Welcome to DES
&
to Today’s Workshop
“Understanding Asbestos: From Product to Waste”
Why Are you Here?

- Required by law and NH Solid Waste Rules.
- Build your resume & accumulate professional development hours.
Why this Workshop?

- Top 10 most dangerous jobs
  - 33 deaths per 100,000 FTE
  - Due to accidents and exposure to hazardous materials and heavy equipment
Desktop Materials & Displays

- Agenda
- Evaluation
- Part of Env-Sw 900 Rules
- Asbestos samples
- Books & posters
- Scrolling pictures and images related to asbestos.
Today's Agenda

- Health Concerns of Asbestos
- History of Asbestos Use & Production
- Current Uses of Asbestos & Asbestos in the Waste Stream
- Break
Today’s Agenda

- Asbestos Regulations
- Best Management Practices
- SW Operator Renewals
- Q&A
THE FACILITIES PEOPLE TELL ME THERE'S ASBESTOS IN THE CEILING.

THEY SAY YOU DON'T NEED TO WORRY ABOUT IT UNLESS IT GETS DISTURBED.

THEY PLAN TO DISTURB IT TODAY.
What Is Asbestos?

- Naturally Occurring Mineral
- Made of:
  - Magnesium
  - Silicon
  - Oxygen
  - Hydrogen
- Most Common Types
  - Chrysotile (Fibers)
  - Amosite (Needles)
Some Characteristics

- High Tensile Strength
- Nonconductive
- Non-combustible
- Resistant to Corrosion
- Strong and Flexible
- Light weight
- Microscopic Fibers
- Non-Biodegradable
How small is asbestos?

2-3 rice grains

20,000 Asbestos Fibers

5-6 human hairs

www.AsbestosDiseaseAwarenessOrganization.org
What are the Health Concerns?

Routes of Exposure

- Inhalation
- Ingestion
Inhaling fibers can cause serious health effects. Fibers can be deposited within the lungs.
First & Second Hand Exposure

- You (inhalation, clothing, shoes)
- Your Co-Workers
- Residents
- Family and Friends
Types of Diseases

- Lung cancer
- Mesothelioma
- Asbestosis
  10 to 40 years before symptoms
Lung tissue with asbestosis

Lung Cancer Cells.

MesotheIoma Lung Cancer Cells
J-M manufacturing video clip
Factors that Determine Risk for Developing Disease

- Dose
- Duration of exposure
- Frequency of exposure
- Occupation
- Smoking status
2nd-hand exposure impact
Any Questions?
History of Asbestos Use
Asbestos Properties

- Durable
- High Tensile Strength
- Non-conductive
- Resistant to Corrosion
- Light weight
- Non-Biodegradable
- Non-combustible

“Asbestos” is the Greek word for “Inextinguishable” or “Indestructible”
End of Stone Age
(6000 B.C. - 2000 B.C.)

- 4200 B.C. - 2000 B.C.
- Asbestos used to strengthen pottery found in Finland, Russia, Norway & Sweden
- "Comb-ware", named for decorative imprints in pottery made by hunter-gatherers in Finland/Norway
Egyptians

- Made asbestos clothing
- Embalmed pharaohs with asbestos
Greek & Roman Times

- Flame retardant cloth, building materials, women’s clothing
- Throw in fire to clean
- “Don’t buy quarry slaves. They die young.”
Medieval Period / Middle Ages
5th - 15th Century A.D.

Asbestos used extensively as insulation in suits of armor.
Year 1095

First Crusade knights reportedly used catapults to fling flaming bags of pitch & tar wrapped in asbestos bags.
Year 1280

Marco Polo, Venetian (Italy) merchant, wrote of Mongolian clothing “...which would not burn...”, discovered on his epic 24 year journey to Asia/China & back.
Early Paper Products

Italy made asbestos paper in the 1700s. By 1800, it was used to produce bank notes.
Asbestos Mining

