NARPM Presents Webinar Series

EPA and the NIEHS Superfund Research Program: Collaborating to Meet Community Technical Assistance Needs at Superfund Sites

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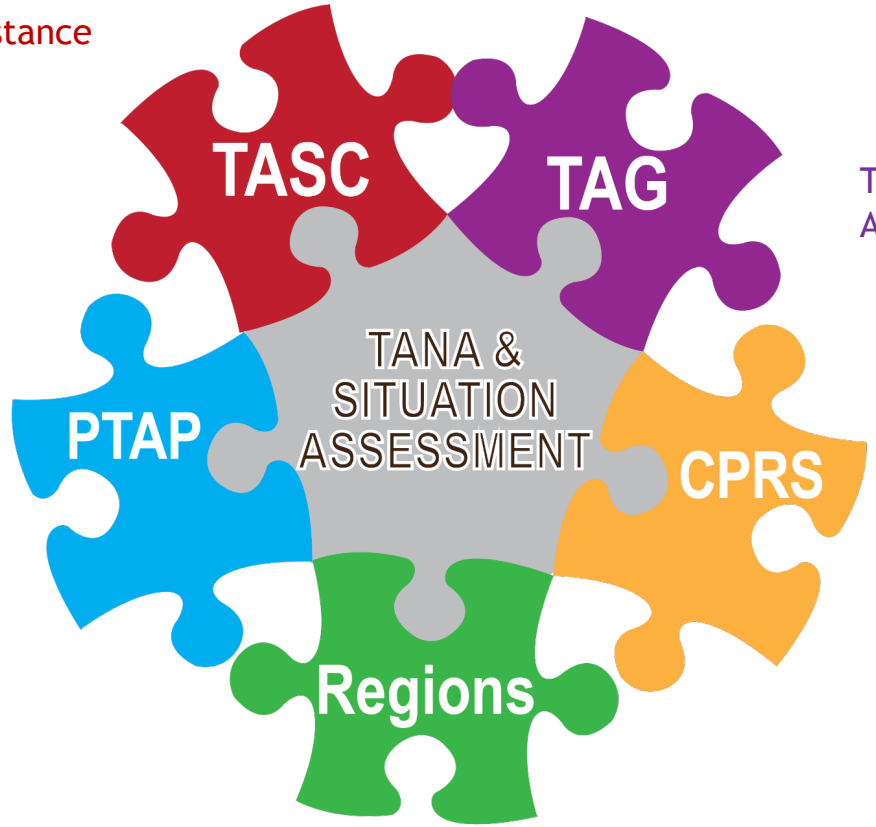
May 6, 2015

Overview

- Background:
  - EPA's Pilot Partners in Technical Assistance Program (PTAP)
  - NIEHS Superfund Research Program
  - Discussion/Questions
- Overview of Oregon State University SRP and Black Butte Mine PTAP project
  - Discussion/Questions
- Overview of University of Arizona and University of North Carolina SRP Centers and PTAP Bioavailability Project
  - Discussion/Questions
- Wrap-Up

Tools and Resources for Enhancing Community Involvement at Superfund Sites

Technical Assistance Services for Communities contract



Technical Assistance Grants

Pilot Partners in Technical Assistance Program

Conflict Prevention and Resolution Services

Partners in Technical Assistance Program (PTAP) Pilot

- Objective of PTAP: To expand opportunities for cooperation between EPA and colleges and universities with the shared goal of assessing and addressing the unmet technical assistance needs of impacted communities.
- Colleges and universities cooperate with EPA and *voluntarily* commit to assist communities with their unaddressed technical assistance needs.
- Best for sites with limited funding or where technical assistance needs are outside EPA's scope of work.
- Currently piloting the PTAP approach with the NIEHS Superfund Research Program (SRP) grantees at Superfund sites

Examples of Technical Assistance Services Provided by PTAP

- Training on environmental issues
- Researching public health and risk
- Redevelopment planning
- Neutral facilitation and mediation services
- Reading and explaining technical reports
- Community outreach and involvement
- Researching scientific/technical issues
- Building capacity of community groups

Access to sites to sample for research purposes is beyond the scope of PTAP

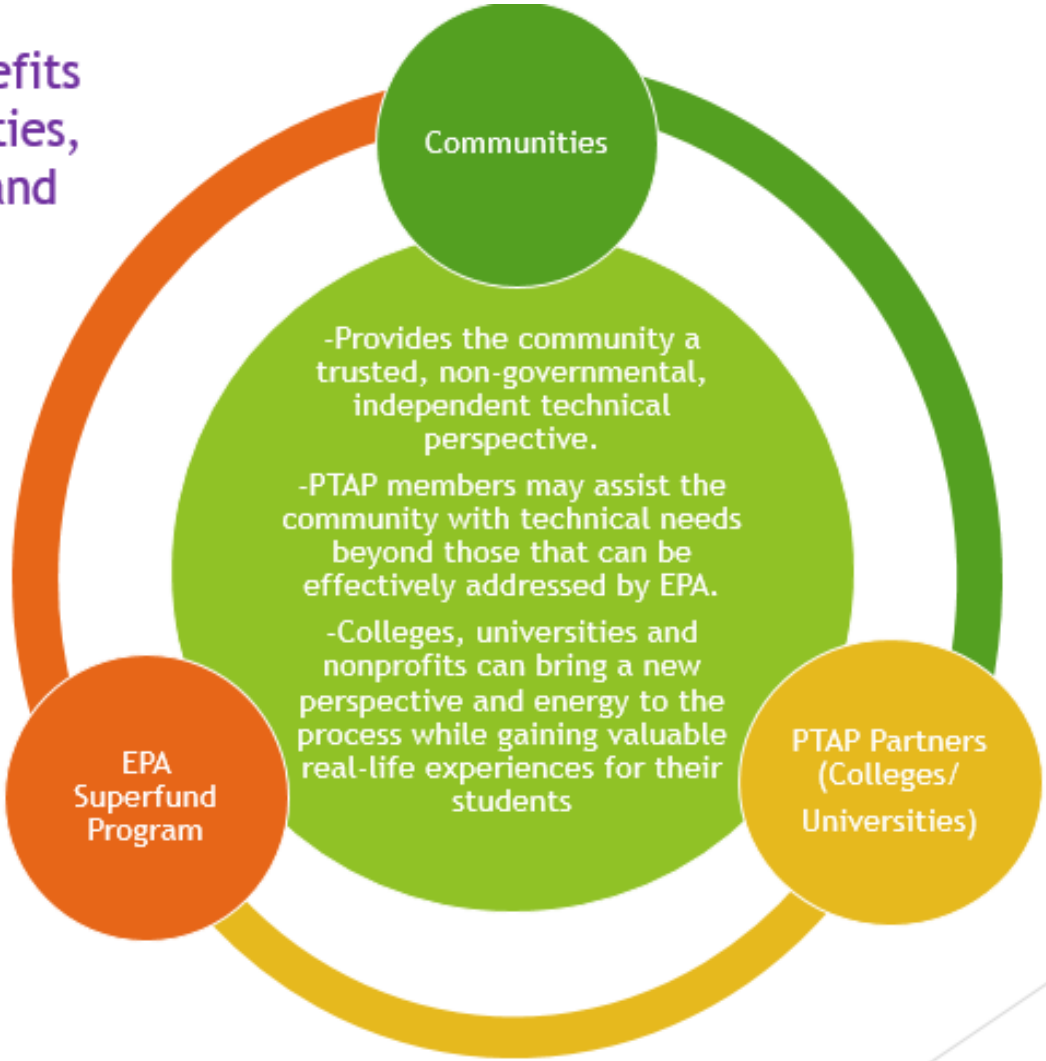
Benefits Afforded to Communities Through PTAP

