

Desktop Soils Tools for SEOs



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Wastewater
SUPERCONFERENCE
February 5, 2024



Objectives

- Recognize the need for a desktop survey.
- Review local, county, state, federal, and global resources available to the SEO.
- Recognize the strengths and limitations of these tools.

Why is the Desktop Survey Important for SEOs?

Prior to visiting any property, what do we know?

Has there been prior testing?
Are there records available?

What are the:
Property boundaries?
Slopes?
Geology?
Watershed?
Natural Features?
Soils?



PA Code 73.13

Isolation Distances

(c) The following minimum horizontal isolation distances shall be maintained between the features named and the perimeter of the aggregate in the absorption area:

- (1) Property line, easement or right-of-way—10 feet.
- (2) Occupied buildings, swimming pools and driveways—10 feet.
- (3) An individual water supply or water supply system suction line—100 feet.
- (4) Water supply line under pressure—10 feet.
- (5) Streams, water courses, lakes, ponds or other surface water—50 feet (for the purposes of this chapter wetlands are not surface waters)..

PA Code 73.13

Isolation Distances

- (6) Other active onlot systems—5 feet.
- (7) Surface drainageways—10 feet.
- (8) Mine subsidence areas, mine bore holes or sink holes—100 feet.
- (9) Rock outcrop or identified shallow pinnacle—10 feet.
- (10) Natural or manmade slope greater than 25%—10 feet.
- (11) A cistern used as a water supply—25 feet.
- (12) Detention basins, retention basins and stormwater seepage beds—10 feet.

First things First!

Where is the property???

- Basic Site Information
 - Property Owner
 - Site Boundaries
 - Tax Parcel Number
 - Address
- Today, a lot of this can be found on County GIS databases!
- Some municipalities as well!



What lot am I on?

Centre County Parcel Viewer

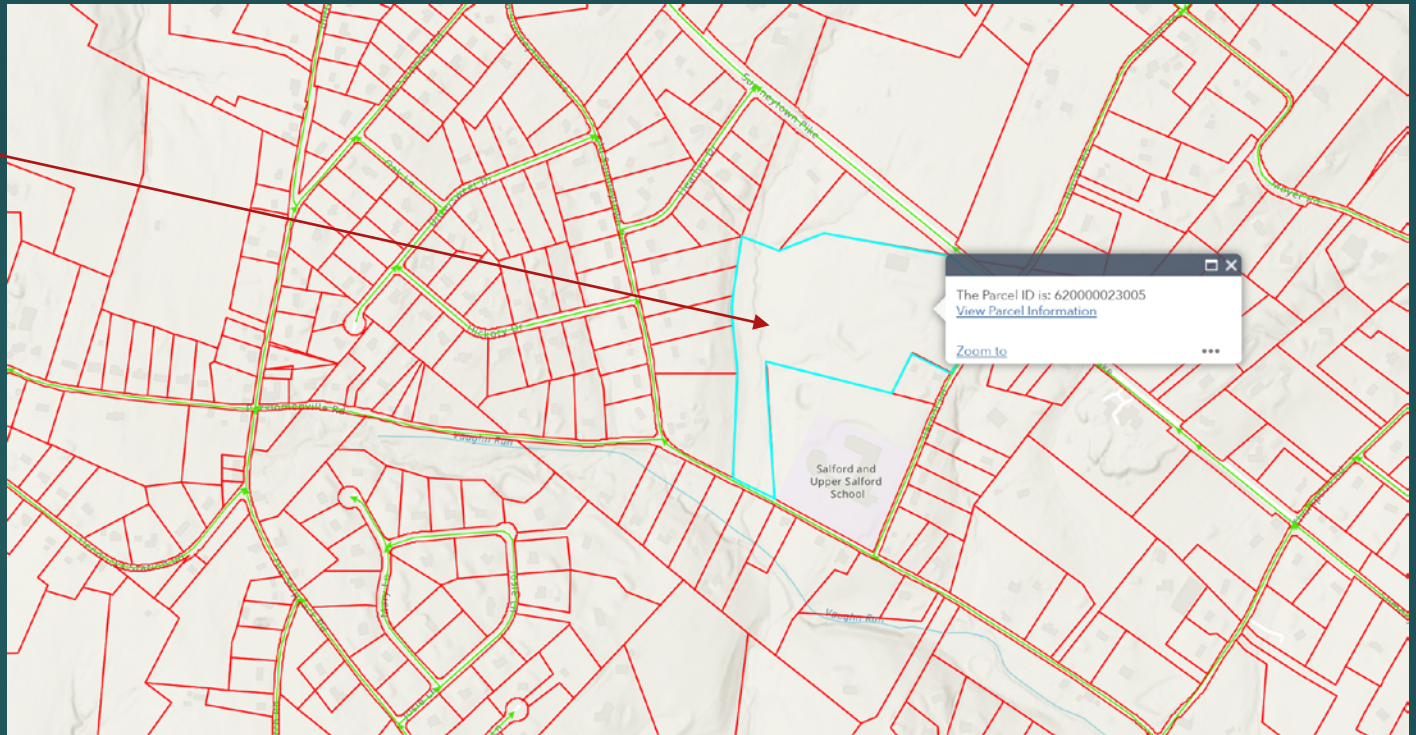
- Parcel #
- Street Address
- Property Boundary!!!



