



United States Department of Agriculture



PA BMP Remote Sensing Pilot Project

Sponsored by:
PA DEP
USDA - NRCS



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Remote Sensing Pilot Project – Potomac Watershed

- Assurance State is receiving proper credit for BMPs installed without cost-share
- Using a statistically reliable data collection method, in a cost-effective manner
- We determined a way to see if BMPs can be counted using aerial photography instead of visiting over 40,000 in the Bay just in Pennsylvania and to determine if the process can work.
- Throughout the project we worked with national office, remote sensing lab Greensboro, NGCE, EPA, and PA DEP.



Remote Sensing Pilot Project – Potomac Watershed

It was determined there were 28 conservation practices that were important to collect -

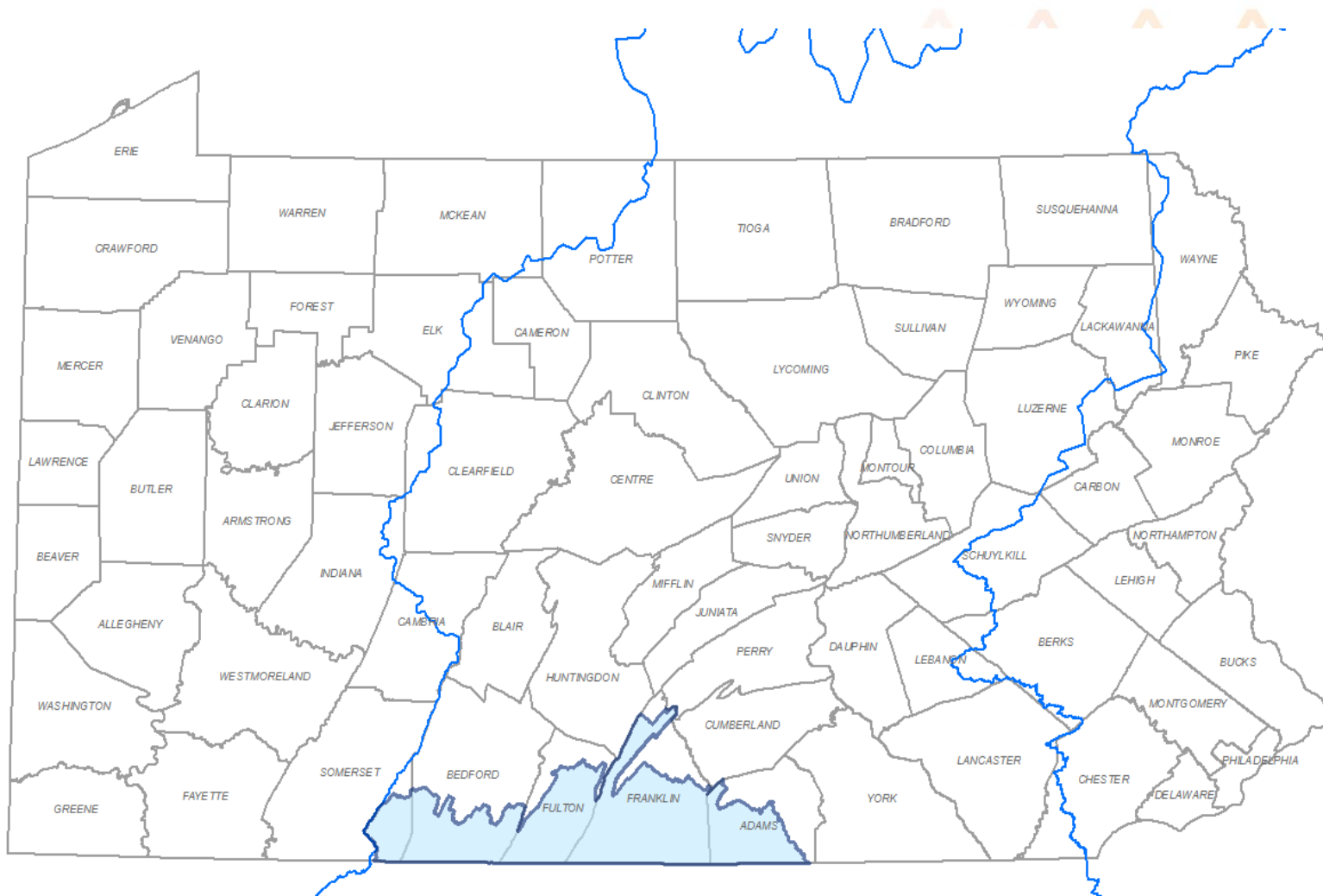
- Diversion
- Windbreak/ Shelterbelt
- Fence
- Pasture Fence
- Field Border
- Lined Waterway or Outlet
- Roof Runoff Structure
- Animal Trails and Walkways
- Terrace
- Vegetative Barrier
- Animal Waste Storage
- Animal Mortality Facility
- Composting Facility
- Waste Treatment Lagoon
- Water and Sediment Control Basin
- Contour Farming
- Contour Orchard
- Contour Buffer Strips
- Cover Crop
- Riparian Buffer
- Access Control
- Prescribed grazing
- Heavy Use Area Protection
- Stripcropping
- Tree and Shrub Establishment
- Vegetated Area
- Grassed Waterway

