



## AGENDA

1. **Opening Remarks** - Jim Martin, Regional Administrator
2. **Toxicity and Risk Data** - Dr. Deborah McKean, Toxicologist Assessment
3. **2011 Cleanup Activities and Next Steps** - Carol Campbell, Assistant Regional Administrator
4. **Closing Remarks** - Jim Martin, Regional Administrator
5. **Questions and Answers**
6. **Availability Session**



# Opening Remarks

Jim Martin  
Regional Administrator  
U.S. EPA, Region 8

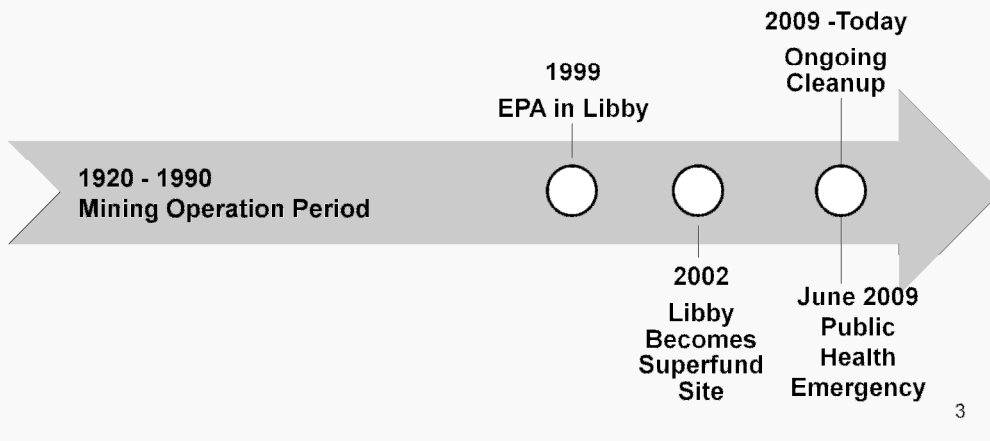
5/3/2011

U.S. Environmental Protection Agency

Presentation #1  
Fact Sheet 1A



## Mining History and EPA Involvement





## Cleanup Accomplishments

- **85,000** Dump Trucks of Soil Removed
- **825,000** Cubic Yards of Soil Removed
- Nearly **1,500** Properties Cleaned Up
- Over **\$370** Million Invested





# Libby Public Health Emergency Declaration

June 17, 2009



Left to Right : Senator Tester, HHS Secretary Sebelius, Senator Baucus, Administrator Jackson (Center)

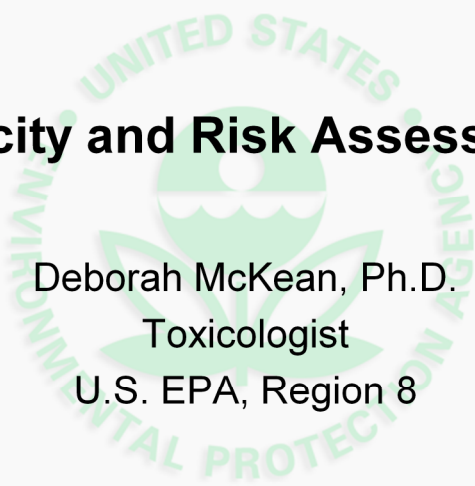
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COMMITMENT  
TRANSPARENCY  
COLLABORATION



# Toxicity and Risk Assessment



Deborah McKean, Ph.D.  
Toxicologist  
U.S. EPA, Region 8

5/3/2011

U.S. Environmental Protection Agency

Presentation #2  
Fact Sheet 2A

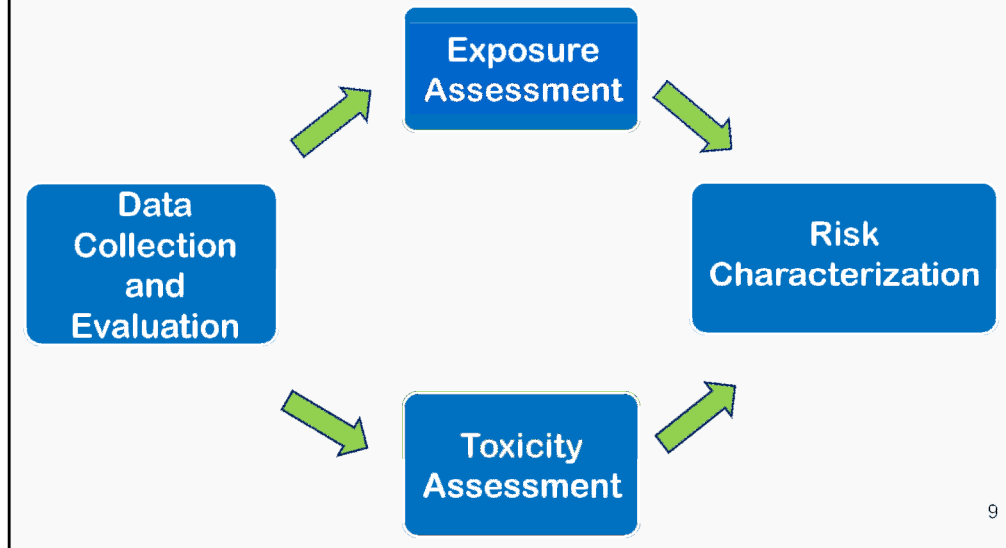


## Introduction

- Today we are sharing the draft toxicity values for Libby amphibole.
- Values are used to estimate potential risks.
- Graphs are based on draft toxicity values and exposure estimates both of which may change pending scientific review and further data collection.