Different Counties have Different Data 8

Montgomery County Parcel Viewer

- Parcel #
- Property Boundary!!!
- NO Aerial



Different Counties have Different Data

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Bucks County Parcel Viewer

- 2023 Aerial Photo

- Wetlands



- Soils

- Floodplains

- Topography

Different Counties have Different Data ¹⁰

County GIS demonstration

Historical Aerial Photographs

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Why is this important?

- ▶ Past land use history
 - ▶ Former structures/disturbance
 - ▶ Vegetation changes
 - ▶ Community changes
- ▶ Google Earth
- ▶ Pennsylvania Imagery Navigator



Other Federal Resources

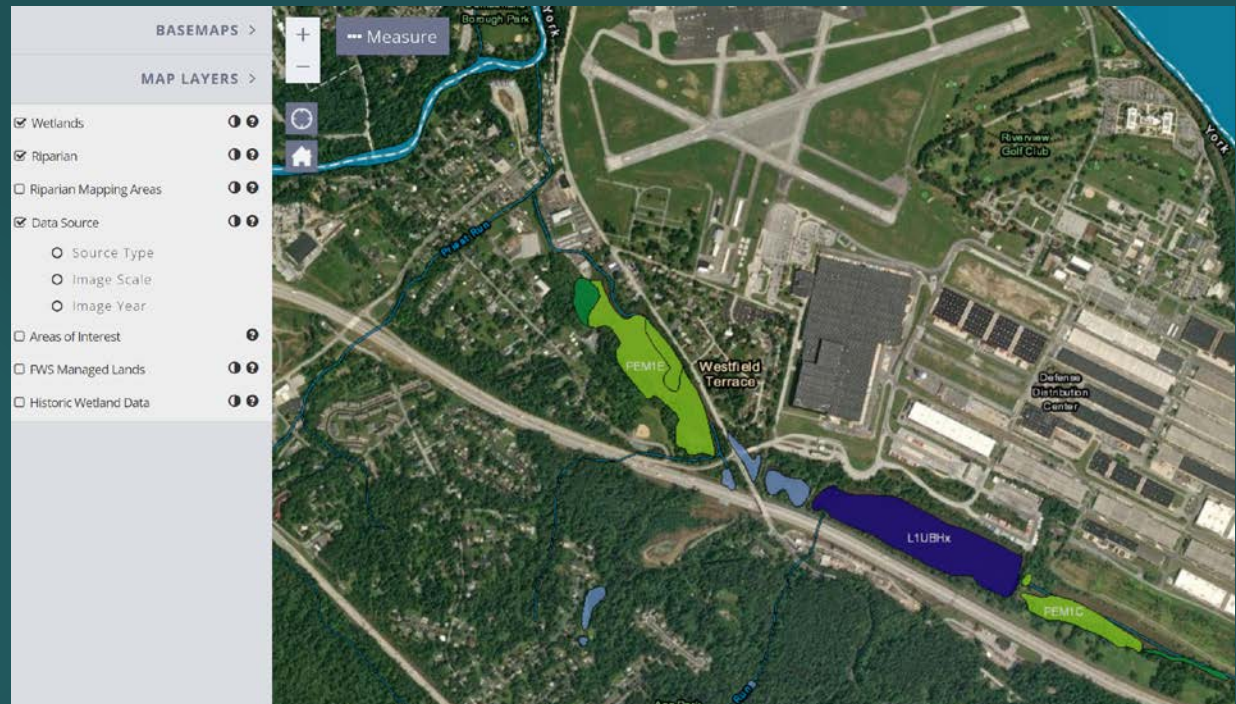
- ▶ National Wetlands Inventory
 - ▶ US Fish & Wildlife Service
- ▶ FEMA Map Viewer
 - ▶ FEMA (Federal Emergency Management Agency)
- ▶ USGS Topoview
 - ▶ US Geologic Survey