- Began 4000+ years ago
- 1st century A.D., quarry on Greek island of Evvoia
- 1879--First commercial mine, Thetford, Canada
- Thereafter, mining grew as demand increased.
- US, Russia, China, India, Brazil, South Africa ...
Nearby Asbestos Mining
Belvidere Mountain----Eden/Lowell Mills, VT
early 1900s - 1993
Asbestos Consumption

- **1879**
  - Commercial mining began
  - 300 tons produced in first year

- **1930’s**
  - 500,000 tons/year

- **1970’s**
  - Peaked at 4 million tons/year

- **1980’s**
  - Dropped to 217,000 tons/year due to new regulations and public health concerns
Eventually, Over 3000 Commercial Asbestos Products Manufactured

- Textiles
- Building materials
- Friction products
- Paper Products
- Insulation
- Packaging, gaskets, coatings
- Vermiculite
- Talc
- Others
Steam Locomotives

- Asbestos became a major component of insulation in boilers, fireboxes and pipes in steam locomotives.
- Boxcars, cabooses, refrigeration units, steam lines, brakes, clutches.
World War II
Asbestos Use Increased

- Common in ships
- 4.3 million pipe fitters, insulators and other shipyard workers
- 14 per 1000 died of mesothelioma
- Deaths due to asbestosis unknown
Wizard of Oz video clip
Asbestos Product Manufacturing in NH

- **Meredith—Amatex** (former Keasbey & Mattison)
  - Asbestos cloth
  - Ceased operation c. 1982
  - Disposed of waste at town landfill

- **Tilton—Quinn-T**
  - Asbestos paper products
  - Ceased operation late 1980’s
  - Disposed of waste in on-site landfills

- **Nashua—Johns-Manville**
  - Asbestos construction & industrial products (transite board)
  - Ceased operation c. 1985
  - Gave waste to area property owners for fill
Asbestos Waste in Nashua & Hudson
Legacy of J-M’s Free Fill Policy

- Dumped for 70+ years;
- Estimate over 400,000 tons
- Effecting over 300 properties
  - Residential
  - Commercial
  - Industrial
  - Institutional
  - Public Land
Asbestos in NH Bridges

- Used 1958 - 1978
- Found in membrane material, pavement, bridge shoes, backwalls
- 400 - 800 state bridges
- ?? town bridges
All the while, people working with asbestos were getting sick...

- A.D. 61-114: Quarry slaves were dying
- 1899: Detected “curious bodies” in lungs
- 1906: 1st autopsy documenting an asbestos related death
- 1918: Insurance companies began decreasing coverage for asbestos workers
- 1924: First diagnosis of asbestosis in UK-- Nellie Kershaw
Timeline con’t…
Asbestos sickness awareness

- **1930**: Dr. Cooke reported 66% of 20-year veteran asbestos workers had asbestosis
- **1931**: First Asbestos Industry Regulations, requiring ventilation in the work place
- **1940s & 1950s**: Documents show that manufacturers knew of this but chose to conceal it from employees
- **1970s**: EPA began to regulate asbestos
Back to the Present...

Questions?
Some Common Products Containing Asbestos

* Vinyl Flooring - tile/sheeting, backing & mastics
* Boiler Pipe Insulation and Cements
* Transite Siding, Roofing and Pipe
* Asphalt Roofing Materials
* High Temp. Gaskets
* Caulking and Putty
* Joint Compounds
* Friction Devices
* Vermiculite
Classifications

“FRIABLE”

Crumbled or pulverized under hand pressure
Classifications (cont.)

“NON-FRIABLE”

Can NOT be crumbled or pulverized under hand pressure
Friable Asbestos Poses Greatest Health Risk
Did You Know?

You can still purchase products that contain asbestos!!!

Read The Product Labels!
May be labeled as containing “Asbestos” or any one of the following:

- **Chrysotile**
- **Amosite**
- **Crocidolite**
- **Tremolite**
- **Actinolite**
- **Anthophyllite**
Vinyl Floor Tile
Ceiling Tile
Transite

A Cement and Asbestos Product
Roofing

Concrete or Asphalt Cements

Insulation

Shingles

Flashings/Caulking
Furnaces and Boilers
Pipe Insulation

Air Cell Insulation
Pipe Insulation
Automotive
Asbestos in the Waste Stream
Why Should You Be Concerned?