## Four Steps of Risk Assessment



- Data Collection:
  - Activity based sampling and air monitoring data used to estimate concentration of asbestos fibers in the air
- Exposure Assessment:
  - Estimate of magnitude, frequency, and duration of exposure.
  - Estimates based on reasonable worst case (for example: mowing a dry lawn rather than a wet lawn)
- Toxicity Assessment:
  - Estimation of the relationship between dose of a substance and the biological response.
- Risk Characterization:
  - The toxicity data and the exposure data are combined to estimate health risk.



## Target Risk Range for Cancer Causing Chemicals

**$1 \times 10^{-6}$  to  $1 \times 10^{-4}$**

*1 additional cancer case in 1 million people ( $1 \times 10^{-6}$ )  
to  
1 additional cancer case in 10,000 people ( $1 \times 10^{-4}$ )*

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EPA's target risk range for cancer

- 1 additional cancer in a population of 1 million (also written as  $1 \times 10^{-6}$  or  $10^{-6}$ )  
to 1 additional cancer in a population of 10,000 (also written as  $1 \times 10^{-4}$  or  $10^{-4}$ )

EPA uses information from risk assessments to make decisions on Superfund sites.

- Risk management (whether to take some action or not) may occur within the target range.
- Above that range (about a cancer risk of  $10^{-4}$ ) some action is typically warranted to reduce risk.
- That action can be cleanup or some measure to reduce exposure.



## Cancer Inhalation Unit Risk (IUR) for Libby Amphibole

**Draft Libby Amphibole IUR = 0.17 (f/cc)<sup>-1</sup>**  
(existing asbestos IRIS IUR = 0.23 (f/cc)<sup>-1</sup>)

- Number based on Libby Vermiculite Miner data
- Based on both mesothelioma and lung cancer mortality data

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Inhalation Unit Risk (IUR) value

- IUR provides an estimate of the exposure-response relationship for cancer
- Asbestos-related cancer effects include mesothelioma as well as other lung cancers

The new, draft IUR for Libby Amphibole is 0.17 f/cc<sup>-1</sup>

The current IRIS IUR for a mixture of asbestos types is 0.23 f/cc<sup>-1</sup>



## Target Hazard for Noncancer Chemicals

### Hazard Index = 1

- A level at which it is unlikely that even sensitive populations will experience adverse health effects such as localized pleural thickening.
- If the hazard index exceeds 1, there is an increased potential, or possibility, for adverse health effects.
- A hazard index greater than 1 does not convey the certainty of adverse health effects.

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### Noncarcinogenic Chemicals

- Tend to act by threshold mechanisms. This means that there is some level of exposure to a chemical that is unlikely to cause harm.
- The comparison of the exposure to the threshold dose (RfC) is called the Hazard Index.

EPA uses information from risk assessments to make decisions on Superfund sites.

- Risk management (whether to take some action or not) may occur within the target range.
- Above that range (about a cancer risk of  $10^{-4}$  or a hazard index of one) some action is typically warranted to reduce risk.
- That action can be cleanup or some measure to reduce exposure.



## Draft Noncancer Toxicity Value for Libby Amphibole

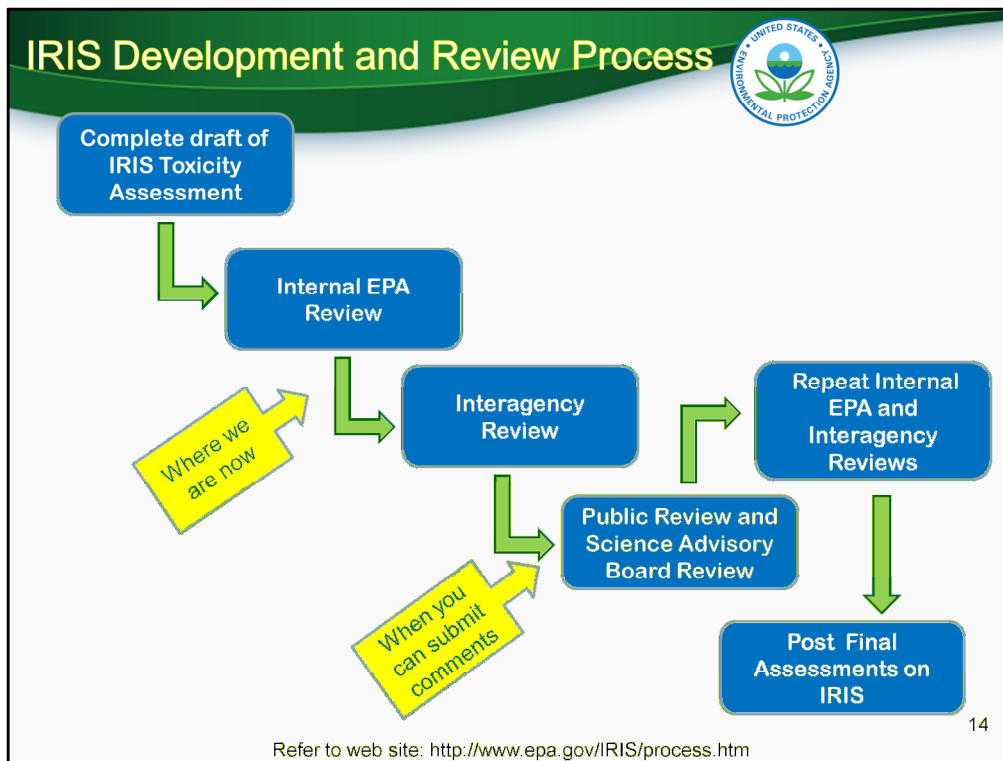
**Draft Libby Amphibole**  
**RfC = 0.00001 f/cc**  
(no existing IRIS RfC)

