



# Remedial Priority Scoring

Extent Areas  
(Areal extent of Contamination)

March 2012





# RPS Extent Area

- The RPS model uses an aerial extent of contamination to evaluate the relationship between a site and nearby receptors. The RPS uses the term “Extent Area” to define this area.
- An Extent Area is needed for all three media that are evaluated by the RPS. The media are:
  - Ground water
  - Soil
  - Vapor
- At this time, SRP does not have a GIS copy of the Extent Areas.
  - SRP creates a “surrogate” Extent Area around the site coordinates for each of the media.





# RPS Extent Area

## ■ Ground Water Extent

- **Goal** (not available at this time):
  - mapped ground water contaminant plume
- **Surrogate** (used in this version):
  - Area:  
calculated based on mapped Classification Exception Areas (CEA) already submitted to the Department
  - Shape:  
circle is used; unless ground water flow direction is known, then an ellipse is calculated in the direction of flow (see next 2 slides)



circle = unknown GW flow  
ellipse = known GW flow

**Example of two different Surrogate Ground Water Extent shapes:**

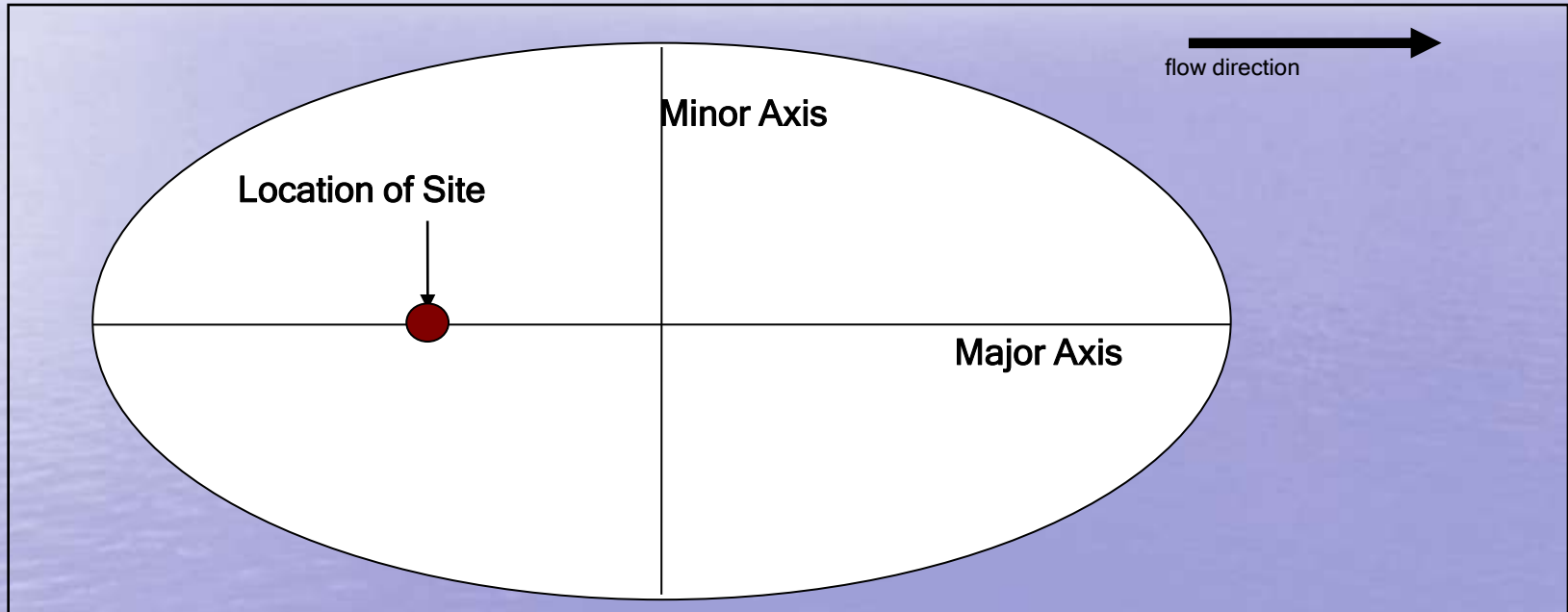




# RPS Extent Area

## Elliptical Surrogate Ground Water Extent Area

Geometry of the elliptical Surrogate Ground Water Extent Area.



The ellipse is:

- drawn with the Site along the major axis.
- The ellipse is oriented in the direction of flow
- 1/3 of the major axis in the up gradient direction.
- ratio of the minor axis to the major axis is 1:3.





# RPS Extent Area

## Surrogate Ground Water Extent Area

- Ground Water Extent Areas Dimensions are based on an evaluation of CEAs for each bureau
  - ❖ The following table is used to calculate the size of the GW Extent Areas.