- Existing grassroots community organizations can receive capacity-building assistance
- PTAP partners may provide technical assistance and expertise to impacted communities as a neutral third party
- Community education needs may be effectively and efficiently addressed through a collaborative relationship established between the EPA, PTAP partners and the community
- The collaborative nature of PTAP will minimize the duplication of technical assistance provided to an impacted community, as appropriate

Benefits Afforded to PTAP Pilot Partners: SRP Grantees

- Will aid the SRP grantee in determining the technical assistance needs of a community impacted by a given site
- Will assist SRP grantees in meeting the requirement of establishing community partnerships for their Community Engagement Core activities
- Will assist in opening the lines of communication between the SRP grantee, impacted communities, and nonprofit organizations
- Will assist the SRP grantee in engaging the community at the earliest stage possible in the remedial/ removal process
- Will provide SRP trainees with opportunities to collaborate with communities
- Will streamline the process of establishing partnerships between EPA and SRP grantees (as required of all SRP grant recipients under their Research Translation Core)
- Will provide an opportunity for SRP Centers to collaborate

PTAP Benefits Communities, Partners and EPA



Current PTAP Partners
(18 SRP Centers)

- Boston University
- Brown University
- Dartmouth College
- Duke University
- Harvard University
- Louisiana State University
- Michigan State University
- Northeastern University
- Oregon State University
- University of Arizona
- University of California-Berkeley
- University of California-Davis
- University of California-San Diego
- University of Iowa
- University of Kentucky
- University of North Carolina-Chapel Hill
- University of Pennsylvania
- University of Washington

National Institutes of Health
National Institute of Environmental Health Sciences
Superfund Research Program

Fundamental Knowledge → **NIH Research Mission** → **Health Outcomes**

…with environmental exposures

…including health, risk assessment, remediation and detection

National Institute of Environmental Health Sciences

Superfund Research Program (SRP)
SARA Legislation

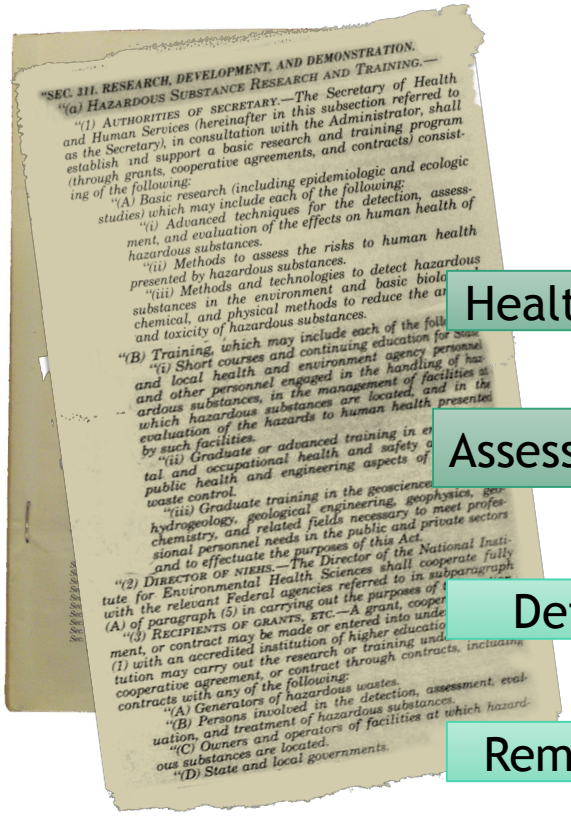
…caused by hazardous substances

…relevant to Superfund stakeholders

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

SRP Mandates under SARA


"SEC. 311. RESEARCH, DEVELOPMENT, AND DEMONSTRATION.
"(a) HAZARDOUS SUBSTANCE RESEARCH AND TRAINING.—
"(1) AUTHORITIES OF SECRETARY.—The Secretary of Health and Human Services (hereinafter in this subsection referred to as the Secretary), in consultation with the Administrator, shall establish and support a basic research and training program (through grants, cooperative agreements, and contracts) consisting of the following:
"(A) Basic research (including epidemiologic and ecologic studies) which may include each of the following:
"(i) Advanced techniques for the detection, assessment, and evaluation of the effects on human health of hazardous substances.
"(ii) Methods to assess the risks to human health presented by hazardous substances.
"(iii) Methods and technologies to detect hazardous substances in the environment and basic biolo
chemical, and physical methods to reduce the a
and toxicity of hazardous substances.
"(B) Training, which may include each of the follo
"(i) Short courses and continuing education for
and local health and environment agency personnel
and other personnel engaged in the handling of haz
ardous substances, in the management of facilities
which hazardous substances are located, and in the
evaluation of the hazards to human health presented
by such facilities.
"(ii) Graduate or advanced training in e
tal and occupational health and safety
public health and engineering aspects of
waste control.
"(iii) Graduate training in the geoscience
hydrogeology, geological engineering, geophysics, ge
chemistry, and related fields necessary to meet profes
sional personnel needs in the public and private sectors
and to effectuate the purposes of this Act.
"(2) DIRECTOR OF NIEHS.—The Director of the National Insti
tute for Environmental Health Sciences shall cooperate fully
with the relevant Federal agencies referred to in subparagraph
(A) of paragraph (5) in carrying out the purposes of t
"(3) RECIPIENTS OF GRANTS, ETC.—A grant, cooper
ment, or contract may be made or entered into unde
(1) with an accredited institution of higher educatio
tution may carry out the research or training und
cooperative agreement, or contract through contracts, including
contracts with any of the following:
"(A) Generators of hazardous wastes.
"(B) Persons involved in the detection, assessment, eval
uation, and treatment of hazardous substances.
"(C) Owners and operators of facilities at which hazard
ous substances are located.
"(D) State and local governments.