National Wetlands Inventory Mapper

<https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>

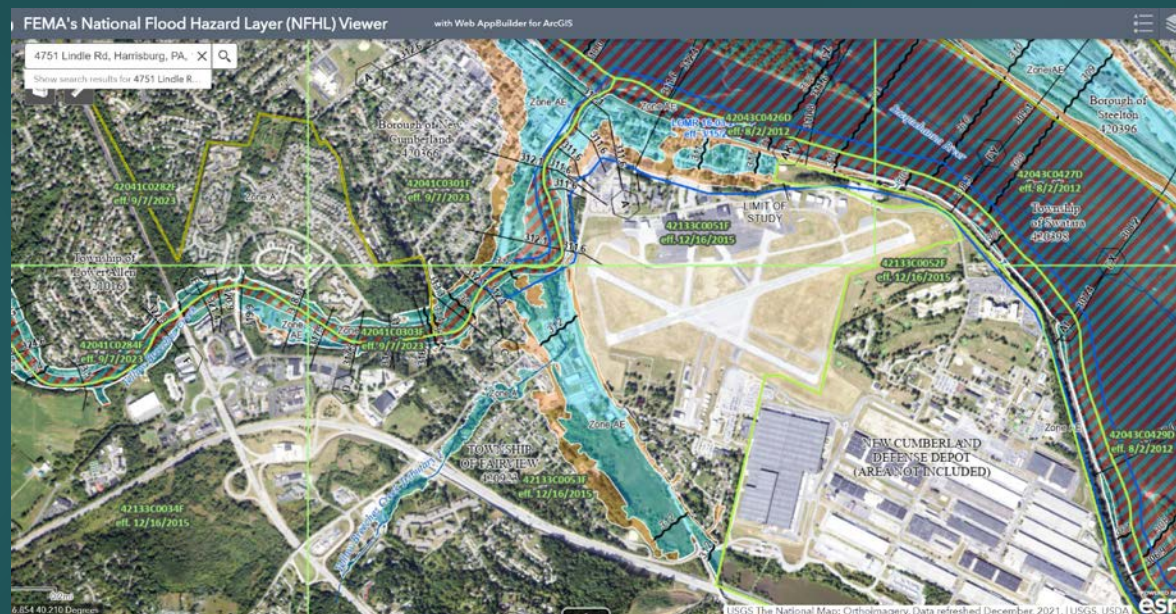
- Photo-interpretation of wetlands and streams
- Wetlands not conducive to site suitability
- Impact site layout