<b>Bureau</b>	<b>Area (acres)</b>	<b>Circle Radius (ft)</b>	<b>Ellipse Major Axis (plume length)</b>	<b>Ellipse Minor Axis (plume width)</b>
BCM	30.5	650	2252	751
BFO-N	6.5	300	1039	346
BFO-S	6.5	300	1039	346
BIDC	30.5	650	2252	751
BISR	18.0	500	1732	577
BOMM	4.2	240	831	277
BUST	4.2	240	831	277
OBR	72.0	1000	3464	1155
OWR	72.0	1000	3464	1155
SA	72.0	1000	3464	1155
Unknown Bureau	30.5	650	2252	751





# RPS Extent Area

## Soil Extent

- **Goal** (not available at this time):
  - Mapped soil contamination at the site
- **Surrogate** – Parcels (Used if Block/Lot info is in this model):
  - Area:  
block and lot(s) for the site
  - Shape:  
polygon is the shape of the block and lot(s)
- **Surrogate** – No Data available (used if no block/lot info):
  - Area:  
based on mapped block and lots already submitted to the Department by Bureau
  - Shape:  
circle with the area based on lots submitted to the Department



**Example of the two different Surrogate Soil Extent Area shapes: No Data Available and Parcel data available**





# RPS Extent Area

## Surrogate Soil Extent Area

- Soil Extent Areas Dimensions are based on an evaluation of parcel sizes for each bureau
  - ❖ The following table is used to calculate the size of the Soil Extent Areas.

<b>Bureau</b>	<b>Area (acres)</b>	<b>Circle Radius (ft)</b>
BCM	19.7	522
BFO-N	1.8	157
BFO-S	2.7	195
BIDC	5.5	277
BISR	9.7	367
BOMM	4.1	239
BUST	2.0	165
OBR	18.2	503
OWR	3.7	228
SA	6.5	300
Unknown Bureau	3.3	213





# RPS Extent Area

## ■ Vapor Extent

- **Goal** (not available at this time):
  - A 100 foot buffer (30 for petroleum compounds) of the vapor trigger isopleth established by on-site sampling.
- **Surrogate** (used in this version):
  - Area: a 100 foot buffer (30 for petroleum compounds) is drawn around the ground water surrogate extent.
  - Shape: The shape is the same as the ground water surrogate area (circle or ellipse).



**Example of two different Surrogate Vapor Extent shapes:**







# RPS Extent Area

## Process to create an Extent Area

- RPS collects a substantial amount of spatial data that is very difficult to evaluate
- to process all of the data, the RPS model uses a 100 foot grid to simplify the calculations that the computer needs to evaluation
- Three Extent Areas are converted from a vector to a raster file format.





# RPS Extent Area

This 'example' is intended to illustrate how an RPS surrogate Extent Area for Ground Water is calculated for a hypothetical contaminated site.



