

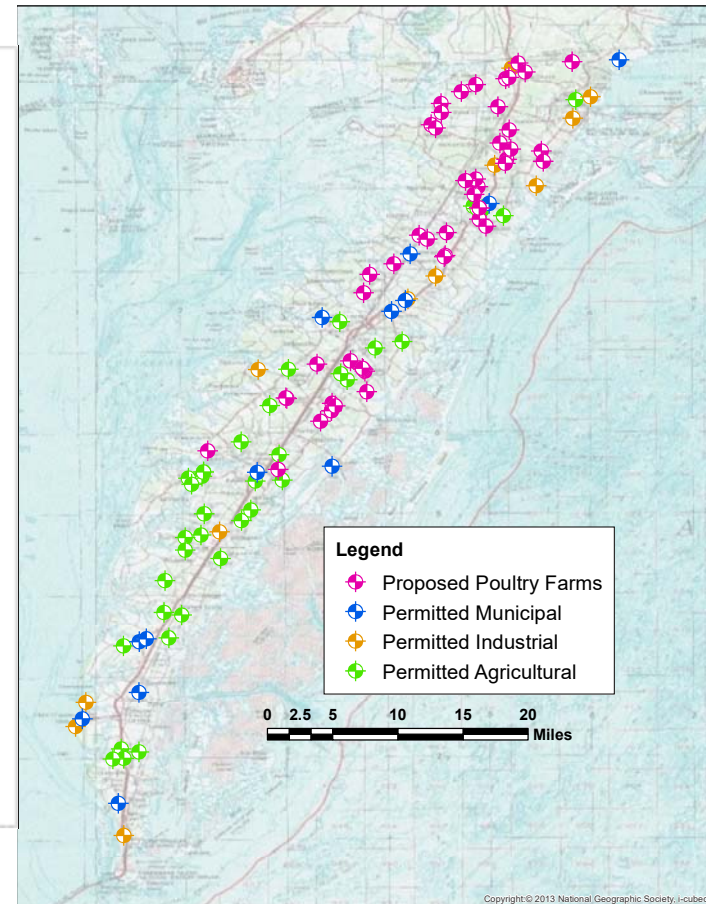
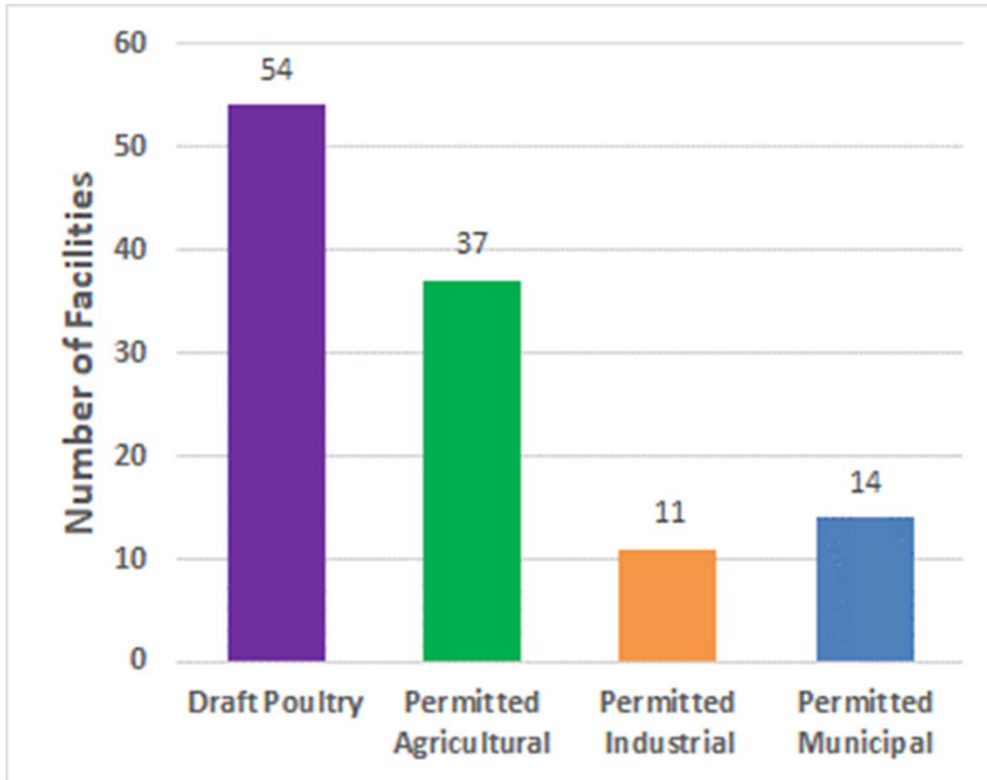
INITIAL REVIEW OF DRAFT POULTRY HOUSE GROUNDWATER WITHDRAWAL PERMITS

