TRANSCRIPT OF OCTOBER 2, 2008

List of Presenters:
1. *Sharon Megdal: Water Resource Availability In The Tucson Active Management Area*
2. *Chris Avery: Tucson Water 2050 Plan Update*

PRESENTER #1
SHARON MEGDAL, DIRECTOR, WRRC: WATER RESOURCE AVAILABILITY IN THE TUCSON ACTIVE MANAGEMENT AREA

VICE-CHAIRMAN MARCELINO FLORES: With no further announcements, I believe we can get into our - our presentations. We have Sharon Megdal coming before us again. I think this is her third time here, and so without any further ado.

MS. MEGDAL: If you don't object, if I can get this out of here. I'd rather kind of stand over here, so my back isn't to the audience. Is - is that okay with everybody and -

VICE-CHAIRMAN MARCELINO FLORES: There - there's a presentation mic available up here if you're . . . if you're hidden.

MS. MEGDAL: Well . . .

UNIDENTIFIED SPEAKER: It'd be easier for me, Sharon, I'm looking right through everybody's heads.

MS. MEGDAL: Okay. I can do that. I didn't see that one up there. Different room. Oh, okay. All right. This is much better.

MS. MEGAL: So, good evening. And, yes, it's Sharon again, but talking on a different subject than before. And I do appreciate the opportunity and the invitation to appear before you. And what Jim Barry asked me to do was talk about a study that I did over two years ago on Water Resource Availability for the Tucson region.

And if you've had a chance to flip through the - the Power Point slides, you see that what I'm going to do is actually go through the assumptions that were behind the spreadsheet analysis that I did, because many times it's said that nobody's talked about how much water' s available to the region. How much water do we have that we know we have and

might use? And this study attempted to look at that.

And, as you'll see, what I'm going to go through, the details - and I have to admit, I haven't even looked at all those footnotes and found some editorial typos in them - but, what you'll see is, when I did the study, I attempted to detail every single assumption made so that, number one, if anybody wanted to check the numbers, they could. And, number two, if things change over time, which they always do, you know, you could just slip in different numbers, and so forth.

So, I'm going to go through that and - but, let me just give you the context and tell you about the study. It is available online on our Website; it's about - the main text of it's about 40 pages and then it's got some appendices. And it really was attempted to - it - it was done in an attempt to answer the question of: If we use the water that's known to be available to the region, how many people can be supported by that water supply?

And this - there was great interest in the analysis. And I actually went back to my little tally of presentations and counted up - I was surprised - over 25 presentations on this, or at least partly on this, sometimes this was mixed into something else. The area of focus was Metropolitan Pima County, not the full Active Management Area. And one of the things that's very important to point out is that, for the most part, I use numbers that came from existing projections and plans. Where I modified those, I was very explicit about that.

So, for example, I used the PAG population projection for 2030 because, if I used something else, then people could argue, "Well, your population projection is off," and you get into an argument about that. This is the official population projection at the time, and 2030 was as far out as it went. So, that's as far out as this analysis went.

A lot of it was based on a look at the Tucson Water 2050 Plan, as released, and what was in existence at the time, and other plans and - and reports, including, at that time, Pima County Wastewater Management, as it was known at the time, was going through a Long-Range Plan and estimation of numbers and figures for the amount of effluent, and even within a few months, when I made a presentation at the Water Resource 's Research Center, somebody said, "Well, that number's too low; it's already been outdated." So, again, the - the exact numbers would vary, depending upon the point in time.

One of the things that I did insist on, when I agreed to do this study, was that I needed to provide the regulatory and institutional context. Well, you've been getting a lot of that over the last many months, so I'm not going to spend any time on that. Certainly, if there are any questions, I'd be

happy to answer that. But, whenever I make presentations or do analyses, I always want to do it in the context of the - the regulation and institutions that govern decision-making. And the - these are simple spreadsheet calculations, and - and nothing more than that.

The study was funded by a consortium led by the Pima - Metropolitan Pima Alliance; it was about a $30,000 study. The reason I'm telling you that is you look there was a consortium of community and business groups that funded it, and we had an Advisory Committee that worked with me on it. Kelly - I don't know that Kelly was able to make it from the Department of Water Resources - Kelly Mont Le Croux (ph.), who was a Planning student at the time, was my Research Assistant, and I had full control of the final content. So, I got input along the way, but the final context, including any errors, are - are my responsibility.

And the spreadsheet computations really looked at water availability for people; it wasn't a Safe-Yield analysis; it doesn 't include agricultural and industrial mining use of water, nor environmental demands for water, and we can talk about that later if you wish. I just wanted - the one institutional context I'll put up for you is the map of the Tucson AMA, with which you're very familiar. And just a reminder, this study focused on Metropolitan Pima County. As you know, the bulk of the - of the population of the County is in Metropolitan Pima County.

