**Management Objective Two – Maximizing Returns**
**A Summary Report of Basin Advisory Committee Responses**
**Submitted to the Georgia Environmental Protection Division**
**By the Fanning Institute**
**The University of Georgia**
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## Introduction

The second management objective of the Comprehensive Statewide Water Management Plan, Maximizing Returns, focuses on three primary means of returning water to the basin of origin: 1) returns of water to the basin of origin by managing interbasin transfers; 2) the use of on-site sewage disposal systems; and 3) land application of treated wastewater where water quantity is limited. In seven Basin Advisory Committee (BAC) meetings held around the state between March 7 and March 21, 2006, discussions surrounded: the three main topics (interbasin transfer, septic systems and land application systems); the importance of integrating this management objective with the first objective, minimizing withdrawals; the need to define terms, such as "safe allowable consumptive use;" and the necessity of gathering the hard data and information upon which the prototype policy framework should be built.

Maximizing returns of water is an important issue for myriad reasons. These returns help maintain the flow volume and patterns that satisfy a wide array of instream needs and off-stream demands. The existence, health and diversity of native aquatic communities depend largely upon the quantity timing and quality of waters in these streams. Adequate stream flows are essential for assimilation of the waterborne pollutants that reach these waters through point and non-point sources, and much of the electrical power in the state is produced by way of stream flow directed through turbines. Adequate stream flows also provide water-based recreational opportunities.

Off-stream uses of stream flows include water supply for present and future demands, including water for industrial and commercial purposes as well as other economic development opportunities. As Georgia's population and economy grow in the decades ahead, many of these water based demands will grow as well. Maintaining stream flows and their attributes are important considerations as we seek to address both the instream and off-stream needs of the state. To that end, maximizing the amount, and quality, of the water that is returned to streams is of vital importance.[1] It should be noted that water quality issues will be specifically addressed in management objective four.

In addressing the Maximizing Returns management objective, EPD provided BAC members with materials to review as well as questions on the Prototype Policy Framework and the suggested Polices and Practices to Maximize Returns. BAC members also discussed local experiences concerning interbasin transfers, septic systems and land application systems. Following is a summary of the discussions held in the seven BAC meetings as reported to the

[1] Adapted from EPD's "Rationale for Maximizing Returns and Maintaining Stream Flows," BAC Discussion Packet 2, Maximizing Returns. The Discussion Packet and copies of all BAC reports may be found at www.gadnr.org/gswp.

Fanning Institute. This report captures examples of responses by BAC members and is not intended to fully reflect all comments. Full reports from each BAC are attached.

**Discussions on Septic Systems, Interbasin Transfers and Land Application Systems**

Numerous factors affect the flow of rivers and streams, however, there are a limited number that we can control.[2] Septic systems, interbasin transfers (IBTs), and land application systems (LAS) are within human control and therefore the focus of the discussions surrounding Maximinzing Returns. Septic systems, IBTs, and LAS all have their place in the overall process of water resource management. However, site specific parameters and conditions must be considered at the sub-basin level in the decision making and management processes. A broad, one-size-fits-all approach to management policy for these options is less than optimal and could potentially result in ignoring other viable options, as was discussed in more than one BAC meeting. Examples of comments from around the state on these three subjects are as follows.

Septic Systems

Use of septic systems for wastewater treatment occurs throughout the state. For many local governments, the cost of a wastewater treatment plant and the associated infrastructure are not economically feasible. In some cases, sparsely populated regions, particularly in the southern part of the state, make construction of a wastewater treatment plant in lieu of individual septic systems economically undesirable. Numerous comments were made about the reliability of septic, the responsibility of maintenance of the system, and the need to better document the location of septic systems. Following are representative comments from the BAC meetings:

- Soil percolation – systems are being put in inappropriate areas where the perk time doesn't allow for the water to be properly cleansed before it reconnects to groundwater systems;
- The necessary minimum lot size for septic systems should be defined;
- Need to know more about return rates from septic systems – the water does get back to groundwater or streams, we just don't know the timing;
- New development on septic should be ready to tie-in to sewer when it becomes available;
- Wastewater treatment plant capacity can be a factor in septic vs. sewer;
- State and local health departments do not have the personnel capacity to inspect septic systems;
- Need to limit development on septic in urban and suburban areas and Atlanta needs to get all homes off of septic and on to sewer;
- Some counties, such as Echols and Brantley are nearly 100% reliant on septic systems, as are parts of Clinch, Appling, and Jeff Davis. While these are only a few examples of

[2] Climate, stream/aquifer interaction, and ground cover/slope are factors beyond human control.

septic reliance, it must be noted that it isn't practical or feasible to sewer these and many other locations;

- Education for homeowners on the maintenance and care of septic systems needs to be done - some don't even know that they have a septic system; and
- Planning to retrofit high density areas that are currently on septic to move to sewer needs to be done now.

Interbasin Transfers (IBTs)

Many BAC members recognize the necessity of future IBTs and the fact that they are already occurring, such as Gwinnett County's withdrawal from the Chattahoochee basin with returns to the Ocmulgee basin. An important consideration is the need to return to the basin of origin water of the same quantity and quality. The timing and location of those returns will play an important role in the overall flow regime. Management of how and when IBTs take place will be vitally important to their acceptability. Comments from BAC members include:

- Need rules governing IBTs and a process for what has to occur for an IBT to be approved;
- Conservation and reuse should be maximized before an IBT is considered;
- Must be wary of potential abuses like trying to sell water;
- Equity and return of water should be considered;
- IBT policy should focus on no net loss or gain, a balance of transfers in and transfers out;
- Water should be returned to its basin of origin;
- Need to quantify current IBTs and their impact on current and future land use;
- Until we know all the facts on IBTs, we shouldn't be doing them; and
- Is desalination considered an IBT? At some point, utilizing desalination will become a necessity.

Land Application Systems (LAS)

Discussions on LAS varied from basin to basin in terms of its cost and effectiveness in treating wastewater. Frustrations were voiced in several BACs concerning the perception that EPD, once a proponent of LAS, now seems to be discouraging this treatment option. Others were concerned with the relationship of LAS and Total Maximum Daily Loads (TMDL) listings. Representative comments are as follows:

- A LAS is very much like septic – it takes time for the returns to be realized, additionally, a percentage is lost to evaporation;

- Water quality with LAS needs to be studied;
- Studies are needed on the percentage of water going back to surface water or groundwater and the timing of those returns;
- EPD needs to be consistent in their "preference" of LAS versus point source discharge for wastewater treatment;
- LAS is not a one size fits all – factors like rainfall, geology and topography have to be considered in determining if it is the right treatment option;
- In some parts of the state, the high cost of land makes LAS economically impossible;
- There is a high cost in converting from LAS to a treatment plant;
- The state should assume responsibility for LAS;
- LAS should have to obtain an NPDES permit;
- Conversion from LAS to plant with direct discharge – long term and expensive;
- Some use LAS because full treatment plant is not an affordable option; and
- Some areas have been abusive of LAS with runoff into ditches or sudden or very heavy rainfall that decreases treatment and increases polluted runoff.

**Prototype Policy Framework**

The Prototype Policy Framework, as described by EPD, has three key components:

1) Establish desired flow regimes in sub-basin settings;
2) Set "safe allowable consumptive use" for sub-basins; and
3) Manage interbasin transfers, septic systems and land application systems within sub-basins to conform to "safe allowable consumptive use."

BAC members were asked to respond to each of the components of the framework and to a series of questions: What aspects of the prototype are on target? What misses the mark? What are alternative approaches? The following comments capture the essence of the discussions held at each BAC meeting, beginning with responses to the key components of the framework.