A crosswalk was needed because the practices in the Bay Model are not the same as the NRCS practices.





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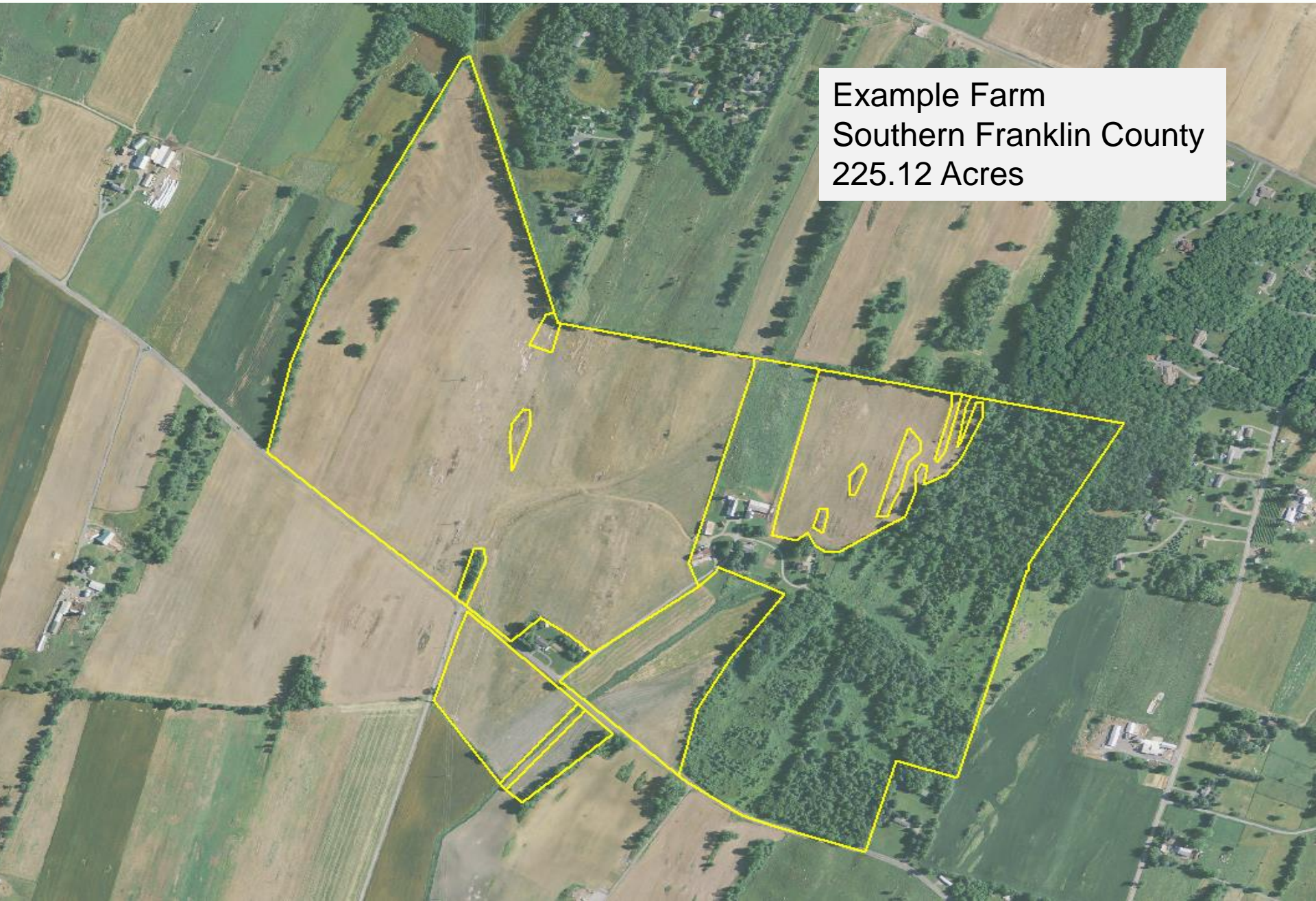


