Data Collected by Mark Dubin.
Data Analyzed by Vanessa Van Note
Data Incorporated into CAST by Jess Rigelman Sucharith Ravi.

Summary of Expected Outcomes from the Addition of the Hillandale Population to CAST

Consensus based decision for incorporating this data will be requested at the August 5th WTWG meeting utilizing a roll call vote. Email questions to vannote.vanessa@epa.gov.

Which new dataset would be introduced if approved?

The facility population data for the Hillandale Layer Operation in two PA counties, Adams and York. The Hillandale operation is a CAFO operation.

The actual population numbers from the operation were not introduced into CAST directly as this would impact the model's calibration period. Instead of introducing the actual population numbers, the population data was and will be introduced to the existing CAST data as a year-to-year change, or "Change Product".

> *For example, if there were 1,000,000 layers present in 1995, and 1,100,000 layers present in 1996; the "Change Product" introduced into CAST will be 100,000 layers (the 1996 Hillandale population – the 1995 Hillandale population). The 100,000 layers will be added to the existing CAST layer population for 1996.*

For the 2017 Progress Scenario, incorporating the year-to-year change in the Hillandale population data results in 2.6 million layers in Adams county and 891,000 layers in York County for 2017.

> ### Why are we introducing this dataset?
>
> *This population is not currently accounted for in the watershed model.*

Where were scenarios run?

Scenarios were run in a draft version of CAST, utilizing CAST-19 with the most recent CAST-21 land use dataset up to 2017.

Please note: CAST-21 is not finalized. These loads are estimations only to assist in the decision-making process.

Which scenario years were run?

The 1996 to 2017 Progress Scenarios were run. Each Progress Year scenario has two version:

1) the scenario for a given year run without the Hillandale population, and

2) the scenario for a given year run with the Hillandale population to determine the change in loads.

The scenario loads summarized in this document is the **2017 Progress Scenario.**

Is there a change in the way land use is distributed?

Land Use changes only occur in Adams and York Counties as these are the counties where the layer population is introduced. The most significant land use change occurs to the **permitted feeding space land use**.

The Bottom Line: How are loads impacted across the watershed?

Which states experience no change in loads?

The District of Columbia.

Which states experience an increase in loads?

Delaware, Maryland, New York, Virginia, West Virginia, and Pennsylvania, with PA having the most significant increase. Summarized below are the EOT load increases across the watershed from 2017 Progress:

Table 1. Estimated EOT Load % Increase between 2017 Progress without the Hillandale Population and 2017 Progress with the Hillandale Population			
State	**EOT N (lbs N)**	**EOT P (lbs P)**	**EOT S (lbs S)**
Delaware	0.10%	0.05%	-
District of Columbia	-	-	-
Maryland	0.04%	0.03%	-
New York	0.04%	0.08%	-
Pennsylvania	0.14%	0.45%	0.003%
Virginia	0.02%	0.02%	-
West Virginia	0.02%	0.02%	-

(Positive percentages represent an increase in loads.
Load change = 2017 Progress with Hillandale Population – 2017 Progress without Hillandale Population)

Table 2. Estimated EOT Load Increase between 2017 Progress without the Hillandale Population and 2017 Progress with the Hillandale Population			
State	**EOT N (lbs N)**	**EOT P (lbs P)**	**EOT S (lbs S)**
Delaware	6,910	63	-
District of Columbia	-	-	-
Maryland	23,470	1,065	-
New York	6,238	554	-
Pennsylvania	157,485	17,701	73,789
Virginia	13,024	1,144	-
West Virginia	1,452	109	-

(Positive numbers represent an increase in loads.
Load change = 2017 Progress with Hillandale Population – 2017 Progress without Hillandale Population)

Where do the load changes occur?

Load increases occur in the Agriculture (across all land uses except Ag Open Space and Feeding Space) and Natural Sector (stream bed and bank land use) for all states.

Which states/counties are most heavily impacted?

Four PA counties and one DE county are most heavily impacted with an increase in EOS N loads greater than 5,000 lbs (summarized below):

- Adams, PA
- York, PA
- Franklin, PA
- Lancaster, PA
- Sussex, DE

Table 3. The Estimated EOT Load % Increase between 2017 Progress without the Hillandale Population and 2017 Progress with the Hillandale Population

Geography	EOT N Change	EOT P Change	EOT S Change
Adams, PA	4%	15%	-
Franklin, PA	0.1%	-	-
Lancaster, PA	0.1%	-	-
Sussex, DE	0.2%	-	-

| York, PA | 0.8% | 7% | - |

(Positive percentages represent an increase in loads.
Load change = 2017 Progress with Hillandale Population – 2017 Progress without Hillandale
Population)

Table 4. The Estimated EOT Load Increase between 2017 Progress without the Hillandale Population and 2017 Progress with the Hillandale Population

Geography	EOT N Change	EOT P Change	EOT S Change
Adams, PA	66,810	12,029	13,595
Franklin, PA	5,326	177	3,210
Lancaster, PA	10,962	379	19,537
Sussex, DE	5,487	26	-
York, PA	33,477	2,993	8,881

(Positive numbers represent an increase in loads.
Load change = 2017 Progress with Hillandale Population – 2017 Progress without Hillandale
Population)