*1) Establish desired flow regimes in sub-basin settings.*

- The variety of factors that determine flow regime are important;
- Including floods, pulses, and drought are important considerations as these are part of a natural flow regime;

- We need to have enough data available to determine flow regime, especially considering the reduction of gage stations due to budget cuts;
- Must avoid political influences in establishing flow regimes;
- Seem to be developing a one-size-fits-all approach when conditions across the state vary widely;
- Land use and its effects on flows must be considered;
- Seems to be a refinement of the interim instream-flow policy-so not a big departure;
- What kind of science is needed to support this framework and will it be available?;
- How do you say yes to a flow regime until you know what it will be, who will set it, what criteria will be used, and what effect it will have?;
- Establish desired flow based on needs of the river;
- Once we establish a desired flow regime, how do we not violate it?; and
- Careful in choosing the "years" of flow regime to mimic.

*2) Set "safe allowable consumptive use" for sub-basins.*

- How is "safe allowable consumptive use" defined and who will be determining this?;
- Would it be a varying scale for regions or an absolute for the entire state?;
- The inclusion of "safe" will be counterproductive and invite tremendous controversy;
- We don't have the capabilities to measure consumptive use;
- Consensus should be built around "good uses" of water and eliminate those that don't fit;
- The rationing of water that could be associated with safe allowable use could create conflict;
- Uses should be prioritized;
- Consumptive use should be defined in terms of the difference between what is withdrawn and what is returned;
- Once you've reached your consumptive use maximum, what happens- must all growth and development stop?;
- Allowable consumptive use allows for degredation of the water source; and
- Policy should not be "safe allowable consumptive use" but instead built around "no consumptive loss."

*3) Manage interbasin transfers, septic systems and land application systems within sub-basins to conform to "safe allowable consumptive use."*

- Can IBTs really be utilized?;
- Process must be bottom up/stakeholder driven;
- "Total" return of IBTs – must consider potential cost and the change of flow regime, particularly if an unregulated stream is receiving the return;
- Will the quality as well as the quantity of the returns be a management factor?;
- How much data do we have regarding returns to basin? – can't make good policy decisions without sound data;
- More research is needed on loss from septic and LAS – General Assembly needs to know that money is needed for data-collecting studies;
- Don't eliminate use of LAS in the plan;
- How will sub-basins be defined?;
- LASs do return to streams, therefore we must account for them; and
- Policy has to address instances where systems take water from one point and then return it at a different area or point in the water source.

*What aspects of the prototype are on target?*

- This is a good foundation – a point of departure, but concerned about excessive political influence;
- Like the variety of factors in determining flow regime;
- Support the concept of the plan but need to recognize duality of needs – to supply water for use by people and to protect the environment;
- Good framework and starting point;
- Good prototype – don't let it get watered down;
- Framework seems logical but moving forward without adequate data is a problem;
- Great concept but implementation will be difficult;
- Good start – flexibility is built into flow regime;
- A move in the right direction; and
- Framework is on target by talking about "historical flows" as long as we pick the right span of years (pre-1970 recommended).

*What misses the mark?*

- Needs to be something that speaks to a timetable or schedule on doing studies;
- Need a mechanism for finding funding for needed research;
- Launches us into a process to put us in a place where we will have a policy but not necessarily a policy related to actual facts;
- Doesn't say anything about land use and permitting being in compliance with management development;
- This type of management structure requires a volume of stream flow data – lack of data is a weakness;
- Must be some consideration of the drought management plan;
- Policy should be driven from bottom-up planning – not top down- currently would allow for excessive gerrymandering of human demand projections and substantial political influence on establishing flow regimes;
- Need to define sub-basins with a basin-wide mass balance established first;
- Setting a statewide policy without sufficient data is a dangerous course to take;
- Flexibility is needed as technology changes;
- Land use planning will have great influence on the outcomes- land use drives water use;
- Should have considerations for quality of life in overall framework;
- Cooperative regulatory framework is also needed for land use;
- Low water levels negatively impact organisms and aquatic life – this should be considered;
- Nothing accounts for populations and sustainability;
- It should include relevant federal policies and relevant federal agencies;
- Implementation of this "scares the heck out of me;"
- Lack necessary data to create target flow regimes;
- Need a better reference point for flow regimes – natural, historical, existing – what about regulated and unregulated?;
- Clarify terminology; and
- Consider how to resolve desired flows versus human consumptive needs.

