Remedial Priority System

Human Health Layers

Vapor Exposure: Residential

March 2012

Human Health Layers

The Human Health Layers developed by the Department are:

- Water Media
  - Private Wells
  - Community Supply Wells
  - Non-Community Supply Wells
  - Surface Water Intakes
  - Surface Water Body (Surface Water Quality Standards)
  - Agricultural
- Soil Media
  - Soil Exposure: Residential,
  - Soil Exposure: School / Day Care
- Vapor Media
  - **Vapor Exposure: Residential**
  - Vapor Exposure: School / Day Care

Vapor Exposure: Residential Layer

Vapor Exposure: Residential Layer ➔ derived Layer (a layer created by DEP) based on population and exposure duration

- Mode of Exposure:
  - People being exposed (Inhalation) to contamination emanating from the site
- Background:
  - Vapor intrusion (VI) is defined as the migration of volatile chemicals from the subsurface into overlying buildings
  - Presence of volatile organic compounds in soil or ground water offers the potential to impacting indoor air quality
  - RPS model is based on the "Decision Flow Chart for Vapor Intrusion Pathway" shown as Appendix A of the SRP's "Vapor Intrusion Technical Guidance" Document

Vapor Exposure: Residential Layer

- Source Layer:
  - Land Use
    - Basis for layer: identifies residential properties and the type of usage

- Cell Values
  - Population served:
    - Cell values for each Land Use type are assigned based on estimated populations derived from with the 2000 census data

  - Exposure Period:
    - A 5 year exposure period is used to account for a theoretical time between the contamination being identified and completion of the Remedial Investigation phase
      - ❖ The value assigned by the land use layer is multiplied by an exposure period of 5 years

Vapor Exposure: Residential Layer

- Cell Values
  - The assigned Cell Values are as follows:

Soil Exposure: Residential	Cell Value
Agricultural wetland, croplands, pastures, orchards, vineyards, horticulture, plantations, general agriculture	0.25
Residential, rural, single units	1
Residential, single units, low density	2.5
Mixed residential	6.25
Residential, single units, medium density	8
Residential, high density, multiple dwellings	15.5
Mixed urban or built up land	20

Vapor Exposure: Residential Layer

- Calculation Method:
  - All cells that are within the Vapor Extent Area are summed
    - Cell Values are summed because they are based on a the population density

Vapor Exposure: Residential Layer

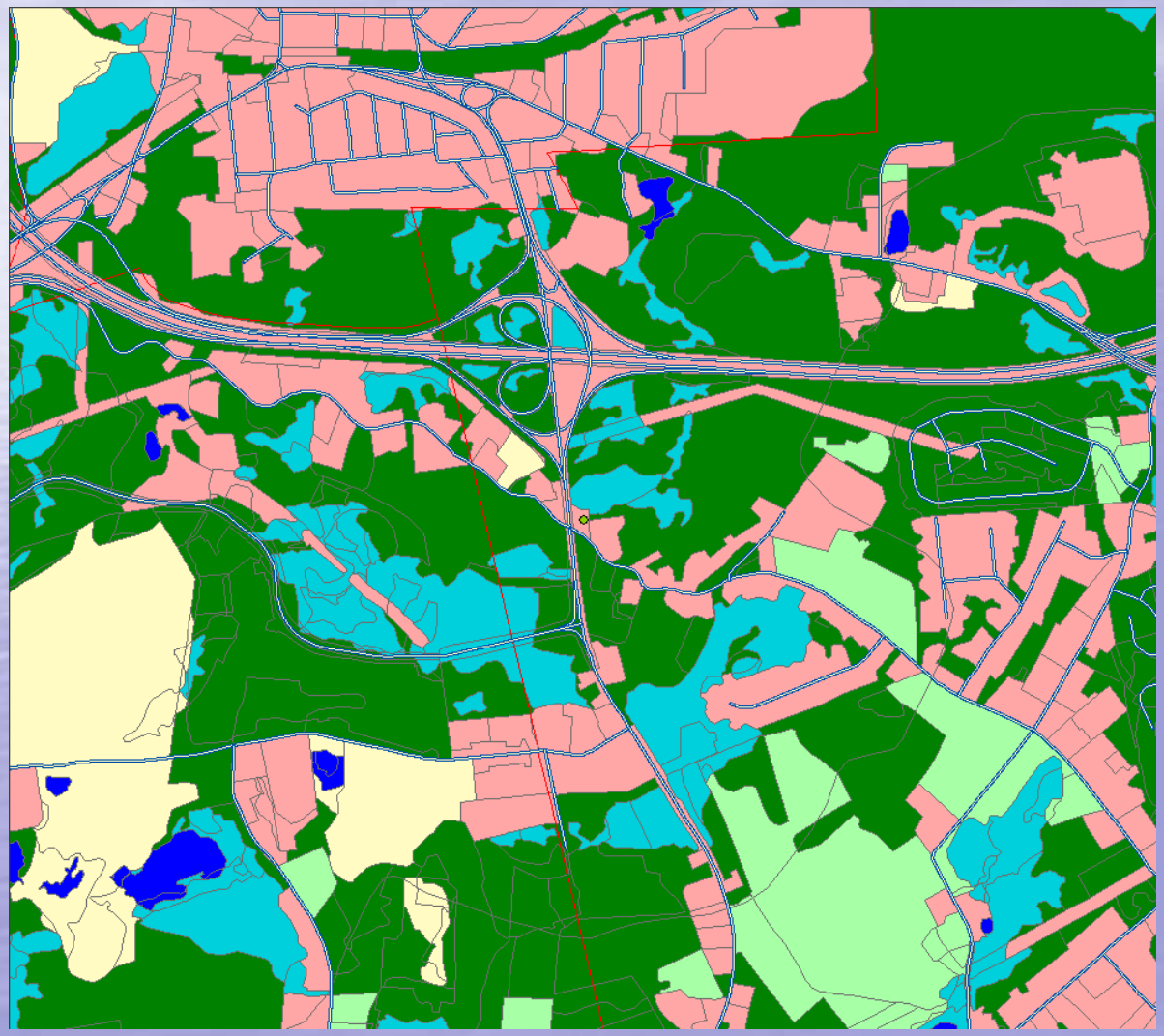
- The following is the method used to create the Vapor Exposure: Residential Layer