May 2019

2018 Consent Special Order

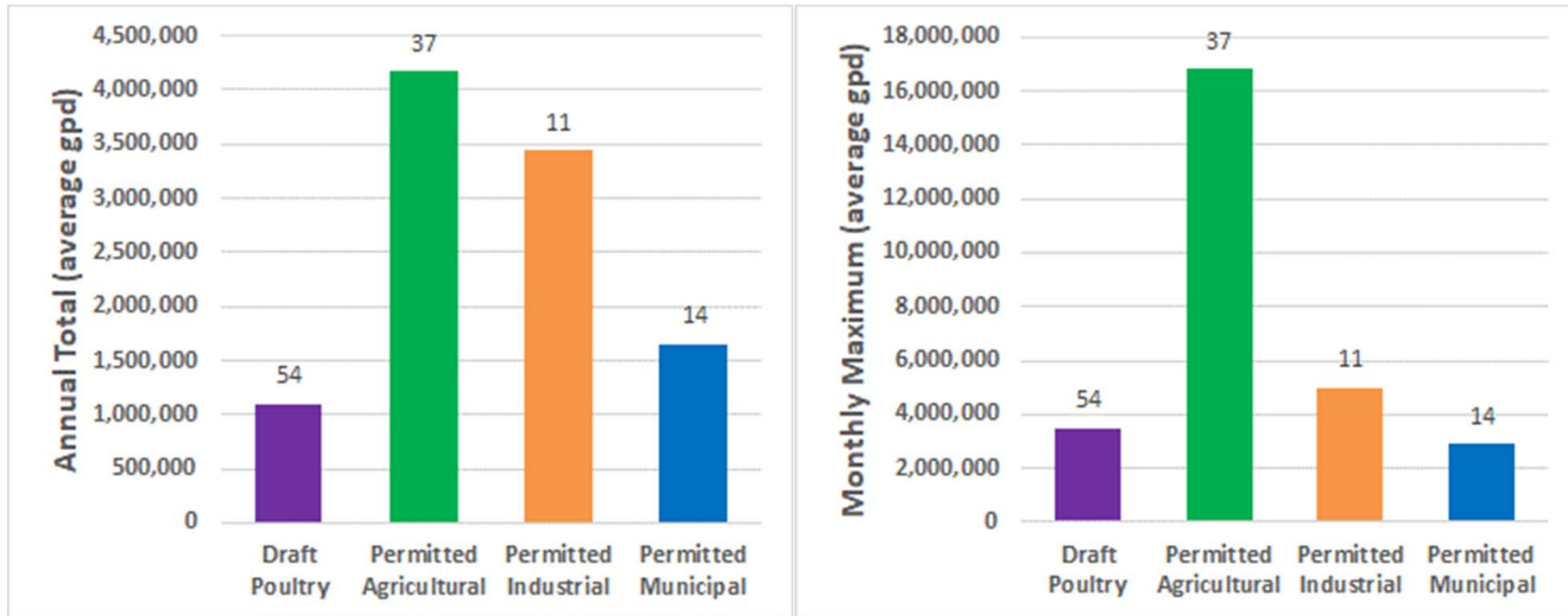
- 56 poultry farms
 - 54 were identified as requiring a permit
 - 49 draft permits moving forward with public notice
 - 5 still need authorization from owner (as of May 17)
- Schedule:
 - Public comment period: May 24, 2019 through July 12, 2019
 - Public hearings:
 - June 24 at Arcadia High School
 - June 25 at Eastern Shore Community College
 - June 26 at Northampton High School
 - DEQ will review comments and revise draft permits if appropriate
 - DEQ will present draft permits and public comments to SWCB, tentative Sep 5th