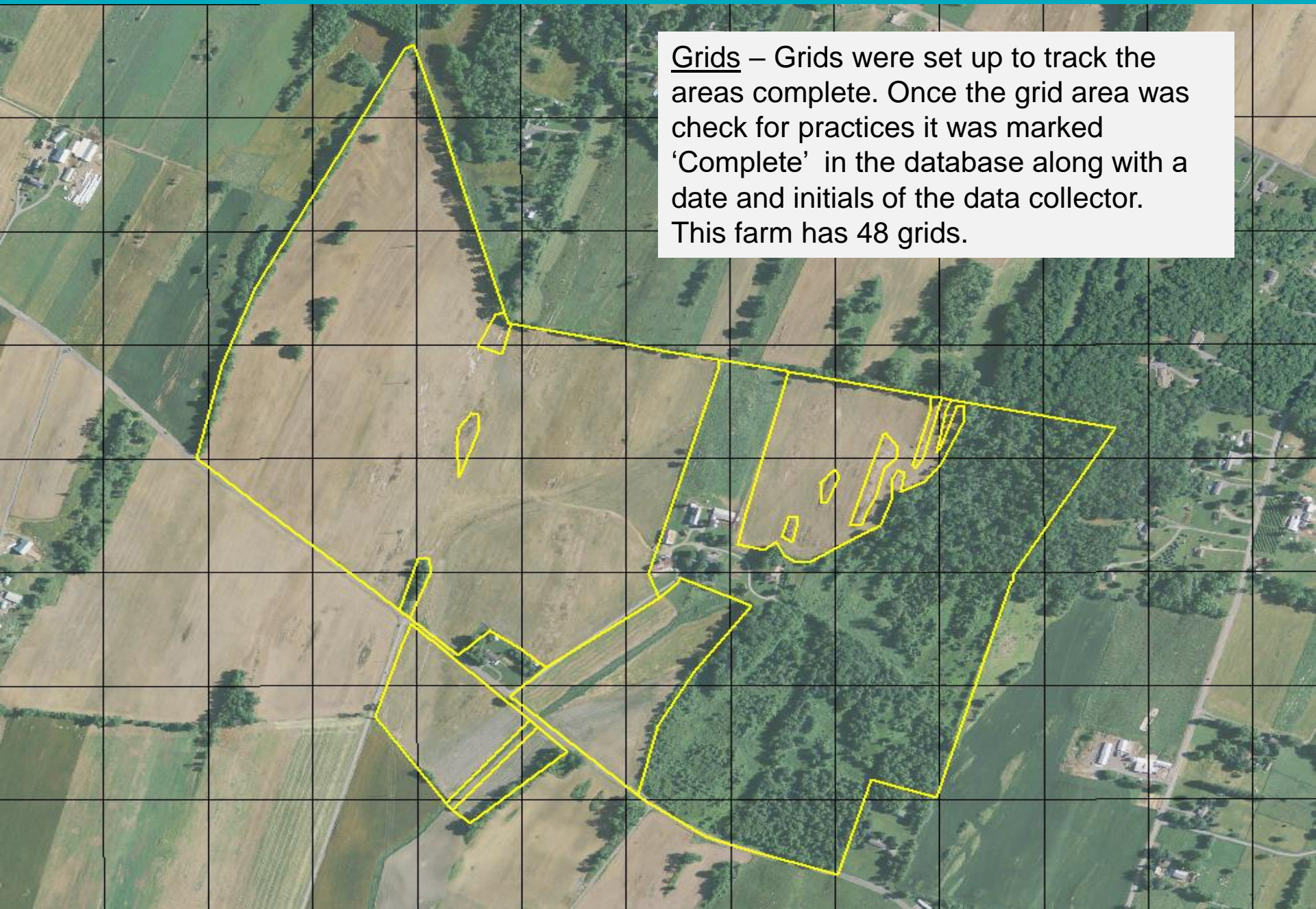
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