

Environmental Health and Land Reuse Certificate

Module 4: Redesigning with Health in Mind

**Agency for Toxic Substances and Disease Registry,
(Created 2020)**

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Guest Instructors:

Redesigning with Health in Mind: Objectives

- ❑ **Develop basic understanding of site cleanup methods**
 - Describe 3 site cleanup methods.
- ❑ **Understand community needs and vision**
 - Describe why health is an important part of redevelopment plans.
 - Define “healthfields” and give 3 examples
- ❑ **Demonstrate how to use the action model**

Redesigning with Health in Mind: Test Details

- ❑ **Pre-test**
- ❑ **Post-test: 70% or higher to receive a certificate**
 - Create a 4-digit number to identify your pre-test and post-test
 - Memorize your number or keep a written copy
 - Use the same number on both the pre- and post-test



ATSDR Regional Representative taking a test. ATSDR, 2019.

Redesigning with Health in Mind: Pre-test Module 4

- ❑ **Pre-test Module 4**
- ❑ **Put your memorized 4-digit number on the top right corner of your pre-test**

Basic Understanding of Site Cleanup Methods

Objective

DESCRIBE 3 SITE CLEANUP METHODS

Cleanup before Redevelopment

- ❑ **Identify and prioritize**
 - Contaminants
 - Exposure pathways
- ❑ **Understand future use for**
 - Children
 - Adults
 - Elderly
- ❑ **Establish protective cleanup goals**
- ❑ **Implement the cleanup**



Common Site Cleanup Methods (1 of 2)

Site Cleanup Method	Key Points
Activated carbon treatment	Adds activated carbon to wastewater, to absorb toxic compounds (fuel oil, PCBs, PFAS)
Air stripping	Removes VOCs from water
Bioremediation	Uses microorganisms to transform toxic compounds into nontoxic compounds (petroleum, solvents, pesticides)
Capping	Covers buried waste to prevent migration
Excavation	Removes contaminated materials
Soil vapor extraction (SVE)	Removes vapors from below ground for above-ground treatment

Common Site Cleanup Methods (2 of 2)

Site Cleanup Method	Key Points
Immobilization	Treating soil slurries or waste sludge to prevent migration of toxic compounds from soil
Incineration	Burning to destroy organic compounds (e.g., dioxins, PCBs) in waste
Pump and treat	Purifying aquifers/groundwater by removing dissolved contaminants <ul style="list-style-type: none">• Treating to remove contaminants,• Discharging treated water. (Solvents, PCBs, pesticides)
Soil washing	Scrubbing soil ex situ: <ul style="list-style-type: none">• Dissolving or suspending soil in wash solution• Concentrating soil into smaller volume
Thermal desorption	Removing organic compounds from soil and sludge using low temperature heat line separation process

Knowledge Check #1

Select the best answer:

_____ is a process to cover buried waste materials in order to prevent migration (movement) of the contaminants.

- a) Incineration
- b) Immobilization
- c) Capping
- d) Excavation

Knowledge Check #2

Select the best answer:

Bioremediation uses _____ to transform harmful substances into non-toxic compounds.

- a) Man-made chemicals
- b) Microorganisms
- c) Aeration
- d) Activated carbon

Knowledge Check #3 (1 of 2)

Soil washing is a surfactant-based process for scrubbing soil ex situ (away from the original site) to remove contaminants.

- a) True
- b) False

Knowledge Check #3 (2 of 2)

