Memorandum

To: *Coastal Georgia Regional Water Planning Council*

From: *Rick Brown and Katherine Zitsch, CDM*

Date: *11/17/10*

Subject: *Council Meeting 7 - Summary*

This memorandum provides the meeting summary of the Coastal Georgia Regional Water Planning Council Meeting 7 (CM 7) held on September 1, 2010 at Coastal Electric Cooperative (EMC) in Midway.

1) Welcome and Introductions/Recap CM 6/Approve Agenda/Approve CM6 Summary

   Chairman Ben Thompson called the meeting to order and welcomed the Council.

   Chairman Thompson introduced Mayor Washington of Midway and she welcomed the Council. Mayor Washington thanked the Council for coming to Midway and wished the Council the best in completing the challenging job of developing the water plan for the region.

   Chairman Thompson then asked the Council and the public introduce themselves.

   Chairman Thompson provided an overview of the agenda. The agenda was approved by consensus.

   The PC identified potential dates for CM #8 and Council agreed to hold the meeting on November 3rd in Midway (following the Council meeting it was determined that Midway EMC is not available and Richmond Hill will be the location for the next Council meeting).

   The PC then provided an overview of the CM #6 meeting summary and provided an overview of Council feedback regarding the meeting. Overall the Council felt CM#6 was very useful.

   The PC asked the Council for a motion to approve the meeting summary; Council approved the meeting summary by consensus.

The meeting continued with an overview of the objectives for Council Meeting 7 including:

- Review current and future conditions resource assessment model results and forecasted demands to identify and refine water and wastewater needs/gaps.
- Develop and refine management practices to address water availability, wastewater needs and gaps.
- Review and organize current water quality impairment information and list of impaired segments.
- Discuss Subcommittee work on Water Plan development, and plan development review process.
- Develop a deeper understanding of water resource dependent ecosystems in the region (Department of Natural Resources, Coastal Resources Division and Wildlife Resources Division).
- Develop an understanding of Management Practices and Water Resource Planning at Beaufort-Jasper Water Authority in South Carolina.
- Review the status of the Coastal Sound Science Initiative groundwater modeling work.

The PC then proceeded to the next major agenda item.

2) Quantification of Gaps and Needs

The PC presented an overview of the technical approach and method of summarizing a large volume of information that helps illustrate the regional and local forecasts and water resource gaps and needs. The work was initially presented to the Management Practices Subcommittee on July 27th. After receiving input from the Subcommittee it was agreed that the PC should continue to refine the approach for presentation to the full Council. The PC emphasized that one of the goals of this effort is to have a concise and usable summary that each Council member can review for accuracy and share the data and preliminary conclusions with local governments, water and wastewater utilities and other stakeholders. The PC mentioned that it is extremely important that we remember our goal is to develop a "Regional" plan and that one danger of having the detailed information by County is that we end up focusing on 9 individual County needs. Our goal is to use the County information as the solid foundation for the overall regional plan and ultimately a

statewide plan. As we go forward we now need to be thinking about resources on a more regional level based on watershed and aquifer units.

Finally it is important to acknowledge that the data as summarized is based on many different information sources and the level of precision should not be our main focus. In other words when a number is presented think of that as a general value and ask yourself if we are in the approximate range based on your local knowledge? If there are errors that would change our fundamental conclusions than please point those out and we will make the necessary inquiries.

The PC then provided the following handouts: map of local drainage areas (smaller watersheds that make up planning nodes), detailed county-by-county assessments, and a general summary of the planning process that Council can share with local stakeholders and that can be rolled out to public and government officials. The information provides the preliminary conclusions and most relevant planning elements; please keep in mind these are draft preliminary findings and should be viewed as a "strawman" for you to look at and provide comments and input. There are specific action items for you to take home and review and discuss with your local officials. It was noted that all official decisions are made in the Council meetings and not at subcommittee meetings.

The planning contractor then walked the Council through the general discussion draft of the summary document "*Overview of Regional Water and Wastewater Forecasts, Identification of Water and Wastewater Needs and Gaps, and Preliminary Management Practices to Address Regional Needs and Gaps between Forecasts and Available Resources.*" The planning contractor noted that these handouts will be available for the public on the Georgia Water Planning website http://www.coastalgeorgiaCouncil.org/.

It was pointed out that the groundwater resource assessment showed that there is generally groundwater available based on a regional aquifer level scale, but please be careful in concluding that groundwater can be the ultimate solution to all forecasted water supply needs. There may be cumulative impacts of all Councils developing more groundwater. The results were also presented on a larger than regional level, and there may be impacts at a local level if we withdraw high volumes of water in localized areas.

The discussion then focused on surface water forecasts and resource assessment results. The discussion focused on the Kings Ferry and the immediate upstream nodes – Eden and Claxton. These are important to keep in mind as we talk about surface water gaps. The Atkinson node is on the Satilla River which flows into the region, but we don't have any uses in the Coastal region and there are current and forecasted gaps at Atkinson (the PC

reminded the Council that a gap is present if off stream water uses increase the frequency or magnitude of flow shortages to the critical low flow period (7 day lowest flow period in a 10 year period). Council should decide if you want to have a shared resources meeting with Suwannee-Satilla? The Claxton node also has surface water gaps from upstream uses. There are also gaps at Eden and Kings Ferry nodes.

For surface water nodes with gaps the development of Preliminary Potential Surface Water Gap Management Practices need to start with identifying and verifying causes. The gap at Kings Ferry appears to be associated with regional agricultural surface water use, primarily in Bulloch County and upstream surface water use on the Canoochee and Ogeechee Rivers. The Coastal Council might want to coordinate with the Savannah-Upper Ogeechee Council for Eden node demands.