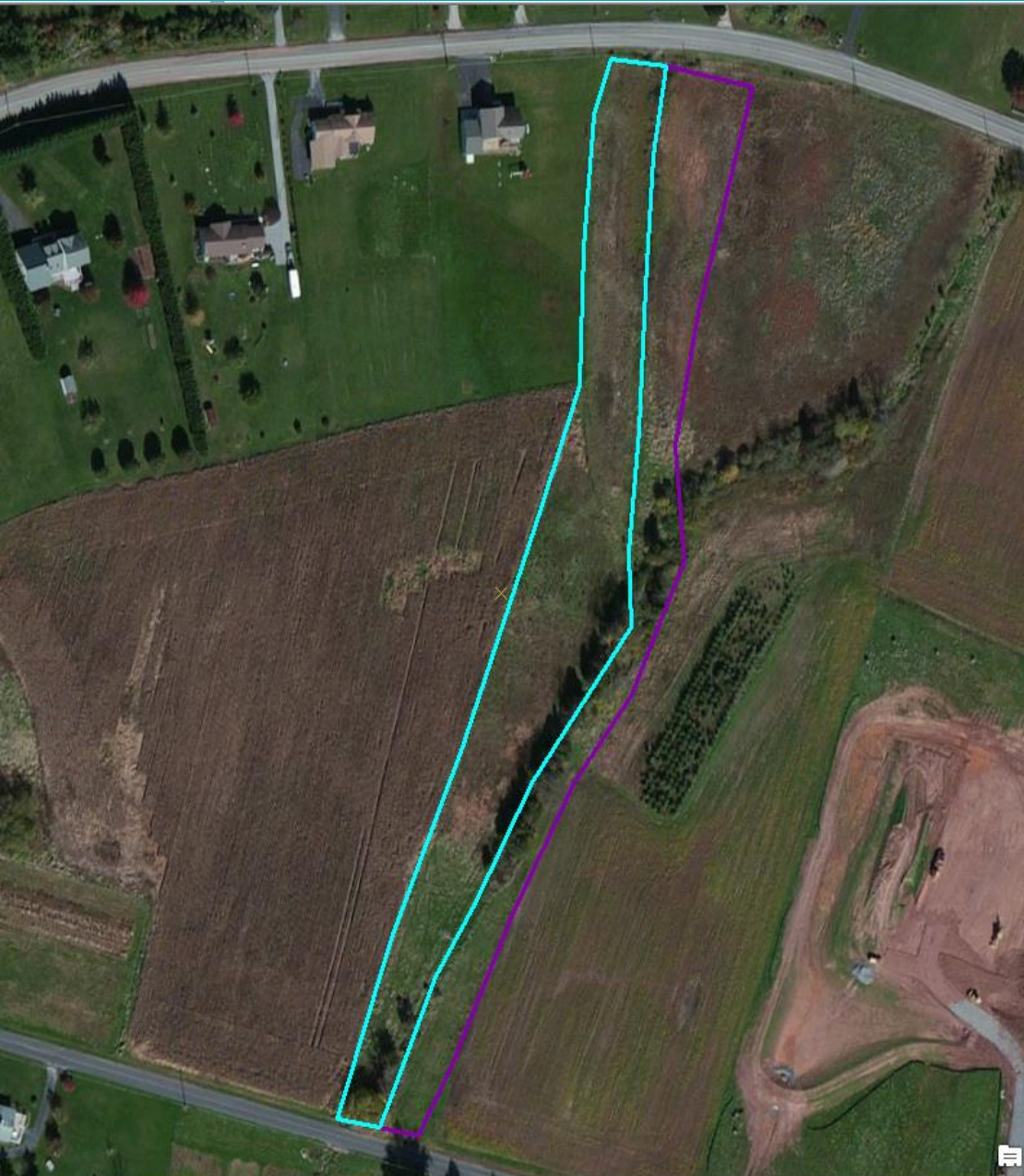


