Purpose of Today's Discussion

Introduce VA's proposal and answer the following:

- What is the proposed change?
- Why is the change being proposed?

Provide basic knowledge of the targeted practices

Update on the AgWG's most recent decision

To collect questions that must be answered before a decision can be requested.

To collect questions specific to land use to provide to the Land Use Team.

Backout Refresher

1) **Understanding a load source change**

Load source change practices alter a previously-projected load source to a new load source. For example, tree planting can alter an acre of pasture to an acre of forest. By changing from a higher loading load source to a lower-loading one (from pasture to forest), nutrients are automatically reduced on that acre of land. Each additional unit of load source change typically results in a lower load for a given geographic area.

Also referred to as: Land Use Change, Land Conversion

Information on Load Sources here.

2) **Load Source Change BMPs and Historical Data**

Load source change BMPs are not applied to historical land uses since those land use changes would already be present in the data used to generate the historical land use.

For example, Tree Planting in the past would be detected as forest by a satellite image and not reported as pasture in an Agricultural Census.

3) The Backout Calculation

Amount backed out = Total units of a land use change BMP in a specific geography that are part of the cumulative record, but no longer receive land use change credit for the reported amount as the model now captures the benefit from the on-the-ground change in land use. The efficiency portion of the credit is still applied.

Amount not backed out = Total units of a land use change BMP in a specific geography that were submitted and receive credit in the model because the area is not incorporated with the land use projection. The efficiency portion of the BMP credit is applied even when the land use change portion was backed out.

The unit of a Load Source Change BMP applied in a scenario (also referred to as the **"land use change credit")** = *The amount submitted in a scenario - The amount in the scenario used to project the land use for that scenario year*

4) Purpose of Backout

- The backout calculation avoids double-crediting acres.

How?

The land use submitted as a BMP is already are present in the data used to create the initial land use for that year (also known as the Base Conditions).

Information for this slide found in P6 Model Documentation, Section 6, "BMPs", pg. 6-3 and the Submitted vs. Credited Report in CAST.

BMP	From Land Cover	To Land Cover	Current Backout Method	VA Suggestions to the Workgroup for Backout
Abandoned Mine Reclamation	Barren	Low Vegetation	The backout for land use change BMPs from 2017-2025 is 2017 progress.	n/a
Impervious Surface Reduction	Impervious	Low Vegetation	The backout for land use change BMPs from 2017-2025 is 2017 progress.	n/a
Septic Connections	n/a	n/a	Backout is determined using census data	VA proposes backout of septic connections be constrained to only the BMPs encompassed by the service areas for which mapped changes are incorporated.
Alternative Crops Grass Buffers Land Retirement Wetland Creation Wetland Restoration	Low Vegetation	Low Vegetation	The backout for land use change BMPs from 2017-2025 is 2017 progress.	VA proposes discontinuing all backout currently based on land use forecasts or Ag Census. VA proposes discontinuing all backout of herbaceous BMPs as they are highly unlikely to be properly classified as a land use change when the change is low vegetation to low vegetation.

*The land ... either natura... ate the agricu...

Low Vegetation: Plant material less than approximately 2 meters in height. Includes lawns, tilled fields, nursery plantings with or without tarp cover and natural ground cover.

Breaking down the BMPs
– Load Source Change/Land Use Change/Land Conversion BMPs

1) Grass Buffers

- **Definition:** Linear strips of grass or other non-woody vegetation maintained to help filter nutrients, sediment and other pollutants from runoff.
- **Reported as:** Grass Buffer Strip, Field Border, Filter Strip, Grassed Waterway, Riparian Herbaceous Cover
- **Converted from:** Double Cropped Land, Full Season Soybeans, Grain with/without Manure, Leguminous Hay, Other Agronomic Crops, Other Hay, Silage with/without Manure, Small Grains and Grains, Specialty Crop High/Low
- **Converted to:** Ag Open Space (Unmanaged agricultural land that receives no manure, biosolids, fertilizer or other nutrient applications.)

Load Sources and definitions pulled from CAST Source Data.