Note that some of our upstream Councils have observed these rivers have historically gone dry. The flow regime is based on unimpaired flow (natural flow without human impacts). The models look at whether these low flow events occur more frequently or for longer duration, which is a gap that the Councils will need to close. If human uses make critical dry year periods worse, then Councils need to address those critical dry year periods. There was some question on how the data were collected and information modeled, especially as it relates to agricultural ponds. We recognize that there may be data limitations here and improvement and more detailed characterization of gaps may be considered.

The PC then presented an observed flow hydrograph that showed the number of days in dry years when flows were less the 5 CFS on the Canoochee. From the data it is clear that there has historically been very low and 0 flow periods, the 1950s in particular, but starting in the 1970s it is apparent that the frequency of low flow days seems to increase. This is a way to say we are seeing more frequent dry periods. Addressing these low flow periods may require more than one type of management practice and one of the management practices that Council has available is to recommend additional data collection and modeling to determine if these gaps are in fact present for the indicated years and at the level of magnitude modeled in the resource assessment. Council can recommend additional data collection, but we should also consider practices we can help close the gap.

The PC and Council then discussed additional information regarding the Eden node, Claxton node, and Atkinson node and provided an overview of gap and preliminary, potential management practices.

Finally the PC mentioned the difference between gaps related to demand shortages (insufficient water to meet full water supply for off stream uses) and the flow regime shortages which are shortages to instream flows.

CM – At the Gross node on the St Mary's where we're saying there are no surface water problems there – are we thinking about how the St John's Water Management Districts (SJWMD) may use water from the river which could cause gaps?

PC - As I understand it SJWMD is undertaking an Integrated Water Resource Planning effort. One of the practices they may consider is the use of the St Mary's river. We wouldn't recommend commenting on their planning process through our planning process. We don't know if or when there might be a gap. Nevertheless, for the Coastal Plan there are certain assumptions that have been made about the use of surface water– it may be worth noting that conclusions regarding the gap at Gross do not include future withdrawals by SJWMD.

CM - Has there been any consideration on the withdrawal and discharge from Plant Washington on the Oconee? Is that going to impact low flow if we have another 10 MG coming down the stream every day?

EPD – We haven't run any simulations to that point, but it's a good request to ask.

PC – If groundwater is being developed and returned to surface water – or interbasin transfers result in new return then this may change surface water quantity and quality which could be neutral, positive or negative impact.

CM - We need to identify stakeholders and talk to them about issues. Include interest groups.

The PC and Council then discussed water quality including parameters that are most frequently exceeded in some areas – dissolved oxygen (DO), fecal coliform bacteria, Trophic Weighted Residual (TWR) for mercury in fish tissue. It was noted that the Total Maximum Daily Load (TMDL) process for the Savannah River is also going on. It is recommended that Council support the bi-state stakeholder process and acknowledge that this is the type of "triggering" event that we may include in our plan. Specifically, if the bi-state process is successful, then the TMDL moves forward. If it is not successful, then this may be an event that "triggers" revisiting this planning assumption and additional action would need to be covered by future planning.

The PC reminded the Council of the Watershed models for nutrients (nitrogen and phosphorous) for the Savannah and Satilla Watershed and asked the Council; Do you want to be proactive in generating management practices for nutrient standards that might be coming? It will be important to include something in the plan to help advance non-point source practices for nutrients.

The PC then described the specific material in the handouts highlighting an example of one county level set of results and made the following points:

Permitted results need to be viewed with caution they are not facility specific. They show overall permitted status in relation to overall forecast and are provided to give a general overview of how cities and counties sit in regard to ultimate needs and what is permitted to date. Note that this doesn't necessarily mean that a city has what they need – it may be one permit in a county that has permit capacity and another city doesn't. This is the balance between regional planning, county level planning and more detailed studies as required for municipality water/wastewater master planning (not part of this effort).

CM - We need to include a glossary of terms when this becomes a public document.

CM – Do all Councils have this level of information? No – we have prepared this for Altamaha, Suwannee-Satilla, and Coastal as a means for digesting the bigger picture. Please recall that the resource assessments were completed on an aquifer basis, planning node for surface water, and reach level for streams with discharges – so results in the final plan will be on a more regional level to be consistent with the resource assessments.

CM - I noted that in regard to population projections for the region – Statesboro and other counties in the region seem to be increasing in growth. Is that factored in? Yes – that's where we used the current population and water use to derive a water use per person. We took that with forecasted population and water use to get water use you see.

CM – I realize more detailed information can be a lightning rod, but I think it's better to have more information. Without the data, there isn't as much trust.

CM – Please clarify, the detail that is provided is a powerful tool and it seems the information that was used to draw this tool together would be very useful for counties and municipalities in the future. Will this level of information gathering continue so that at this particular point in time and future planning efforts, we have the opportunity to adopt some standardization to adopt data collection practices so planners can use and improve on the information?

PC – For each of those action items in your handout where we want your input, data collection can be a recommended suggestion so that we can standardize collection and presentation. We used the best information we had for this planning effort and it wasn't always readily available and easy to interpret.

CM - If we're ahead of the curve in our detail, are we going to have to dumb down our information to match the rest of the state?

PC - The water plan will be Coastal Councils plan. The main body of the plan will be similar to all Councils. But the two background documents – Interim Forecast Report and this handout will become the gap analysis technical appendices and we will capture our detail in these documents.

