DRAFT Summary of discussions with stakeholders regarding agricultural water use projections for the Pee Dee basin. C. Alex Pellett, SC DNR Hydrologist, October 2023.

Consumptive use

- We have assumed 100% consumption, which is equivalent to 100% water use efficiency for irrigation.
- Site-specific analysis could provide more accurate estimates.
- In some cases, center pivots have been found to be 80-90% consumptive.
- Irrigation through subsurface draintile often results in return flows to surface water and/or infiltration to groundwater. On a state-wide basis, subsurface irrigation is relatively minor and has not been expanding. Subsurface irrigation could be (is?) predominant in some areas of the state (in the Pee Dee basin?).
- Maximum water consumption (evapotranspiration) can be estimated using established methods without the need for field investigation. This could be relevant for water availability models and calculation of safe yield.

Economic considerations

- Increasing commodity prices can drive investment in irrigation infrastructure as a form of "insurance" for the increasing costs of land, seed, fertilizer, fuel, etc.
- Money supply is currently tightening. Some investors in farmland improvement have slowed down expansion recently.
- Farmers in other parts of the country, where irrigation water availability appears to have peaked, have come to operate in this region, where water is more abundant, and can be expected to continue.
- If agricultural land continues to decline, then agricultural practices might respond by shifting towards more intensive production on smaller fields. Typically, intensive investment and management means high water use efficiency.
- Farming can be a means of maintaining ownership of land, which can be a motivation even if margins are small.

Land availability for continued center pivot expansion (44% growth over 50 years)

- Other kinds of agricultural water use are not subject to the same constraints.
- Constraints: Wetlands, Developed Areas (including projected expansion to year 2065), slopes > 5%, Protected Areas, parcels < 30 acres.
- Remaining "unconstrained pixels" were then filtered to contiguous areas large enough fit a center pivot.
- There are many other constraints (logistical, financial, social), but they are not so readily modelled with available data.
- The constraints are intended to be conservative (overly constraining), in response to previous comments indicating that there may not be sufficient land available for continued expansion of irrigation.
    - Many existing irrigation polygons overlay the constraints.
    - Some center pivots are smaller than the filter threshold.

    - A location was identified where a center pivot is under construction in "constraint" pixels.
- Areas were identified where the analysis did not find constraints, but real-world evidence shows that there is insufficient source water availability. Water availability is not considered a constraint at this stage of the analysis. The water demand projections are input to the water availability models, to assess water availability constraints.
- Next Step: prioritization of irrigable areas.
    - Proximity to existing irrigation.
    - Agricultural land.
    - Large tracts of unconstrained land.

<u>Recommendations</u>

- Contact pivot vendors. To discuss their perspectives on projected expansion of irrigated area(?)
- Determine the sensitivity of the groundwater availability model to the location of projected irrigation wells.
- Further investigation of consumptive use.
- Evaluate groundwater recharge for different kinds of land cover.
- Survey irrigators.
    - Solicit feedback on current and possible future irrigated areas.
    - Could start with a sample of irrigators, to determine if further investigation is needed.
    - Opportunity for a state-wide push for more accurate information on water use.