National Flood Hazard Mapper

<https://hazards-fema.maps.arcgis.com/apps/webappviewer/index.html?id=8b0adb51996444d4879338b5529aa9cd>

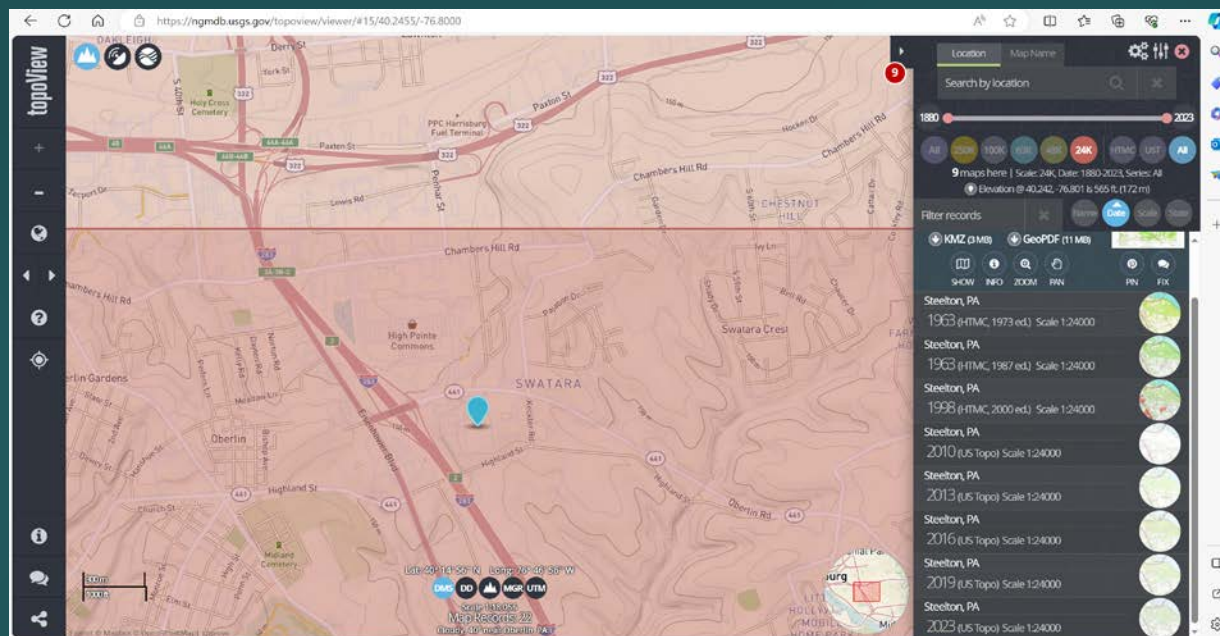
- Remote sensing and some field verification
- Identification of floodplains, floodways, flood elevations



USGS Topo Viewer

<https://ngmdb.usgs.gov/topoview/viewer/#4/39.98/-100.06>

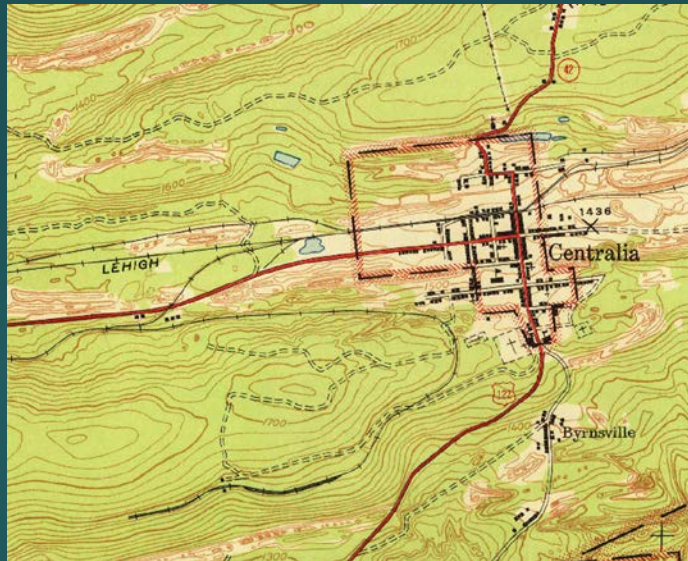
- Topographic Maps for the entire country
- Identification of elevations, streams, mines, etc.