Distribution of Permitted Groundwater Withdrawals



All draft Poultry Farm Permits are in Accomac County

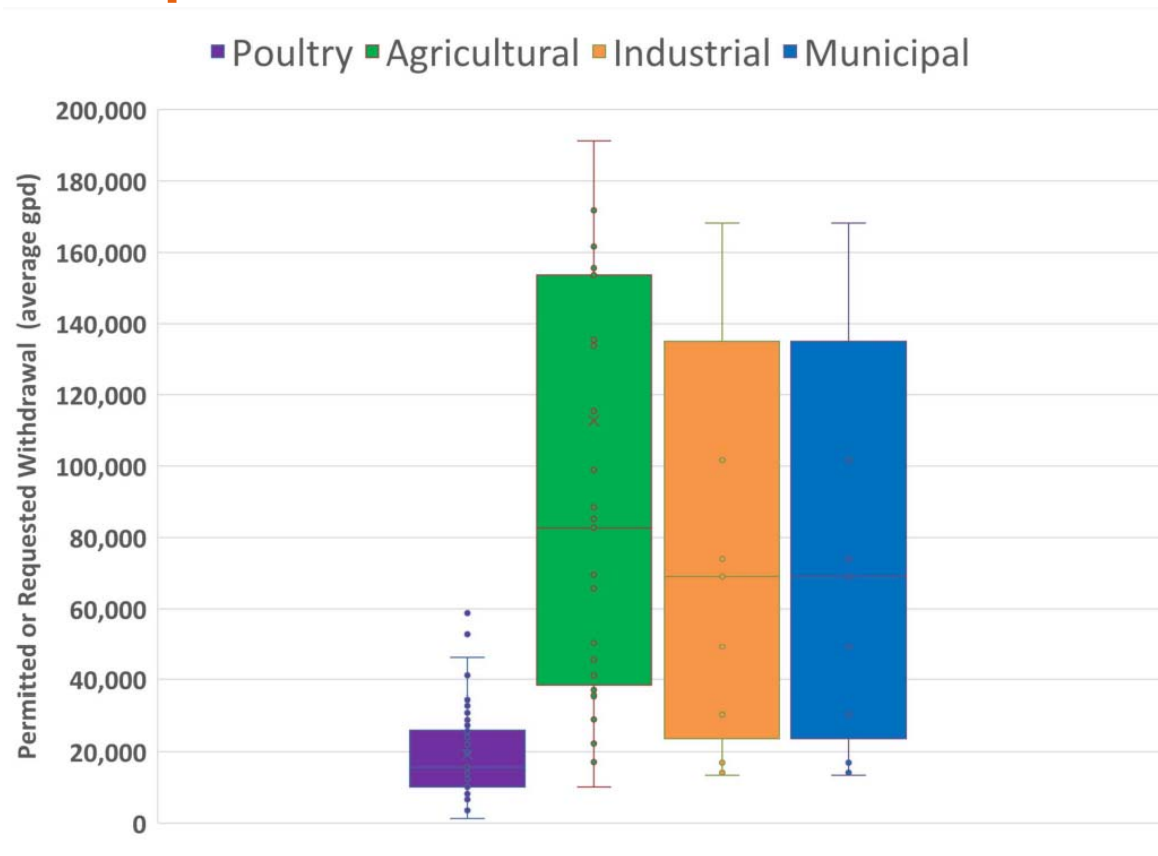
Total permitted withdrawals by category



Notes: Ag: Actual agricultural use is predominantly for drought use, and normal year use is typically less than 20% of permitted use.
 Ind: Actual industrial use almost equal permitted use (>90% for most users).
 Municipal: Actual Municipal use is close to permitted use (close to 80% for most users).