Example Farm
Southern Franklin County
225.12 Acres





Grids – Grids were set up to track the areas complete. Once the grid area was checked for practices it was marked 'Complete' in the database along with a date and initials of the data collector. This farm has 48 grids.



Attributes

- Collect_poly
- Forest or Grassland buffer?

OBJECTID	4381
practice_group	<Null>
Practice_Code	riparian buffer
applied_amount	<Null>
measurement_unit	<Null>
applied_date	<Null>
operation_type	<Null>
type_name1	Forest or Grassland buffer
type_value1	grassland
Var_name_1	Land Use Before Buffer
Var_Value_1	Associated Ag land
Var_Name_2	Buffer Length
Var_Value_2	1150
var_name_3	Fenced?
var_value_3	NO
var_name_4	Feet of Stream Fenced
var_value_4	1150
var_name_5	<Null>
var_value_5	<Null>
CAFO	<Null>
farm_number	<Null>
tract_number	<Null>
land_unit_number	<Null>

OBJECTID

Object ID

Create Features

- Diversion
- Fence / Pasture Fence
- Lined Waterway or Outlet
- Roof Runoff Structure
- Terrace
- Vegatative Barrier
- Windbreak, Shelterbreak

Collect_Points

- animal mortality
- animal waste storage
- composting facility
- spring development
- waste treatment
- waste treatment lagoon
- water and sediment control

Collect_poly

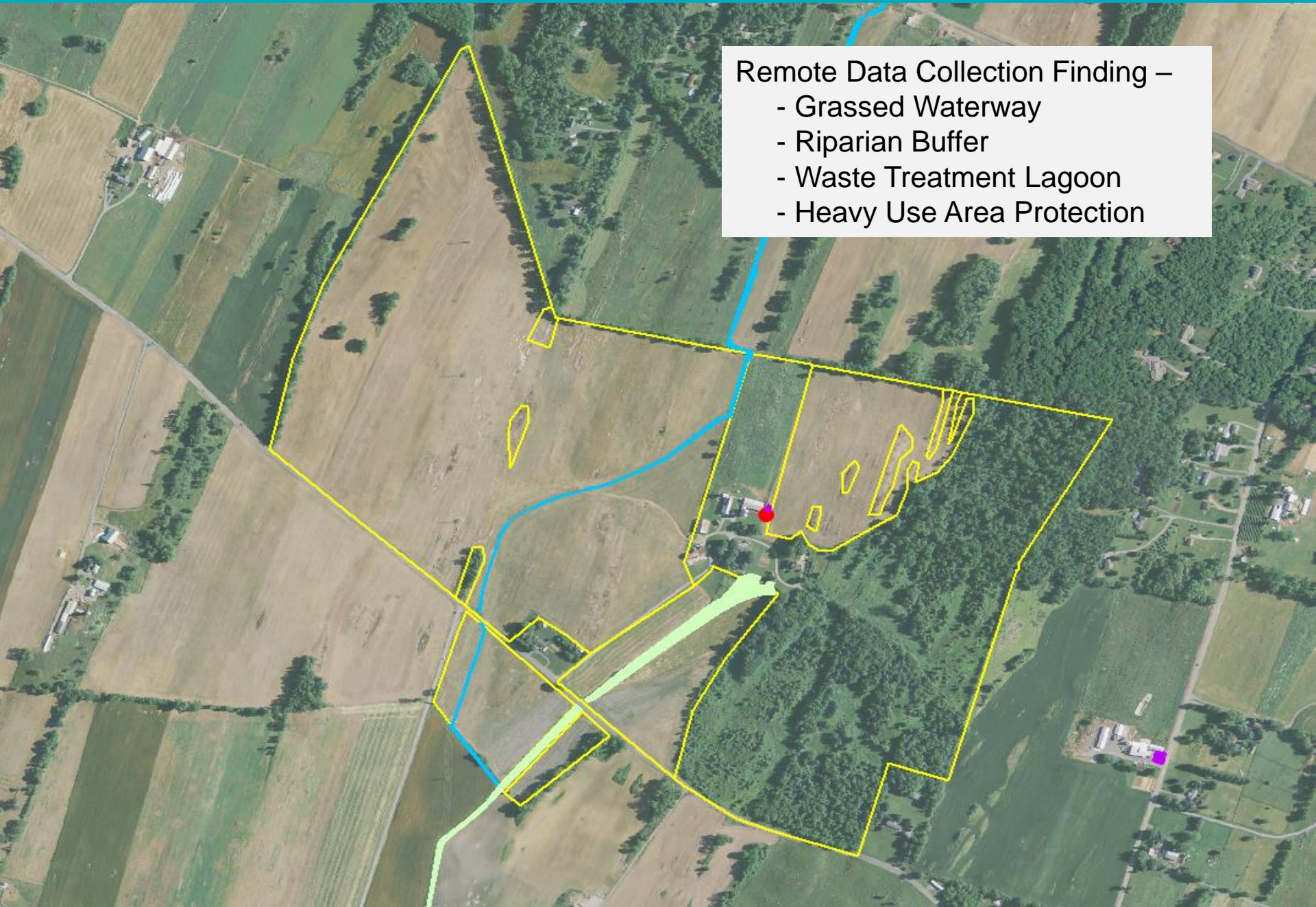
- access control
- contour buffer strips
- contour farming
- contour orchard
- cover crop
- Field Border
- grassed waterway
- heavy use area protection
- prescribed grazing
- riparian buffer
- strip cropping
- tree and shrub establishment
- unvegetated treatment area