Site Location

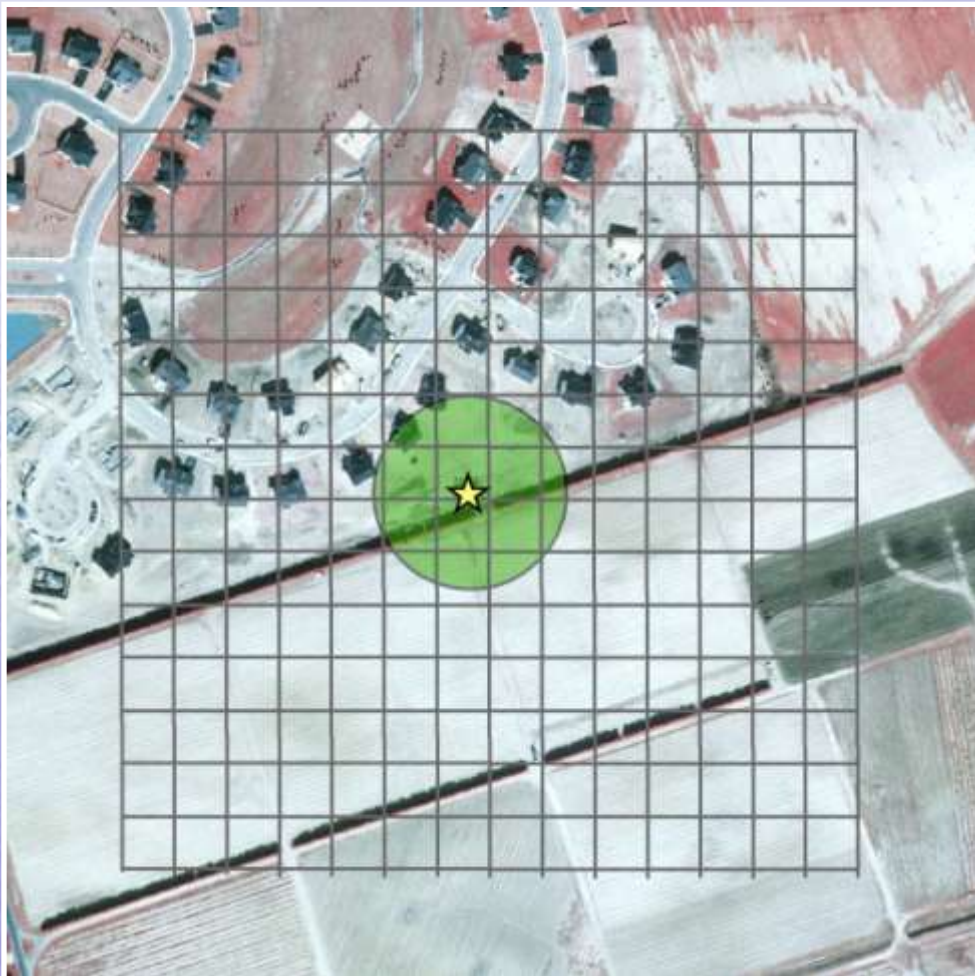




# RPS Extent Area

## Creating a Ground Water Extent Area

The size of the Extent Area is based on analysis of classification exception areas (CEAs) for each Bureau.



- The Ground Water Extent Area is located on the map
- A 100 by 100 foot Grid is overlain on the Extent Area

Note: The Extent Area is a circle since ground water flow direction is unknown in this example.

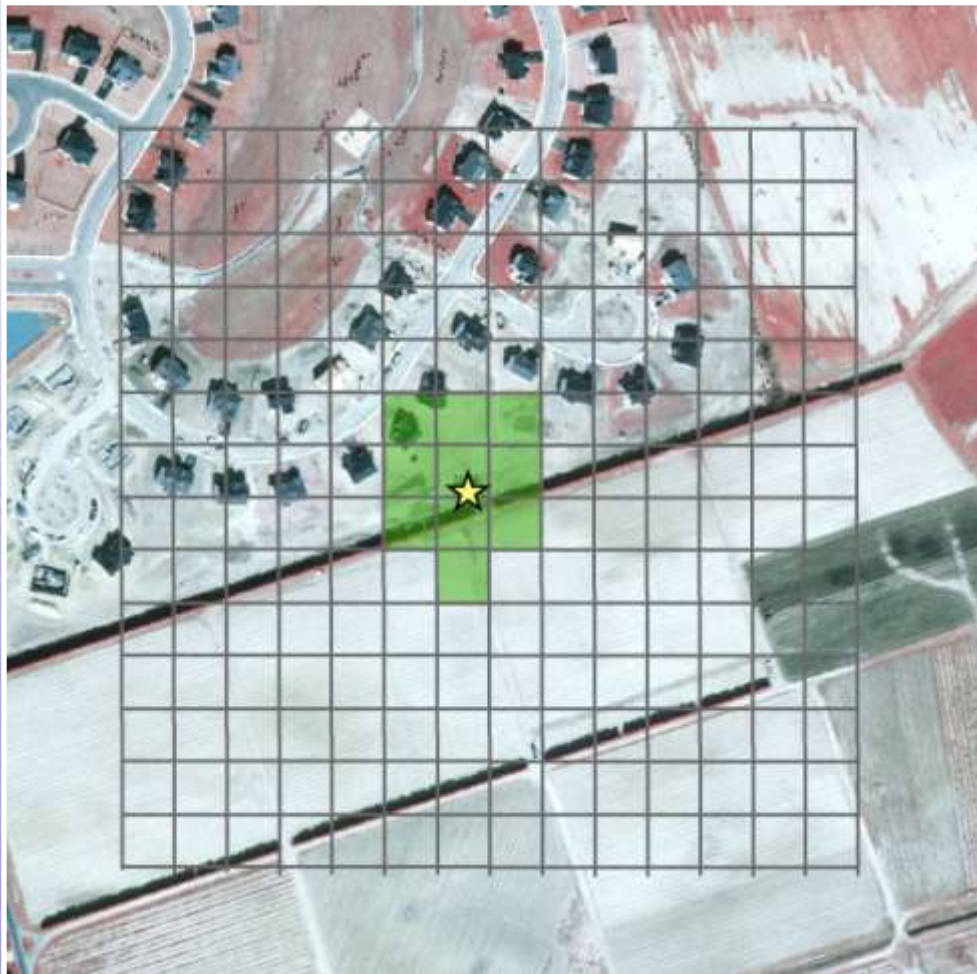




# RPS Extent Area

## Creating a Ground Water Extent Area

The Extent Area is modified from a vector file to a raster file using the 100 by 100 foot grid.



- Cells that contain 50% or more of the vector Extent Area are included in the raster Extent Area

Note: All Extent Areas are converted to a raster file in this manner

Each Extent Area Raster files is used to evaluate the receptors layers created for that media





# RPS Extent Area

- This process is repeated for each media of concern to convert the Soil and Vapor Extent Area vector files to raster files.