Vapor Exposure: Residential Layer

Creating the Vapor Exposure: Residential Layer

Vapor Exposure: Residential Layer

Creating the Vapor Exposure: Residential Layer



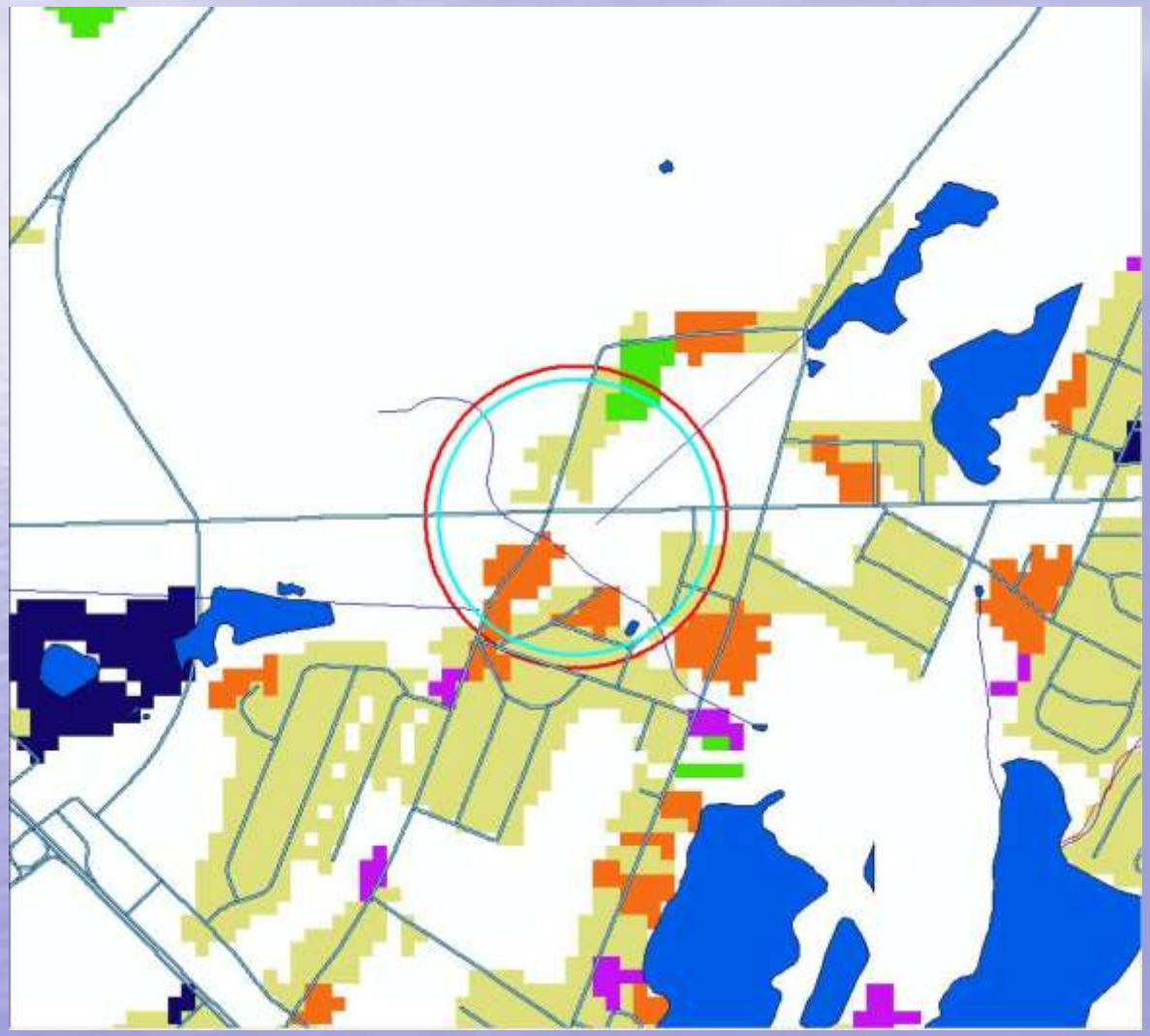
Start with Land Use layer

- The following table is the basis for assigning cell values:

Agricultural	0.25
rural, single units	1
One unit, low density	2.5
Mixed residential	6.25
One unit, med density	8
high density, multiple	15.5
Mixed urban	20

Vapor Exposure: Residential Layer

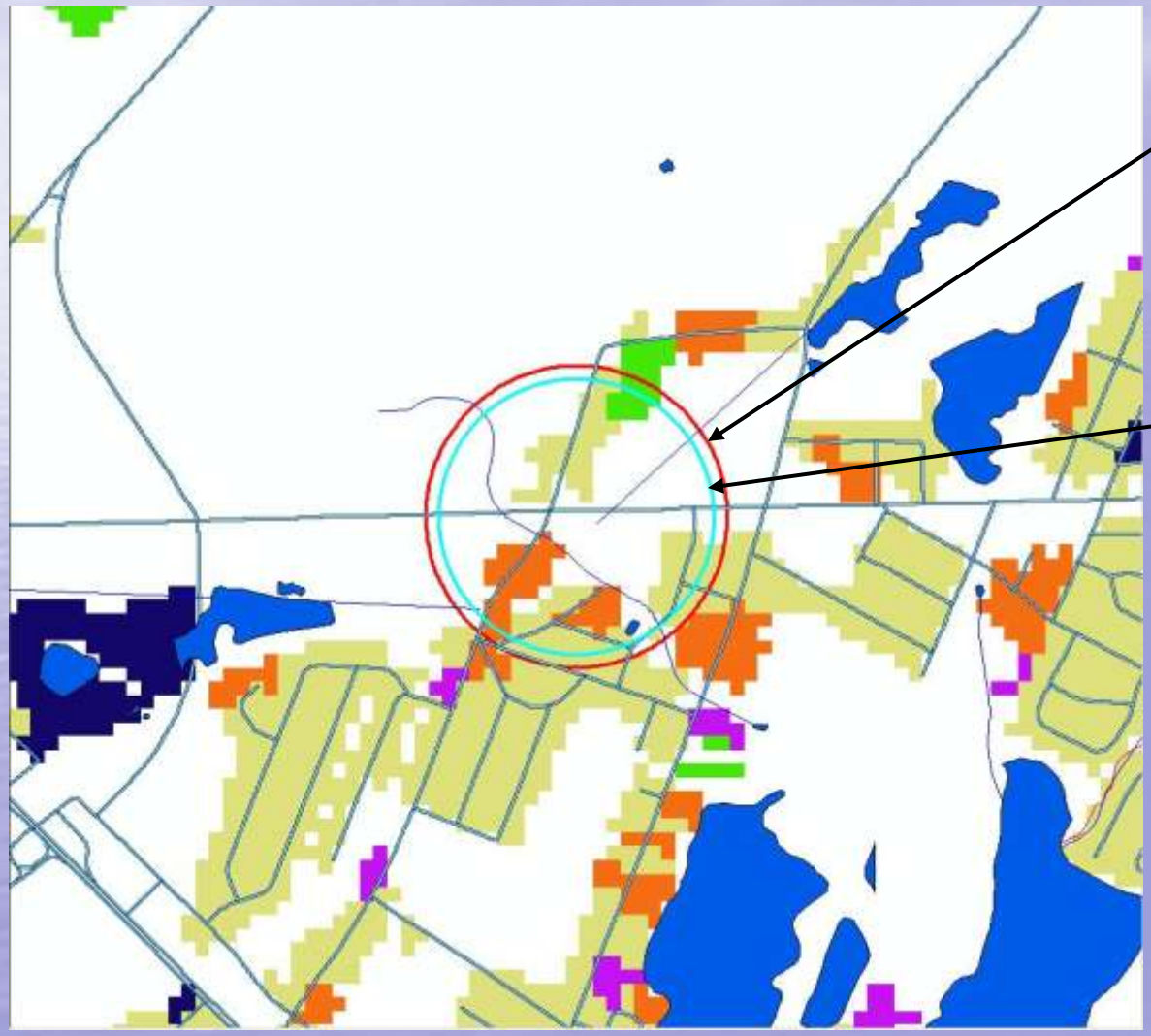
Creating the Vapor Exposure: Residential Layer



