



## Agriculture Water Demand Technical Work Group Meeting

### Conference Call Summary

January 7, 2013 from 2-4 pm CST

The following summary was prepared by CDM Smith and is intended to capture the general topics, and discussion that was held and is not intended to be a verbatim transcription of the conference call. The following individuals participated in the call:

Evan Teague – Arkansas Farm Bureau  
Bo Bishop – Arkansas Farm Bureau  
Dennis Carmen, White River Irrigation District  
Andrew Grobmyer – Agricultural Council of Arkansas  
Adam McClung – Arkansas Cattlemen’s Association  
Cynthia Edwards – Arkansas Department of Agriculture  
Becky Cross – USDA – Ag Statistics  
Chris Soller – ANRC  
Chris Henry – University of Arkansas Rice Research Center  
Mike Armstrong – Arkansas Game and Fish Commission  
Tim Snell – The Nature Conservancy  
Linda Johnson – FTN  
Wes Bramlett - FTN  
Mitch Horrie – CDM Smith  
Jessica Fritsche – CDM Smith  
Rick Brown – CDM Smith

The meeting began at 2 pm CST time and followed the agenda.

### Overall Conclusion(s) drawn from the Meeting

- CDM Smith should proceed with collecting data and generating preliminary numbers for the agricultural forecast. CDM Smith should consider generating a range (i.e., average, high etc.) of forecasted demand if the data supports such an approach.
- CDM Smith should remain in communication with the work group and work group members as they begin to collect the data and refine any methodologies. The work group wants to see some of the preliminary numbers and results prior to developing the draft forecast (May/June timeline).
- Overall the group felt that Arkansas irrigated acreage is likely to continue and upward trend; probably not at the rate it has over the last 20 years, but given the following major factors some trend type analysis should be incorporated into the forecast approach:
  1. There is available crop land in Arkansas (non-irrigated and irrigated).
  2. There likely are additional arable lands in Arkansas.
  3. There has been an upward trend in irrigated acreage in Arkansas.
  4. The state of Arkansas is likely to maintain a very strong agricultural base as a foundation for the economy (other industrial and commercial growth is likely but there do not appear to be any factors that would suggest a major shift toward urbanization and industry). This



# Arkansas Water Plan Update



factor is further supported by the challenges other states, especially some of the western and central states, are facing in regard to decreasing water supplies and higher rates of urban growth.

5. The demand for food production will trend with population and with an upward trending population an increase in the demand for food is expected.
- CDM Smith should look closely at the relationships between crop water needs, irrigation application practices and efficiencies, and overall system wide efficiencies (use and reuse) to ensure a credible water use and water balance.
  - Livestock trends may be more likely to remain constant over the planning horizon but CDM Smith should do some one on one outreach to some of the livestock work group members that were not able to be on the call.

The remainder of the summary provides the discussion items that support the above conclusions and overall direction provided to CDM Smith.

## Opening Remarks/Review of December 17<sup>th</sup> Meeting:

- CDM Smith noted we are in the preliminary phase of data collection and analysis. The Methodology white paper that was provided at the December 17<sup>th</sup> meeting is a preliminary outline of approach based upon limited analysis of available data and conference call participants may want to have both the 5 page outline that was sent to facilitate today's conference call and the white paper available. CDM Smith highlighted the goals/purpose of the call and noted that this call will help the group to understand the drivers of the demand forecast and how those drivers will affect the approach. In many cases drivers of the demand forecast are both quantitative and qualitative and the work group can be especially helpful in areas where there are professional judgment calls.

### Questions:

- Has CDM Smith looked into the Water-Use Registration Database (WUDBS) and are the data easily accessible for analysis?
  - Yes, CDM Smith has begun a preliminary look at the WUDBS. The majority of the data needed has been acquired from USGS. We still need to examine some of the level of detail of the data because this will have a large influence and the level of detail on the forecast.
  - We have begun to look at a comparison of these WUDBS to other data sources including the National Agricultural Statistics Service (NASS) and USDA Agricultural Census data.
- Is another face-to-face meeting anticipated before May?
  - We will likely utilize conference calls for future meetings unless we come across issues where it will be necessary for a face-to-face meeting. If things go smoothly, the next face-to-face meeting will be in May.
- Are there plans for a third party independent review of the demand forecast?
  - We do not have plans for a formal peer review. We are advocating that the technical work group serve as the informal review process. If a third party review is something people think becomes necessary as we move forward, we can consider it.



## Overview of Initial Approach and Assumptions

- Factors that drive future changes in water use are extremely variable. However, simply put - future water demand will increase, decrease, or stay the same. CDM Smith has not identified any major drivers heretofore that can tell us, with certainty, what we can expect. The discussion then focused on the major elements of the forecast inputs.

### *Irrigated Acreage*

- Given the observed trend showing a rapid increase in irrigated acres over the last 20-25 years, what are some likely trends and relationships moving forward? The following observations we made by work group members
  - Irrigation will increase, not at the same rate as over the last 20 years, but it will increase.
  - Urbanization will not be a significant factor limiting the expansion of irrigated acres in Arkansas.
  - Every acre that can be irrigated will be in the future.
  - Assuming a steady level of irrigated acres is a mistake.
  - There is a cap to the amount of acres that could be irrigated.
  - Future drought-like conditions and recent experiences with drought, supports the stance that more irrigation will be developed as a form of yield insurance.
  - CDM Smith needs to look at the data to analyze where Arkansas is in terms of producing on land that is producible and where certain crops can and cannot be grown (due to soil type or other constraints).
  - Another question is with respect to irrigating pasture land.
    - We are seeing more hay producers accessing money for irrigation as a result of drought conditions. In recent times, pasture land has not been irrigated much but a revival is likely.
  - About large percentage of row crop acreage (one member estimated 80% others urged caution and ask that it be looked at closely) is already irrigated.
  - Improved efficiencies do not necessarily correlate to reduced water use. Water saved through efficiencies is likely to go to another irrigated acre or increase yield on the existing land.
  - There is a point of diminishing return with respect to irrigating more marginal lands. Some land may not have an irrigation water source. The decision to irrigate is based simply on economics.

