

Public Health Concerns
Adela Salame-Alfie, Ph.D.
NYS Department of Health

How does the Health
Department Perform the
Assessment of Sites with
Potential Contamination?

Pathway Analysis

- Source
- Environmental Transport
- Dose/Exposure Analysis
- Scenario Analysis

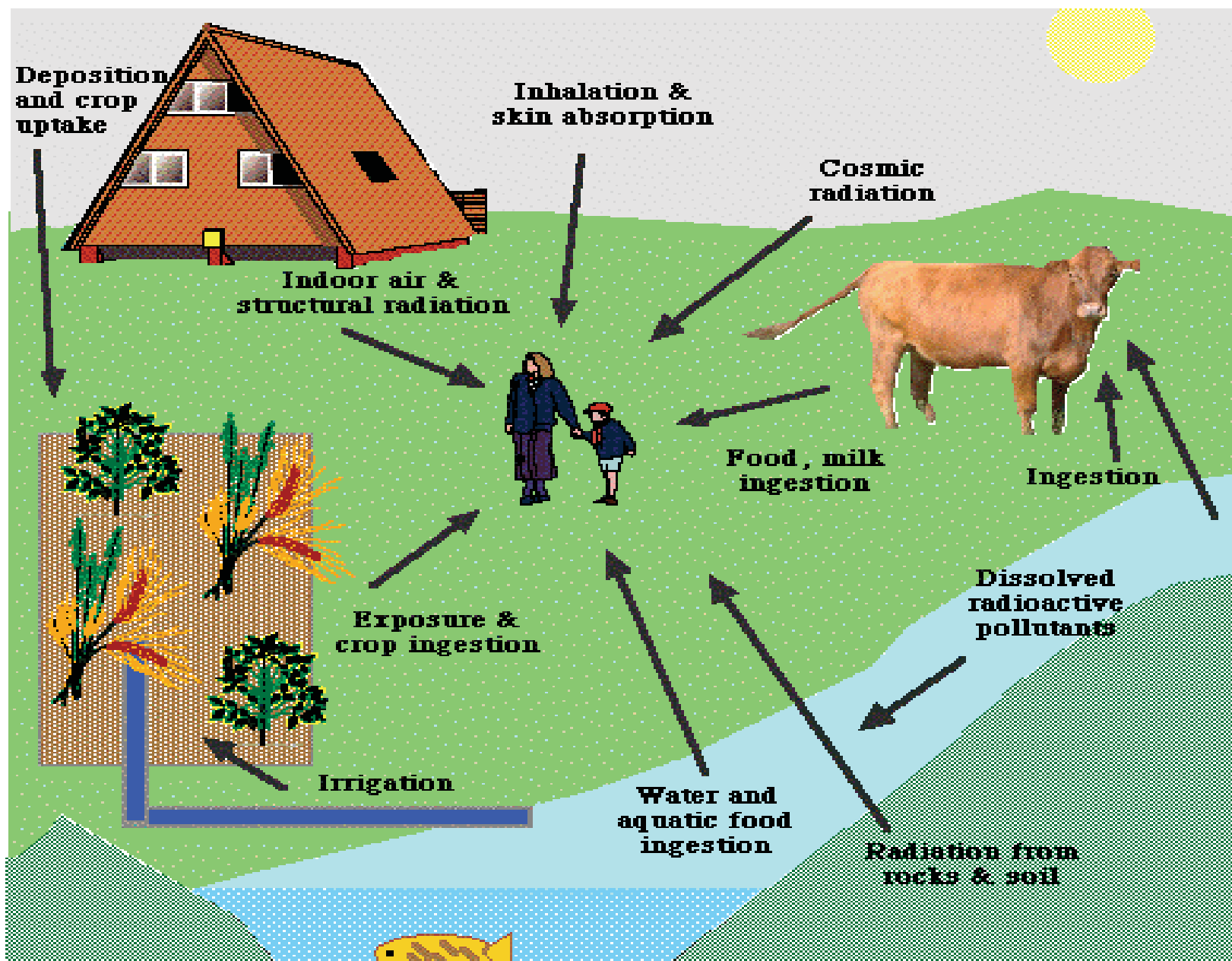
Source analysis:

- Deriving the source terms that determine the rate of release of radioactivity into the environment
 - Geometry of the contaminated zone
 - Concentration of radionuclides present
 - Ingrowth and decay rates of radionuclides
 - Removal rate by erosion and leaching

Environmental Transport

- Identifying environmental pathways by which radionuclides can migrate from the sources to a human exposure location
- Migration rates along these pathways

Pathways for Exposure/Dose



Potential Pathways of Exposure

- External Radiation

- Ground
- Air
 - Dust
 - Radon
 - Others

- Water

- Inhalation

- Dust
- Radon
- Others

Potential Pathways of Exposure (cont'd)

- Ingestion

- Food

- Plant foods (vegetables, grains, fruits)

- Meat

- Milk

- Aquatic foods (fish, seafood)

- Water

- Groundwater (well)

- Surface water

Dose/Exposure Analysis

- Derivation of Dose Conversion Factors for the radiation dose that will be incurred by exposure to radiation
- Dose conversion factors are specific for each radionuclide and pathway of exposure

Scenario Analysis

- The parameters that control the rate of radionuclide release into the environment
- The severity and duration of human exposure at a given location (as determined by patterns of human exposure)
- Credible scenarios/maximally exposed individual scenarios

Exposure Scenarios

- Resident farmer (most conservative) assumptions:
 - Direct radiation from radionuclides in the soil
 - Inhalation of resuspended dust
 - Inhalation of radon and its decay products
 - Ingestion of food from crops grown in contaminated soil
 - Ingestion of milk from livestock raised in the contaminated area
 - Ingestion of meat from livestock raised in the contaminated area
 - Ingestion of fish from a nearby pond contaminated with radioactive material
 - Ingestion of contaminated soil

DOH Environmental Surveillance Program near Indian Point

- Air
 - South side of Site (weekly)
- Water
 - Verplank (weekly)
 - Discharge canal (quarterly)
 - Inlet canal (quarterly)
- Fish
 - Hudson River (annually)
- External radiation
 - At 4 locations around the plant (quarterly)