The Tucson AMA, however, you know - as you know, extends partly into Pinal County, some areas that are - are growing very rapidly, a tiny bit into Santa Cruz County where there isn't much population. And so at times there is not a perfect coincidence or matching of area of the numbers. Sometimes, like when we're taking things from the Active Management Area Management Plan, they're AMA-based, other times they're County-based, but that's about the best you can do when you do this kind of analysis.

Just wanted to point out that the context for the 2050 Plan was the one that was released at the time. Chris Avery will be providing an update today, and it's been updated numerous times, but remember this was done in the summer of 2006, and this is what the - the key figure for the Plan looked like at that time, and I - I pasted in this - this was the assumption about per-capita water use for the Plan period by Tucson Water, which was 177 gallons per-capita-per-day, including all community uses. And, as we get into the assumptions, I used - you'll see that I used lower numbers than in the - in the Plan.

And the other thing I wanted to just point up - point out in context was we - we looked at CAP water available to the region. This shows the non-Indian water available to the Tucson AMA, user existing CAP allocations; these were the pending reallocations, which - have they been finalized? Anybody from - Chris? Yes, they have finally been finalized, but they were pending at the time. So, this was the total for non-Indian water. This was the total for Indian water, and a grand total at the bottom. And, as you'll see as I get into the analysis, I did not assume that the municipal use in the region would make use of any Indian water, so you'll see that's one of the assumptions.

So, this is the spreadsheet and Sandy, or whoever, has - has that. We're not ready to do the escape yet. But, what I'm going to do is talk about the assumptions behind it, and then come back to it, and I think the Staff here have indicated that they will post this one slide in Power Point version, as opposed to pdf, and you'll see behind it is a live spreadsheet. So, if anybody actually wants to go in and play with the numbers, you can do that.

So, I want to go through it I want to just highlight - I'm going to - I put these arrows kind of by what I consider some of the key numbers that determine the output, you know, the output of any spreadsheet or analysis depends upon the inputs. And so, obviously, the PAG population projection is very, very important.

Clearly, there are a lot of uncertainties about effluent utilization, and I had a couple different scenarios included in the analysis that I'll talk about momentarily. And then what you assume as the total gallons per-capita-per-day for the community. And, as I pointed out in the Tucson Water Plan - and remember this is community wide - the Tucson Water Plan focused on Tucson Water Service Area. So, everything is incomparable here; this was not meant to be a replication by any means of the Tucson Water 2050 Plan, but it's a - it's a point of reference. We did - I did some calculations here with 165 and then with 150.

And so I'll go through, basically, what the calculations were and then go through the details. And so we looked at the population projected for 2030, which is about 1.5 million. And just, again, for point of reference at that time, the most recent estimate was for 2005 at just over 900,000. We know that's increased considerably since then.

And then I tallied up the water supplies available in acre-feet, and so this line here is the Central Arizona Groundwater Replenishment District amount that they are projected to have to replenish in their Plan of Operation in the

year 2030. And, again, I 'm going to go through the - the - the detailed assumptions in just a minute.

There's certain groundwater that is allowed to be used, according to Department of Water Resource's regulations. There's allowable groundwater that's allowed to be used by designated water providers, you know, there's an allowance in there. There's exempt well groundwater that's allowed to be used, and that was quantified. The undesignated groundwater - water provider groundwater use. Basically, if you're not designated, you can use groundwater to serve the existing pre-'95 population indefinitely. And these are all numbers that were taken from various reports from the Department of Water Resources.

Then there's the question of the effluent, and I want to come back to the assumptions behind that. And I separated out the effluent that's under the control of the water providers in the County from the effluent that's under the control of the Department of Interior through the SAWRSA settlement. And then you'll see I have a couple of different scenarios where you' re assuming you use all that's available and half that's available, and the half is an arbitrary assumption; it was just what if it's less? And then these are the numbers for the municipal and industrial Central Arizona Project water, including those pending reallocations, which were fairly certain.

And so if you tally all those up, you get a total annual supply in acre-feet. And then, you know, an acre-foot is approximately 326,000 gallons. If you multiply this number by the number of gallons, you get this humongous number, but all of our minds work in different ways; it was easier for me to work in that number, and then divide it by how much you assumed a person used on an annual basis. So, you take the 165, you multiply it by 365, and then you divide this big number by that number and you get a population that can be supported under those assumptions by that water supply. So, if you have this much supply in acre-feet, you assume that community use, including all uses, and all service of municipal water providers, which can be commercial/industrial - this isn't per household use - this is total community use on a per-capita basis, you get that this many people can be served by the population.