### *Livestock Inventories*

- There has been a dramatic decrease in dairy cattle numbers.
- Hog numbers have declined but appear to be stabilizing. Cargill has an interest in maintaining or slightly increasing production.
- Beef cattle and poultry numbers represent a symbiotic relationship in that poultry litter is used to fertilize hay production to feed cattle. Recent droughts have brought down populations.
- There has been a reduction in aquaculture production due to competition but going forward some of this water use will likely comeback or move into other production.



## *Demand Forecast and Groundwater Sustainability*

- We have heard that Arkansas is on an un-sustainable course with respect to groundwater. How does that factor into the demand forecast?
  - One work group member noted that the past analysis of groundwater sustainability indicates that groundwater withdrawals levels will need to decrease to achieve sustainability.
  - Arkansas is water rich but there has to be investments in infrastructure for water supply.
  - We do not want to overstate or understate a demand because we are presupposing a constraint or conclusion. We look at the demand, and then look at the solutions.
  - The challenge is that we know that agricultural producers are extremely flexible and able to move to advantageous production schemes. We have to be able to defend that what we are forecasting as a reasonable foreseeable condition. That is where we will get into the data and look at things like total crop land, irrigated land, and arable land (based on slope, soil type, supply availability, etc.)

## *Trends in Crop Mix/Future Crop Mix*

- Are there any apparent drivers in statewide crop mix?
  - We have seen a decline in cotton and switch to corn.
  - Increase in peanut production in the northeast part of the state.
  - Rice acres are decreasing but holding steady from a historical standpoint.
  - The past is a good judge for the future with respect to agricultural land. Total agricultural land will not change much. The mix of crops will change but over the long-term will be a fairly steady number.
  - May need to look at the mix of forest, crop, and pasture land rather than individual crop types.

## **Additional Questions/Discussion Items**

- Recommend to keep the current mix of irrigation water supply source the same. If we do see shortfalls in supply using this approach, that is where we will look at solutions to address these challenges. If there are supply projects we know with certainty will alter this mix, we want to incorporate them into the forecast.
  - Do not see how you can do anything else at this point.
  - All water uses need to be treated the same way.
- Are we missing any major data sources?
  - The Agricultural Census and NASS data are very complete and involve a lot of follow up data acquisition. It is not necessarily 100% reporting but they do account for people that do not report data; data/survey return is about 85% or more. A statistical method is used to fill in missing data based on other reports in the area.
  - USDA has an aerial imagery system, however, the best source they find is directly from the producers themselves.
  - We have identified one USDA report that looks at world food production trends are people familiar with this? No. We will look at it and share the report which can be found at [http://www.usda.gov/oce/commodity/ag\\_baseline.htm](http://www.usda.gov/oce/commodity/ag_baseline.htm)
- What is the driver to convert forest land into row crop or pasture?



# Arkansas Water Plan Update



- Where you will find changes is in woodland areas that have been clear cut and converted to pasture. Some CRP land could convert back to production. Overall, forest land and crop land are pretty stable.
- Approach is to use a irrigated acres times water requirement divided by efficiency factor.
  - How will we measure crop irrigation water requirement?
    - Empirically-derived: Modified Blainey-Criddle water requirement numbers have been produced in the Grand Prairie Project area (corn, sorghum, soybeans, sod grass, and rice). See beginning page 136 of:  
<http://www.mvm.usace.army.mil/grandprairie/maps/pdf/Earcsvo2.pdf>
    - Literature-derived values.
    - Observed data from WUDBS.
    - Efficiency factors may not exist in the literature. CDM Smith may have to use the WUDBS to back into the efficiency estimates.
    - Crop water use may change into the future as yields increase.
    - Ideally, the forecast would consider irrigation methods by county from the WUDBS in developing efficiency factors.
    - USDA does not have water use or irrigation method at the county level.
    - It is not know if county conservation districts collect data on irrigation method. Most people depend on USDA for those types of data.
  - Should potential changes in temperature and precipitation be looked at?
    - This exercise may complicate the forecast beyond its usefulness because of uncertainty and variation in the down-scaled climate models. The impact of these changes may be well within the margin of error associated with other forecast assumptions.
    - Incorporating reliable temperature or precipitation trends will be difficult especially since our planning horizon is shorter than some of the climate models.
    - Examining historical records may allow us to most closely understand what will happen in the future.
  - Will the forecast be a single number or a range?
    - For now we are suggesting to use a range. This could change as we get further into the data.
  - Livestock Water Requirement
    - University of Arkansas Agricultural Extension has some numbers for Beef Cattle but these may have come from Nebraska and could be dated. There may be more recent data from Ontario. Not aware of state-specific data.
    - Economic Research Service may have some information.

When is the next meeting?

- Suggesting that there will probably be some one on one calls as we dig further into the data and need to discuss specific issues.

We are shooting for having something together for a larger audience in May.

If group members have people in mind that they have identified as experts that we should reach out to, please send that information to CDM Smith.

The call concluded at 4:25 pm.