Two methods of soil washing are

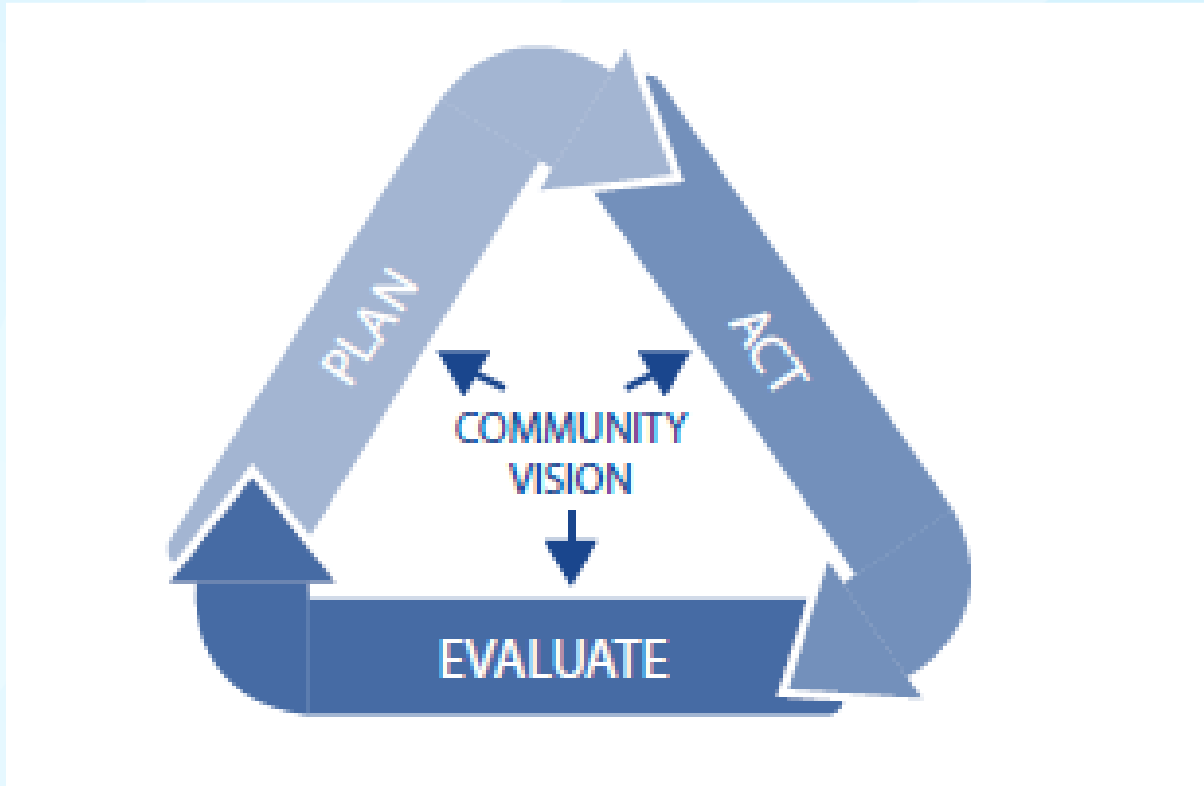
- a) Dissolving or suspending soils in a wash solution (which can be sustained by chemical manipulation of pH for a period of time)
- b) Removing contaminated soils from a hazardous waste site using heavy construction equipment
- c) Incinerating soils to destroy organic compounds
- d) Concentrating contaminants into a smaller volume of soil through particle size separation, gravity separation, and attrition scrubbing (similar to techniques used in sand and gravel operations)

Community Needs and Visions

Focusing on Community Vision



Image of a community visioning session (ATSDR, 2016)



Emphasizing Health in Redevelopment



Image of Social Determinants of Health. Healthy People 2020

How healthy is your community?

Determinants of Community Health

- ❑ Income and social status
- ❑ Social support networks
- ❑ Education
- ❑ Employment/working conditions
- ❑ Social environments
- ❑ Physical environments

Other Determinants of Community Health

- ❑ Personal health practices
- ❑ Coping skills
- ❑ Healthy child development
- ❑ Gender
- ❑ Culture

Knowledge Check #4

Including health considerations in redevelopment plans is important, because if a project lacks a vision for a healthier community, it may never happen.

- a) True
- b) False

Redesigning with Health in Mind:

**ATSDR BROWNFIELD/LAND REUSE
ACTION MODEL**

4 Step Action Model

1. What are the issues in the community?
2. How can development address these issues?
3. What are the corresponding community health benefits?
4. What data are needed to measure change?

Building a Development Community

- ❑ Concerned citizens
- ❑ Business owners
- ❑ Developers/Planners
- ❑ Tribal leaders
- ❑ Government agencies
- ❑ Health agencies
- ❑ Nonprofits



Image of a Development Community event. ATSDR, 2016.

Where do you find them?