Risk to You, Your Co-Workers, and Family & Friends Health!!
Demolition/Renovation Projects

NHDES receives about 1,200 demolition/renovation notifications per year.
Demolition/Renovation Projects (cont.)

Town comparison (2013):

**Town #1:** Permits issued for 12 projects.
Processed 70 tons of C&D.
NHDES received 0 notifications.

**Town #2:** Permits issued for 51 projects.
Processed 540 tons of C&D.
NHDES received 0 notifications.

**Town #3:** Permits issued for 87 projects.
Processed tons of C&D not reported.
NHDES received 1 notification.
Some Helpful Questions

Ask the Resident/Contractor:

- Where did the waste material come from?
- How old was the building from which the waste came from?
- Was an asbestos survey completed before beginning the demolition/renovation project?
- If so, was all asbestos properly removed and disposed of before bringing the waste to the transfer station?
What To Do?

If you have any concerns:

- Do not accept the waste.
- Handout NHDES’ Asbestos Brochure.
- Direct them to Contact NHDES for assistance.
Asbestos in the Waste Stream
Asbestos in the Waste Stream
Costly Disposal For A NH Town

$$ Guess How Much it Costs $$

< $1,000 \quad $10,000+/- \quad $20,000>
Any Questions?
Break Time!
Asbestos Regulations
Regulation History

- **1932:** England, First asbestos industry regulations:
  - Ventilation
  - Made asbestosis an “excusable work-related disease”

- **About 10 years later:**
  - Similar legislation in U.S. about 10 years
Regulation History

- **1922**: U.S. Navy lists asbestos work as hazardous and recommends respirators
- **1940’s**: ACGIH establishes exposure limit guidance
- **1969**: Federal contracts over $10,000 must adhere to workplace standards
- **1971**: OSHA regulations take effect. EPA lists asbestos as a hazardous air pollutant
Regulation History


• **1975**: NESHAP bans many thermal applications
Regulation History

- **1970’s – 1980’s:** Continued adjustments to safe exposure limits, bans on certain products, and labeling
- **1982 – 1986:** EPA issues various regulations about asbestos in schools
- **1987:** EPA---Asbestos Worker Protection Rule, applying OSHA standards to government workers
Regulation History

- **1989**: EPA promulgates Asbestos Ban and Phase-Out Rule
- **1991**: Much of the rule is overturned by U.S. Circuit Court of Appeals. Prohibition of new uses remains intact.
TODAY, asbestos is regulated as...

- Hazardous Air Pollutant
- Solid Waste

It is **NOT** regulated as a:
- Groundwater Pollutant
- Hazardous Waste
Four Key Areas of Regulation

1. Worker Protection
2. Removal from structures ("Abatement")
3. Transportation
4. Disposal
Worker Protection Requirements

Federal
• 29 CFR 1926.1101 (OSHA)
• 40 CFR 763 (US-EPA Worker Protection Rule)

New Hampshire
• Lab 1400 (NH Dept. of Labor)
• Env-A 1800 (NHDES ARD)

Asbestosis  Healthy Lungs  Mesothelioma
Worker Protection Requirements

1. Employers must train & protect their workers.
2. Workers must comply with employer protections.
“Asbestos Abatement” Requirements (removal from structures)

- Federal: NESHAP - 40 CFR 61
- State Law: RSA 141-E
- State Rules: Env-A 1800
  - Survey/inspect for ACM
  - Notify NHDES-ARD
  - Licensed Contractor
  - Trained/Certified Workers
  - Controlled Work Procedures
  - Air Monitoring
  - Decontamination
  - Recordkeeping
Homeowners can do their own abatement work...

- They must use the same work practices and properly package and dispose of the waste
- But... do they always?
- Be cautious about loads of demolition debris
ERROR: stackunderflow

OFFENDING COMMAND: ~

ERROR: stackunderflow

STACK: