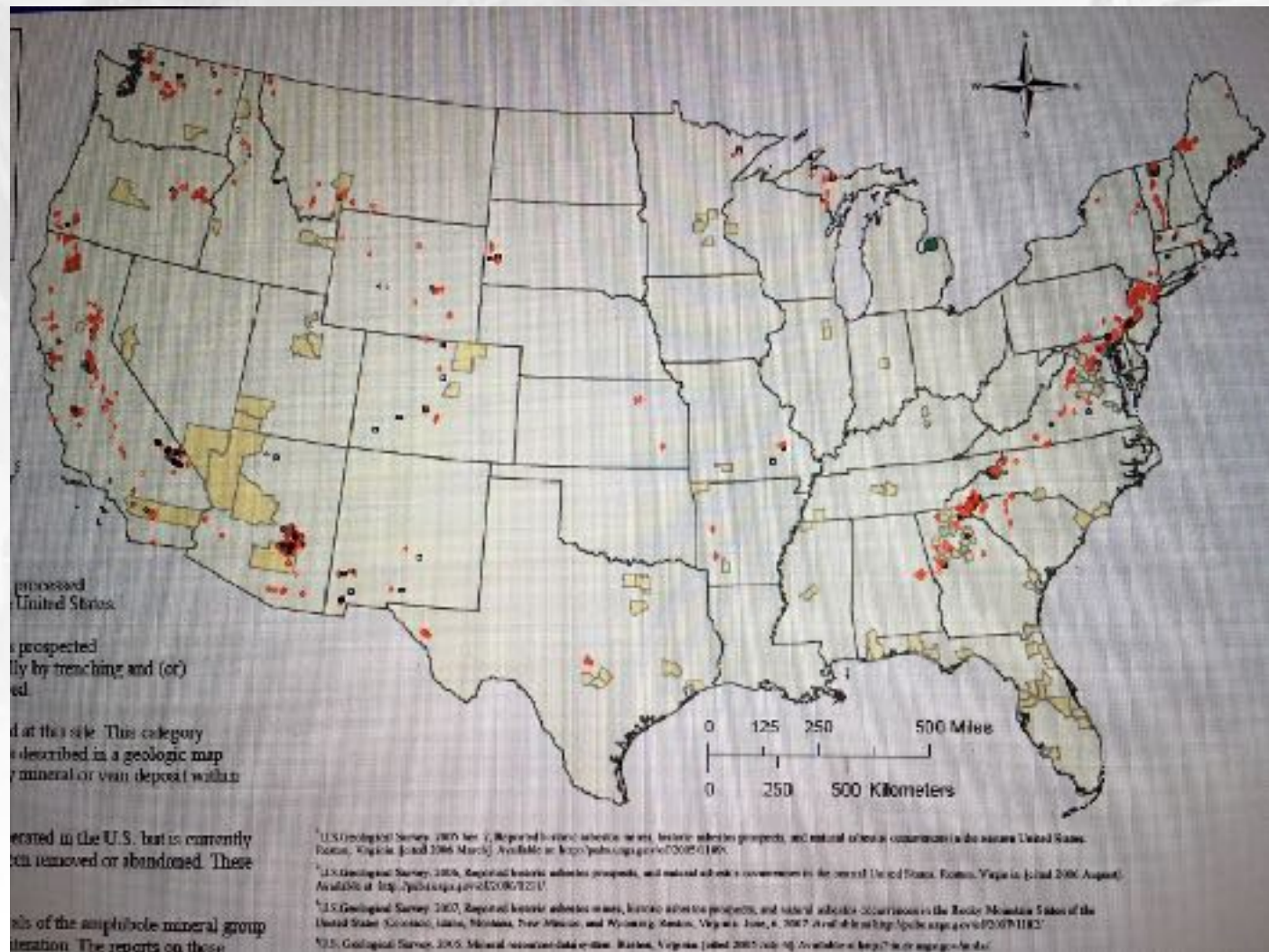
By Danielle McCrea, Special to The Sunday

Sunday, July 20, 2014 | 2 a.m.

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NOA—Recorded Asbestos Locations



NOA—Why is this an Issue?

Despite the lack of evidence that NOA in *aggregates operations* has caused harm:

- Regulations and recommendations:
 - ❑ CARB (Calif.) Regulates at 0.25%
 - ❑ EPA (TSCA) Regulates at 1 %
 - Will EPA further regulate NOA?
 - Will the 1 % limit be lowered?

NOA—Why is this an Issue?

Despite the lack of evidence that NOA in *aggregates operations* has caused harm:

- Lawsuits
 - ☐ Asbestos producers (not aggregates)
 - ☐ Asbestos users (not aggregates)
 - ☐ Vermiculite mining (not aggregates)
 - ☐ Talc (not aggregates)
 - ☐ Crushed stone (at least 2 suits)

Second Issue: **Non-asbestos Particles**

Certain common rocks that are
NOT asbestos:

1. Have the same *chemical properties* as asbestos, but
2. Have different *physical properties* from asbestos.

Why is this an Issue?

Because the two forms are not always distinguished from each other.



The aggregates industry has not been associated with asbestos disease—yet inaccurate mineral identification unfairly taints the industry.

