

Memorandum

To: Georgia Regional Water Planning Councils – Altamaha

From: CDM Smith

Date: October 28, 2019

*Subject: Georgia Regional Water Planning Council Meeting
of the Altamaha Council Meeting Summary*

This memorandum provides the meeting summary of the September 10, 2019 Altamaha Regional Water Planning Council Meeting, held at the Plant Hatch Energy Education Center in Baxley, GA. The Council Meeting was held from 10:00 AM to 2 PM. This memorandum provides a summary of the items presented during the Council Meeting.

1) Welcome and Introductions

Chairman Jeffords initiated the meeting and welcomed the attendees. During his welcoming statements, Chairman Jeffords also mentioned his recent participation on a panel discussion with the Coastal Georgia Regional Water Planning Council, the Metropolitan North Georgia Water Planning District and Georgia EPD at the Georgia Environmental Conference (GEC) in August 2019. Chairman Jeffords requested the Planning Contractor (PC) to send out the PowerPoint slides from the GEC conference to the Council Members. Following Chairman Jeffords' welcoming statements, Daniel Carter with the Southern Company also welcomed the group and provided a safety briefing for the facility. The Planning Contractor (PC) then presented the meeting agenda and asked if there were any changes and if not, if the Council would be willing to approve the agenda for today's meeting. A motion was given, followed by a second and all council members present voted to approve the agenda. The PC then presented the meeting minutes from the last Council meeting held in January 2019 and asked for the Council's approval. A motion was given, followed by a second and all council members present voted to approve the previous minutes.

2) Power Generation and Energy Sector Forecasting for Regional Water Planning – Bill Davis, CDM Smith

Next, Bill Davis with CDM Smith (Planning Contractor) reviewed the outline for the energy sector discussion which covers how electricity is generated, how water is used in generating electricity, and how electricity is transported. Bill provided an overview of thermoelectric power and explained that the prime mover is typically steam but in newer technologies, it is compressed gas. Depending on the combination of fuel type, prime mover and cooling system, each has an impact on how water is used.

Based on information provided by the Energy Information Administration (EIA), in the 1950s, the primary renewable energy source was hydropower. Coal was at its peak in 2000 (comprising 50% of U.S. electricity generation at that time) but it is now closer to 28%. In terms of renewable biomass, in north Georgia, the poultry industry is generating chicken pellets which are then sold as an energy source.

Next, the types of cooling systems were discussed. An open loop system has little to no consumption, but it requires a lot of water for cooling and it puts a lot of it back to the water source it was pulled from. For a closed loop system, the water taken out of the river is run through a cooling tower and keeps recirculating water. Withdrawal is a lot less but there are high evaporative losses so there is a higher level of consumption. Most of the cloud we see coming out of the Plant Hatch facility is steam as water vapor. Water use by generation combination was then discussed.

Question: The EPD representative asked if the examples shown represent the same size facility with similar power generation?

Response: Bill Davis stated that CDM Smith collected data from the Department of Energy (DOE) on capacity and generation and EPD data on withdrawals, and calculated the coefficients for facilities here in Georgia. In 2016, we found a national study with calculated water use for power generation by generation combination across the country. Their numbers were very close to what CDM Smith developed for Georgia at the state level. Regionally, in an arid climate, you will get better efficiency from a cooling tower than you would in a humid environment due to differences in dew point. Age, climate and other factors can explain small differences.

Question: A Council Member (CM) asked what kind of fuel type is the most expensive?

Response: Bill Davis stated that he thinks natural gas is the cheapest. Nuclear is the second cheapest.

Comment: The representative from Georgia Power stated that fuel is an interesting topic. If you consider water as a fuel, hydropower is the cheapest. Solar or wind are more economical than natural gas as well. However, they don't have the capacity that natural gas can carry. You need to consider the load/demand curve which determines the fuel type you dispatch. Peaks are supported with natural gas, a little bit of coal and hydropower. Georgia Power is building a lot more solar in the state, but it only provides energy when the sun is shining. Georgia Power is also looking into battery storage and ways to carry solar more into the demand curve when sun is not shining.

Comment: The representative from Southern Nuclear stated that it all depends on the cost of the fuel at the time.

Question: A CM asked what about pump storage for peaking?

Response: Bill Davis stated that in Missouri, they use hydropower to generate electricity during the day and at night when electricity is cheap, they turn the pumps on and pump it back to the top of the mountain. Pumped storage is common in a lot of places.

Comment: A CM stated that we need to look at these numbers state by state and region by region. Fuels are more affordable if you are near the source. In Georgia, solar costs are much lower than in other places. Your location and what fuel resources are nearby will determine the most cost-effective model.