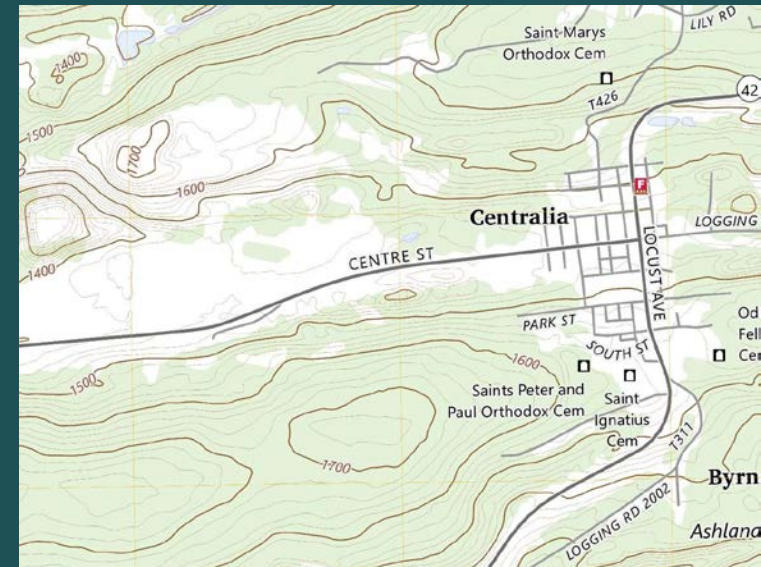
Disturbance Detection

Past Land Use

Centralia, 1947



Centralia, 2023



- Infrastructure Changes
- Land Disturbance Changes

Federal Resource Databases

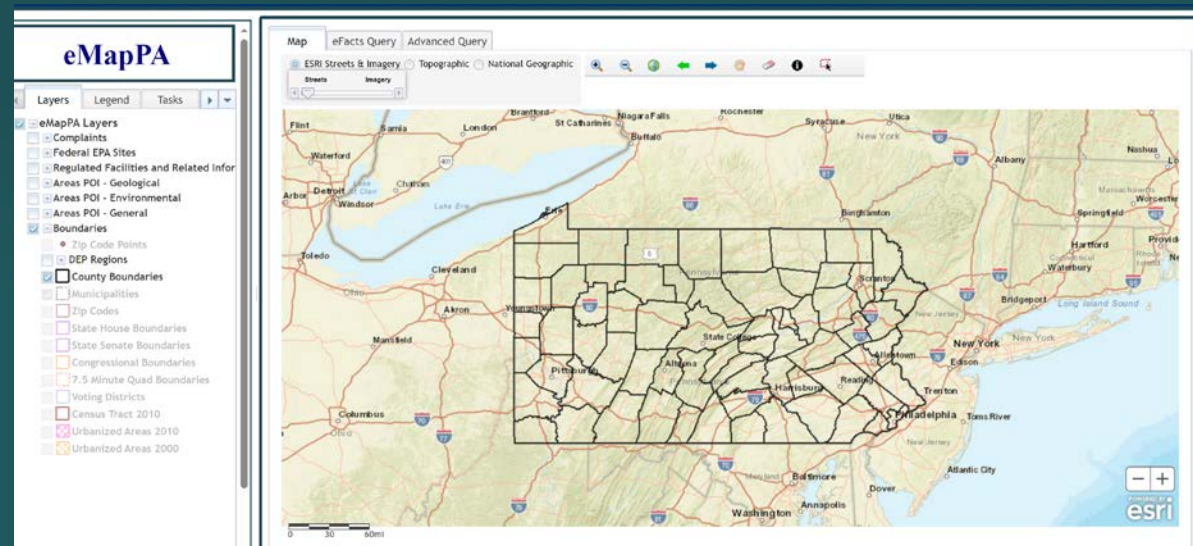
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Database Demonstrations

EmapPA

<https://gis.dep.pa.gov/emappa/>

- Site geology and geologic hazards
- Watersheds and stream assessments
- Environmental hazards



Why do I care about geology?