"Reported as" pulled from NEIEN Appendix.

2) Alternative Crops

- **Definition:** Accounts for those crops that are planted and managed as permanent, such as warm season grasses, to sequester carbon in the soil.
- **Applicable Crops:** Double Cropped Land • Full Season Soybeans • Grain with Manure • Grain without Manure • Other Agronomic Crops • Silage with Manure • Silage without Manure • Small Grains and Grains
- **Converted from:** Double Cropped Land, Full Season Soybeans, Grain with/without Manure, Other Agronomic Crops, Silage with/without Manure, Small Grains and Grains
- **Converted to:** Ag Open Space
- **Reported as:** Alternative crops; Alternative crop/Switchgrass RI (RI-3), Carbon sequester alternative crop

3) Land Retirement

- **Definition:** *Converts land area to hay without nutrients (Ag Open Space) or pasture.* Agricultural land retirement takes marginal and highly erosive cropland out of production by planting permanent vegetative cover such as shrubs, grasses and/or trees.
- **Converted from:** Double Cropped Land, Full Season Soybeans, Grain with/without Manure, Other Agronomic Crops, Silage with/without Manure, Small Grains and Grains*, Leguminous Hay, Other Hay, Pasture, Specialty Crop High/Low
- **Converted to:** Ag Open Space or Pasture
- *Load sources below marked with an asterisk (*) are only applicable for Land Retirement to Ag Open Space and are not eligible for Land Retirement to Pasture.*
- **Reported as:** Conservation cover; Conversion to hayland RI (RI-14); CREP Wildlife habitat; Critical area planting; Grass nutrient exclusion area on watercourse narrow; Land retirement; Permanent wildlife habitat, noneasement; Retirement of highly erodible land, pasture and hay planting, permanent introduced grasses and legumes.

4) Wetland Creation

- **Definition:** *Establishment.* The manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site
- **Reported as:** Headwater wetland creation, wetland gains-established
- **Converted from:** Ag Open Space, Double Cropped Land, Full Season Soybeans, Grain with/without Manure, Other Agronomic Crops, Silage with/without Manure, Small Grains and Grains*, Leguminous Hay, Other Hay, Pasture, Specialty Crop High/Low
- **Converted to:** Non-tidal Floodplain Wetland, Headwater or Isolated Wetland

5) Wetland Restoration

- **Definition:** *Re-establishment.* The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland.
- **Reported as:** CREP Wetland Restoration, Wetland Gains-Reestablished
- **Converted from:** Same as above.
- **Converted to:** Same as above.

Which datasets inform these land uses?

The current approach to differentiating and classifying the land uses associated with the low vegetation land cover is based on:

- Ancillary datasets (wetlands, NLCD, USDA Cropland Data Layer),
- Census of Agriculture
- Parcel boundaries
- Local zoning and use maps
- Geographic cues (proximity of impervious surface, size of vegetated area, etc).

May AgWG Decision on Using Land Cover Imagery

- **May Decision:** CAST-21 Draft Workplan Task 4: Investigate use of latest land cover & LiDAR imagery to better define changes in total ag (& other land use) acres.

➢ The AgWG supports the adoption of the proposed land use methodology for determining **the change in total agricultural area** from 2013 to 2017.

- The previous method used the Agricultural Census Total Harvested Cropland for total agricultural area.

April Agriculture Workgroup Meeting Minutes

➢ Compared the 2017 Census of Agriculture and the draft 2017 high-res land use for 14 prototype counties and discussed the data review process

May Agriculture Workgroup Meeting Minutes –Approval of decision

Explore the Draft 2013-2017 CAST-21 Land Use here.

VA Proposal for Low Vegetation BMPs

What is the proposal?

Discontinue the backout of land use change practices that involve a conversion from one low vegetation class to another: alternative crops, grass buffers, land retirement, wetland creation and wetland restoration. These practices will still be subject to their partnership approved credit durations.

Why?