Similar to the initial agricultural permits, requested amounts used for the annual and monthly max totals

Individual Requested and Permitted Use

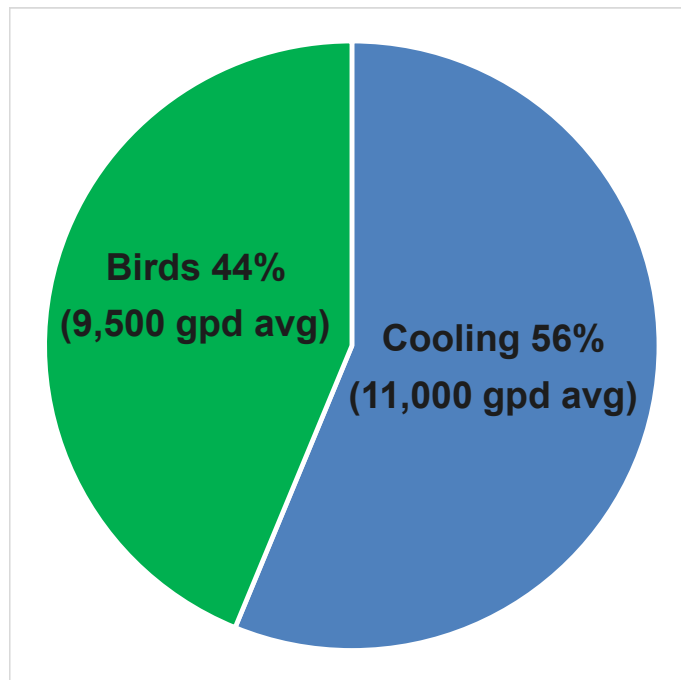


Note: Perdue (1.9 MGD avg) and Tyson (1.0 MGD avg) are included in the statistics but not show on the chart scale

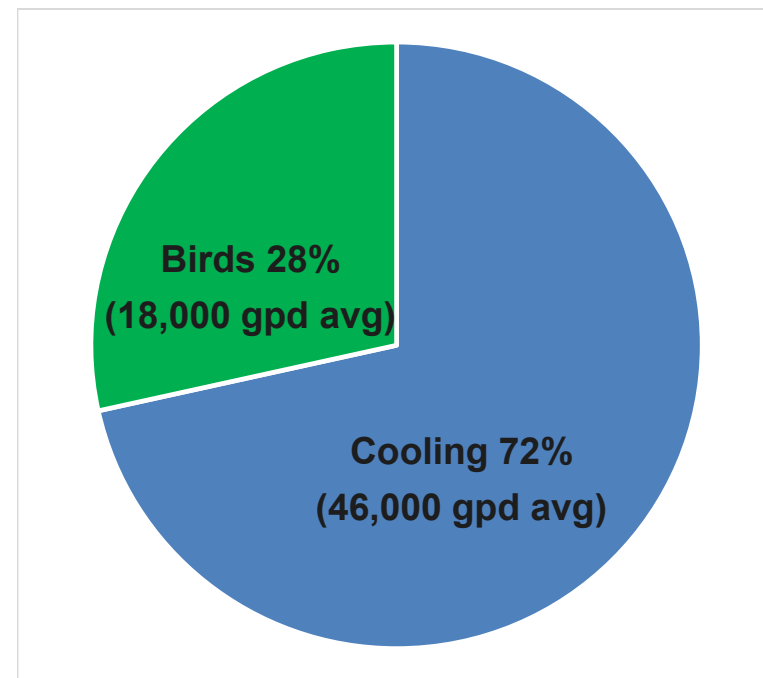
Relative to other Permitted Withdrawals, individual poultry facilities use less water on average