Penn Twp, Lancaster Co

- Limestone geology
- Karst Features
- Both system siting and planning implications



Depression

Sinkhole

What kind of watershed am I in?

Penn Twp, Lancaster Co

- Is it a stream?
- Warm Water Fishery
- Impaired – on 303(d) list
- Both system siting and planning implications

The screenshot displays the eMapPA web application interface. The top navigation bar includes the Pennsylvania Department of Environmental Protection logo and the names of the Governor (Josh Shapiro) and Interim Acting Secretary (Jessica Shirley). The main interface is divided into a left sidebar and a central map area. The sidebar, titled "eMapPA", contains a "Layers" panel with various environmental data layers, including "Complaints", "Federal EPA Sites", "Regulated Facilities and Related Info", "Air", "Land Reuse", "Mining", "Oil and Gas", "Radiation", "Sample Information System", "Streams and Water Resources", "Surface Water Related", "Fish Information", "Flooding Information", "NHD HUC (National Hydrography)", "Water Monitoring", "Water Quality", "Impaired Streams Assessment", "Supporting Streams Assessment", "TMDL Streams", "Existing Use Streams", "Existing Use Streams Migr", "Designated Use Streams", "Designated Use Streams h", "Impaired Lakes Assessment", "Supporting Lakes Assessment", "TMDL Lakes", and "Existing Use Lakes". The central map area shows an aerial view of a rural area with a stream highlighted in green. A pop-up window titled "Designated Use Streams (6 of 9)" is open over the stream, displaying the following information:

Designated Use Gen ID:	14424
GNIS Name:	
GNIS ID:	
ReachCode:	02050306001244
COMID:	57462403
Length Miles:	1.513
Map Symbology:	WWF
Length Miles:	1.513
Designated Use:	13
DES Use ID:	6
Use Description:	WWF(WARM WATER FISHES)
Migratory_Fish:	Y
HUC:	02050306
Basin:	N
Basin Narrative:	Null
Segment Narratives:	Null
Evaluation Date:	Null
Last File Date:	Null
Zoom:	10

EmapPA

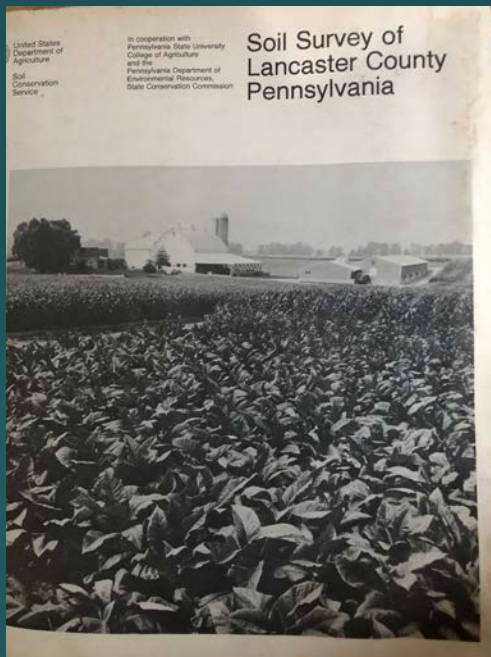
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Database Demonstration

Online Soil Survey Information

<https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

px



Boomer



Official

Web Soil Survey

What is it?