So, the key outcome was what is the scenario population? And, obviously, if there's less water, the population that can be served is lower. And in - in this side, if you assume more efficient use, less use per-capita, then there's going to be more people that are able to be served by an existing water supply.

And then just because, again, these numbers all get big and what do they mean? Is if you take a ratio of the scenario population to the projected population - and that's greater than one - that means that you have some room to grow, you know, that - if - if it were just one that would say that the water supplies are exhausted by that projected population by 2030. If it's greater than one, obviously, you've got 2.1 million here, and 1.5 million there, the water can be stretched over more people. So, this just gives you, to me, an easier way to look at some of the different scenarios and look at how close do you get to one, if you fall below one, that means you're kind of bumping into your water supplies sooner.

So, before I go on - if it's okay Mr. Vice-Chairman - to see if there are any questions, because then I want to go into the assumptions in a little bit more detail. I'm trying to go quickly 'cause - easily can take a lot of time going through this.

VICE-CHAIRMAN MARCELINO FLORES: Well, we have - sorry - we have - is this on? We've usually waited for after the presentations, both -

MS. MEGDAL: Yeah.

VICE-CHAIRMAN MARCELINO FLORES: - presentations for questions.

MS. MEGDAL: Yeah, I'm just asking for any questions of clarification at this point; otherwise, I'm just going to keep rolling.

MEMBER ROB KULAKOFSKY: I just have a quick question.

VICE-CHAIRMAN MARCELINO FLORES: Rob?

MEMBER ROB KULAKOFSKY: Okay. Just a quick question. On - on one of your slides you show like the - it' s the Tucson Water Recommended Plan -

MS. MEGDAL: Yes.

MEMBER ROB KULAKOFSKY: - 2004; it says - it has an average of 177 -

MS. MEGDAL: Uh-huh.

MEMBER ROB KULAKOFSKY: - total water use, and you are assuming either 165 or 150. I didn't really quite catch the rationale.

MS. MEGDAL: Well, it - it was felt that - that maybe we could be a little bit more ambitious in our assumptions about conservation potential, knowing that, as you grow over time, housing stock changes and we're going to become more efficient in our use, and - and so it was attempting to be a little bit more aspirational in term of - in terms of community use because of conservation, but it's just an assumption.

And, again, you'll see in a few minutes there is a case where I assume it to be 175, which is exactly, or almost

exactly in that. But - and, again, remember that this - that was Tucson Water's Plan. This is meant to be community-wide, and we know there 's growth occurring and, you know, low-flow fixtures and all that kind of stuff, so -

MEMBER ROB KULAKOFSKY: Okay.

MS. MEGDAL: - you know, again, you can argue about any of the numbers and say, "Why not this or that?" and they are just assumptions, and so you can look at - you can see the scenario, the sensitivity to - to these numbers as - as I - I go through this, because I did do some scenario analysis.

So, let me just go through -

VICE-CHAIRMAN MARCELINO FLORES: Okay. Were - were there any other questions for . . . ?

MS. MEGDAL: Oh, I'm sorry.

VICE-CHAIRMAN MARCELINO FLORES: Bruce?

MEMBER BRUCE GUNGLE: Sharon, you said that - you indicated that you were not dealing with the AMA, you were dealing with more Pima County Metro Area, but then the only geographic slide you showed was of the AMA. So, I'm a little confused of what the boundaries were -

MS. MEGDAL: Well -

MEMBER BRUCE GUNGLE: - for the study.

MS. MEGDAL: - my - my purpose in pointing that out was that certain numbers are reported only on an AMA basis in reports, like, from the Department of Water Resources, and there wasn't - I mean, we weren't going to go and dig into numbers that were from the Third Management Plan and try to separate that out. So, what I was pointing out is that there's not a perfect correspondence of every single number to the County, and that's really what I was trying to point out there.

MEMBER BRUCE GUNGLE: Okay. Thank you.

VICE-CHAIRMAN MARCELINO FLORES: If I can ask a question. The - the gallons per-capita-per-day numbers, what was - what is the actual number? How does it compare to Phoenix and - and nationally? How does that compare in the GPCD?

MS. MEGDAL: Oh, that might be a better question to ask the Tucson Water Staff when - when they come up. I do know that Tucson Water's numbers are looking lower, I think, than they were at the time of the Plan as well. Maybe Chris can -

VICE-CHAIRMAN MARCELINO FLORES: Yeah, and I know -

MS. MEGDAL: - answer that.