Construction Tools

- Polygon
- Rectangle
- Circle
- Ellipse
- Freehand

Remote Data Collection Finding –

- Grassed Waterway
- Riparian Buffer
- Waste Treatment Lagoon
- Heavy Use Area Protection






Database Attributes on Practices Collected

Practice_Code	riparian buffer
applied_amount	0.615587
measurement_unit_display	acres
applied_date	<null>
operation_type	<null>
type_name1	Forest or Grassland buffer?
type_value1	grassland
Var_name_1	Land Use Before Buffer
Var_Value_1	Crop
Var_Name_2	Buffer Length
Var_Value_2	1208.20
var_name_3	Fenced?
var_value_3	NO
var_name_4	Feet of Stream Fenced
var_value_4	N/A
var_name_5	Buffer Width
var_value_5	less than 35 ft
CAFO	<null>
farm_number	<null>
tract_number	<null>
land_unit_number	<null>
applied_year	2003
ortho_source	NAIP
ortho_date	1/29/2003
reviewed_by	amr
Comments	<null>
level_of_review	rsi
review_date	4/9/2015
conservation_plan	no
conservation_plan_name	<null>
conservation_plan_id	<null>
plan_county	<null>
county_name	Franklin
state_name	PA
huc_12	<null>
Latitude	39.745445
Longitude	-77.68324
SHAPE	Polygon
DataCollectionType	RC