University-based basic research program established in 1986 under Superfund Amendments Reauthorization Act (SARA)

Development of:

- **Health Effects**: Advanced techniques for the detection, assessment, and evaluation of the human health effects of hazardous substances
- **Assessing Risks**: Methods to assess the risks to human health presented by hazardous substances
- **Detection**: Methods and technologies to detect hazardous substances in the environment
- **Remediation**: Basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances

SRP Funding Mechanisms

Multi-Project Centers (P42)
Designed for integration across disciplines: Biomedical and Environmental Science & Engineering; Community Engagement, Research Translation, and Training. Basic and application-oriented.
Request for Applications. Annual RFA.

Small Business Research Grants SBIR/ STTR (R41-44)
Foster the commercialization of technologies, relevant to hazardous substance clean-up and monitoring. Ongoing Funding Opportunity

Individual Research Project (R01)

Designed to address specific issues to complement the multi-project research program; tackle issues of emerging concern for Superfund. Most recent solicitation:

Biogeochemical Interactions Affecting Bioavailability for in situ Remediation of Hazardous Substances (R01)

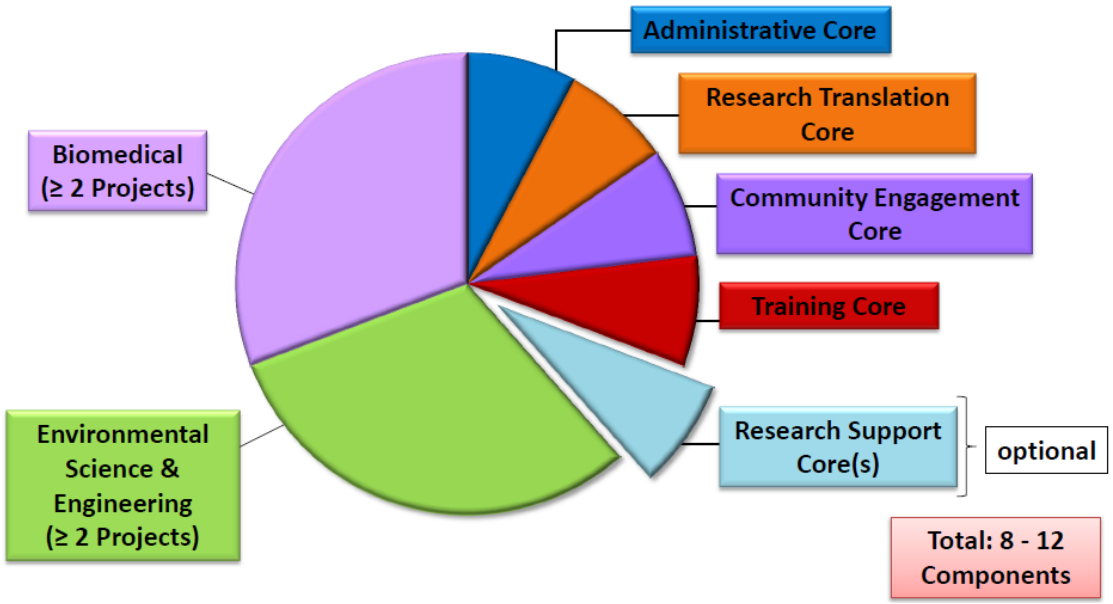
Occupational Training (R25)
Emerging issues in EHS training.

Supplement Awards
Trainee externships/work exchanges, technology transfer opportunities.

Funding Opportunities:
http://www.niehs.nih.gov/research/supported/dert/cris/programs/srp/funding/index.cfm

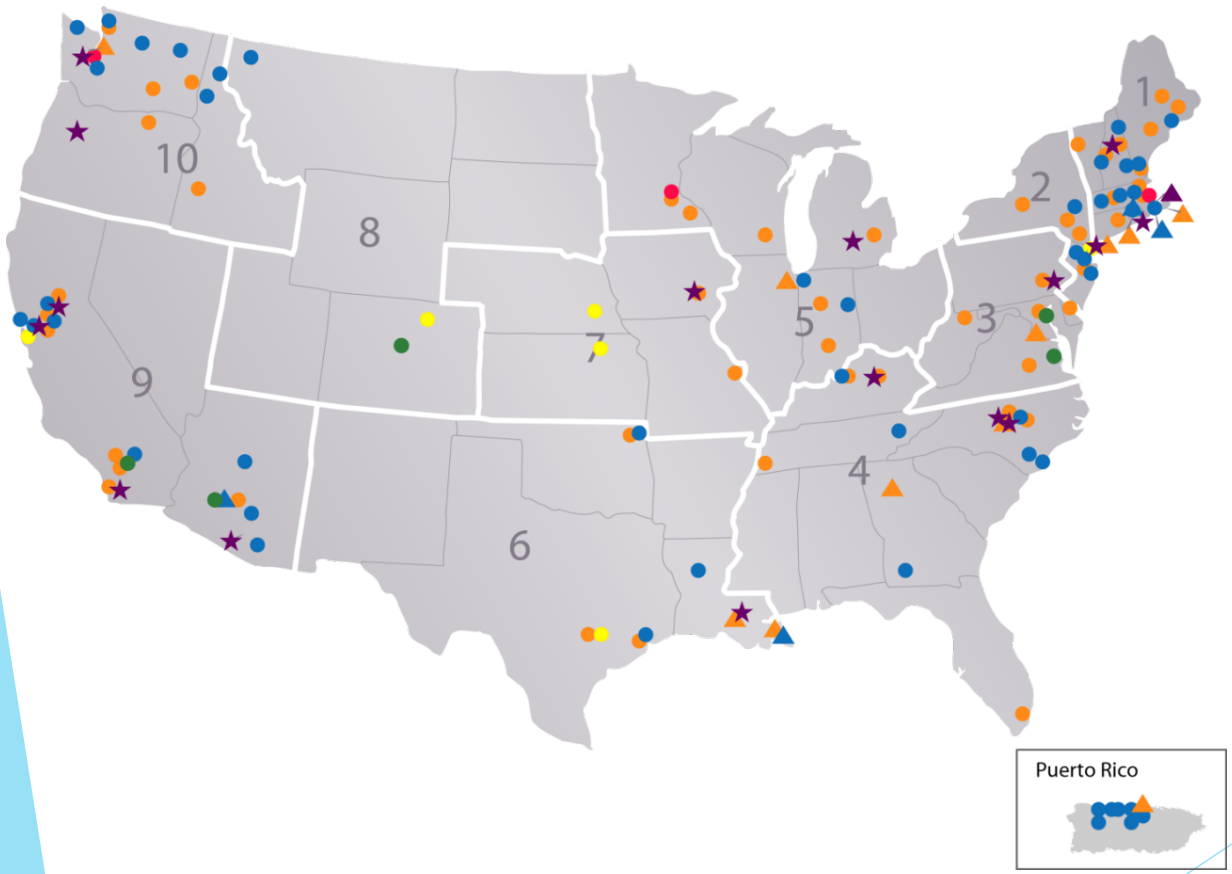
Multi-Project Centers (P42)