Portion of Withdrawal Used for Cooling

Annual Total



Monthly Maximum



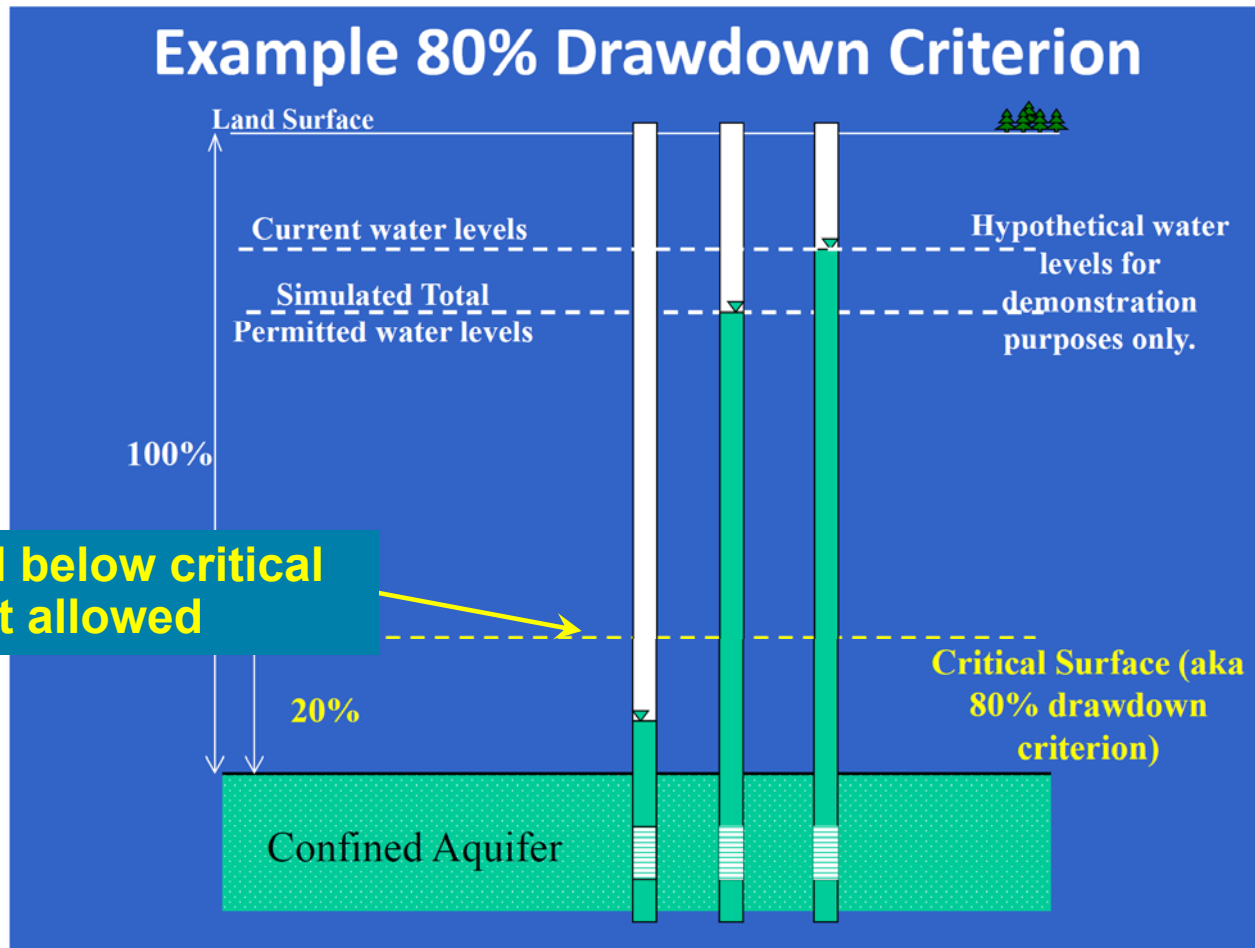
Majority of the water will be used for cooling. Less than 1/2 is used by the birds for consumption.

Source Aquifers

- None of the 54 facilities under the Order are proposing to use wells screened in the Columbia (surficial) aquifer
- Some wells were installed earlier (greater than 10-years ago). Other wells were installed as recently as July 2018.
- There is no documentation of test wells for the Columbia aquifer at any of the facilities from the permit applications.
- Most of the applications give one of the following reasons for not screening the Columbia aquifer:
 - *“it is believed that a shallow groundwater supply system would lack the reliability, volume, and/or quality”*
 - *“the surficial aquifer does not yield water of sufficient quantity or suitable quality for meat production at this location”*

The Groundwater Committee has made preferred use of the Columbia aquifer to reduce stress on the Yorktown-Eastover aquifer a major goal to maintain a sustainable resource for over 20-years.