3) Management Practices - Develop and refine management practices to address water availability and wastewater needs and gaps

The Council was then provided about 20 minutes to review and discuss the information with other Councils in an informal work session. Following this discussion the full Council reconvened.

Chairman – It seems to me that some of the most important work by Subcommittees is to discuss possible management practices. Look at the bulleted lists and discuss some of the management practices that were thrown out for discussion. Some are as generic as developing additional surface water supply and some are more specific. Should we be more consistent and specific where we can?

PC - Yes that makes a lot of sense. Our next effort is to look at a thorough list of management practices and take the larger list and narrow down to most implementable and effective practices and get at a shorter and more detailed list. As you all know in regard to salt water intrusion there are State-to-State discussions with South Carolina and therefore we are not sure how our thoughts on management practices may mesh with that effort which will not conclude until after the plan needs to be written. As we discussed a valid approach is to "bracket the issue". If no additional groundwater would be available, what would be the best means to address future needs? If more is available, what would be the best means?

CM - Under bullet number 1 – is that groundwater gap for the region or is it at a county level?

PC - Council has a lot of flexibility to talk about whether or not – given the uniqueness of yellow and red zones – you want to focus at the County and Sub-county level as well as the region. If there are some nuances you want to look at in terms of smaller scale, that is possible. Clearly in Effingham – you need to look at sub-county level because of the red to green zone transition. However, please remember the Groundwater Resource Assessment was completed only at the aquifer level. In the case of salt water intrusion, this topic is evaluated with the CSSI model and specific sustainable yield metrics have not yet been fully developed. This will be part of the ongoing work of the Bi-state stakeholder group.

CM - In the region, there are areas that can deal with surface water to deal with shortage, but there are other areas in the region that don't have surface water. If we're looking at these gaps and management practices, we need to look at what is feasible and reasonable to use – county by county. List of practices need to be regional, but implementation needs to be county.

CM - I noted that the Coastal regional supplement for stormwater is not included in either of the management practices. We need to add information on this as these plans are coming on board now.

CM - There is also a product out there that they take detention areas and make them percolate into the ground so as to avoid downstream problems – not sure that is a viable thing – overflows from storm into aquifer without putting in well.

CM – Where is the backup data for these charts? In regard to groundwater withdrawals and surface water uses, is this correct for Chatham? I thought groundwater withdrawal in Chatham has drifted into the 50 MGD range for industrial. Surface water I&D plant is providing 24 MGD and this is showing 49 MGD. What is utilized from the I&D plant? CM – last year more like 30 MGD because my industries use is half of the amount from I&D plant to industrial.

PC – We can relook at this the data is from withdrawals and runs over several years but not from last year.

CM – It looks like on the gap analysis you're looking at permitted capacity. Need to look at demand gaps rather than permitted capacity.

PC - Yes, you are correct for determining demand needs we are looking at total need. In terms of how we will meet that total need we will look at three things:

1. Is there existing permit capacity available to meet some or all or the total need/

2. Are there any existing plans or projects that will be coming online to address some or all of the total need.

3. If after looking at 1 and 2 if there is a remaining need, are there some specific management practices that the Council would like to identify to help address this need and gaps.

A specific discussion may help. If we look at the forecasted groundwater need based on how supply has historically been met then in Bryan County, we are in the yellow zone and there is a forecasted need of 7.9 MGD; 4.39 MGD publicly supplied. Going forward using our bracket approach we can assume that a range of no additional groundwater would be available or some/all of this amount would be available. The "answer" is something between 0 (no more) and full use of the Upper Floridan; so the question becomes how would the Council like to see this in the management practices section of the plan.

There was a discussion regarding the results of a United States Geologic Survey Study and its conclusions. Some Council member(s) believe that additional groundwater withdrawal in some areas does not impact salt water intrusion on Hilton Head Island and indicated that this is confirmed by the study. A USGS study participant indicated that the study did not support the conclusion of no impact to saltwater intrusion.

The discussion then moved back to the original question: CM – seems to me that if we at least provide information documenting that there is a need to identify the groundwater availability in the area as well as proposed management practices then we can advance the discussion. Maybe adding this in the row on management practice and data needs that would support those questions would be helpful. If we can bracket this, and ongoing studies show that withdrawal in Bryan and Liberty don't have effects on salt water intrusion then we may have selected the "wrong" practices.

PC - This is a challenge that you have been wrestling with and our challenge is to try advance the regions planning on this.

CM - Although we don't know how much more groundwater could/should be withdrawn in the yellow zones, there are other resources available, such as the Lower Floridan aquifer. In my opinion we don't have a groundwater problem, we have a water management problem.

It was pointed out that the relationship between the Upper and Lower Floridan is another complex issue. USGS has studied how withdrawals in the Lower Floridan aquifer impact the Upper Floridan aquifer, focusing on leakage between the two aquifers. The study did not analyze potential implications associated with Hilton Head Island.

CM - To what extent are we willing to pump and cause an incremental impact on saltwater intrusion? One way to deal with this uncertainty is to bracket with different options – assume worse, assume best, assume something in the middle.

CM - A Council member that is on the South Carolina and Georgia Saltwater Intrusion Stakeholder group addressing recommendations to address salt water intrusion offered a summary of that process. There are 5 GA and 5 SC representatives. The group recently viewed a presentation some of which we're going to see this afternoon. The results are a culmination of 13 years of study. The group is going to look at how the aquifer is managed (backed with different what if modeling scenarios) can optimize water supply and resource protection. In this way we can take proactive steps to get us the result that we desire. It is interesting to note a statement that was made at a recent meeting …"the aquifer has been mined, it has not been managed. Now we're taking the first steps towards managing the aquifer".