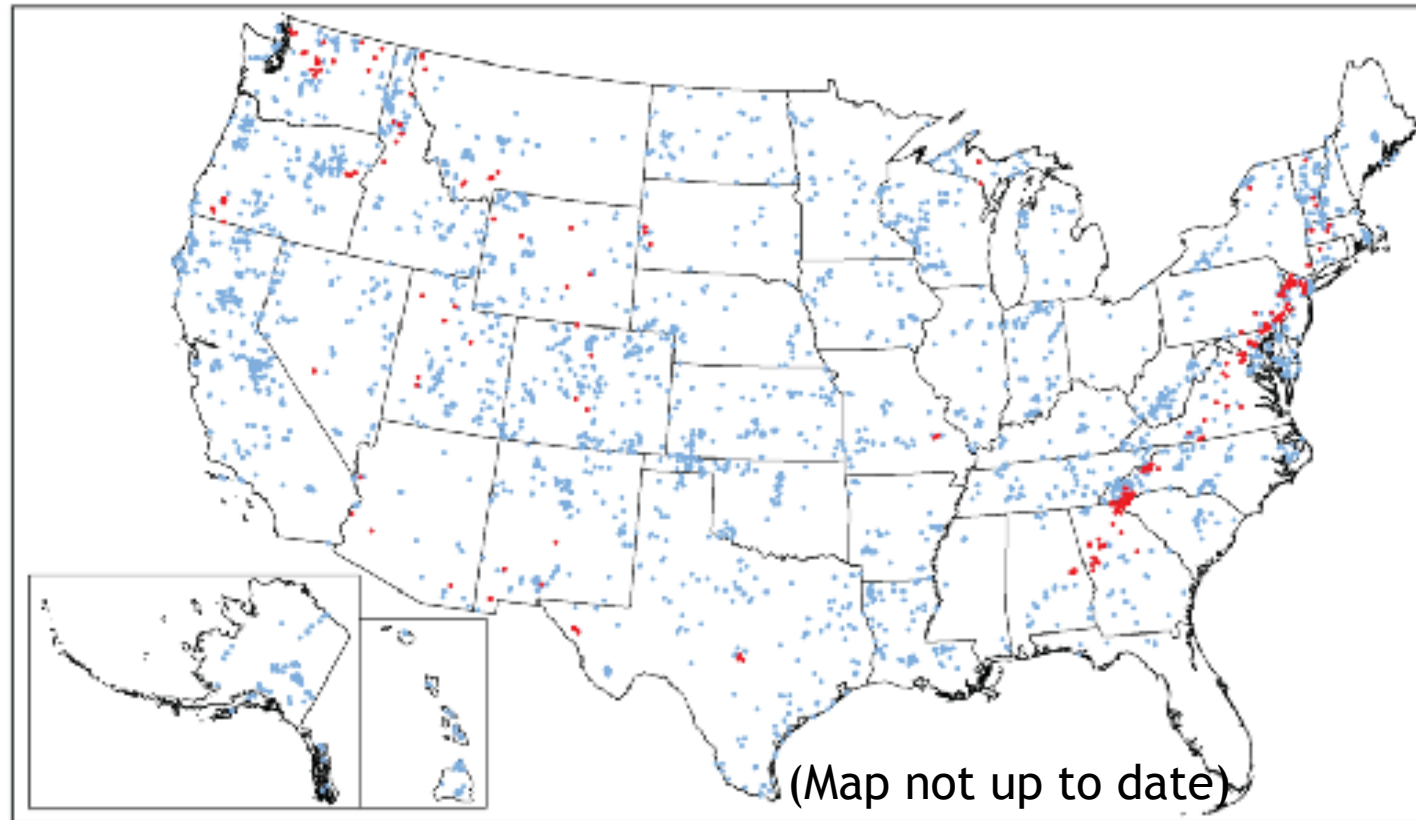


Actinolite asbestos



Actinolite Rock

Amphibole & Asbestos (NOA) Reported Locations

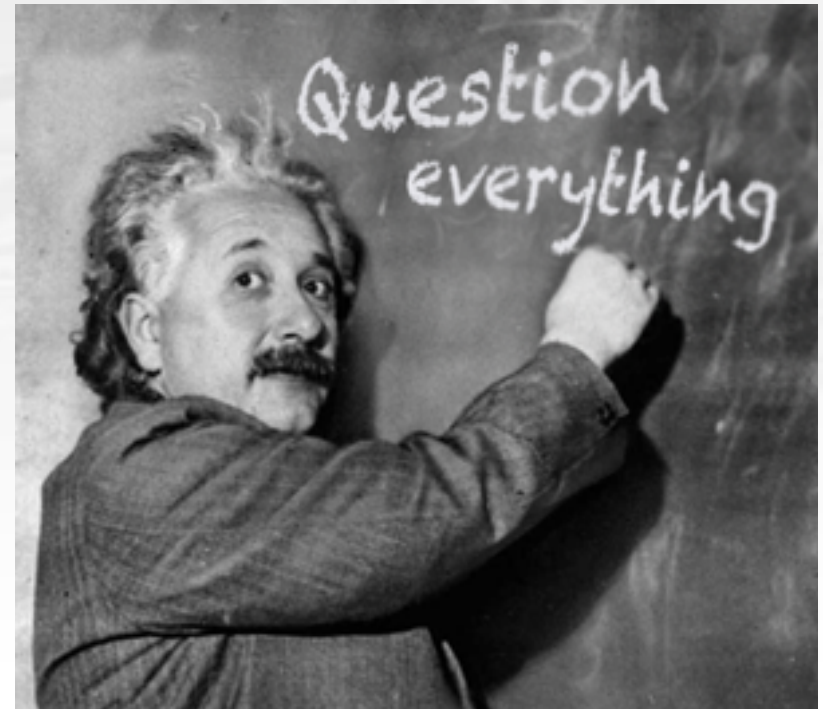


Blue Dots = Amphiboles
Red Dots = Asbestos



Thank You!

Questions?



Mineral Identification & Management Guide Workshop

WHAT WE PROVIDE:

- We come to you—*at no cost*
- Four hours of highly interactive, adult-based training
- Presented by a Professional Geologist & a Certified Industrial Hygienist
- All training materials
- Confidence: “You can manage this process.”