- **Marysville Vermiculite Processing Worker data**
- **Based on localized pleural thickening – the most sensitive endpoint**

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### Noncancer Reference Concentration (RfC)

- There is currently no estimate of noncancer harm from asbestos exposure in the EPA's IRIS data base = there is currently no RfC
- Estimates noncancer harm that people might experience from breathing LA.
- The data used to estimate the LA RfC came from data on both exposure and health effects collected at a vermiculite processing plant in Marysville Ohio.
- Noncancer illnesses from exposure to LA include pleural abnormalities called localized pleural thickening, and asbestosis (an illness of progressive scarring of lung tissue).
- Localized pleural thickening
  - Growths of fibrous tissue within the sack that surrounds the lung. In the early stages of this illness, it is often not possible to measure any change in lung function.
  - As exposure continues, it is possible to experience a decrease in lung function and some pain.
  - A limited number of those affected may progress to asbestosis.
- Using localized pleural thickening as the threshold response for the estimate of the toxicity of LA is a very cautious, health protective approach.
- The new, draft RfC for LA is 0.00001 f/cc (or  $1 \times 10^{-5}$  f/cc).



The draft LA toxicity values, both the cancer and noncancer values, are currently undergoing review through EPA's IRIS process.

- Internal review is just about completed
  - It is currently highly unusual for EPA to release draft toxicity values prior to the completion of the review process
  - EPA is committed to transparency and openness with the Libby community
- About to begin Interagency review
- When the values reach the Public Review stage, just before entering SAB review, you will have the opportunity to comment on the toxicity estimates.
  - Your comments will be evaluated by the SAB and they will be published in the federal register.
- After the SAB review, the documents will again be reviewed by EPA scientists and other Federal agencies.
- Final values used in the human health risk assessment of exposures in Libby and Troy and, also, will be used to help make cleanup decisions in Libby and Troy.



## Example Risk Estimates Based on Draft Toxicity Values

- Draft cancer risk and noncancer hazard estimates
- Individual exposure scenarios evaluated:
  - Ambient air in Libby
  - Indoor air exposures (resident and school children)
  - Outdoor air exposures (school children and occupational)
  - Yard work exposures
    - Mowing, raking and digging
    - Adult resident and occupational
- Preliminary cumulative risk estimates

Risk from adult indoor + yard work exposures = cumulative risk

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### Graphs:

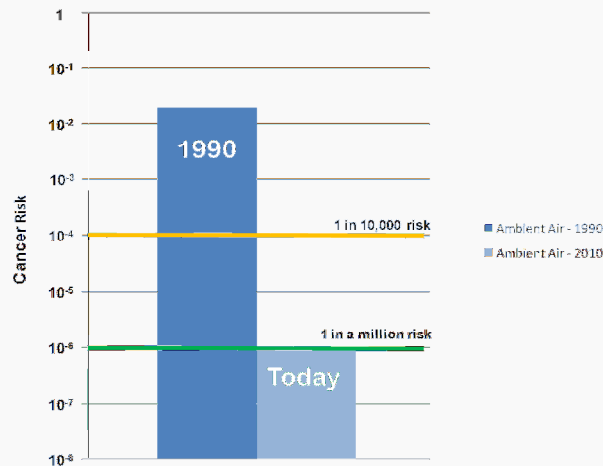
- Toxicity values and the exposure estimates are still in a draft status
- Some of the calculated values may change as we refine our estimates.

### Examples of a variety of exposure scenarios:

- Different outdoor air concentrations throughout the past 20 years.
- Indoor air concentrations that may be experienced within the home or within schools.
- Outdoor exposures in school yards as children play
- Some occupational exposures
- Some typical yard work exposures that someone may experience in their yard from mowing, raking and digging.
- Estimates represent what we call reasonable maximum exposures.
  