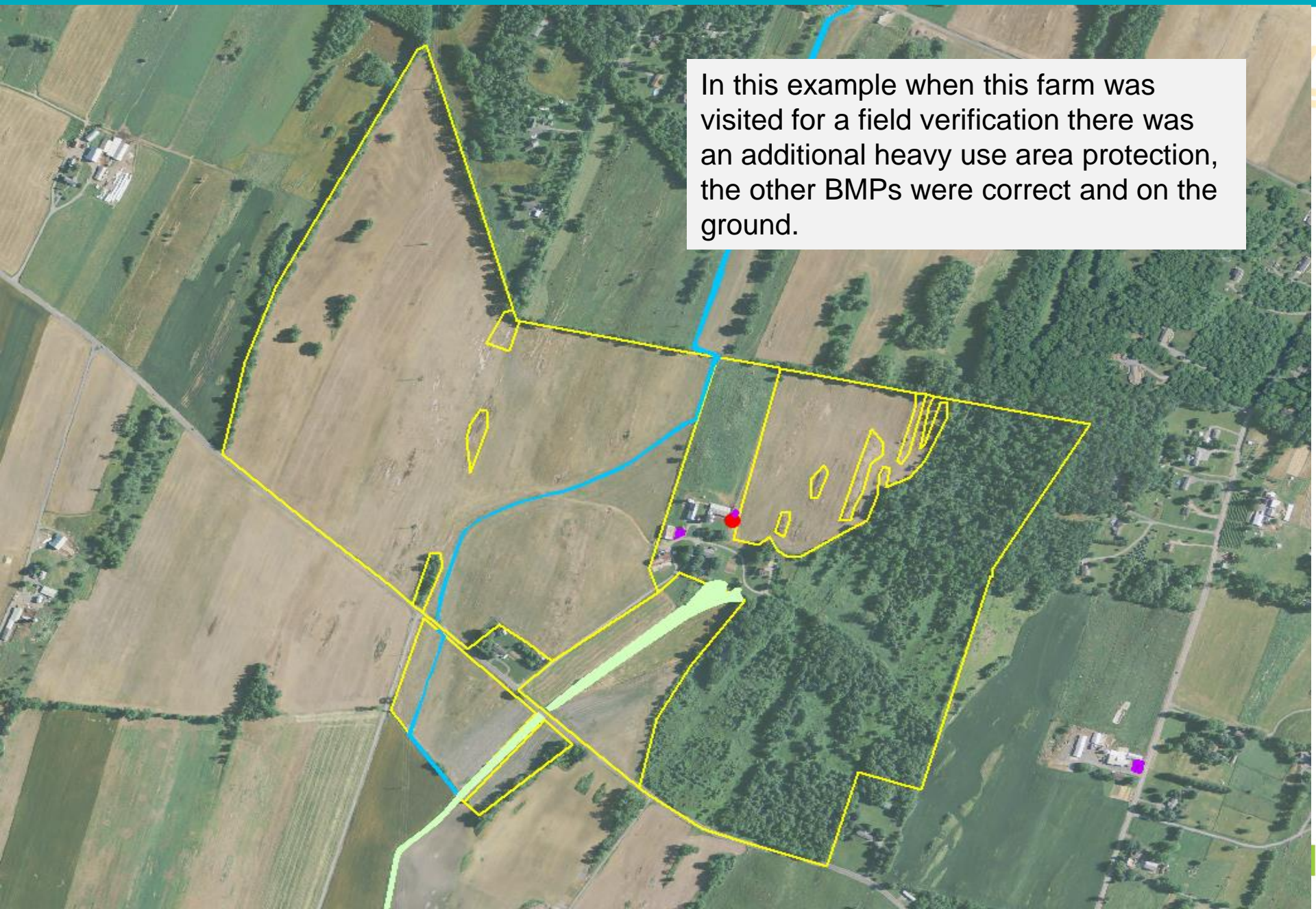
Practice_Code	grassed waterway
applied_amount	0.721129
measurement_unit_display	acres
applied_date	<null>
operation_type	<null>
type_name1	N/A
type_value1	N/A
Var_name_1	Acres Treated
Var_Value_1	104.21
Var_Name_2	N/A
Var_Value_2	N/A
var_name_3	N/A
var_value_3	N/A
var_name_4	N/A
var_value_4	N/A
var_name_5	<null>
var_value_5	<null>
CAFO	<null>
farm_number	<null>
tract_number	<null>
land_unit_number	<null>
applied_year	2003
ortho_source	NAIP
ortho_date	1/29/2003
reviewed_by	amr
Comments	<null>
level_of_review	rsi
review_date	4/1/2015
conservation_plan	no
conservation_plan_name	<null>
conservation_plan_id	<null>
plan_county	<null>
county_name	Franklin
state_name	PA
huc_12	<null>
Latitude	39.748184
Longitude	-77.684277
SHAPE	Polygon
DataCollectionType	RC

Practice_Code	heavy use area protection
applied_amount	0.011036
measurement_unit_display	acres
applied_date	<null>
operation_type	Dairy
type_name1	Animal Units
type_value1	Less than 500
Var_name_1	Land Use before Grazing
Var_Value_1	Associated agricultural land
Var_Name_2	N/A
Var_Value_2	N/A
var_name_3	N/A
var_value_3	N/A
var_name_4	N/A
var_value_4	N/A
var_name_5	<null>
var_value_5	<null>
CAFO	<null>
farm_number	<null>
tract_number	<null>
land_unit_number	<null>
applied_year	2008
ortho_source	NAIP
ortho_date	<null>
reviewed_by	amr
Comments	<null>
level_of_review	rsi
review_date	4/1/2015
conservation_plan	no
conservation_plan_name	<null>
conservation_plan_id	<null>
plan_county	<null>
county_name	Franklin
state_name	PA
huc_12	<null>
Latitude	39.747559
Longitude	-77.681602
SHAPE	Polygon
DataCollectionType	RC