CM - I want to again note that the more important issue is not permitted capacity, but instead based on sustainable groundwater that is available.

CM - In regard to the Savannah River at Clyo, Altamaha at Doctortown, and St Mary's at Gross; how much is available at these locations? If we're going to plan, then we need to know how much is available. Need to look at alternatives and balancing surface water and groundwater in the coastal region. We have a tremendous resource of water in the groundwater and everyone wants it. We also have I think significant surface water and I am concerned that someone might take the rest that is available. I want to be able to say, "I want to sell this." Without knowing the upper limit, we don't know how much is truly available.

PC - This request has been made and we will work with EPD to identify possible options. The challenge is that with surface water, arriving at just one number is difficult. Supply varies significantly within the year and between years and it varies depending on where you are in the watershed. What is available is also affected by instream flows, reservoirs, contractual and regulatory obligations and interstate considerations. The PC then encouraged the Council to focus on addressing the needs for the region and then worry about how it falls within the context of a statewide plan.

CM -Yes but from a synergistic point of view developing numbers on supply available will allow Councils to coordinate between those two Councils on projected needs between those two Councils. There is a potential shortcoming in the current approach that doesn't allow us to understand what that total capacity may be – even the ranges of it – making it difficult to work with states or other regions on any needs. For example if we have subcommittees working with another Council and through the process of planning see that we have another impact up stream that will affect our surface water, that will make us look at groundwater more closely. We need surface supply information as best as we can project it – understanding the caveats – in order to support coordination between regions. This type of information will be extremely useful.

CM - In some cases we talk about groundwater gap and using surface water and this dynamic varies geographically. Replacing surface water withdrawals with groundwater withdrawals in dry years may not be not practical. For example, in Bulloch County our highest agricultural county, to say to me as a farmer, I'm irrigating out of my pond using surface water but I should use more groundwater – I don't have a well, so that's a real concern for those of us that are in agricultural areas. I am also confused because you are saying we should consider replacing groundwater use with surface water.

PC - Good point and I will try to clarify. There is groundwater available in areas where there is a surface water gap specifically at Eden and Kings Ferry. If however you go to Chatham County at the Savannah River, there is surface water available where there may not be groundwater. The other piece to distinguish is that there are current uses and there are potential shortages in dry year periods. There are also forecasted future surface water increases so how we address future needs may be different than how we address current needs. So for future agricultural needs we could suggest looking to groundwater as source rather than surface water. Closing current gaps is more difficult because it affects current users.

CM - Bulloch County doesn't want to be handcuffed by anything that comes out of this Council in terms of agriculture.

CM - These are just the tough issues we need to address. Similar to Bulloch county, in the Liberty County area we're going to have to talk about water use there. These are the tough decisions we need to make.

CM - This also applies to shared resources – and need to talk about upstream and South Carolina.

4) <u>Guest Presentations – Mr. Spud Woodward, Georgia Department of Natural Resources, Coastal Resources Division; and Mr. Joel Fleming, Georgia Department of Natural</u>

Resources, Wildlife Resources Division – *Developing a deeper understanding of water resource dependant ecosystems in the Region*

Mr. Fleming began the guest presentations by providing information on freshwater resources; stressing how biodiversity in natural systems are related to diversity associated with the natural flow regime – which has periods of lows, highs and floods. Natural systems have a great deal of variability within years and between years. This creates habitat areas and connectivity between areas, provides for species interactions, and variability very important.

Mr. Fleming continued his presentation highlighting the following points:

Hydrologic variability and yearly flow variation including low flows that some rivers experience in extreme drought where there is flow that is only at or below aquatic subsistence flow level. However, species also need flow for other important life cycle function for exam flow conditions at higher flows support certain functions (i.e., spawning, recharge flood plain, exchange of nutrients, change channel morphology etc.). In addition there are different ecological species that benefit from different flow levels. Protection of low flows such as the 7Q10 is more of a subsistence level flow – 7Q10 is minimum required to assimilate waste. This is also minimum level that would allow for minimum habitat for short period of time. Subsistence flows provide minimum protection for aquatic life – maintains some key habitats – allow fish to swim freely.

Why would we need to go beyond subsistence flows? Base flows are typically higher than 7Q10 and can provide more diversity of habitat. High pulse flows are important for flushing system (silt and waste assimilation).

Mr. Fleming then noted some data on economic benefits of fisheries both recreational and commercial; including some of the fishing tournaments that attract people to the region. He also highlighted several species; including mussels, and mentioned that several species are fairly rare species.

Mr. Fleming presented some optional ideas about different flow options related to Georgia's Instream Flow Policy (three options for interim instream flow in Georgia: Monthly 7Q10, site specific instream flows, and mean annual flow options) and mentioned a few ideas to improve river flows including water conservation; return water near the location of withdrawal; direct withdrawals versus storage; identify high priority streams for conservation where environmental flows are especially important for the protection of aquatic life.

CM: It looks like data for the Altamaha shows 80,000 on peak and if there is a 7Q10, how much can you withdraw and not cause a detrimental impact?

Mr. Fleming - These things are highly complex – this is a very generalized presentation. What I'm trying to show is that if we equalize that water over time – we need variability in system. We'd lose some of the nutrients from floodplain.

For more information please see CM 7 presentation for the PPT slide presented by Mr. Fleming.

The Council thanked Mr. Fleming and welcomed Mr. Spud Woodward from the CRD.