Response: Bill Davis stated that in southern Illinois, there are coal mines but it's high sulfur coal and there is no demand for that. Chicago buys their coal from Montana for regulatory purposes, so the closest source may not always be the best source.

Next the energy grid was discussed, and Bill explained that this power from Plant Hatch is distributed in the southeast sub-region of the Southeast Reliability Corporation (SERC). If other regions have excess demand, the energy gets moved through grid to other places. The northeast blackout a few years ago was due to a substation in Ohio which lost power and created a domino effect such that the entire northeast grid went black.

Nationally, each region and sub-region has an annual review of their capacity, what they think their demands are, their existing capacity and which facilities are being retired or coming on-line. This is then rolled up to the national level. Coal is now 28% of power being generated. Renewables and natural gas are projected to expand going into the future.

Comment: Chairman Jeffords stated that this assumes the cost of natural gas would remain below that of coal.

Between 2010 and 2020, renewable electricity generation shows a big expansion for wind but it levels off after another 10 years because most of the prime locations will have been used by then. Today, solar is a pretty small piece of the renewables portfolio but looking out to 2050, solar will play a much larger role in terms of total electricity generation.

Question: A CM asked do you have those numbers for Georgia and what the future trend looks like?

Response: Bill Davis showed the SERC Reliability Review Subcommittee (RRS) Annual Report 2018 highlights, which includes the southeast sub-region (Alabama, Georgia and part of the Florida panhandle). He explained that the SERC RRS sub-committee members contribute to the outlook. They produce a baseline forecast and then they start coming up with different scenarios for the future. [Follow up: *A post-meeting review of the SERC RRS 2018 report shows that the projections are at the regional level, but not at the sub-region level.*]

Question: Chairman Jeffords asked if solar is going to increase in the next 30 years and if it is typical of the southeast, what makes up that solar capacity? Is it large land masses of solar panels or rooftops in urban areas?

Response: Bill Davis stated that there are large solar systems that provide power into the grid and there are small private systems for homes and business for use on-site that do not put power into the grid. Bill said he would also follow up with the Council on the graphic with solar projections shown.

Question: Specifically, what does the title of the graphic “renewable electricity generation including end-use” mean? The PC will distribute the follow-up information to the Council. [This is the generation of electricity including the use of electricity on-site.]

Next, Bill Davis discussed how expected requirements for new generating capacity will be met by renewables and natural gas. Bill explained that the negative values shown on the slide represent generating facilities that are going to be retired. A lot of coal fired facilities have been retired or are soon to be retired. The positive values are the new generating facilities that have been bought on-line. An example of this is Plant Vogtle. Past 2023, new capacity is evenly split between natural gas and solar. As new facilities come on-line to generate future capacity, its projected to be mostly natural gas and solar. Bill stated he will provide a report to the Council that shows what this looks like specifically for the Altamaha Region.

[Follow up: “Capacity resources in the SERC Region for 2018 total 256,400 MW. Net capacity resources in the Region are expected to increase for the first five years of the 2019-2028 planning horizon to 266,900 MW. Net capacity resources are projected to level out in the last five years of the planning horizon with natural gas-fired capacity additions being largely offset by coal-fired capacity retirements. Capacity resources in the SERC Region in 2028 are projected to total 267,600 MW. For the period 2018-2028, natural gas-fired capacity is projected to increase from 42.6% to 44.1%. Through the same period, coal-fired capacity is projected to decrease from 31.2% to 29.1%. SERC members have not announced any large-scale coal-fired capacity retirements through the near-term planning horizon. Nuclear powered resources supply 14.3% of the SERC capacity in 2018. This share is projected to increase to 14.6% in 2028 due to two 1,100 MW nuclear plant additions in 2022 and 2023. Existing solar (photo-voltaic) capacity resources in the SERC Region are reported at 1,700 MW, but planned solar additions of over 2,400 MW are projected through 2023. With these additions, combined-type capacity resources would supply 7.9% of the SERC total by 2028, up from 7.3% in 2018. Hydro capacity resources are projected to remain essentially unchanged through the forecast period at approximately 4.5% of the Regional total. Biomass, wind, and other resources in the Region are small and do not contribute significantly to the SERC capacity totals or resource mix.” (SERC RRS Annual Report 2018)]

Net internal demand vs. anticipated capacity resources was then discussed. The long-term outlook indicates there is adequate capacity which is more than demand within the SERC SE sub-region.