80% Drawdown Criterion is a principal metric DEQ uses in their technical evaluation

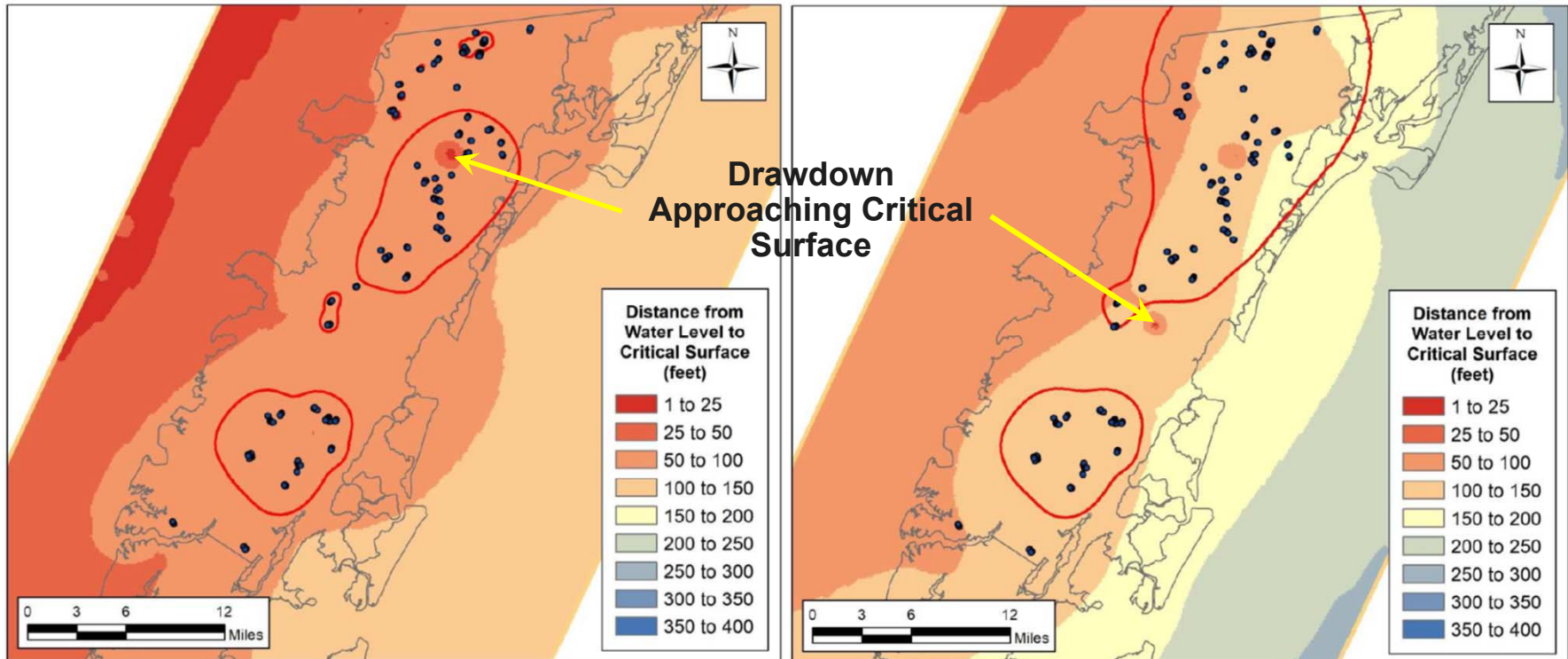


Drawdown is calculated from ALL withdrawals in model (permitted and unpermitted)

80% Drawdown Criterion Critical Surface Almost Reached in Locations in the Upper and Middle Yorktown-Eastover aquifer

Upper Yorktown-Eastover Aquifer

Middle Yorktown-Eastover Aquifer



Once drawdown drops below Critical Surface future withdrawals that have impacts extending to the critical area will be restricted/denied

Comments on the 80% Drawdown Criterion

- Drawdown is calculated from the permitted withdrawal amounts plus estimated actual non-permitted use
- The current permitted withdrawals plus the draft poultry farm permits meet the 80% criterion
- Two locations are close to exceeding the criterion:
 - Upper Yorktown-Eastover aquifer near Tyson
 - Middle Yorktown-Eastover aquifer near Perdue
- Most of the drawdown at these two locations are the results of the individual withdrawals by Tyson and Perdue.
 - The other withdrawals, including the draft poultry house use contribute to the total/cumulative drawdown
- It is likely any additional large withdrawal from the Yorktown-Eastover aquifer will result in exceedance of the 80% criterion in at least one of these two locations, resulting in possible denial for the requested withdrawal.

