Memo: ***Finding Best Practices and Peer Reviewers for Large-Scale Water Management Plans***
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To: City/County Water and Wastewater Study Oversight Committee
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I. Overview:

Why understanding global best practices, and finding peer review, are important when creating large-scale water management plans

Given the complexity and changeability of these times, when the climate is shifting, populations grow, our supplies of energy and water are decreasing, and the ecosystems we depend on are becoming degraded, it's vital that individuals and groups charged with creating large-scale water management plans become familiar with best practices in this complex field. Also, that they seek (and publicly share) peer review of their plans from local as well as international experts, when possible, in order to ensure that the hardest issues and those which are politically contentious have been adequately and transparently addressed, and that local work is placed in a broader context.

For some reason – a significant problem – by and large, discussions about sustainable water management in Arizona exist as if in a vacuum, at least at the level of public debate, uninformed by decades of work outside the U.S. Values, laws, idiom, methodologies – a holistic approach that's being created around us – to managing water in a time of mounting scarcity and climate change, for the most part don't form part of local dialogue. In part, perhaps, this is true because we don't believe major changes in our environment are imminent. An unspoken belief, central to who we are, is that we are exceptional – that our financial resources and technology will set us apart from other countries, enabling us to meet our challenges through spending and engineering solutions. These core beliefs are our Achilles' heel.

Perhaps the most important goal of large-scale management plans needs to be translating the reams of data which inform them into a few clear messages which policy makers and the public can understand. One of the dangers, in these exceptional times of change, is drowning in data and failing to summarize – to connect the dots - and by default conveying the sense that the world we're living in is much as it has been, and water management, as well as our private lives and habits, can continue as they have without perhaps significant sacrifice. The abundance of data obscures the scale of the problem as well as integrated solutions to it.

Other countries, like Australia and South Africa, are seen as taking the lead in developing new approaches to managing water in a time of scarcity because water scientists and water managers in these countries have taken a significant first step – changing core perceptions about this moment, and conveying to the public and policy makers two

important concepts. First: Nature is the base of human civilization, and if we are to survive, we need to conserve it (therefore, conserving water for nature is seen as the principle goal vs. as a luxury, affordable only after human needs are met). Second: these are exceptional times, requiring difficult tradeoffs and sacrifice. ***The importance for sustainable water management of being able to generate public understanding of and political support for these simple concepts can't be underestimated – they are the basis for all the complex plans, data and programming that water management in these changing times requires. But it won't happen if documents don't transcend data, aren't clear, and don't take a stand.***

In a recent article, "Wake Up: Here is What a Real Water Crisis Looks Like," about parallels between Australia and the Western U.S., international expert Peter Gleick speaks of the kind of major shift we need in the Southwest U.S., in how we view and manage water, in keeping with the international shift toward holistic management defined by sustainability principles underway elsewhere:

"This real [Australian] drought has, at last, led to transformational changes in Australian water policy – changes unlike the tiny, incremental modifications we've fought over in the Western U.S." (Gleick, Pacific Institute blog posting, July 2, 2009)

A first significant step towards our transformation in Arizona amounts to a public relations campaign. All documents about water in this state need to convey the singularity and urgency of this moment; that technology can help us, but by itself isn't a solution and can't substitute for maintaining the ecosystems which sustain us as healthy as possible; and the tradeoffs we will have to make will be much harder than they have been and will require sacrifice. *By creating acceptance for these ideas we begin to join a growing community of nations responding to this moment very differently than we are, and takes steps towards creating the political will we'll need to create substantive legal and policy changes regarding water.*

II. Preparation for this memo

1. Interviews via e-mail and exchanges of documents

I wrote to two Arizona water experts and seven international water experts with experience creating and evaluating large-scale water management plans, and familiar with what can be called the new holistic, or sustainable water paradigm. Different titles and methodologies are ascribed to this paradigm, including Integrated Water Resources Management, environmental flows methodologies, sustainable water management, and others. There are differences among them, and, as the times change, and as striking a balance between conserving water for nature, for basic human needs, for industry and for development becomes more challenging, terms are merging and changing. But all share a few fundamental properties described below.