Question: Chairman Jeffords asked what is net internal demand? The state is growing so demand and efficiency should be going up and not staying flat.

Response: Bill Davis answered that internal demand is the demand within the sub-region but he needs to confirm the exact definition. [Follow up: *Total internal demand is the peak hourly load for the summer and winter of each year based on normal weather, and includes the impacts of distributed resources, energy efficiency, and conservation programs. Net internal demand is the internal demand minus the amount of controllable and dispatchable demand response which may include any demand response part of an emergency procedure. The word “internal” refers to the demand for energy within the specific region or subregion.*]

Next, Bill discussed the facilities that were taken into account for the water demand forecasts for the 2017 RWP.

Question: Are the facilities shown on the map from the 2009 RWP?

Response: Bill Davis answered the map shows those that were retired in red as identified in 2017.

Question: Chairman Jeffords asked if there are solar plants on this?

Response: Bill Davis answered that the graphic only represents thermoelectric facilities.

Question: A CM asked what the Effingham County Power Project is?

Response: Bill Davis stated that he thinks this is most likely gas turbine, but he will confirm and report back to the Council. [Follow up: *The two generating units of the Effingham County Power Project are both natural gas combined-cycle units.*]

Bill then provided an overview of the Georgia thermoelectric power generation forecast. In 2009, we came up with a kilowatt-hour (kWh) per capita value and using population projections, we have a projection of future need in kWh. That need is going to be met by different fuel types and energy generating combinations. We then looked at where those fuel types/generating types are located, and we distributed that future water demand by location.

In 2016, we used an updated list of facilities and had new population projections. In the 2016 update, the main difference was that the revised population projections came down quite a bit from the original projections. It was pointed out that Plant Hatch is running at 94% capacity and the table shows 93% capacity for nuclear generating units, so the estimate is quite close. Under the withdrawal table, for fossil fuel once-through cooling, there is a big drop over time as a couple of large coal-fired facilities were being retired that used a lot of water. Under added capacity, the statewide estimate of future need forecasted needing some additional capacity over time so we assumed half of this would be met by solar and the other half met by natural gas.

Question: Chairman Jeffords asked under the second row of the withdrawals table, do these represent coal fired facilities?

Response: Bill Davis answered that these represent coal fired and natural gas and these would ramp up to 85% of their capacity.

Next, Bill reviewed the consumption, or the volume not being returned to the river.

Comment: Chairman Jeffords noted that the Altamaha region is doubling our consumption of water - mostly due to cooling towers.

The local energy/water nexus was then discussed. Bill explained that EMCs (Energy Management Corporations) take the power from the grid and sell the power to the customer and they also promote energy efficiency. The amount of water it takes to produce energy for a

house is more than the water you use in your house. There is a nexus between energy efficiency and water efficiency.

Comment: A CM stated that related to growth, we are going to increase our efficiencies on a per capita basis. Even with growth, we are becoming more efficient.

Response: Bill Davis replied that yes, we are becoming more efficient on a per capita basis. The USGS compiles data on water use. The total water use in the US peaked in 1980 and it has been coming down since even though population has increased. Most of the decrease is in water use in the energy and agricultural sectors.

3) Water Conservation and Sustainability Practices at Plant Hatch – Plant Hatch Representative

Daniel Carter then provided an overview of Plant Hatch. Nuclear power generates 20% of electricity in the United States. It provides 56% of emission free power in the United States. There are currently 98 nuclear reactors in the United States. Southern Company covers most of the SERC sub-region. Southern Company has a presence in many other states and they are expanding into other renewables. Plant Hatch began commercial operations in late 1975/early 1976.

Question: Chairman Jeffords asked whether the Plant Hatch facility operates any groundwater wells.

Response: Daniel Carter replied that the facility has groundwater wells which are for potable water and fire suppression. River water is used as part of the steam process. The steam system is closed loop; surface water is used for cooling, and it is then returned to the river except for what is lost to evaporation.

Question: A CM asked what the drought contingencies were for Plant Hatch.

Response: Daniel Carter answered that the facility coordinates with Georgia Power on releases from the lakes that are controlled by dams upstream from the facility.

Next, Daniel described the re-fueling process. At Plant Hatch, they re-fuel units every year. Inside each fuel assembly, there are rods and fuel pellets. One pellet (about the size of an eraser) is equivalent to one ton of coal. The facility only moves out about one-third of the fuel during the re-fueling process. When the plant shuts down, some of the bundles are removed and the rest are moved around. Independent spent fuel storage is kept on site in dry storage containers and not sent out of state. Most facilities have gone to this process until the country's long-term repository issue gets resolved.