“I firmly believe that the success of any community action lies with the enthusiasm of its people.” — Participant in the Linnton, Oregon Action Model

State and Federal Support

- ❑ ATSDR Land Reuse Team (**mailto:atsdr.landreuse@cdc.gov**)
- ❑ EPA Brownfields Program (**https://www.epa.gov/brownfields**)
- ❑ EPA Environmental Justice Program (**https://www.epa.gov/environmentaljustice**)
- ❑ **Health departments** (state, local, tribal)
- ❑ **State environmental protection agencies**

Ask Questions



Development Community meeting. ATSDR, 2017.



HOW BIG SHOULD THE DEVELOPMENT COMMUNITY BE?

Members of a development community in Navajo Nation. Source: Lloyd DeGrane, 2019.

Action Model

1. What are the issues in the community?
2. How can development address these issues?
3. What are the corresponding community health benefits?
4. What data are needed to measure change?

Healthfields

Address many health-related issues:

- Contaminant and exposure reduction
- Environmental justice
- Fresh food availability
- Community recreation and green space
- Health care access
- Employment
- Crime

Willa Carson Health and Wellness Center, Clearwater, FL



Clearwater Healthfield redevelopment. Source: Leading Change for Healthy Communities and Successful Land Reuse. Available at: https://www.atsdr.cdc.gov/sites/brownfields/docs/ATSDR_LandReuse.pdf

Lynchburg Grows, Lynchburg, VA



Promotional image for Lynchburg Grows community supported agriculture. How to Get What We Grow. Retrieved from: <https://www.lyncburggrows.org/ourstory>.

Baraboo, WI, Riverwalk



Knowledge Check #5

Select the best answer:

What is a “healthfield?”

- a) One example of a “healthfield” is working as a nurse.
- b) A location where many healthy people gather together for like-minded activities is a healthfield.
- c) A former land reuse site that has been transformed from an underused, potentially contaminated property into a vibrant area that serves a number of community health needs is a healthfield.
- d) None of the above describes a healthfield.

Knowledge Check #6

Which of these would be considered an example of health-focused redevelopment? (Choose all that apply)

- a) Reusing existing underground storage tanks for a new gas station at the site of an old gas station.
- b) Increasing the availability of fresh food in a community by creating a community garden on an abandoned lot.
- c) Creating a senior center and health clinic inside an abandoned school.
- d) Demolishing an abandoned warehouse and fencing the property to protect the community from the danger of the debris left behind.
- e) Remediating asbestos contamination inside an old mill and redeveloping the building to be a cultural center.

Action Model

Objective

**DEMONSTRATE HOW TO USE THE
ACTION MODEL**

Practice: Redesign with Health in Mind



Old fuel tanks behind a gas station. Lloyd DeGrane, 2019.



Old school that needs cleanup. Lloyd DeGrane, 2018.

Practice

You are working with a rural community like the one shown in the previous slide that has

- High number of land reuse sites
- No grocery stores
- No community gathering spaces that can also serve as storm shelters
- A low median income
- An aging population (median age 48)
- No early childhood education programs
- Primary health care or dental providers located 25 miles away
- Gas station located 5 miles away
- Grocery store located 10 miles away
- Residents who don't drive and can't get to doctor appointments and grocery stores.

Practice

The development community recently received a cleanup grant to clean up:

- Former school contaminated with
 - Lead
 - Mercury
 - PCBs (polychlorinated biphenyls)
 - Asbestos
- Former gas station where
 - Tanks leaked gasoline in soil and groundwater
 - Groundwater VOC (volatile organic chemical) plume migrated from the gas station to the former school

Practice

- ❑ What would be the steps in the cleanup? What are some potential cleanup methods?
- ❑ Who are the members of your development community?
- ❑ Create an action model (steps 1-3):
 1. What are the issues in the community?
 2. How can development address these issues?
 3. What are the corresponding community health benefits?
- ❑ How can you redesign with health in mind or create healthfields?

New Healthfields Example

- Vendor Village – Crafts village with community amenities in Chinle, AZ



Review

- ❑ **Review your slides and knowledge checks**
- ❑ **Post-test is next. It is an “open-book” exam.**
 - Score 70% to pass
 - Take it multiple times if needed to reach an 80% score
 - Add your 4-digit number in upper right corner.
- ❑ **We will grade these on the break.**

Thank you!

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