- Also - partial cumulative estimate – one that combines indoor and outdoor residential exposures



## Example Cancer Risk Estimates Using Draft Cancer IUR



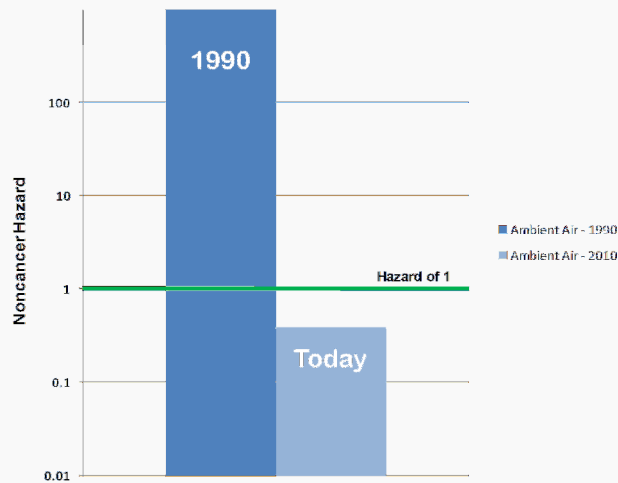
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For each type of exposure represented by the following series of graphs (this one is exposure to ambient air):

- First of each pair is the cancer estimate
  - Vertical axis ranges from risk of  $1 \times 10^{-8}$  ( $10^{-8}$ ) to 1
  - Yellow line points to  $1 \times 10^{-4}$  target risk
  - Green line points to  $1 \times 10^{-6}$  target risk
- Second of each pair is the noncancer estimate (next slide)
- Shown here are exposures to ambient air.
  - Ambient air is the outdoor air surrounding us that we breathe.
  - The dark blue bar represents adult exposures to the ambient air in 1990 before EPA began the cleanup.
  - The light blue bar represents exposures to ambient air today.
  - Some of the decrease in the air concentration between 1990 and today is due to the closure of the WR Grace facilities; some is due to the EPA cleanup.
  - Today, the cancer risk to adults breathing air in Libby is below  $1 \times 10^{-6}$ .



## Example Noncancer Hazard Estimates Using Draft Noncancer RfC



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Here are the same exposures, but with a calculation of noncancer hazard.

- Vertical axis ranges from a noncancer hazard of 0.01 to over 100.
- Green line points to target hazard of 1.

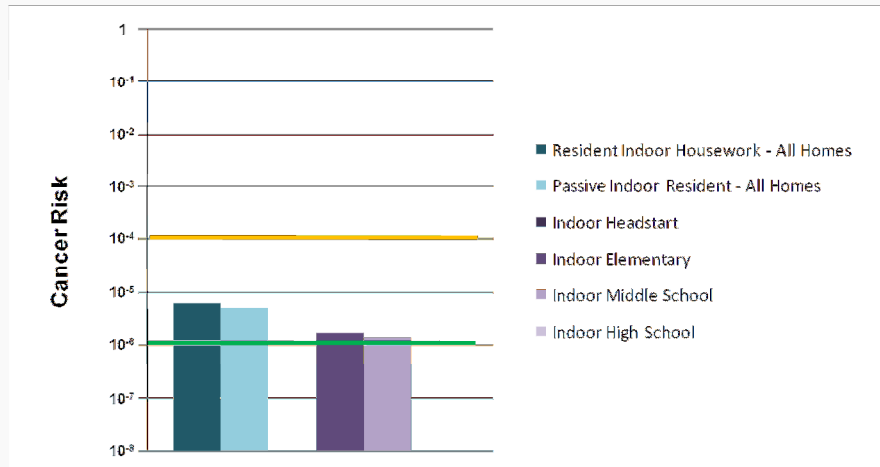
The noncancer hazard:

- Hazard index for Adult breathing air back in 1990 is over 100
- Today, the hazard index from breathing ambient outdoor air is less than 1.

## Indoor Resident and School Child



### Example Cancer Risk Estimates Using Draft Cancer IUR



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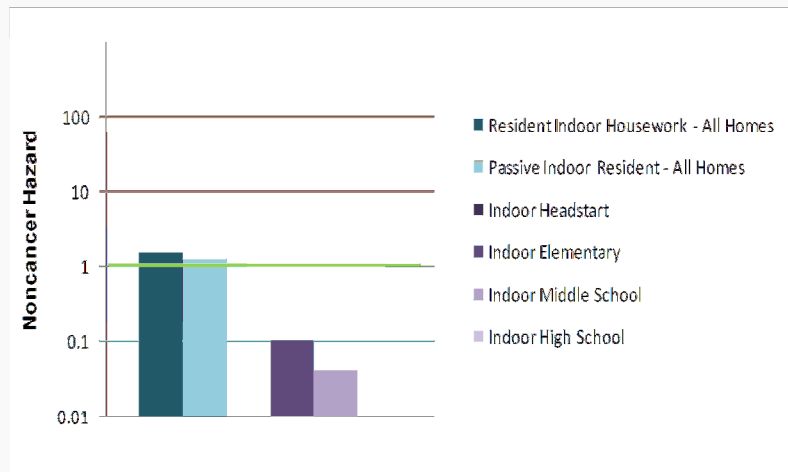
Graphs representing indoor exposures – Cancer risk.