- Compilation of all soil surveys across the United States
- Map Scale: 1:24,000 (1 inch = 2,000 ft)
- Map unit names and composition
 - Other soils that may be present
- Descriptions
- Physical and chemical lab data
- Land classification

Web Soil Survey

What is it?

- These are the official soil maps for the USDA
- Digitization of the soil survey books, ortho-correction
- Usually did not update the original mapping, but may have updated names.
- What about the old survey books?
 - Valuable information that is in your hand
 - Not the official maps, however....
 - Act 537 plans might reference the books
 - Municipal ordinances might reference the books

Web Soil Survey

What can I learn???

- Soil series that may be present
- Depth to limiting zones
- Soil physical and chemical characteristics
- Land classification

Web Soil Survey

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Database Demonstration

A QUESTION OF SCALE...

East Vincent Twp, Chester Co

Warning: Soil Map may not be valid at this scale.

You have zoomed in beyond the scale at which the soil map for this area is intended to be used.

Mapping of soils is done at a particular scale. The soil surveys that comprise your AOI were mapped at 1:24,000. The design of map units and the level of detail shown in the resulting soil map are dependent on that map scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.



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Soil Survey Reliability

East Vincent Twp, Chester Co

28 test pits
investigation

Classification
matched in 3 of 28
test pits

1963 Soil Survey did
not recognize
wind-blown silts
(loess) in soils

Test Pit #	Soil mapped as	Hydrologic Soil Group	Soil classified as	Hydrologic Soil Group
1	Penn	B	Abbottstown	D
2	Penn	B	Chalfont	D
3	Penn	B	Penn	B
4	Penn	B	Penn	B
5	Penn	B	Doylestown	D
6	Penn	B	Doylestown	D
7	Penn	B	Chalfont	D
8	Penn	B	Chalfont	D
9	Penn	B	Chalfont	D
10	Penn	B	Chalfont	D
11	Penn	B	Lawrenceville	D
12	Penn	B	Lawrenceville	D
13	Penn	B	Lawrenceville	D
14	Penn	B	Penn	B
15	Penn	B	Reaville	D
16	Penn	B	Reaville	D
17	Penn	B	Reaville	D
18	Croton	D	Lawrenceville	D
19	Croton	D	Lawrenceville	D
20	Croton	D	Lawrenceville	D
21	Croton	D	Lawrenceville	D
22	Croton	D	Lawrenceville	D
23	Croton	D	Lawrenceville	D
24	Croton	D	Bucks	B
25	Readington	C	Lawrenceville	D
26	Readington	C	Lawrenceville	D
27	Readington	C	Lawrenceville	D
28	Readington	C	Reaville	D

Soil survey is
accurate at
1" = 2,000 ft

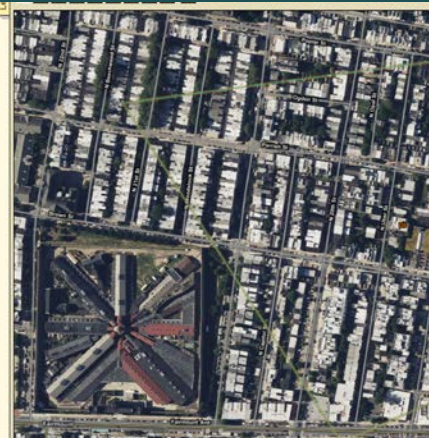
Not at
1" = 100 ft

What do we do about Urban Land???