VICE-CHAIRMAN MARCELINO FLORES: - we're better than Phoenix, so . . .

MS. MEGDAL: Oh, we're - we're definitely well below Phoenix. Phoenix is still over 200, isn't it, Mark?

MEMBER MARK STRATTON: I think it's like - the last time I knew it was 234 I think; it's a over, I think.

MS. MEGDAL: Yeah, and they've been coming down so, yes. Now, we're - we're - we're looking pretty good. And I - actually, in the report, I believe we have a table that attempted to compare some western cities, but you never know in those reports whether people are really comparing apples to oranges. We took that from another report.

So, let me quickly go through this so not to take too much time. I already talked about the population projections. The first note by the asterisk, these calculations are meant to be illustrative only and I, you know, this is the kind of disclaimer, they're all based on assumptions, they're not meant to be forecasts, but they're meant to be illustrative.

The footnote 2, the CAGRD number, that does merit some - or warrants some explanation. The Central Arizona Groundwater Replenishment District - I - I think you've had presentations on it - they have to do a Plan of Operation every ten years. They submitted a Plan in November, 2004, and behind that Plan was a very extensive analysis - they called it "Outlook" - I think - "2003" - where they attempted to quantify what the projected replenishment obligations would be by individual member. And this is a case where we actually took a look at their numbers and - and their study numbers.

And notice that for certain water providers that really are anticipated to use the - the GRD for replenishment, there were often zeros. They listed it by designated water provider, and then they listed it by member land. And, in particular, the Tucson Water number was zero, and the contract that Tucson Water has with the CAGRD has an upper limit of 12,500 acre-feet of replenishment obligation. Tucson Water, at the time, was going through its redesignation exercise, so it all wasn't done and whatever, but both Tucson Water officials and ADWR officials indicated that it looked very likely that that 12,500 acre-feet would have to be included as replenishment obligation by the GRD. So, the number that's in the table, which is that 35,600 number, is the number in the CAGRD plan for the Tucson AMA, plus the 12,500 acre-feet for Tucson Water, so that is a place where I deviated from an existing Plan and documented that.

As I indicated, the allowable groundwater numbers are often various projections and estimates from the Department of Water Resources, so that takes you through notes 3, 4 and 5. And then Number 6, the number used there was based on the - the posted number at the time by Brown and Caldwell as part of the Long-Range Planning effort that was going on by - then known as Pima County Wastewater Management. And - and the number in the report deducted the output to the Non-Metropolitan Treatment Plants - no, it added the Non-Metropolitan, and then took out

the 10,000 acre-feet of Conservation Pool effluent, so that wasn't assumed; that 10,000 acre-feet of Conservation Pool effluent was not included in there, so that was not intended to go to people, and it wasn't included in there.

And then, as I indicated, the - the 28,200 acre-feet of effluent held in trust by the Secretary of the Interior for the Tohono O'odham Nation was separated out. And then I noted that there's great uncertainty about that number, and - and so it's like, you know, we could put in a zero for that number and see what the numbers look like, or - or some number greater than that.

Footnote 7 relates to the 28,200 acre-feet of effluent; it assumed that it would likely be used by municipal users in the Tucson AMA, and it always - that effluent was always expected to generate revenues to be used for the Secretary of the Interior to meet the obligation to the Tohono O'odham Nation. The Tohono O'odham Nation, over the years, indicated it did not intend to use that water directly, and so this is - this assumption is consistent with publicly-articulated expectations about the use of that effluent. However, it's possible the GRD might look to some of that effluent to meet its obligation. So, to the extent that the GRD is using that water, there could be some double-counting, if you assume the GRD is going to find it's 35,000, plus you've got that 28,000. So, again, I tried to be as explicit as I could as to where there were potentials for double-counting or, you know, uncertainties.

And then 9 and 10 are just calculation assumptions. And then 11 was just clarifying that - that the gallons per-capita-per-day is - includes all customers and water sources served by municipal water providers and, for example, if - if golf courses use effluent or reclaimed water, that - through a municipal water system, that's included in - in that figure; and then, of course, conservation would affect that number. And then the last slide is just the - the - the assumptions about the calculations.

So, Michael, is it - maybe we could just very quickly - and - and I don't have that many more slides - I just wanted to show you if that - if that slide is - if you do it in the spreadsheet, anywhere in the spreadsheet . . . just double-click - yeah, if you double-click on that slide, you've got a live spreadsheet behind it. So, if anybody wants to go in there and change numbers, change something to zero, change it to some other number, you can do that. And I'm just not fancy enough to figure out how to do these interactive things on the WR or C Website, so we never did it that way, but you can - you can get

to it in case anybody would like to. So, we can go back now to the presentation.