- Dark blue bar = activities such as housework – averaged over all homes
- Light blue bar = quiet activities in the home – averaged over all homes
- Purple bars = breathing by school children in schools
  - There were no detections of asbestos in Headstart and High school

Cancer risk for these exposures are below or within target range for cancer.



## Example Noncancer Risk Estimates Using Draft Noncancer RfC



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Graphs representing indoor exposures – Noncancer Hazard.

- Dark blue bar = activities such as housework – averaged over all homes
- Light blue bar = quiet activities in the home – averaged over all homes
- Purple bars = breathing by school children in schools
  - There were no detections of asbestos in Headstart and High school

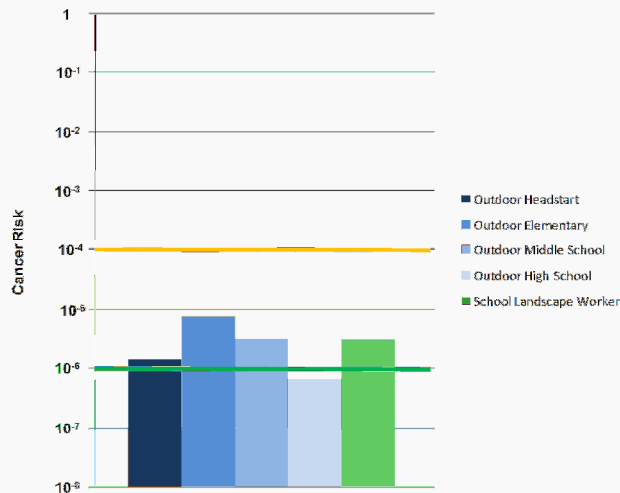
Noncancer hazard

- Indoor residential exposures at the target hazard
- School exposures below hazard target of 1.

# Outdoor School Child and School Landscaper



Example Cancer Risk Estimates Using Draft Cancer IUR



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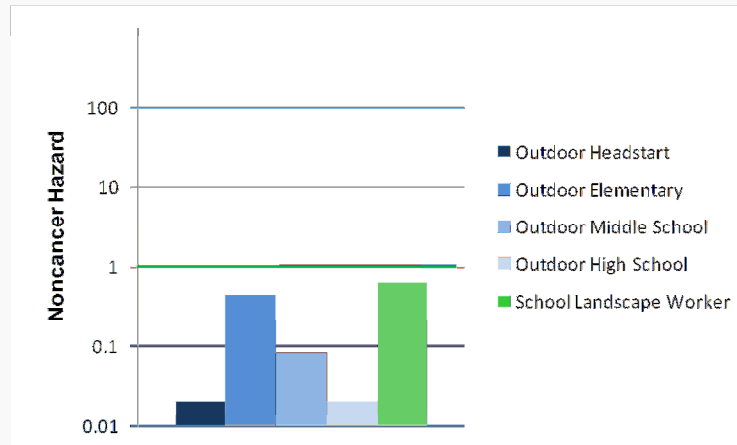
Graphs representing outdoor exposures – Cancer risk.

- Blue bars = outdoor play in schools (exposures based on site-specific data reflecting school schedules (days per year, total years, etc.)
- Green bar = maintenance worker cutting grass at all schools (5 days a week, 8 hours a day, for 26 weeks a year, for 25 years).

Cancer risk for these exposures are below or within target range for cancer.



## Example Noncancer Hazard Estimates Using Draft Noncancer RfC



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Graphs representing outdoor exposures – Noncancer hazard.

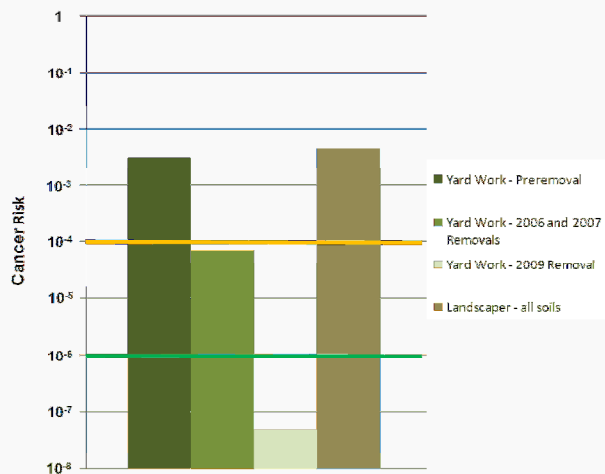
- Blue bars = outdoor play in schools (exposures based on site-specific data reflecting school schedules (days per year, total years, etc.)
- Green bar = maintenance worker cutting grass at all schools (5 days a week, 8 hours a day, for 26 weeks a year, for 25 years).

Noncancer hazard for these exposures are below target hazard of 1.

## Residential and Commercial Yard Work



### Example Cancer Risk Estimates Using Draft Cancer IUR



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Graphs representing yard work (mowing, raking and digging) – Cancer risk.