Designed for integration across disciplines: Biomedical and Environmental Science and Engineering; Community Engagement, Research Translation, and Training. Basic and application-oriented. Request for Applications. Annual RFA.



All Components Interacting, Addressing Problem

SRP Across the Country



- Superfund Multiproject Research Centers
- Individual Research Projects
- Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) Projects
- Research Education Programs in Emerging Technologies
- SRP Partnering Institutions
- SRP Research and Outreach at Hazardous Waste Sites

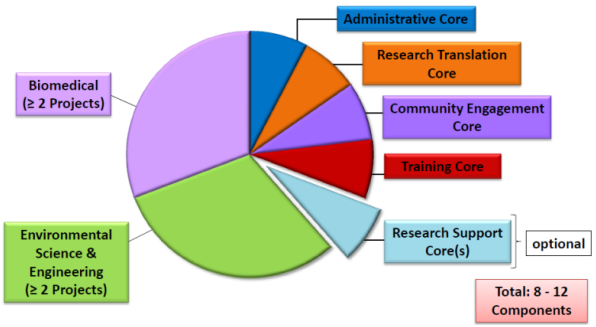
Research Translation Core

Research Translation Core Function:

Communicating and facilitating the use of research findings emanating from the program in the manner most appropriate for their application and the advancement of research objectives.

Four Components

1. Communication
2. Government Partnerships
3. Technology Transfer
4. Information Dissemination

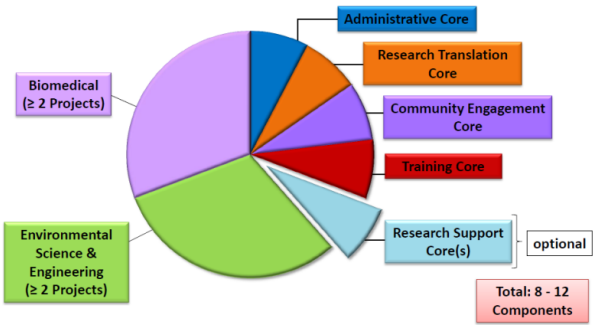


http://www.niehs.nih.gov/research/supported/dert/programs/srp/outreach/index.cfm

Community Engagement Core

Community Engagement Core Function:

To enhance knowledge exchange and to support community needs with regard to the science emanating from the Center



Target communities

SRP defines target communities as those impacted by sites contaminated with hazardous substances.

- **Members of the affected community**
- **May also include:** local government, tribal councils, community service groups, non-governmental organizations

http://tools.niehs.nih.gov/srp/outreach/outreach2.cfm

SRP Contact Information

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suk@niehs.nih.gov

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Alicia Lawson, MPH
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(919) 316-4593
Alicia.lawson@nih.gov

http://www.niehs.nih.gov/research/supported/dert/programs/srp/about/contacts/contact_staff/index.cfm

First PTAP Pilot Project: Collaboration with Oregon State University SRP

Black Butte Mine NPL Site

- Former mine site - Cottage Grove, OR
- July of 2012 – Community information session with residents of Lane County and Cottage Grove
- How can we best inform & keep residents updated on EPA activities?
- Laurie Briggs (Principal, London School) – suggested materials to educate students about the mine
- Educate community via educating children

First PTAP Pilot Site:
Black Butte Mine

- A Technical Assistance Needs Assessment (TANA) was conducted at Black Butte Mine Superfund site, Cottage Grove, Oregon (Region 10) under Technical Assistance Services for Communities (TASC), in March 2013. The PTAP Request for Response (RfR) was released in June 2013.
- Oregon State University (OSU) Superfund Research Program began a partnership with EPA through this Pilot to expand upon the community outreach capabilities surrounding the Black Butte site.
- In December 2013, OSU and EPA met with Laura Briggs, Principal of the London School in Cottage Grove, because she had a strong desire to give her students and their families' science and environmental health knowledge. About 100 rural K – 8th grade students go to London School. Monthly meetings continued through September, 2014.

First PTAP Pilot Site: Black Butte Mine

Technical assistance provided through PTAP included:

1) Addressing community and educational needs.

- Creating a hands-on, project-based integrated curriculum related to the science of the Superfund site and mercury contamination that can serve as a model for other rural, small schools.
  - "Mercury, the Community, and Me" curriculum for grades K-8 covering Environmental Health, Hg and Health, and Hg in the Environment modules
- Discussing ways to educate the students and community and expand and build a sustainable partnership.
  - Potential citizen science project and school science fair

2) Providing training opportunities for SRP Trainees wanting outreach experience.

3) Helping students understand career opportunities in environmental and life sciences.