Drawdown in the Yorktown-Eastover near Tyson and Perdue highlights the need for use of alternate source such as the Columbia aquifer

Special Conditions added to the draft Permits

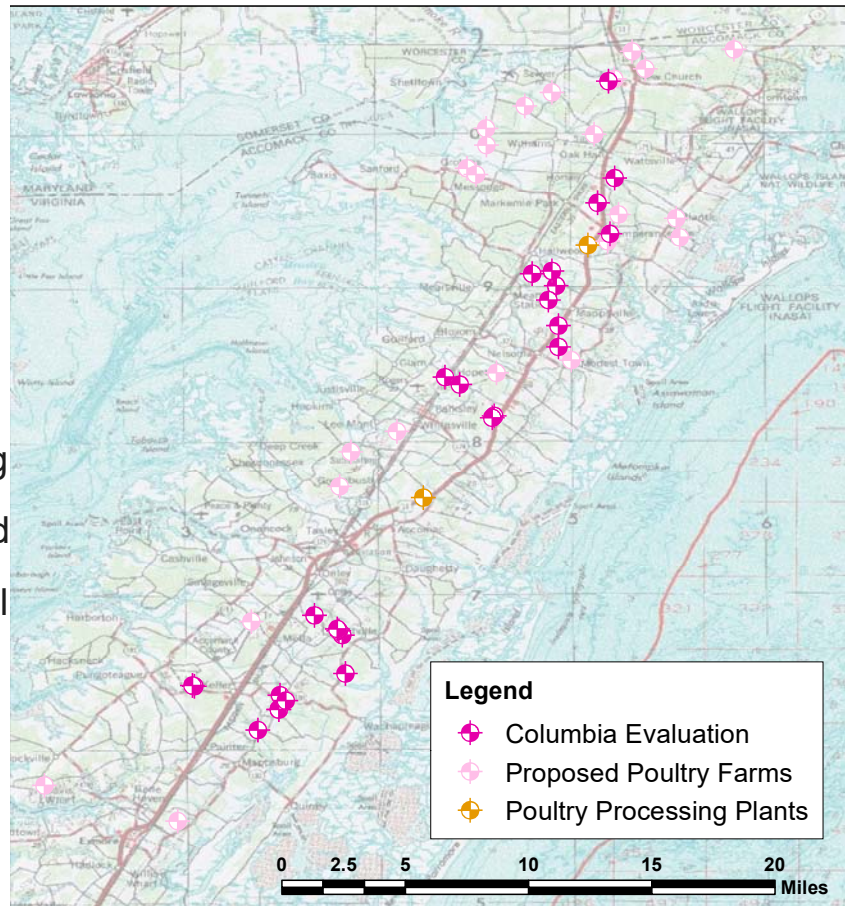
- Geophysical Logs: 38 (78%)
- Pump Intake Determination: 39 (80%)
- Verification of Meter Installation / Correction: 49 (100%)
- Alternative Source Investigation (Columbia / Surficial Aquifer): 26 (53%)
- Water Quality (Chlorides): 4 (8%)

Note: out of a total 49 permits

Special Condition: Columbia Aquifer Investigation

1. By September 30, 202X the Permittee shall conduct an investigation of the surficial aquifer(Columbia) to evaluate the ability of the surficial aquifer to provide all or part of the water supply needs for the facility. The investigation shall include water quality and pump test data collected from a surficial aquifer test well constructed on-site with Department oversight to ensure the well is properly screened in the surficial aquifer. A geophysical log shall be obtained from the surficial aquifer test well per Part III.K of the permit unless a geophysical log collected from an existing production well is accepted by DEQ as representing the Columbia aquifer at the test well location. An existing well screened in the surficial aquifer located on or near the facility property may be used where approved by DEQ as an alternative. An existing well must have sufficient well construction information available to verify it is screened in the surficial aquifer and properly constructed in order to be considered.