Mr. Woodward discussed the Coastal regional water resources which are a combination of fresh, brackish and salt water environments. He emphasized the unique and sensitive nature of some of the rare ecosystems found in the coastal region. Mr. Woodward noted that if we deprive the estuaries of freshwater, you create a more salty environment than typically exists. Coastal Georgia is defined by barrier islands, sand beaches, open Atlantic Ocean. One thing that sets us apart from rest of eastern seaboard is 9 major estuaries including 350,000 acres of salt marsh and 150,000 acres of open water. Most of these resources have not been significantly altered since the European settlements.

Mr. Woodward describes the characteristics of an estuary noting it is a semi-enclosed body of water which has a free connection with the sea and within which sea water is measurably diluted with fresh water. Without the fresh water input, you have a lagoon or a bay. Key characteristic of estuary is salinity. Other characteristics are temperature, dissolved oxygen, pH, total suspended solids, and nutrients. Coastal Georgia has largest tidal amplitude south of New England in Northern Hemisphere.

Sources of freshwater for estuary include: river flows, groundwater (industrial and municipal discharges after water use through groundwater withdrawal), and upwelling of groundwater through geologic features. In years where rivers are flowing at low rate, we think that the groundwater coming up preserves the estuarine system. During drought, we found isolated areas where salinity had been diluted and the only reasonable explanation was groundwater dilution. We have also changed the nature of estuaries through dredging of navigation channels and the construction of jetties and other hard structures. Estuarine environments create diversity of life that is unparalleled in other portions of the state. Hundreds of species of animals and plants exist because of unique mixing of saltwater and fresh water. If the fresh water were removed, the diversity would change immensely from where we are today.

Strategies for organisms to deal with changing salt concentrations include: 1) use of physical processes to regulate salt content based on surrounding environment; 2) move to more suitable areas. When talking about streamflows, it's good to talk about the quantity of flow, but also when it flows. Persistent and widespread increases in salinity can alter estuarine ecosystems. This allows other species to come in that wouldn't otherwise be present (oyster drill, green-lipped mussel, hematodinium). During drought, the estuary gets salty – higher concentrations further inland. You can have higher than ocean salinity in the estuaries from water that gets trapped and then evaporates, leaving higher concentrations of salt. Blue crab for example cannot tolerate the increased salt levels and have declined in recent years. There was also disease that affected the blue crab. White shrimp, on the other hand, have been able to survive the droughts.

In summary Mr. Woodward made the following points:

- Most estuarine plants and animals are tolerant of wide variations in salinity but within boundaries
- Each species has different tolerances of change
- Mobile species have options for escaping unsuitable salinity – but at a cost
- Early life history stages are more vulnerable to changes in salinity
- The more rapid and greater the salinity change the larger the potential for negative environmental impacts

He also noted the following issues of concern:

- Potential for diminished flow in Atlantic slope rivers
- Changes in the timing and duration of flows in Atlantic slope rivers
- Poor understanding of groundwater inputs to estuaries
- Diminished groundwater inputs to estuaries
- Sea level rise

CM – You mentioned the flow of groundwater, are you monitoring specific areas of the state. Specifically, when Durango shut down did that have any changes?

Mr. Woodward - We didn't do specific monitoring related to this.

CM –It occurs to me that since the estuaries are somewhat more essential aspects to coastal Georgia, that somewhere between state and federal governments there ought to be a little more monitoring in order to determine the health of the ecosystem (DO and salinity).

Mr. Woodward - There have been some attempts to model this, but they are not to the point that they can be used for decision making. In the absence of having that, the take home message for y'all is the more you can leave, the better of it is. If we use wisely what we need for human needs, leave what you can in there. There is a degree of uncertainty we'll never know about.

Chair – I would like us to think about what we want to do with this information. As a Council, we have authority to decide what we want to be low flow. We've done that based on monthly 7Q10. Information from Spud and Joel suggests that we can also consider additional options. There has been a letter to Council chairs asking for them to consider other flow regimes.

CM – Maybe information on blue crab should become an appendix to our reports. This is unique to our Council. We're the only Council that has to worry about estuary health. We need to take this to the table when we start talking about joint resources.

CM - Has there been a significant rebound of the marsh since the 2001 drought?

Mr. Woodward: Yes it appears to be healing itself. The drought did show us our naïve belief that these estuaries are resilient. If we create increased salinity, then we'll impact the system.

CM - Once we have our identified best management practices we must recognize that no single entity can implement all the practices so two things should be considered: 1) have flexibility in what practices are implemented by specific municipalities/local government as many communities do not have the financial resources to implement all actions; 2) identify opportunities for state funding and/or pooling resources to address region wide implementation and/or leveraging of local funding.

CM - We may need to add the term estuary to the Coastal Vision and Goals and we should revisit this before we finish drafting the plan.

The Council thanked Mr. Woodward for attending the meeting and for his presentation.

For more information please see the CM 7 presentation for the PPT slide presented by Mr. Woodward.

5) Shared Resources Discussion

The PC presented draft suggested topics for joint meeting discussions. The Council discussed whether there was a need to meet with other Councils and determined that meeting(s) should be held in situations where:

- there are surface water gaps in the Coastal region and the surface water drainage area extends beyond Council boundaries and there are surface water demands both inside and outside the Council boundaries
- there are surface water quality issues in watersheds that are within the Coastal Council boundary and the watersheds also extend upstream beyond the Council boundary

The following Council members volunteered to work on the shared resources issues described below:

Surface water gaps at Eden, Kings Ferry, Claxton – Bill Hatcher and Fred Blitch

Surface water gap at Atkinson (if needed no demands associated with Atkinson within the Coastal boundary) – Roger Weaver

Surface water quality - Satilla River Watershed model – Roger Weaver and Keith Post

Surface water quality - Savannah River Watershed model – Larry Stuber and Michelle Liotta

Surface water quality - St. Mary's River (DO) – Roger Weaver

CM - Regarding the proposed statewide joint meeting timing is not good because we are stressed as a Council in drafting our regional plan.