  - "Careers in Environmental Sciences" and "Black Butte Mine" videos

The Project Team

Mercury, the Community and Me

"The way to reach the London community is through the children."
~Laurie Briggs, former London School principal

APPROACH

A modular package of educational materials and videos was created that lets teachers select and adapt activities for their individual classroom.

London School

- K-8
- Rural
- >70% students qualify for free/ reduced lunch
- 24% students in the special education program

London School also houses many community events, serving as a focal point for the community.

Mercury, the Community, and Me

EDUCATIONAL PACKAGE

Evaluated and compiled existing resources to build each section.

Section 1:
Environmental Health

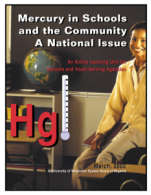
Section 2:
Mercury in the Environment

Section 3:
Mercury and Human Health

Selected Products

Careers in Environmental Health

EPA Healthy Homes



The Black Butte Mine

EPA Fish Kids

STUDY

superfund.oregonstate.edu/mercury

Includes activities from thirteen agencies, universities, associations and programs

Careers in Environmental Health Video

- The video “Careers in Environmental Health” was created to introduce students to various careers in science. Environmental Health includes chemists, biologists, toxicologists, epidemiologists, and many more careers. Scientists from Oregon State University and the Environmental Protection Agency were interviewed about their job, as well as how they ended up becoming a scientist.

Black Butte Mine Video

- This video was created for students to learn about the history of their community. Many people have no knowledge of the Black Butte Mine or the role it played in local and national history. The history of the Black Butte Mine is fascinating and important for the current environmental health of the surrounding community.

Mercury, the Community, and Me

CONCLUSIONS

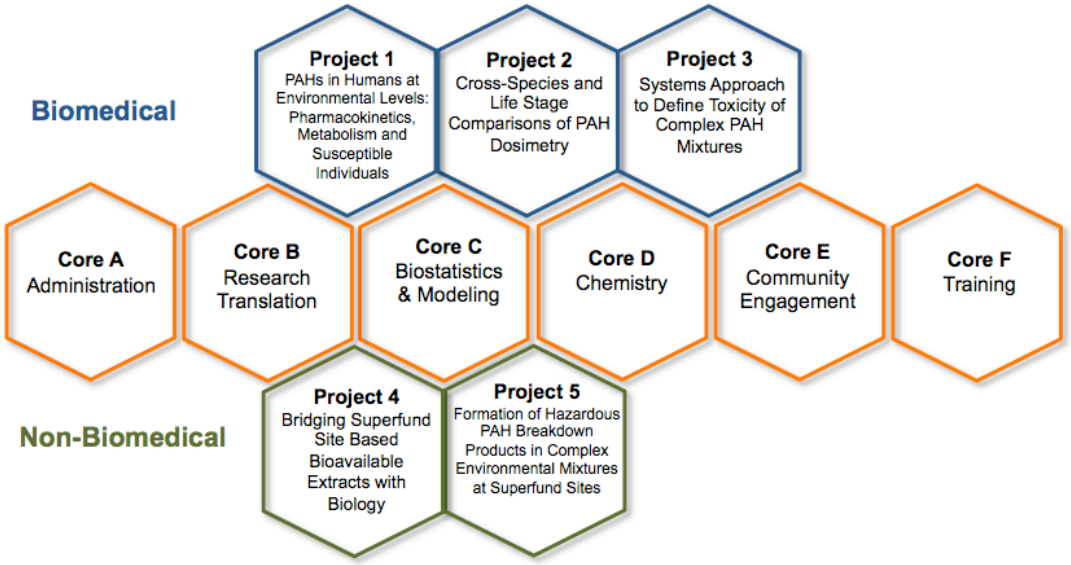
The PTAP pilot program at Black Butte Mine initiated partnerships between regulatory agencies, OSU SRP Center and a local community.

The program created a framework to:

- Leverage existing resources to support community education
- Incorporate environmental health literacy into K-8 programs
- Expand local knowledge regarding a historical environmental contaminant and human exposure
- Provide student trainees with on-the-ground experience in communities
- Enhance EPA/community/PTAP partner relationships to the benefit of all parties involved

Project Update:

London School reported the educational materials met their needs and they were happy with the products. The school is planning to debut the educational materials at Parent Night/Science Fair on Earth Day, and begin the curriculum during the next school year.



http://superfund.oregonstate.edu

Oregon State UNIVERSITY OSU

Mercury, the Community and Me

OSU Team Members for the PTAP Project

Research Translation Core

Justin Teeguarden, Ph.D, DABT, Leader, PNNL

David Stone, Ph.D, Co-Leader, OSU

Naomi Hirsch, EdM, Project Coordinator, OSU

Sean Ross, Network Admin, OSU

Oregon State University OSU

Community Engagement Core

Tribal-University Evaluation of Chemical Exposures to Improve Community Health

Anna Harding, PhD, Core Leader, OSU

Molly Kile, PhD, Co-Leader, OSU

Diana Rohlman, PhD, Program Coordinator, OSU

Greta Frey and Andres Cardenas, grad students

Corey Fisher, former MPH student

Jamie Donatuto, PhD, Community Liasion, Swinomish

Barbara Harper, PhD, Co-Leader, Oregon State University

Stuart Harris, B.S., Consultant and Tribal Member of CTUIR

Second PTAP Pilot Project: Communicating Bioavailability of Lead and Arsenic in Soil

Background:

- EPA defines bioavailability as the amount of a contaminant that is absorbed into the body following skin contact, ingestion, or inhalation
- Relative bioavailability is how much of a contaminant is absorbed from soil as compared to how much of that contaminant is absorbed from food or water. EPA is incorporating relative bioavailability information for human exposures at Superfund sites exposed to soil contaminants via oral pathway
- Work of the EPA Technical Review Workgroup (TRW) Bioavailability Committee (BAC)

Project purpose:

- Assist EPA with developing materials to help the public to understand the concept of bioavailability, and how incorporating related data into risk assessments at Superfund sites may influence site clean-up levels or remedy decisions

Background

EPA Technical Review Workgroup: Bioavailability Committee (BAC)

- The TRW BAC was formed to promote consistent applications of best science practices in assessments of oral bioavailability of metals in soil for site investigations and human health risk assessments.
- The initial focus of BAC activities was on validation of methods for assessing soil arsenic and lead bioavailability.
- Activities have expanded to include emerging issues such as assessment of bioavailability of soil PAH and PCDD/F.
- BAC includes members from the EPA Regions, and Headquarters (Office of Superfund Remediation and Technology Innovation and other program offices)