*What are alternative approaches?*

- Start with the last consumer in the basin and establish a demand model from the end of the basin back up to the top;
- Need to consider the impact of impervious surfaces on returns;
- Consider reservoirs and catchments as part of the system;
- Impact on groundwater and small streams needs to be addressed;
- Look at "older" countries and how they have managed water;
- Manage growth and development;
- Look at Clean Air Campaign model;
- Need scientifically based research to fill in the blanks; and
- Establish minimum stream flows, look back and analyze streams under those conditions.

**Policies and Practices Related to Maximizing Returns**

There are numerous examples of existing polices and practices that could be adopted to maximize returns and to address potential flow impacts from the use of land application systems, septic systems and interbasin transfers. EPD identified four categories of actions and provided BAC members with examples of each. BAC members were asked to respond to these policies and practices by answering: 1) Which of these examples seems particularly useful for Georgia; and 2) Should specific examples be revised to improve their fit? The following tables introduce the categories, the policies and/or practices and representative responses.

| Category | Policy/Practice for General Consideration | BAC Comments |
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| Category 1: ***Require long term studies and monitoring to demonstrate returns to donor basins and assess long-term impacts on water resources.*** | For any activity that may result in loss of water from a donor basin, allow the director to require an environmental impact report that considers the impact of the activity of present and future water uses and water quality in the donor basin and that includes a plan to meet water supply needs in the donor basin for a minimum of twenty five years. (State of Connecticut) | • Science and studies should be done in both the donor and receiving basins;<br>• Is there an obligation to revisit new data that is collected?;<br>• Need a framework for the study;<br>• Valuable question, but lots of paperwork;<br>• "Any activity" seems overly broad, should be more narrowly defined;<br>• A monitoring process would be necessary. |
| Category 2: ***Establish permitting requirements or*** | Allow activities that will result in a loss of water from the basin of origin | • Needs to be some mention of reuse; |

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| ***standards for any activity that would result in a loss of water from the basin of origin*** | only when the activity is found to be necessary; is compatible with long-range water resource planning for the state; and is consistent with the state's water management goals as well as the state's conservation and development plans. (State of Connecticut)<br><br>Implement comprehensive watershed-based permitting that links water supply and wastewater discharge permits<br><br>To protect the natural resources impacted by the proposed activity, allow the General Assembly to attach terms and conditions to any permit that would result in a loss of water from the donor basin. (State of Oregon) | • What's the relationship between 'necessary,' 'planning,' and 'consistency'?;<br>• Just because it is 'necessary' doesn't mean it should be done;<br>• Loss from basin to vague<br>• Sewer systems are problematic, how would those be addressed;<br>• Why would I want to let the General Assembly establish any environmental requirements?;<br>• Should be a function of EPD, not General Assembly; and<br>• Remove politics from those decisions. |
| Category 3: ***Establish local and/or regional actions to phase out activities that contribute to a net loss of water from the donor basin*** | No EPD Recommendation. | No Comments. |
| Category 4: ***In areas approaching limitations on consumptive use, allow or require direct augmentation of stream flow in the basin of origin.*** | Allow water users to use reclaimed water to augment the flow of surface water systems. (State of Washington) EPA allows reclaimed water to be discharged directly for purposes such as 1) maintaining adequate flows for aquatic life; and 2) for downstream use. (EPA 2004) | • Why wouldn't we allow return of treated water to streams?;<br>• Need to further refine elements of if and when required – should allow choices to meet requirements;<br>• Doesn't seem to be any real benefit to this point;<br>• People are often adamant about not putting treated effluent back into streams;<br>• Stream augmentation is different than wastewater discharge;<br>• Is this just semantics?;<br>• Are there areas of the state that would benefit by augmenting streams with reclaimed water?; and<br>• Clarify "reclaim" and "reuse" definitions. |