CM - I like the idea of an overall joint meeting to discuss how the plans become a statewide plan.

CM - I would like to suggest the topic of how/what flow changes upstream will be impacting flows downstream.

CM - I would like to discuss how the region can sell water to other regions.

CM - What is expected of us in those discussions at this point? It seems that our inter-Council discussions are the main venue for our dialogue.

CM - It might be a good idea to suggest an alternate date for the statewide joint meeting.

6) Guest Presentation – Mr. Charles Sexton, Beaufort-Jasper Water and Sewer Authority (BJWSA)Management Practices and Water Resource Planning at BJWSA

Mr. Sexton provided an overview of the activities that historically lead to the creation of BJWSA and current and future actions and trends associated with water resource management and planning in their service area. He noted that the formation of BJWSA is a management practice. We were developed as a result of saltwater intrusion at Paris Island. Mr. Sexton then discussed two major initiatives they have undertaken; off-stream reservoirs and aquifer storage and recovery (ASR). He noted that their service area is 1500 square miles with a total capacity =44 MGD, and average demand of 19 MGD with peaks up to 32 MGD.

BJWSA has two reservoirs on/associated with their water supply canal. Chelsea WTP Reservoir 150 MG, Purrysburg WTP Reservoir 170 MG + 85 MG canal capacity. We realize the need for this additional storage when we were faced with a shutdown of our intakes following the upstream tritium releases from Savannah River site; we only had a one week supply! Now we have approximately 30 days of off-stream storage from primary/direct water supply.

In regard to ASR this allowed us a way to dampen our peak demand in order to defer building a new WTP. This is not the ASR that was proposed in Savannah a while back – we are not pumping in one location and withdrawing in another. We store water in wintertime and produce it in summertime. We are permitted to store 500 MG with 100% recovery (actually over 100%). We have monitoring wells to show it doesn't leave the property. 500 MG of storage is just over our property line and we have easements on the adjacent properties.

We are currently evaluating reuse ASR. Our effluent is meeting drinking water standards and we're looking at using that for peak demands. Current source water is the Savannah River water treated before it's injected. When it comes out of ground, all we add is chlorine. We have not had problems with other water quality issues that some ASR has experienced.

CM – Under what permit authority does ASR operate?

We have a permit which is an Underground Injection Control permit.

Overall BJWSD objective is to have a reliable, sustainable supply of water to meet the needs of the next 50 years. We have three major strategies: become water efficient (not conservation only, but also use water wisely), reclaim and reuse water, develop new water sources.

Another challenge we were faced with is that we could not discharge everything to estuaries. We have been discharging to golf courses – this is now reuse.

Going forward our long-term goal is to reduce demand day peaking factor from 1.75 MG to 1.4 MG by 2040. We are going to redefine our rates so that indoor water use is base rates and everything else a higher rate for water use. I think about 15-20% is the maximum you can get out of water efficiency as a management practice.

We've looked at deep water aquifers, desalination, stormwater reuse, Savannah River expansion with ASR, wellfields in northern Jasper County. Every one we have a price as to how much it will cost our customers. Finally we are looking at the potential to move our intake upstream on the Savannah River. It is currently mile 39 directly across from Rincon area. We're looking to purchase the land to move intake 7 miles upstream because of harbor deepening, and in case we see increasing salinity upstream if we experience sea level rise.

CM - The City of Savannah is well aware of this as well.

CM - If you were not in the region you're in with all of the golf courses, would you be making this investment into reuse?

Mr. Sexton - Yes – we couldn't discharge into estuaries, so we have to discharge to land disposal. Golf courses brought us to one point. Developers funded our reuse program to go to tertiary treatment so that we'd have unrestricted reuse product. Without that, our secondary system required buffers that were land restrictive. We're just beginning to recover costs on this investment. Reuse rate will be 80% of our water rate. We are a true regional water authority. We now operate Port Royal, Hardeeville, Bluffton, four military bases, plus Beaufort and Jasper.

CM - This is a topic we brought up in this room – what a regional water authority would look like in the coastal region.

7) <u>Current Water Quality Impairments</u>

The PC provided a brief overview of the proposed grant program to assist regions in addressing current water quality impairments. In order to help Council with this process and address current impairments the management practices subcommittee has been evaluating dissolved oxygen issues in relationship to current impairments. In addition the process of organizing listed segments will help Council get a sense of the status of existing impairments and how the Council may facilitate implementation of some of the TMDL plans.

The PC and EPD mentioned that EPD will provide up to $100,000 in non-competitive Section 319(h) funds to a specified funding recipient(s) in each Water Planning Region. EPD is making these funds available to encourage Council discussions about nonpoint source pollution impacts on water quality and to facilitate implementation of nonpoint source pollution management practices. These funds will be provided to a jurisdiction(s) identified by the associated Council to serve as a recommended eligible funding recipient. It was noted that there is an annual cycle of funding for the overall 319 Program from the Environmental Protection Agency and this process for the Councils will fit within that program. There will be up to $1 million in funding (up to $100,000 per Council) and the funding recipient (and partners, if applicable) must demonstrate implementation commitment by providing a minimum of 40% in non-Federal matching funds or in-kind services for use in completion of the project. EPD has prepared a guidance memo (provided to the Councils) to guide the Councils (and their planning consultants) in the selection of an implementable nonpoint source pollution management project to be included in their recommended Regional Water Plan.