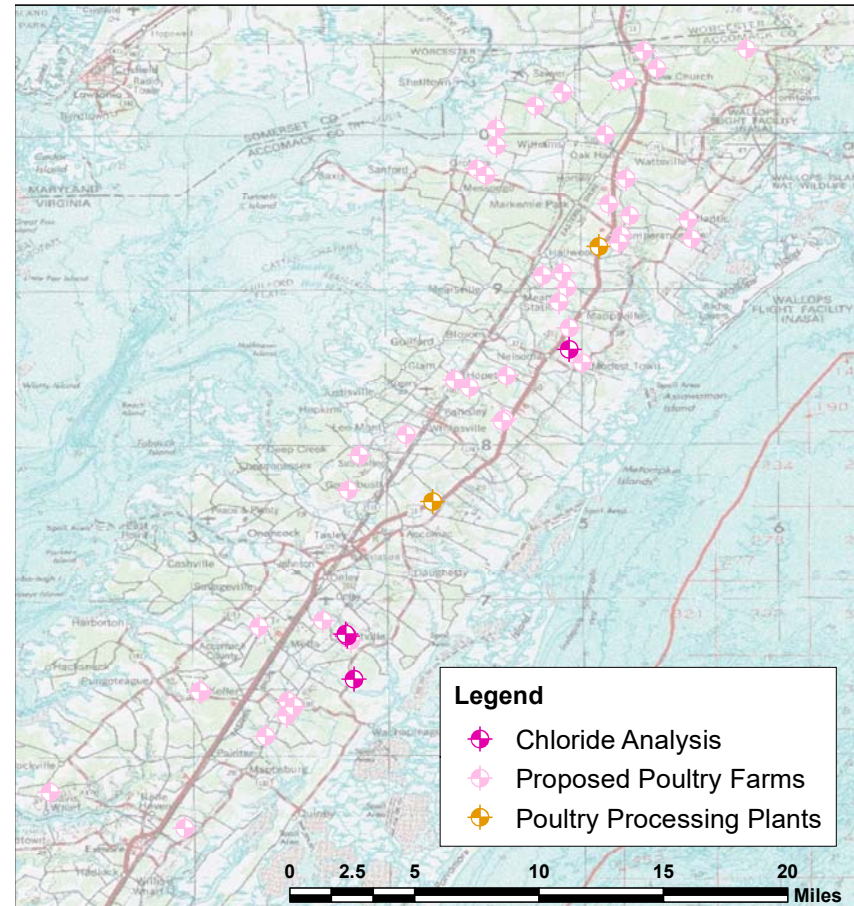
2. A report on the results of the investigation shall be provided to DEQ by March 31, 202X.



DEQ oversight of test well construction required. All tests required within 5-years of permit.

Special Condition: Water Quality

- Collect quarterly samples from specified wells and analyze for chlorides



Note: if water quality is a concern to the user, routine water quality testing should be part of any normal operations.

Preliminary Comments

- Special Conditions:
 - Geophysical Logs: will provide valuable information on the aquifer framework.
 - Meter and pump intake verifications: important to insure accurate use records and prevent dewatering.
 - Columbia aquifer investigation: None of the 54 facilities under the Order are proposing to use the more sustainable Columbia aquifer
 - 26 of the draft permits require an aquifer test and water quality sampling from a test well completed in the Columbia aquifer.
 - There is no specific requirement under the Special Conditions to use the Columbia aquifer if available. This may be a consideration if/when the permit is renewed (15-years).
 - Water quality: only 4 facilities are required to monitor for chlorides.
- 80% Drawdown Criterion:
 - Drawdown from withdrawal at total permitted amounts are close to exceeding the criterion at two locations: near Tyson in the upper Yorktown-Eastover and near Perdue in the middle Yorktown-Eastover
 - Drawdown in the Yorktown-Eastover near Tyson and Perdue highlights the need for use of alternate sources such as the Columbia aquifer
 - Current actual use is about 2/3's total permitted use (principally because agricultural use is much less than permitted to address droughts).

Review of the Draft Permits will continue through June