- Backout is a procedure to avoid giving double credit for BMPs that are reported for annual progress and also captured in the base land use used for the model. Just like forest and tree planting practices, in order for a land use change BMP to be captured in the base land use, the BMP must be detectable in the imagery by the automated land cover classification systems, and properly classified by the land use algorithms.
- In the case of land use change practices that involve a conversion from one low vegetation class to another, since there is no change in land cover, the key to detection is in the land use algorithms. The current approach to differentiating and classifying the low vegetation land uses is based on using ancillary datasets (wetlands, NLCD, USDA Cropland Data Layer), parcel boundaries, local zoning and use maps, and geographic cues (proximity of impervious surface, size of vegetated area, etc).
- Unfortunately, none of these data have the resolution to differentiate a grass buffer from upland pasture, an alternative crop from cropland, land retirement from active agricultural production, or a restored or created wetland from an agricultural field. Unlike the tree and forest planting practices, this is not an issue of allowing enough growing time to allow for detection. Until there is a new methodology or dataset that allows for a more precise differentiation of low vegetative land cover into the many associated land uses, these BMPs are unlikely to be detected and properly classified in the model's base conditions. As such, there is minimal risk of double crediting reported low-veg to low veg land use change practices.

What questions need to be answered to move forward?

What questions do we have for the Land Use Team?

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*The land cover product from Chesapeake Conservancy does not include a True Forest Category. Tree Canopy is defined as deciduous and evergreen woody vegetation of either natural succession or human planting that is over approximately 3-5 meters in height. Land cover was used for this table instead of land use because it does not incorporate the agricultural census.

What are Septic Connections?

- **Septic connections convert from private septic tanks to a municipal sewer system.**
- *How does this work in CAST?*
- The septic connection BMP eliminates the septic load for the number of systems selected. The load is assumed to be captured in the wastewater data. Wastewater loads are measured, and the measured load is reported. This measured load will include the loads from the newly-connected septic areas.
- *What is the load source change that occurs?*
  - The septic connection BMP **removes the septic load source** once implemented.

What informs the Septic Load Source in the Base Conditions?

From the CAST-19 Document, “Understanding the Modeling Tools”:

- Sewer service area boundaries (updated every two years; CAST 2019 and every model version thereafter)
- Septic system growth by county and/or model land-river segment (updated every two years; CAST 2019 and every model version thereafter)

– If sewer service area in County X in CAST-21 is larger than the one in CAST-19, the estimates of population served by the sewer will increase.

What informs the Septic Load Source in the Base Conditions?

- The original sewer service area (SSA) data was collected by Tetra Tech via a survey of WWTP's in 2009 to support the TMDL.
- Data was received for 60% of WWTPs.
  - Outside of those areas, **SSAs were modeled using population density, populated place, and the 1990 Census (last year census collected WW info).**
- For Phase III WIPs/milestones**, SSA maps updated with data from localities/counties.**
  - Goal: Replace modeled with mapped info wherever possible.
  - When the sewer model is updated for each milestone, Census County-level population is used to control total estimated population on sewer and septic. The future population for 2025 is forecasted.

What informs the Septic Load Source in the Base Conditions?

- **For CAST-21,** the Chesapeake Conservancy requested SSA data from localities throughout the watershed in 2019 and 2020.
  - *This data is being assembled and compared to the current data to determine which dataset is more detailed/covers a larger area.*

Some things to consider:

- SSA's may include communities served by septics, therefore, estimations of population on sewer may represent the high-end of the range.
  - **In VA**, septics are being underestimated by approximately 200,000.
- **In WV**, SSA has been expanded in the current zoning baseline scenario by one mile in all directions.
- **For DE's land policy BMP,** SSAs expanded proportionally to expected growth.
- It may be best to hold off on backout decisions for septic connections for CAST-21 until the under-count issue is addressed, which cannot be done until Phase 7 (due a step change being introduced that is not reflective of temporal trends).

VA Proposal for Septic Connection BMPs

What is the proposal?

VA proposes backout of septic connections be constrained to only the BMPs encompassed by the service areas for which mapped changes are incorporated.

Why?

Septic connections in one county may be impacting the septic connections in another county.

What questions need to be answered to move forward?

What questions do we have for the Land Use Team?