8) Update of Coastal Sound Science Initiative Modeling Work – Dr. Jim Kennedy, Georgia EPD

Dr. Kennedy opened his presentation by noting that the USGS research and analysis of groundwater flow indicates that before there was any groundwater development of Upper Floridan Aquifer, the groundwater flow was from the land towards the Atlantic Ocean and Port Royal sound and it was an artesian aquifer system. With the long term development of the aquifer system, it was/is no longer an artesian aquifer system. Also, groundwater movement is now from the ocean and Port Royal sound inland toward the cone of depression. Today the groundwater flow is coming from the saltwater bodies down into the system.

As I have described in the past the model we are using is a Finite Element model and it includes almost the entire coastline of Georgia– into South Carolina and parts of Florida

and north up to fall line. The model configuration can concentrate elements in the area of interest, which happens to be Hilton Head Island and some of Savannah. There are multiple layers in the aquifer. We modeled the surficial, the confining unit, Upper Floridan Aquifer, confining unit, and Lower Floridan Aquifer and Middle Floridan Aquifer as defined by South Carolina Department of Health and Environmental Control SCDHEC) and South Carolina Department of Natural Resources (SCDNR). The boundary between the Upper Floridan Aquifer, confining unit, and Lower Floridan Aquifer was based on what was in play at the time of the modeling. There is a recent revision by USGS, but only affects nomenclature we had all aquifers represented in the model.

Once we achieved adequate calibration our goal was and is to use the tool to evaluate potential management scenarios for the aquifer. The first step was to calibrate to water levels and then to the historical movement of saltwater plumes within Upper Floridan Aquifer in South Carolina both for steady-state for water levels and transient conditions.

The model was considered to be adequately calibrated because simulated water levels closely matched water levels measured in wells and the model closely simulated when the salt water plume arrived at wells and the range of chloride concentrations at the well.

Under the base case – the modeled conditions continued movement of saltwater plume with pumping at rates used in 2007 model for 30 years. Then pumping was reduced in Savannah 50%, Hilton Head by 50%, and then both reduced by 50%. Even with pumping reduced by 50% in both areas the movement of the salt water plume doesn't go as far in 30 years as with no reductions pumping, but the plume boundary still extends past where it started in 2007.

We also looked at what would have happened if there was historical pumping in the Savannah area with no pumping on Hilton Head at all. We did project salt water intrusion in Port Royal sound and Colleton River. The plume hit the north shore of Hilton Head but didn't come to the blue line (2007plume extent). We then looked at what would have happened if there was only pumping at Hilton Head and not Savannah. The model showed saltwater intrusion. Not to the extent as with Savannah only, but the plume did come to the north end of Hilton Head and didn't come to the blue line. Our overall conclusion is that it took pumping at Savannah and Hilton Head to cause the plume at Hilton Head.

It is important to note that even with a 100% reduction in Savannah area withdrawals, groundwater movement is toward a cone of depression on Hilton Head Island and not toward the ocean. With 100% reduction in Savannah and 70% reduction and Hilton Head,

we would have a lower gradient, but still have saltwater movement inland towards the island. This showed us that even with severe cutbacks we do not restore the pre-development hydraulic gradient.

The USGS evaluated how long it would take to restore groundwater quality– if everyone turns off, how long to restore groundwater quality – if they simulated the plume in the 2004 base case even after 100 years it wouldn't have moved much. In other words saltwater plumes will continue to exist for 100s of years into the future even with no pumping. Once saltwater is in a system it takes a long time for natural gradient to move it out.

In summary Dr. Kennedy made the following points:

- Reducing groundwater withdrawals from the aquifer, even by large amounts, would not eliminate salt-water intrusion into the aquifer
- Groundwater withdrawals in both the Savannah area and on Hilton Head Island were needed to create the inland extent of the current salt water plume on Hilton Head Island
- Almost any groundwater withdrawals would cause salt water to continue to move into the aquifer and toward water supply wells
- Salt-water plumes would continue to exist well into the future even if all groundwater withdrawals were eliminated

Dr. Kennedy also noted that increased groundwater withdrawals in Bryan and Liberty counties. Shifts groundwater contours even on Hilton Head.

CM - Did you look at what would happen if we started aquifer recharge?

Dr. Kennedy - No

Dr. Kennedy noted that in regard to the Brunswick "T" shaped plume the mechanism is different in this area we theorize that the fracture systems allow hydraulic connection from deep salt zone upward into the Upper Floridan Aquifer as opposed to Hilton Head which is coming from the ocean.

For the Brunswick area we asked ourselves - What would happen if some of the Brunswick wells were turned off? The results showed that the wells that are pumping in

T-shaped plume are effectively capturing the plume. If the wells are turned off, the plume would be captured by the natural gradient and the plume would start to migrate.

CM – In regard to Savannah and Hilton Head and Bryan/Liberty County –could we simulate decreasing Savannah and increasing withdrawals in the yellow/green zone?

Dr. Kennedy - Yes, we could simulate the combination of decreased withdrawal in Savannah area and increased withdrawal in Bryan and Liberty.

CM – Now that we have the modeling tool are there resources (and funding) to run the model?

Dr. Kennedy - We do have a well calibrated model for water levels and saltwater intrusion. We responded to South Carolina comments with hope of getting an approved model and we are now at a place that South Carolina and Georgia both agree the model can be used to evaluate these discussions. The resources to run the model involve both man-power and funding.