| Category | Policy/Practice for Land Application Systems | BAC Comments |
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| Category 1: ***Require long term studies and monitoring to demonstrate returns to donor basins and assess long-term impacts on water resources.*** | Require any applicant for a land application system and/or the use of reclaimed water to demonstrate that the activity conserves water supplies, facilitates the indirect recharge of groundwater, and provides an alternative to discharging wastewater effluent to surface water (i.e. in areas where surface water quality is a limiting factor). (State of Maryland) | • Essentially being done now;<br>• Can't measure and monitor return flow with this method;<br>• Needs to be a balance; between quantity and quality;<br>• No more LAS permits should be allowed;<br>• LAS is not as effective as source point discharge at stream to maximize returns; and<br>• How do you demonstrate that LAS conserves water? |
| Category 2: ***Establish permitting requirements or standards for any activity that would result in a loss of water from the basin of origin*** | In areas where reclaimed water is available, prohibit the use of potable water for non-potable uses that are not directly discharged back to a surface water source. Examples of such non-potable uses include irrigation for cemeteries, golf courses, parks, and highway landscaped areas, as well as some industrial uses. (State of California)<br><br>Allow land application systems only in areas where there is 1) a demonstrated need for the application and where the LAS would offset the use of an existing or pre-determined water source (i.e. for irrigation purposes) or 2) a demonstrated water quality benefit of the application system (i.e. constructed wetlands).<br><br>Require that new land application systems be sited within the watershed or drainage basin from which the water originated. | • Look at this as a spray irrigation system;<br>• If I couldn't explain LAS as a benefit, how am I going to implement this?;<br>• Limit use of LAS;<br>• Same requirements for IBT should be applied for permitting because the same factors are in play;<br>• Third item is way too generic, needs to be a site specific review;<br>• Shouldn't be restricted to watershed;<br>• Should also consider TMDLs within basin and if LAS would be detrimental to that;<br>• LAS should fall under an NPDES permit; and<br>• Categorically opposed to LAS where ever they are. |
| Category 3: ***Establish local and/or regional actions to phase out activities that contribute to a net loss of water from the donor basin*** | Encourage or require that any new developments with dual-distribution lines (i.e. purple pipes for reuse water) be located within the watershed or drainage basin from which the water originated. | • Dual distribution in basin of origin only – no, not big picture enough; and<br>• Doesn't sound workable. |
| Category 4: ***In areas approaching limitations on*** | | |

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| ***consumptive use, allow or require direct augmentation of stream flow in the basin of origin.*** | No EPD Recommendation. | No comments. |

| Category | Policy/Practice for Septic Systems | BAC Comments |
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| Category 1: ***Require long term studies and monitoring to demonstrate returns to donor basins and assess long-term impacts on water resources.*** | For proposed developments using individual or community septic systems, require studies and analyses to confirm that the systems do not adversely affect water availability and public health or significantly degrade the quality and availability of ground or surface water now or in the future. (State of Florida) | • In place already, needs to be implemented;<br>• No more septic tanks should be allowed if we can't get a handle on where the water is going;<br>• No way to require individuals to do a study – must be done by the jurisdiction;<br>• Will put significant burden on cities and counties; and<br>• What threshold would trigger the need for these studies? |
| Category 2: ***Establish permitting requirements or standards for any activity that would result in a loss of water from the basin of origin*** | Create one statewide program for septic system regulation. Such a program could consider human health and environmental health conditions collectively.<br><br>In localities that provide public sewer services, only issue permits for septic systems in areas where public sewer service is not feasible. (State of Colorado) | • Not practical;<br>• Who determines what is feasible?;<br>• Have one program but understand that septic works differently in different areas;<br>• Need something to address septic density;<br>• Need funding for statewide septic program (education); and<br>• Permit fees should fund monitoring. |
| Category 3: ***Establish local and/or regional actions to phase out activities that contribute to a net loss of water from the donor basin*** | Encourage or require sewer tie-in for existing buildings or new developments within a certain distance of a sewer line. (Gwinnett County; Columbus, GA; State of Maine)<br><br>Encourage or require dry sewer in new developments.<br><br>Coordinate development and infrastructure planning and decisions. Encourage or require that local infrastructure or facilities plans guide | • We endorse a permitting system for septic to ensure maintenance, pump-out, etc with the fee assessed on property tax;<br>• Concern about installing dry sewer – by the time it is converted a dry system might be useless – requiring subdivisions to have a plan for when and how conversion will happen might work better;<br>• First recommendation may |