The two Arizona experts I contacted are Kathy Jacobs and Dr. Sharon Megdal, and I exchanged notes and documents with the following international experts, listed below. All have participated in creating and advising large-scale water management plans and are familiar with global best practices in this field:

Jamie Pittock – an Australian who is the former head of World Wildlife Fund's freshwater program and who is knowledgeable about large-scale management plans throughout the world.

Dr. Jackie King – a South African aquatic scientist who for 20 years has served as a lead advisor about sustainable water issues for the World Bank. She's directed and participated in creating large-scale water management plans, including national water plans for South Africa, Tanzania, the Mekong Basin, and other areas.

Dr. Kevin Rogers – a South African ecologist with experience implementing South Africa's water law and creating management plans.

Katharine Cross - former director of the World Conservation Union's website about environmental flows and the sustainable use of water.

(I also wrote to The Nature Conservancy Director of Sustainable Waters Program, Dr. Brian Richter; Dr. Peter Gleick, of the Pacific Institute; Sandra Postel of the Global Water Policy Project; and Dr. Carl Bauer, of the University of Arizona, but didn't receive responses.)

I asked two questions:

Which examples can you give of best practices for large-scale water management plans – i.e., which countries and regions are taking the lead creating these plans, and why?

Is it possible to find peer review by knowledgeable experts of large-scale water management plans, to ensure that those who are creating these plans ask the hardest and most politically sensitive questions, and that the framework and methodologies they are using are in accordance to global best practices?

2. Reading

I read the white papers sent to my by the City/County Water and Wastewater Study Oversight Committee; Robert Glennon's *Unquenchable* (for its call for national water reform in the US); sections of six long documents forwarded by international experts; and references cited in correspondence. In addition to this memo I'll be sharing with the committee two of these items:

The Basin Plan: A Concept Statement, developed by Australia's Murray-Darling Basin Authority

"Wake Up, Here is What a Real Water Crisis Looks Like," by Peter Gleick

III. Research Results:

Shared concepts and understandings evident in large-scale sustainable water management plans, and answers to interview questions:

1. Water is the source of life. Any alterations to aquatic systems – rivers, wetlands, aquifers – will ultimately affect people, cities, and industries, as well as nature. Any proposed alteration needs to be measured, as rigorously and transparently as possible, in terms of its social, environmental, and economic impacts.

2. Consensus among diverse groups about the degree aquatic systems will be altered needs to be reached *before* alterations take place. Dialogue about proposed changes – including turning to new technologies to provide new supplies of water – needs to be rigorous, open, inclusive, and transparent, and when possible include outside peer review.

3. These are exceptional times and demand new ways of understanding and managing water. These times will also demand a strict new conservation ethic reflected in private lives, water laws and adaptive management strategies, often amounting to very difficult decisions and exacting trade-offs.

4. Best practices: Australia and South Africa are held up as examples of global best practices for large-scale water reform. National water laws in these countries which give the right to water first to nature and people have been translated over two decades into national, regional and basin management policies and plans. This represents a profound shift away from piecemeal legislation based on the belief that water isn't scarce and on engineering and high-tech solutions to address scarcity. (U.S. experts, like Robert Glennon, Peter Gleick, and others are calling for national-level reform, given that legislation and policies enacted by the states overall isn't working in this time of change.)

In both Australia and South Africa however it's been extremely difficult to implement laws and policies. The transfer of knowledge between aquatic scientists, trying to make a case for the need to conserve aquatic systems as not only the base of plant and animal species, but of human life and civilization, has been slow, mainly because it takes time to accrue the necessary political will to support nature when there's ubiquitous pressure to develop. In Australia, climate change is making it extremely difficult to implement management plans (Jamie Pittock, July 6, 2009). But ultimately the process of implementing sustainable management plans will be slow, because it requires a transfer

of new scientific knowledge into the public realm, and incremental progress shouldn't be seen as a sign that this new paradigm and related stewardship principles aren't working.

5. One of the most important questions when creating large-scale management plans becomes: At which level, or levels – national, state, regional, local - do legal, policy and management changes need to come from, and how will these changes overlap? **How will regional water plans, for example, be affected by state or national plans and changes which take shape?** Those who are creating large-scale plans, as well as policy makers and the public, need to be able to answer these questions. In Australia and South Africa national-level reform has led to corollary regional and basin reforms. These plans are linked and support and inform each other.