TRW BAC Mission

- Develop guidance and policy concerning site assessment and cleanup at hazardous waste sites
- Site consultations in support of regional requests and identify research needs to address data gaps relevant to contaminant bioavailability in soil site assessment activities
- Primary point of contact, information archive, and repository of outreach materials for the methods recommended in the guidance documents
- Review new methods for assessing bioavailability of inorganic soil contaminants (new method validation)
- Compile and evaluate information on applications of bioavailability assessments in EPA site risk assessments, with the objective of promoting consistent application of the framework described in this guidance across the EPA Regions

TRW BAC Major Accomplishments (Metals)

- *Guidance for Evaluating the Bioavailability of Metals in Soils* (OSWER 9285-80)
  - Articulates the rationale for considering bioavailability in human health risk assessments of metals
  - Lays out a decision framework for incorporating bioavailability information and data collection in human health risk assessments
  - Specifies criteria that must be satisfied for validating methods for regulatory use

TRW BAC Major Accomplishments (Lead)

- *Validation Assessment of an In Vitro Lead bioaccessibility Assay for Predicting Relative Bioavailability of Lead in Soils and Soil-like Materials at Superfund Sites* (OSWER 92000 3-51)
  - Documents the basis for the validity and regulatory acceptance of an IVBA assay for predicting oral RBA of lead in soil for use in site investigations and human health risk assessments
- *Guidance Standard Operating Procedure for and In Vitro Bioaccessibility Assay for Lead in Soil* (EPA 9200.2-86)
  - Specifies procedures and quality control measures required for performance of the lead IVBA assay.

TRW BAC Major Accomplishments (Lead)

- *Amending Soils with Phosphate as Means to Mitigate Soil Lead Hazard: A Critical Review of the State of the Science* (Journal of Toxicology and Environmental Health: 16:337-380, 2013)
  - Evaluates evidence for efficacy of phosphate amendments for decreasing soil lead bioavailability
  - Discusses practical implementation issues, such as criteria and methods for evaluating efficacy, and potential effects of phosphate on mobility and bioavailability of co-contaminants in soil

TRW BAC Major Accomplishments (Arsenic)

- *Relative Bioavailability of Arsenic in Soils at 11 Hazardous Waste Sites Using an In Vivo Juvenile Swine Method* (OSWER Directive #9200.0-76)
  - Specifies procedures for estimating oral relative bioavailability of arsenic in soils using a juvenile swine assay and presents results obtained for 11 soils
- *Compilation and Review of Data for Relative Bioavailability of Arsenic in Soil and Recommendations for Default Value for Relative Bioavailability* (OSWER 9200.1-113)
  - Provides the basis of a national default values for oral relative bioavailability of arsenic in soils to be used when site-specific estimates are not available

TRW BAC Major Accomplishments (Dioxins)

- Bioavailability of Dioxins and Dioxin-like compounds in Soil
  - Summarizes data on oral relative bioavailability of dioxins and dibenzofurans in soil and evaluates adequacy or the data for applications to human health risk assessment.
- *Soil Dioxin Relative Bioavailability Evaluation Framework* (OSWER 9200.2-136)
  - Provides a framework for evaluating strengths and weaknesses of relative bioavailability assays that are proposed or implemented to support human health risk assessments

TRW BAC Major New Developments

- Validation of an *in vitro* bioaccessibility assay for predicting oral relative bioavailability of arsenic in soil
- Developing new soil reference materials for use as a soil standard in IVBA and other assays
- Established new committee to focus on bioavailability issues related to Dioxins and PAH
- Site consultations on bioavailability assessments of dioxins and PAHs

Second PTAP Project: Communicating Bioavailability of Arsenic and Lead in Soil at Superfund Sites

University of Arizona Superfund Research Program

University of North Carolina at Chapel Hill Superfund Research Program

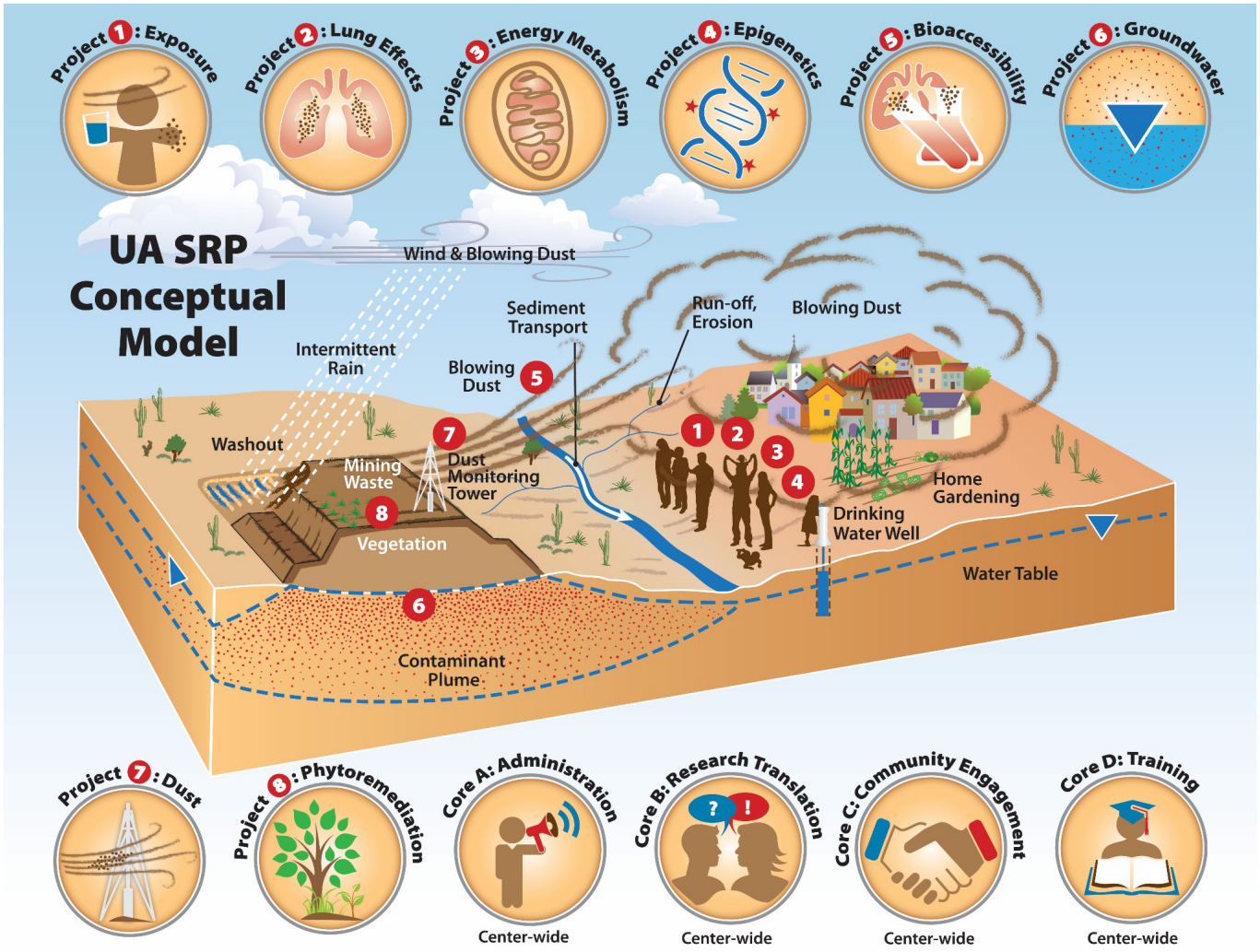
NIEHS Superfund Research Program at the University of Arizona:

Hazardous Waste Risk and Remediation in the US Southwest

Theme: Mitigation of the human health and environmental impacts resulting from hardrock mining with an emphasis on arid and semiarid environments.

Director: Raina M. Maier, PhD
Associate Director: R. Clark Lantz, PhD

Superfund Research Program
The University of Arizona


Project 1: Exposure
Project 2: Lung Effects
Project 3: Energy Metabolism
Project 4: Epigenetics
Project 5: Bioaccessibility
Project 6: Groundwater
UA SRP Conceptual Model
Wind & Blowing Dust
Sediment Transport
Run-off, Erosion
Blowing Dust
Intermittent Rain
Blowing Dust
Washout
Mining Waste
Dust Monitoring Tower
Vegetation
Home Gardening
Drinking Water Well
Water Table
Contaminant Plume
Project 7: Dust
Project 8: Phytoremediation
Core A: Administration
Core B: Research Translation
Core C: Community Engagement
Core D: Training
Center-wide
Center-wide
Center-wide
Center-wide

Research Translation / Community Engagement Cores

RTC Goal:

- Act as a neutral party to provide evidence-based information on arsenic, mining, and other potential hazards, and their impacts on human health and the environment.

CEC Goal:

- Empower underrepresented community members to become active participants in the development and resolution of hazardous contaminant issues that affect them.

Field Study: UA SRP Projects in Action at the Iron King Mine and Humboldt Smelter Superfund Site

Dewey-Humboldt, AZ

Gardenroots

Phyto-stabilization

Size-resolved characterization of metals in dust

MESH

Metals Exposure Study in Home

Metals Exposure Study in Homes (MESH)

Arsenic bio-availability and bio-accessibility

+ Research Translation/Community Engagement Cores

+ Collaboration with local, state, and federal stakeholders

UNC Superfund Research Program

Improving how we **calculate and communicate environmental and human health risks** associated with high priority chemicals found at hazardous waste sites and **evaluating the effectiveness of various remediation strategies** to minimize these risks

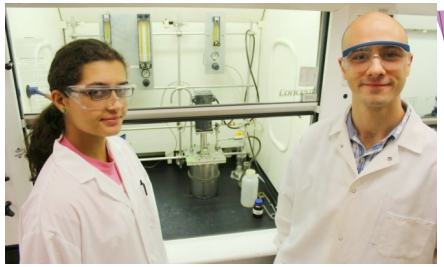
UNC GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH

Director: Jim Swenberg, PhD
Deputy Director: Rebecca Fry, PhD

Srp Superfund Research Program

UNC SRP | Research

- **Biomedical**
  - Toxicity caused by oxidative stress **(PCBs, formaldehyde)**
  - Metabolism of trichloroethylene **(TCE)**
  - Prenatal exposures to toxic metals **(Cd, As, Mn, and others)**
- **Environmental Science & Engineering**
  - **Bioremediation** of **PAH**-contaminated soil
  - Use of **passive sampling devices** to monitor chemicals in water and sediment



UNC SRP RTC | National Projects

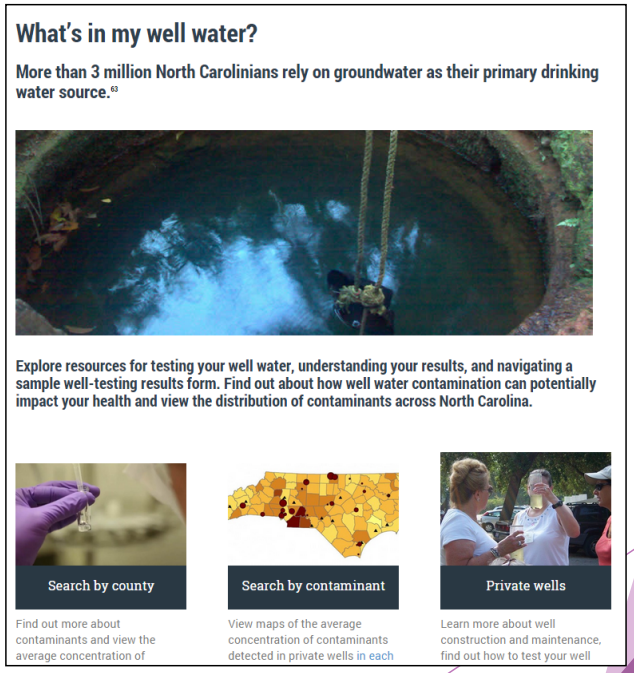
FishNet: participation in national working group on fish consumption advisories, convened by USEPA.

Fish Consumption: researching effective ways to educate vulnerable populations about complex fish consumption advisories.