Practice_Code	waste treatment lagoon
applied_amount	1
measurement_unit_display	Integer Count of items
applied_date	<null>
operation_type	Dairy
type_name1	Dry or Wet?
type_value1	Wet
Var_name_1	Animal Units
Var_Value_1	less than 500
Var_Name_2	<null>
Var_Value_2	<null>
var_name_3	<null>
var_value_3	<null>
var_name_4	<null>
var_value_4	<null>
CAFO	<null>
farm_number	<null>
tract_number	<null>
land_unit_number	<null>
applied_year	2008
ortho_source	Google Earth
ortho_date	5/27/2008
reviewed_by	amr
Comments	<null>
level_of_review	rsi
review_date	4/1/2015
conservation_plan	no
conservation_plan_name	<null>
conservation_plan_id	<null>
plan_county	<null>
county_name	Franklin
state_name	PA
huc_12	<null>
Latitude	39.747451
Longitude	-77.681629
SHAPE	Point
DataCollectionType	RC

An aerial photograph of a rural landscape. The image shows a mix of brown and green fields, with a large area in the center-left outlined in yellow. To the right of this area, there is a dense forest. Further right, there are more fields and some small buildings. The yellow outlines are irregular, following the boundaries of various land parcels. The overall scene is a typical agricultural landscape.

This is what the NRCS Planning Data (Toolkit) shows – Nothing. This landowner is a non participant and is doing conservation practices on their own.

An aerial photograph of a rural landscape with various fields, trees, and farm buildings. A large area is outlined in yellow, and a winding path or stream is outlined in blue. Several small colored dots (red, purple, green) are placed on the map, likely indicating specific locations of interest or violations. A text box is overlaid on the top right of the image.

In this example when this farm was visited for a field verification there was an additional heavy use area protection, the other BMPs were correct and on the ground.

Remote Sensing Pilot Project – Potomac Watershed

- Total of 5,790 Farm Inventoried in 5 Counties

Adams, Franklin, Fulton, Bedford, Somerset Counties

- 200 Farms selected for on the ground Spot Check



Remote Sensing Pilot Project – Potomac Watershed

- **Data collected through this pilot is protected by Section 1619 of the Food, Conservation and Energy Act of 2008.**
- **Data will be released to PA Department of Environmental Protection (DEP) in aggregated form only.**
- **DEP requested that the data be aggregated to the HUC 12 level. -**



Remote Sensing Pilot Project – Potomac Watershed

- 15,787 practice instances were identified as part of this pilot project.
- This serves a baseline of conservation BMP's present on the ground. By comparison, the toolkit data contained in NCPDB only identified 4,226 practice instances.

<u>Practice Type</u>	<u>Unit</u>	<u>Delete</u>	<u>Field Collect</u>	<u>Remote Collect</u>
LINE	Feet	18 (< 1%)	67 (3%)	2084
POINT	Number	4 (< 1%)	63 (11%)*	560
POLYGON	Acre	120 (< 1%)	512 (5%)	12501

* 46 of the 63 practices that were identified during Field Collection were Waste Storage Facilities (313)



Remote Sensing Pilot Project – Potomac Watershed

- Selected practice detailed comparison

Practice Code	Practice Name	Units	Toolkit		Remote Sensing Pilot Collection	
			Count	Applied Amount	Count	Applied Amount
313	Waste Storage Facility	Number	131.0	136.0	263.0	263.0
362	Diversion	Feet	72.0	47,166.9	275.0	82,429.5
391	Riparian Buffer	Acre	298.0	943.1	1,941.0	3,983.2
412	Grassed Waterway	Acre	370.0	189.1	1,637.0	1,002.0
561	Heavy Use Area Protection	Acre	196.0	46,517.0	426.0	2,000.3