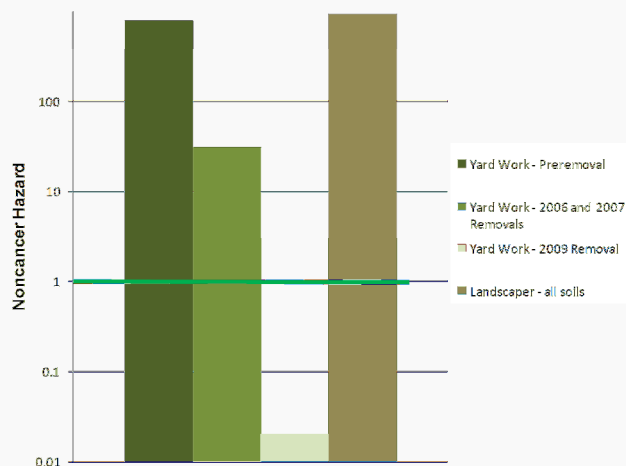
- Green bars = residential yard work
  - Dark green = yards that have not been cleaned - detectable levels of Libby amphibole and vermiculite
  - Medium green = yards cleaned in 2006/2007
  - Light green = yards cleaned in 2009
- Brown bar = commercial worker such as a landscaper doing yard work in types of yards (both cleaned and unclean) (5 days a week, 8 hours a day, for 26 weeks a year, for 25 years. Potential exposure to higher levels of Libby amphibole in yards that have not had an extensive removal.

Cancer risk for residential exposures to yards not cleaned and for commercial exposures to all types of yards are above  $10^{-4}$  cancer target. Residential exposure to yards cleaned in 2006/2007 are below cancer risk of  $10^{-4}$ . Residential exposure to yards cleaned in 2009 are below cancer risk of  $10^{-6}$ .

## Residential and Commercial Yard Work



### Example Noncancer Hazard Estimates Using Draft Noncancer RfC



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Graphs representing yard work (mowing, raking and digging) – Noncancer hazard.

- Green bars = residential yard work
  - Dark green = yards that have not been cleaned - detectable levels of Libby amphibole and vermiculite
  - Medium green = yards cleaned in 2006/2007
  - Light green = yards cleaned in 2009
- Brown bar = commercial worker such as a landscaper doing yard work in types of yards (both cleaned and unclean) (5 days a week, 8 hours a day, for 26 weeks a year, for 25 years. Potential exposure to higher levels of Libby amphibole in yards that have not had an extensive removal.

Hazard index for residential exposures to yards not cleaned, residential exposures to yards cleaned in 2006/2007 and for commercial exposures to all types of yards are above hazard target of 1. Residential exposure to yards cleaned in 2006/2007 are above target hazard of 1. Residential exposure to yards cleaned in 2009 are below target hazard of 1.



## Factors Potentially Impacting Exposure Estimates

- Amount of soil removed
  - Removal of greater levels of Libby amphibole
  - Removal of visible vermiculite
- Source of backfill soil
  - Inside versus outside the Libby valley
- Soil moisture
  - Increased rainfall in 2009
  - Complete lawn cover at schools and some homes
- Sampling methods
  - Mowing in limited areas versus entire yard



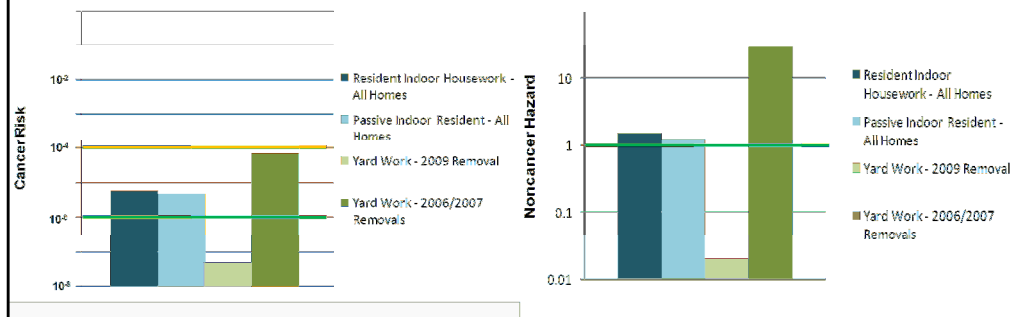
## **Studies Planned to Help Understand Factors Impacting Exposure Estimates**

- Amount of soil removed
  - Repeat sampling of some yards cleaned in 2006/2007 and 2009
- Source of backfill soil
  - ABS on backfill sources
  - ABS at background locations
- Soil moisture
  - ABS mowing on dry versus wet yard
- Sampling methods
  - ABS mowing in limited areas versus entire yard
- Indoor air
  - Repeat sampling to evaluate previous estimates

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## Comparing Different Exposure Scenarios Adult Residential Exposures and Draft Toxicity Values