UNC SRP RTC | Regional & NC Projects

Enhancing Public Health Assessments

Informing Private Well Owners



PTAP Project Original Task:

Work with EPA to develop educational materials for the general public on **relative bioavailability** of arsenic and lead in soil at Superfund Sites (non site-specific)

Project Evolution:

Making distinction between bioavailability and relative bioavailability is likely not needed for general public audience

Revised Task:

Develop educational materials for the general public on **bioavailability** of arsenic and lead in soil at Superfund Sites (non site-specific)

Communicating Bioavailability of Arsenic and Lead in Soil at Superfund Sites

Take home messages

1: Not all of the arsenic / lead present in soil is present in a form that can harm human health.

2: Only bioavailable forms of arsenic / lead will be absorbed into the body following exposure.

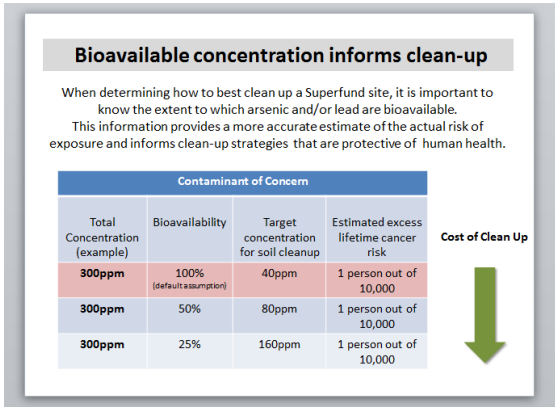
3: Having information about the bioavailability of contaminants at a site can result in an adjusted soil cleanup level that is protective of human health.

4: Individuals can take steps to limit their exposure to these contaminants.

Creation of Educational Materials for Impacted Communities

Fact Sheet + Infographics + PowerPoint slide set

EXAMPLE ONLY

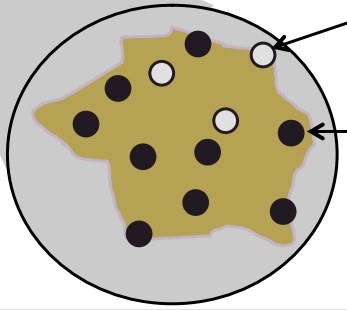


Also in the works…

- Video(s)
- Hands-on demonstration

Different Forms of Contaminant May Be Present in Soil

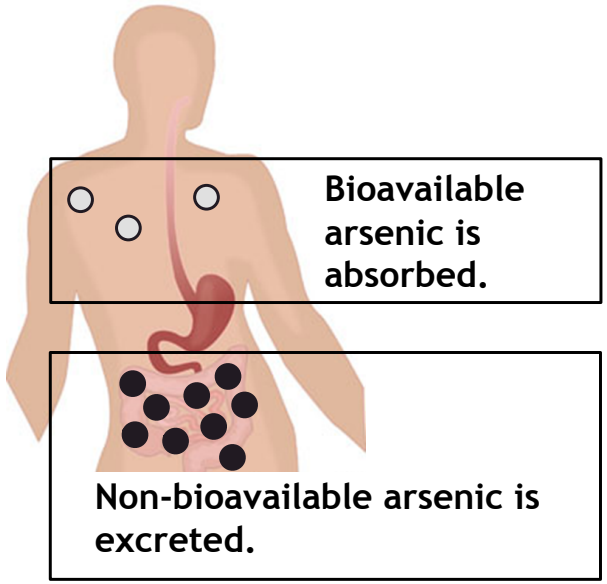
A contaminated soil sample often contains **different forms** of arsenic, not all of which are bioavailable.



Total concentration in soil is **greater than bioavailable concentration**

Bioavailability

Not all forms of arsenic are **bioavailable**, or present in a form that can be absorbed by the body.



When the bioavailable portion is low, then less of the chemical is absorbed by the body from the soil.

Bioavailable Concentration Informs Cleanup

When determining how to best cleanup a Superfund site, it is important to know the extent to which arsenic and lead are bioavailable. This information provides a more accurate estimate of the risk of exposure and informs cleanup strategies that protect human health.

EXAMPLE ONLY

Contaminant of Concern			
Total Concentration (example)	**Bioavailability**	Target concentration for soil cleanup	Formula for target concentration
300ppm	**100%** **(default assumption)**	40ppm (state specific target)	-
300ppm	**50%**	80ppm	If 50% bioavailable then site can be cleaned to 80 ppm (40 ÷ 50%)
300ppm	**25%**	160ppm	If 25% bioavailable then site can be cleaned to 160 ppm (40 ÷ 25%)

Adjusted Soil Cleanup Level STILL Protects Human Health

Factoring bioavailability into adjusted cleanup goals does not alter cancer risk.

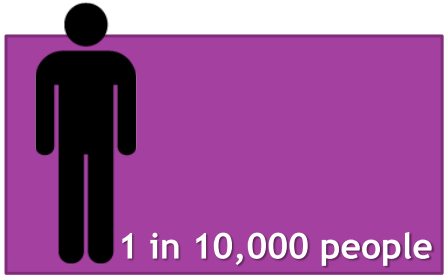
Contaminant of Concern			
Arsenic Total Concentration (example)	Arsenic Bioavailability	Target concentration for soil cleanup	Estimated excess lifetime cancer risk
300ppm	100% (default assumption)	40ppm (state specific target)	1 person out of 10,000
300ppm	50%	80ppm	same
300ppm	25%	160ppm	same

EXAMPLE ONLY

Estimated Excess Lifetime Cancer Risk

- **1 in 10,000 cancer risk** means that one person, out of 10,000 equally exposed people, would contract cancer if exposed continuously (24 hours per day) to the specific concentration of a contaminant over 70 years (an assumed lifetime). This risk represents an increased cancer risk, in addition to any cancer risk borne by a person not exposed to the contaminant of concern.

  Adapted from US EPA.



PTAP Pilot Lessons Learned

- **Leverage existing resources/Conduct thorough research on existing resources and expertise prior to beginning the project**
- **Scoping meeting is important**-Set expectations and plan project parameters at a meeting with EPA site team, project leads, and interested PTAP partners.
- **Provide Opportunities for Trainees**-OSU graduate students worked on the videos and materials and were able to interact with the community and learn more about the site
- **Work with other colleges/universities**-It benefits colleges/universities to have better collaboration amongst themselves, and benefits the PTAP projects by sharing resources and their wealth of expertise

Thank You!

Questions?