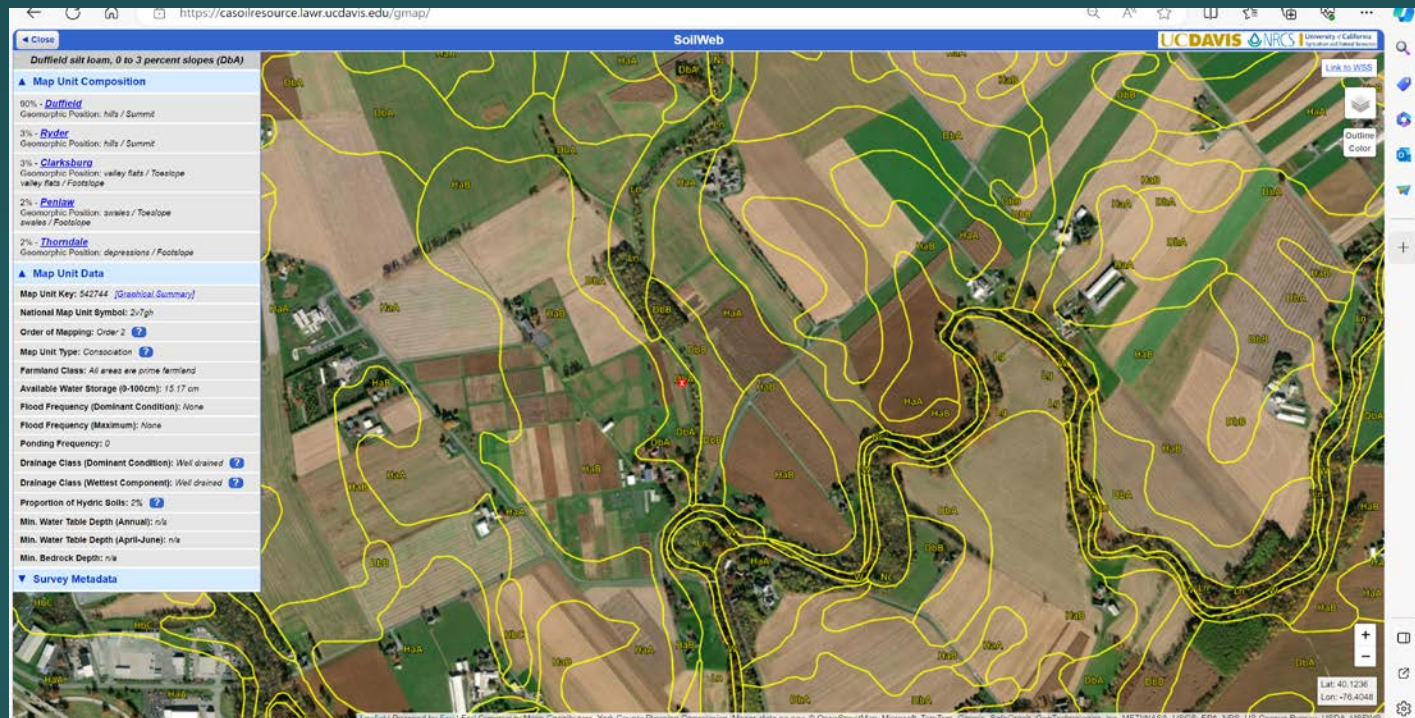
Dig a hole and hope for the best!!!

Philadelphia County, Pennsylvania (PA101)			
Philadelphia County, Pennsylvania (PA101)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ub	Urban land	44.6	100.0%
Totals for Area of Interest		44.6	100.0%



Online Soil Survey Information

<https://casoilresource.lawr.ucdavis.edu/gmap/>



Soil Web

What can I learn???

- UC Davis student's graduate project
- Not the official map
- Less user friendly
- Better visual information

Soil Web

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Database Demonstration

Desktop Survey

- Provides a baseline of information regarding the limitations of a property
 - Lot size
 - Topography
 - Geology
 - Watersheds
 - Soils
- Site preparation

HOWEVER!!!!



YOU STILL HAVE TO DIG A HOLE!!!

CONCLUSIONS

- There are online resources available to complete a desktop survey prior to your field visit.
- These resources are available on federal, state, county and sometimes municipal websites.
- This information aids the SEO in what to expect in the field.
- This information aids the SEO in solving problems regarding problem sites.

QUESTIONS?



THANK YOU!

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