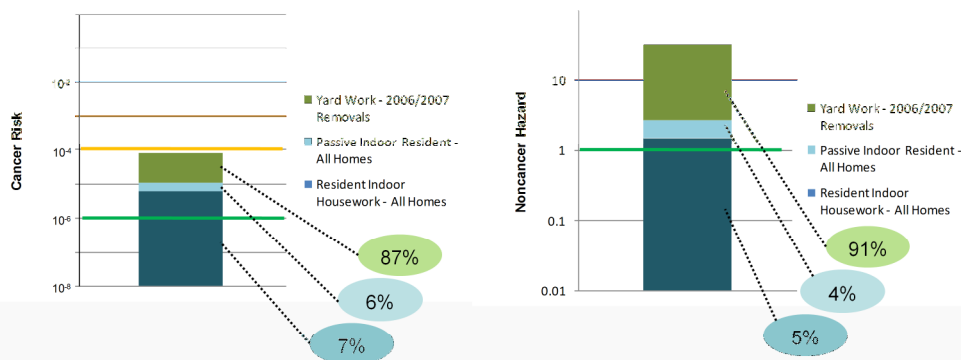
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- Previous slides have shown preliminary cancer risk and noncancer hazard estimates for individual exposures (receptor such as an adult engaging in one activity such as housework).
- Next two slides will demonstrate an example of a cumulative risk estimate
- Above graphs show the individual exposures that will be included in the cumulative estimate
  - Indoor resident engaged in activities such as housework
  - Indoor resident engaged in quiet activities such as watching TV or sleeping
  - Outdoor resident engaged in yard work
    - comparing yard work for yards cleaned in 2006/2007 to yard work in yards cleaned in 2009
- Cumulative estimates for cancer risk as well as noncancer hazard will be shown

## Cumulative Risk and Hazard



### Building Cumulative Estimates with Draft Toxicity Values Adult Residential Exposures for Properties Cleaned in 2006 or 2007



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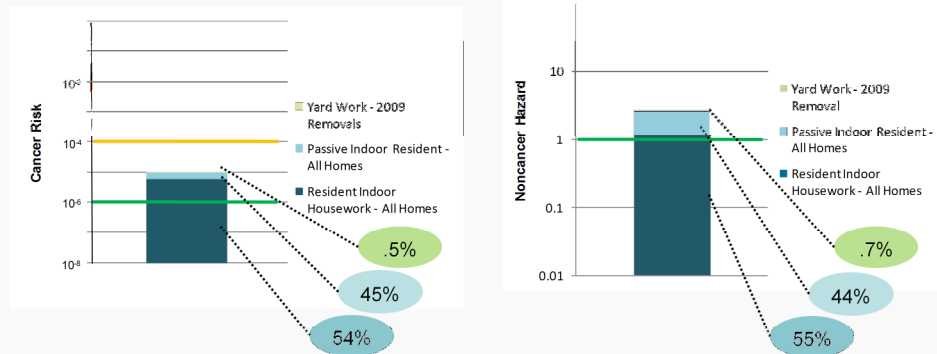
#### Cumulative estimates:

- Above graphs show the addition of cancer risk (on left) and noncancer hazard (on right) for the following exposures:
  - Indoor resident engaged in activities such as housework
  - Indoor resident engaged in quiet activities such as watching TV or sleeping
  - Outdoor resident engaged in yard work in yards cleaned in 2006/2007
- Preliminary cumulative cancer estimate for these three exposures is less than  $10^{-4}$
- Preliminary cumulative noncancer hazard estimate for these three exposures is greater than 10
- The percent values in the small circles indicate the percent contribution of each exposure to the total risk. Here the yard work from the 2006/2007 removals is contributing the majority of the risk.

## Cumulative Risk and Hazard



### Building Cumulative Estimates with Draft Toxicity Values Adult Residential Exposures for Properties Cleaned in 2009



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#### Cumulative estimates:

- Above graphs show the addition of cancer risk (on left) and noncancer hazard (on right) for the following exposures:
  - Indoor resident engaged in activities such as housework
  - Indoor resident engaged in quiet activities such as watching TV or sleeping
  - Outdoor resident engaged in yard work in yards cleaned in 2009
- Preliminary cumulative cancer estimate for these three exposures is less than  $10^{-4}$
- Preliminary cumulative noncancer hazard estimate for these three exposures is greater than 1 and less than 10
- The percent values in the small circles indicate the percent contribution of each exposure to the total risk. Here the yard work from the 2009 removals is contributing less than 1% of the total risk.



## Summary

- At the present time outdoor activities that disturb soil appear to be the greatest source of Libby amphibole exposure.
- Indoor air quality may be of concern because of soil tracked inside.
- Draft toxicity values and exposure estimates may change pending scientific review and further data collection.
- A comprehensive cumulative risk assessment will be developed for a person who is a lifelong resident of Libby as the toxicity values are finalized and exposure assessments are refined.

# 2011 Cleanup and Next Steps

Carol Campbell  
Assistant Regional Administrator  
Ecosystems Protection and Remediation

May 3, 2011

U.S. Environmental Protection Agency

Presentation #3  
Fact Sheet 3A and 3B

- Presentation focuses on Libby and Troy property cleanups (OU4 and 7)
- Other site clean-ups will continue this summer including Riverfront Park (OU1).
- See fact sheet 3a for more information.
  