Vectors are converted into a Raster file (100 by 100 grid) and assign the appropriate values to each cell

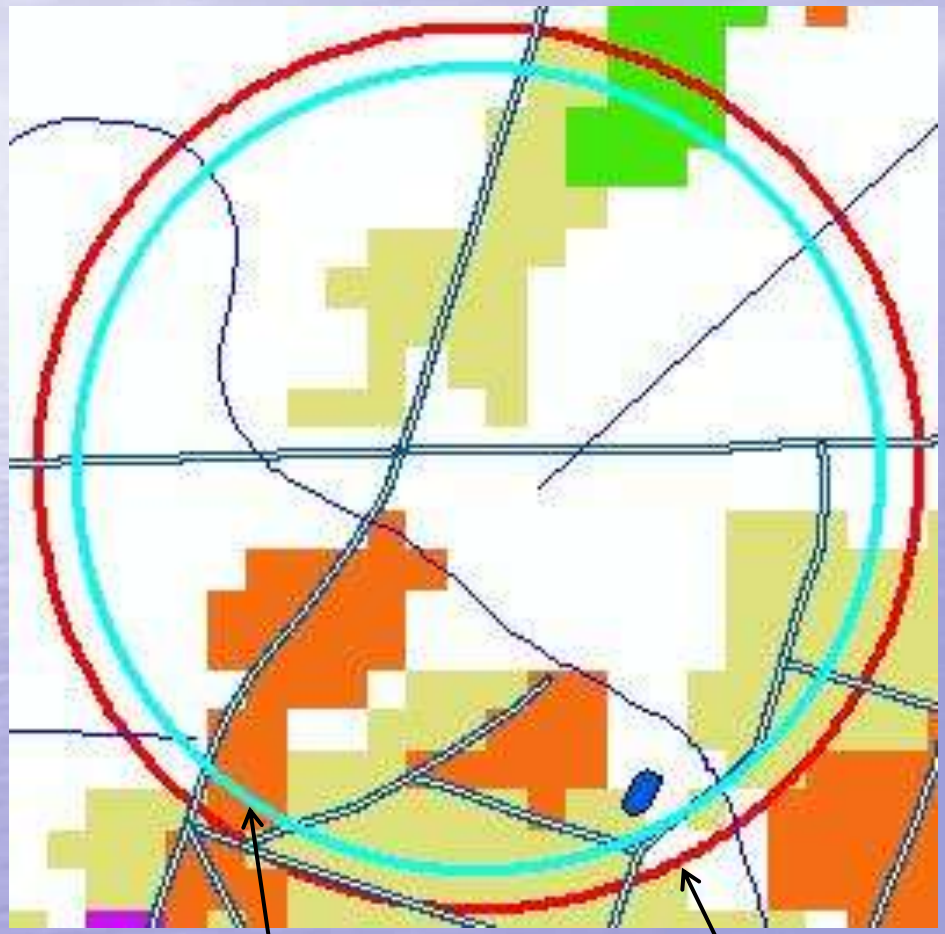
Vapor Exposure: Residential Layer

Creating the Vapor Exposure: Residential Layer



Vapor Exposure: Residential Layer

Calculate: sum up cell value that are within the vapor Extent Area



To calculate the Score:

- Zoom in to the Extent Area
- Sum up all cell values that are within the Extent Area
- sum of cell values = 820.25
  - **Final Score = 820**

Vapor Exposure: Residential Layer

- A Vapor Exposure: Residential Layer is created for the entire state

- The following is the layer used to calculate the Vapor Exposure: Residential Receptor Layer Score

Vapor Exposure: Residential Layer