CM – It should be noted that membership on the salt water intrusion committee from both Georgia and South Carolina adopted a broad resolution that we would like to manage the aquifer to a sustainable yield. We realize that we have not yet established what that means.

CM - If we are 180-feet below sea level in the center of the cone of depression. Can we bring the cone up to 80-foot level and then spread withdrawal out over greater area?

Dr. Kennedy - Theoretically yes, but you may have to pipe the water from far way.

Dr. Kennedy – This effort is a dual effort – GA EPD and SCDHEC / SCDHEC has undertaken modeling of the vertical intrusion of saltwater through the confining units. Everywhere in that cone of depression there could be effects of vertical movement through the confining unit. The plume may be affecting Georgia water supply sources, too. And the cone of depression may have an impact on that.

CM - It sounds like overall there is a big chunk of work to get results by the end of this calendar year – the ability to model Lower and Upper Floridan Aquifers and look at management practices. I am not sure we can do that in the way that is usable for our Councils plan. What are the expectations of the plan in terms of level of specificity and costing of the alternatives?

Dr. Kennedy – In regard to the study group and bi-state committee on salt water intrusion I expect that they will come up with scenarios and the two states will have to decide on comprehensive management practice. They may even decide to come up with a couple, maybe 3, and vet out to the public. Ultimately it will be GA and SC to decide on what to use and how to use it. Fortunately we have some overlap in efforts with Mark Smith, John Sawyer, Tybee Island, Effingham County, International Paper participating in the bi-state committee.

CM - In order to move the ball, we as a Council need to show what is a political reality rather than arbitrary modeling that might not be politically viable. Cost and willingness to cooperate will be critical implementation considerations.

CM - When we go to write the plan, maybe we should have a subset of the plan to address red zone/yellow zone or plan within plan and include a best guess as to what sustainable yield definition is.

CM - We may need a summit of every elected official in Liberty, Effingham, Bryan and Chatham so we can start educating our elected officials. Perhaps our PC can assist with that effort.

CM - It is becoming more clear that we will put up front – hard planning assumptions – we don't have all the answers but the information we have leads us to these conclusions knowing that this will likely change as ongoing studies get completed.

It was noted the bi-state committee will next meet the third week of September (15th or 17th) and first week of November.

9) <u>Water Plan Development</u>

The PC provided an overview of the next steps in plan drafting process highlighting the following points:

The format of the plan was initially focused on completing the general "template" information that was developed from the original strawman Table of Contents and preliminary draft language for Sections 1-5. The next challenge is to add Coastal specific issues and topics and completed Sections 5-8.

The PC then provided some examples of the criteria that will be used to evaluate the plan.

The PC mentioned that a next draft version of Sections 1-8 of the plan is due to EPD on October 15. The PC mentioned the Coastal drafting subcommittee has noted the tricky dynamics associated with concurrently doing our analysis and drafting the plan and emphasized that all of our work is dynamic and may change as we get new information.

10) Local Elected Official Comments

There were no local elected official comments.

11) Public Comments

Merrill Varn encouraged the Council to work with Florida on water quantity and salt water intrusion and include consideration of potential St Mary's River withdrawals by Florida.

Ms. Varn also had some specific suggestions on fecal coliform and current impairments.

12) Wrap-up and What to Expect Next Meeting

The Council agreed to hold the next meeting on November 3, 2010 in Midway (changed to Richmond Hill Midway EMC was not available).

13) Council Meeting 7 Evaluations

The PC distributed the evaluation forms and members of Council filled out the forms. The PC collected the forms. The meeting was adjourned.

cc: Jeff Larson, EPD

Coastal Georgia Regional Water Council
Council Members Attendance List

Coastal Georgia Council Members		**9/1/2010**
1	Dennis G. Baxter	
2	Fred G. Blitch	X
3	Chris Blocker	X
4	Kay W. Cantrell	X
5	Frank E. Feild	X
6	Rick Gardner	X
7	John F. Godbee	
8	William K. Guthrie	X
9	Duane Harris	X
10	Bill Hatcher	X
11	Cecily Hill	
12	Don Hogan	
13	Eric Johnson	
14	Michelle L. Liotta	X
15	Reginald S Loper	X
16	John D. McIver	X
17	Michael J. Melton	X
18	Randal Morris	
19	Phil Odom	X
20	Keith F. Post	
21	Tom Ratcliffe	X
22	Tony Sammons	X
23	Mark V. Smith	X
24	Larry M. Stuber	X
25	James Thomas	X
26	Benjamin Thompson	X
27	Bryan Thompson	X
28	Horace Waller	
29	Marky Waters	
30	Roger A Weaver	X
	Total	***21***

Coastal Georgia Regional Water Council
Public Attendance List

	Public Attendee	9/1/2010	Representing
1	Tim Barrett	X	GA DNR Fisheries Region VII
2	Kirk Croasmun	X	Bryan County
3	Deatre Denion	X	DCA
4	Charles Draeger	X	Garden City
5	Joel Fleming	X	GA DNR - WRD
6	Don Gardner	X	UGA CAES Coop Extension
7	Christi Lambert	X	The Nature Conservancy
8	Jason E. Mallard	X	GSWCC
9	Kelly O'Rourke	X	DNR-CRD
10	Charles Sexton	X	BJWSA-SRBAC
11	Bryan Snow	X	Georgia Forestry Commission
12	Jackie Teel	X	Chatham County - Savannah Metropolitan Planning Commission
13	Sonny Timmerman	X	Liberty County Planning Commissioner
14	Merrill Varn	X	St. Mary's River Management Commission
15	Clemontine F. Washington	X	Mayor City of Midway

Total 15