- Next steps include what you can do while we continue our cleanup and scientific investigations



## Outline

- Overview of Cleanup Technologies
- Residential and Commercial Properties Libby and Troy (OU4 & 7)
- Resources Available to You
- Next Steps



## Overview of Cleanup Technologies

- Removal
- Capping
- Containment



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The term cleanup includes all technologies that will reduce exposure to a contaminate. At this site, EPA is currently using these three cleanup technologies:

Removal –physical removal and disposal of the contaminated material

Capping – placing a barrier such as a soil cover, to block the exposure to the contaminated material.

Containment- Keeping the material in a place that someone will not easily come in contact with it.



## Residential and Commercial Properties

- Goal of 150 cleanups in 2011



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Work will include both interior and exterior cleanup activities.



## Residential and Commercial Properties

- **Continue with improvements made since 2007**
  - Remove visible vermiculite and detectible levels of asbestos
  - Sample yards more extensively to better capture areas of contamination
  - Use only topsoil from outside Libby valley



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Since the beginning of property cleanup activities at the site, EPA has continually improved the cleanup approach.

We have continued to use our findings from ABS to revise our clean-up in order to further reduce exposures.

Since 2007 we have:

Removed all visible vermiculite and detectible levels of asbestos from yards

Increased the number of samples taken on properties to better define clean up

Used only topsoil from outside the Libby.



## New 2011 Plan To Strengthen Cleanup

- Neighborhood approach
- Alleys
- Discrete non-contaminated areas
- Buffer zones
- Plants and small trees
- All fill material from outside Libby valley
- Topsoil Quality

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In 2011, additional improvements will be made to the cleanup approach.

Goal is to minimize the potential for recontamination and reducing exposure.



## Residential and Commercial Properties

- **Activity Based Sampling**

- Indoor Residential
- Outdoor Residential
- Recreational
- Occupational

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- Activity based sampling (ABS) samples air concentrations in the breathing zone while conducting an activity such as biking.
- ABS is used to evaluate exposure.
- We have done a number of ABS activities. You may have seen us in previous years doing these types of sampling events.
- This year we will be asking you to allow us to come back to some of the places we previously sampled for both indoor and outdoor activities.

We are also going to evaluate:

- Sources of backfill in the valley
- Areas in Libby where there has been no human activity, and is lower than Lake Kootenai to understand background
- Effect of soil moisture on results
- Different methods of mowing
- Air concentrations right after cleanup and then 1-2 years later
- Track In of contamination
- Recreational activities such as playing in the park



## Resources Available to the Public

- Information Centers in Libby and Troy
- Best Management Practice Guidance
  - Contractors & Tradesmen Working Indoors
  - For Contractors & Tradesmen Working Outdoors
  - Demolition Activities
  - For Libby and Troy Residents
  - For Lincoln County Do-It-Yourselfers
  - Yard Work and Gardening Activities

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-Deb discussed preliminary results from the exposure assessments being conducted at the site.

-There are resources available to you now that will help you better understand and reduce your risk of exposure to Libby Amphibole asbestos.

-There are 2 information centers available to you. At the information centers, you can:

- get copies of project fact sheets
- review EPA and MDEQ site documents
- find out what work has been conducted on your property
- ask questions of EPA , State and contractor staff

- 6 best management practice guidance documents are available which when followed will help reduce your possible exposure to Libby Amphibole asbestos.



## Resources Available to the Public

- UDIG Utility Location Service
- Environmental Restoration Specialist (ERS)

**Call 406-291-5335** (at no cost to you)



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UDIG is the regional utility locator service.

- Contact them prior to excavation work
- EPA will conduct an evaluation to determine the potential for encountering LA during the work.
- EPA will work with you to ensure LA exposure and additional contamination is minimized

Environmental Resource Specialist should be called if you want to conduct improvements to your property.

- Free service provided by EPA to evaluate the potential for encountering LA during your work.
- If LA is present, EPA will conduct the demolition work for you,
- Then you can complete your improvements and minimize your exposure to LA.



## Next Steps - EPA's Commitment

- We are committed to continuing the cleanup in Libby and Troy.
- Significant progress has been made in reducing exposure to LA.
- We need your input as we move forward.

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- As Jim Martin said we will be in Libby and Troy until the cleanup is complete.
- We have made a lot of progress.
- The draft toxicity values for cancer and non cancer values for Libby Amphibole Asbestos will undergo further scientific review. The numbers may change.
- EPA will continue activity based sampling to more fully understand exposure.
- The final toxicity values and additional exposure data we collect will be used to prepare the final risk assessment.
- The final risk assessment will be used in making final clean-up decisions in Libby.
- We will continue our aggressive clean-up approach changing it as we learn more from our ABS work.
- We want and value your input.



## We Want to Hear From You



- Parallel process of public involvement while the independent scientific review of toxicity values continues.
- We want to engage you in the next steps discussion.
  - How would you like to be involved?
  - What alternatives for clean up should be considered?
  - What practices or restrictions can you live with?

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We would like you to tell us how you would like to be involved.

Some possible options include:

-Monthly brainstorming sessions to identify alternatives

-Discussions during TAG or CAG meetings

-Community conference for day with breakout sessions

- Comment boxes at the Libby and Troy information centers

-Please consider filling out the green card and providing it to us before you leave tonight. It will help us to set up a process that works for you.

- See fact sheet 3b for more information about Community Engagement