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| | decisions regarding future sewer service expansions, installation of dry sewer, etc.<br><br>Allow local governments to prohibit development on septic systems in certain areas.<br><br>Adopt and implement policies or local ordinances to prevent septic system failure. Ensure that owners of properties with septic systems monitor and regularly maintain individual or community septic systems to limit adverse affects on human health or water availability from ground or surface water sources.<br><br>In areas approaching limitations on consumptive use, require local policies or ordinances that increase use of sewer service. Policies can include septic moratoria or sewer tie-in provisions for existing buildings and/or for new developments | be problematic for communities with capacity limitations and no financial capability to expand;<br>• Fifth item seems particularly useful;<br>• Prefer encourage versus require in second item;<br>• Allowing local governments to prohibit septic isn't realistic as political realities would inhibit this; and<br>• How do you pay for tie in – developers don't want to pay for infrastructure. |
| Category 4: ***In areas approaching limitations on consumptive use, allow or require direct augmentation of stream flow in the basin of origin.*** | No EPD Recommendations. | No comments. |

| Category | Policy/Practice for Interbasin Transfers | BAC Comments |
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| Category 1: ***Require long term studies and monitoring to demonstrate returns to donor basins and assess long-term impacts on water resources.*** | Require any applicant for a permit that would result in an interbasin transfer of water to conduct an analysis of several concerns for the donor basin including, but not limited to: water for projected future needs; potential benefits of water lost from the transfer; correlation between ground and surface water and any harm that will result from the transfer; interference of planned uses; and alternative sources of water that would not result in a transfer. (State of Oregon) | • If we have a required report, will it be scrutinized or just rubber stamped?;<br>• Percent of water returned to the donor basin should be required for permit;<br>• Impact to receiving basin should be considered as well as impact to donor basin; and<br>• Add an impact fee to all out of basin transfers. |
| Category 2: ***Establish permitting requirements or*** | Develop a permitting process specific to interbasin transfers. | • Like the permitting process and emphasis on |

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| ***standards for any activity that would result in a loss of water from the basin of origin*** | Condition any water withdrawal or discharge permit that would result in an interbasin transfer on specific considerations. Considerations could include the water quality of the gaining basin and the donor basin, water quantity necessary to meet current and future needs of the donor basin (instream and offstream), and level of water conservation activities implemented by the recipient of the transferred water, among others. | conservation first;<br>• Like the conditions placed on IBT permitting;<br>• Look at integrating the tier system from objective one with these categories; and<br>• Makes a lot of sense to permit and track what water goes where. |
| Category 3: ***Establish local and/or regional actions to phase out activities that contribute to a net loss of water from the donor basin*** | No EPD Recommendation. | No comments. |
| Category 4: ***In areas approaching limitations on consumptive use, allow or require direct augmentation of stream flow in the basin of origin.*** | No EPD Recommendation. | No comments. |

**Conclusions**

As with the first management objective, minimizing withdrawals, BAC members repeatedly discussed the need for more data in this management objective, maximizing returns. While the BACs generally supported the policy framework, the need to fill in the gaps with scientifically based research is a high priority. It was difficult for the BAC members to look past the data needs and give full support to aspects of the statewide water plan, even with the understanding that EPD is aware of the needs and determined to fulfill them. As data is generated to flesh out the policy framework, and as work is done to define the terms, a higher level of agreement with this policy may follow.

The other overriding concern of BAC members was linking land use planning to water resource management. Members cautioned that, while land use planning is primarily the responsibility of local and regional jurisdictions, EPD must consider and incorporate local and regional land use planning into this, and other, management objectives.