6. There's an awareness among scientists and water managers considered leaders in the field of creating sustainable water management plans that they're working in tandem with other countries, and are part of an international movement. No one advocates "one-size-fits all" solutions, but a lot of cross-pollinating takes place, and open sharing with the public. Peer review is actively sought, in which local experts bring in outside experts to create meaningful dialogue and provide monitoring. This in an important habit, or trait, integral to the science and policies which have been developed.

7. Peer review: Only one of the experts interviewed, Dr. Jackie King, suggested ideas for peer reviewers – pointing to a global need which exists to create teams of peer reviewers with experience who can assist the overwhelming number of communities, regions and countries undergoing the same process as southern Arizona. (Dr. King suggested that we turn to World Bank researchers who have written about best global practices for large-scale water management plans. I can share more, if there's interest.)

IV. Comments on City/County White Papers, and a Wish List for the Committee's Final Report:

Having read through the committee's white papers for Phase II, its Phase I report, and attended numerous committee meetings, I'm still uncertain about how the data adds up, as Peter Gleick says, into clear transformational change. I'm also unsure of what our core values are, underlying the need for change?

I know the process of writing it has yet to begin, but I have the sense that, without the single guiding principle which is the core of the international sustainable water movement underway – water for aquatic systems must be conserved, above all, so they can continue to provide for ecosystems over time and for varied human needs – it will be challenging to come into clarity. Conserving water for nature will be seen as a luxury, separate from human needs, and high tech solutions turned to, to continue to bring new water into our region. This single conclusion about nature first is the "north" for the global movement in water science and management underway.

Nor is it as clear from documents and meetings:

- That this is a new, unique, and potentially dangerous moment. To paraphrase Robert Glennon: At the local and also national level, we need to keep this crisis from turning into a catastrophe.

- What the top challenges are that we face, and how they intersect, such as the water/energy/climate change nexus.

- What our top solutions are, and their social, environmental and economic costs and benefits. Thinking through options that are often mentioned:
    - How much will we be able to advance towards sustainability through ***conservation*** initiatives? Will ***desalination*** be feasible? What are the true costs of utilizing highly treated ***effluent***, especially given the public health concerns about emerging contaminants, and that producing it is energy-intensive? We may have no other choice but to turn to highly treated effluent, but we need to understand what we're choosing. Can we continue to draw from the ***Colorado*** given that so many other areas are eying it as their solution? What role will ***water transfers and markets*** play?

- A sense of where our approach fits, within the global best practices for large-scale water management plans.

- At which scale, or scales, will change come from? If national and state policies are enacted how will they affect this regional plan?

- What is the ultimate purpose of this report and process – how will they help shape policy? Who will read the final report, and what will follow it?

Therefore my wish-list for the final report is the following:

1. That it state at the outset and without equivocation that this is a new moment in the Southwest, in Arizona, and in our section of the state regarding water, and explain why. (See the Murray-Darling plan's opening two paragraphs, under "Managing the Murray-Darling Basin.")

2. That it state at the outset that this new moment will require markedly new ways of understanding and managing water. These include:

- Placing our efforts in the context of the global movement underway, which embraces conserving water for nature as a means to protect the environment, but also, people and human enterprises.

- Rigorously and honestly questioning the social, environmental, and economic costs/benefits of top proposed new sources of supply. ***There's a lot we don't understand***

about our choices to increase supply and this uncertainty needs to be prominently mentioned.

- Wide-scale investment in creating a new culture of water, a new ethic – conservation, water harvesting, grey water use, etc.

- Address the scale, or scales, at which meaningful change will need to come from, and how will these scales overlap? This includes the need and potential for national and state legal and policy reforms.

I also feel that it's vital to turn to countries, like Australia or South Africa, which have struggled to implement this new approach to managing water over decades, and to entities, like the World Bank, which has published numerous global studies of best practices, and find peer reviewers for the committee's report and process. (It's striking that in order to publish an article in a top scientific journal, writers have to undergo peer review but plans which can affect millions don't have to submit to the same scrutiny.)

A last note: That the two countries that have taken the lead facing water scarcity with management policies and laws based on sustainability principles are having so much trouble implementing change should be seen as a caveat. Even under the best of circumstances, with sound principles and plans in place, the amount of upheaval the planet is experiencing is creating enormous challenges. Above all, the public and policy makers must understand *this*, in order to prepare people for a time of sacrifice.