Question: Chairman Jeffords asked if there is no re-use for nuclear spent rods?

Response: Daniel Carter answered no, there is not a commercial use for them. An active movement is underway however to look at new technologies.

Question: The PC asked what happens if the site is retired. Does the spent fuel stay on-site?

Response: A Southern Nuclear representative answered that the spent fuel must stay on the site or they can be sent to a repository if that option becomes available. The Nuclear Regulatory Commission (NRC) requires the plant to return the site back to a certain condition. The spent fuel would stay here and be monitored.

4) Council Business

The PC then covered several topics related to council business. The first point of discussion focused on the new content that has been added to the Altamaha Regional Water Plan website and the Council Members were encouraged make comments and suggestions. The plan for the website is for it to be easily and frequently updated, including links to reports, regional highlights, and outreach.

Next, the PC discussed the survey responses and potential topics of interest. To date only a few responses have been received for the survey.

Question: Chairman Jeffords asked what topics would everyone be interested in?

Response: Responses to this question included population projections, management alternatives, surface water and groundwater interactions, and how state and federal regulations, especially future regulations will impact the Council.

Comment: A CM stated there are regulations that may not be the best for us and mentioned private land rights.

Comment: Chairman Jeffords stated the region is largely agricultural, and it needs to be both protected and made viable at the same time, as growth is needed. He also stated that this was our responsibility and we all need to work tougher.

Question: Chairman Jeffords asked what concerns the energy sector has?

Response: The representative from Georgia Power replied drought response and the need for state to state consistency. He discussed the need for regional reservoirs and infrastructure for when water is needed during a drought to meet energy needs. Plant Bowen has its own Water Research Center which focuses on ways to conserve water. Georgia Power has made the commitment to be involved in the regional water planning process.

Next, an update on Regional Water Plan Seed Grant funding for Fiscal Year 2020 was provided. Pre-application meetings must be held by October 17, 2019 and the deadline for applications is October 31, 2019.

Question: Chairman Jeffords stated the seed grant has been focused on agriculture, but could it also focus on water, wastewater treatment, or local businesses?

Comment: Vice Chairman Stavriotis replied that municipal water treatment plants are aging and functioning beyond design capacity, impacting the water quality of streams. In addition, he said that small town infrastructure needs help, sewer collection system facilities are needed, and financial assistance is needed.

Comment: A CM replied that regulations keep increasing but there is not enough money to meet regulations.

Comment: Chairman Jeffords discussed the development of well and septic systems in unincorporated areas, and the potential for cross-contamination.

Response: Vice Chairman Stavriotis replied that there is a funding gap between infrastructure maintenance needs and available funding.

The PC went on to explain that Pine County RC&D and Dr. Hawkins with UGA have identified a potential seed grant project that focuses on nonpoint source pollution and working with farmers to implement best management practices (BMPs). It will also include an educational component.

Next, outreach activities were discussed. The PC shared with the Council that an outreach presentation was made to the Georgia Young Farmers (GYFA) earlier in March. There is also the GYFA Convention that will be held in late January 2020 and perhaps there is a potential opportunity to participate.

Comment: Vice Chairman Stavriotis stated that the Georgia Rural Water Association is looking for topics and speakers for the spring convention in Jekyll Island.

Lastly, the Regional Water Plan video was played for the Council Members.

Question: A CM asked how is the video going to be distributed? Another suggestion was made to make it available to high schools.

Response: The EPD representative responded that it will be made available on the website.

Question: Chairman Jeffords asked what is the status of Council reappointments?

Response: The EPD representative that they want to get appointments by the end of the year for six councils.

There were no comments from the public. The Council identified late January for the next Council meeting in Vidalia, GA. The public portion of the meeting adjourned at 1 PM.

5) Meeting Attendance

The table below summarizes the Altamaha Council Members in attendance as well as public and agency attendees.

Affiliation	Name
<i>Altamaha Regional Water Planning Council</i>	Rex Bullock
	Mark Burns
	Ed Jeffords
	John Roller
	Paul Stravriotis
<i>Regional Water Planning Council Planning Contractors</i>	Danielle Honour Bill Davis
<i>Georgia EPD</i>	Jennifer Welte
<i>Public/Agency Attendees:</i>	
Georgia DNR	Don Harrison
Georgia Forestry Commission	Mathew Mrizole
Public	Furman Peebles
Georgia Power	George Martin
Pine Country RC&D	Rahn Milligan
Southern Nuclear	Daniel Carter
	Jim Deland
	Dale Fulton