And then in - in the report itself, I did do some sensitivity analysis; again, it's just illustrative. You could pick whatever you wanted to. In the red box were those two base scenarios and then I did do it, as I indicated. What if the GPCD is 175 in 2030, as opposed to that lower number? And notice that with half use of effluent - half use of effluent and higher GPCD, you're getting pretty close to - to the number one there. What if the population projection is - is - is off? What if the actual population is 10% higher is 2030, and you have a GPCD of 175? So, what if you grow more quickly than projected, and you have a higher GPCD, and you're only using half the effluent? Notice you get - you - you pretty much grow into those water supplies, assuming again - this is the big assumption - that you actually figure out how to make use of all that CAP water. We're not currently utilizing all that CAP water. So, this is really just - just as I've said, a spreadsheet calculation.

The State Land Department has a 14,000 acre-foot allocation of CAP water; that's included in that total on that slide I showed you earlier of CAP allocations available to the region. What if you take that out? What do the numbers look like? And then what if you take that out and you have a lower GPCD? So, again, it just gives you an idea of the - of the sensitivity of the numbers to some of those different assumptions.

So, that - that was the nature of the analysis. Not rocket science, but interestingly enough, I've never seen anybody else do this and people haven't done it since. So, it's more like a calculator. Some, you know, barometer or something to - to measure things against. And it also, I think, is useful from the perspective of knowing that there are some water supplies available to this region under subcontract or produced in this region, such as effluent, that is here in the region or available to it already, and so as people generally talk about, "We need to find more supplies. We need to go out and do this and that." Well, maybe some of the less expensive options will be to figure out how to use some of the supplies that already are here for the - for the region. Something, you know, to think about as - in some of these broader discussions.

So, what good would a report be without recommendations? So, there were some recommendations that I included in that, and one of them - I'm glad to say that, you know, we did do some follow-up on - and - and this Committee has helped keep that going - and that is: What's the state of the AMA? What are the state of our numbers and so forth? Let's all

get on the same page with information. And I think we - we started some of that last October with the community conversation and, certainly, this Committee has - has helped that process along. That common set of facts is very, very important.

One of the other recommendations is to monitor the growth in the Central Arizona Groundwater Replenishment District; that's kind of a rallying cry of my own, having watched it grow, watch its Plan of Operations change so dramatically from the - the first Plan in 1994, when it really hadn't done anything yet, to 2004. And, again, this Committee has done a number of these things, developed some understanding of the implications of shortages in the Colorado River; again, these are recommendations made in 2006, of course; it's almost part of daily conversation now to talk about shortages on the Colorado River. But, quite honestly, it - it wasn't daily conversation a couple of years ago.

Because this wasn't a Safe-Yield analysis, I didn't want to lose that connection to Safe-Yield, so recommended support for continued efforts to meet the Safe-Yield management goal established in the statute, and then to encourage regional efforts to explore innovative approaches to water treatment, infrastructure investment and securing additional supplies, because it's going to take a lot of decision-making, investment, and collective action to - to use some of these water supplies that were not utilized.

So, my last slide were just some - some observations at the time that I made in - in - in some of my presentations, and that is that many of the suggested actions are associated with collaborative broad-based efforts. And the community, over the last year or so, has certainly gotten more collaborative and - and broad-based than it was a couple years ago in terms of looking at water supply issues. We have to look to the long-term, you know, speaking to the choir here regarding that.

And that - you know, this may sound trite, but it really is something that I had to try to drive home at the time to many of the audiences that I spoke to, because part of my purpose in speaking was to generate interest in some of these water management issues. I mean, it wasn't on the top of everybody's list of concerns at the time, and that water management is not just the concern of water managers.

So, with that, I thank you for the opportunity to be here today, and I understand I'll be open to questions after the next presentation. Thank you.

VICE-CHAIRMAN MARCELINO FLORES: Thank you.

(Applause.)

VICE-CHAIRMAN MARCELINO FLORES: Our next presen- - our next presentation is scheduled to be on the Water Plan for the City of Tucson, and Chris Avery we've heard from before, and so we'll go ahead and - and get into his presentation.

PRESENTER #2
CHRIS AVERY INTERIM DEPUTY DIRECTOR, TUCSON WATER: TUCSON WATER 2050 PLAN UPDATE

MR. AVERY: Good evening. I'm Chris Avery, and I'm still the Interim Deputy Director of Tucson Water. This evening, it's my great pleasure to talk to you about the way Tucson Water assembled some of the building blocks that we've been talking about since the 11th of June. Any Water Plan is a combination of assessing the current resources that are available to the water utility or the planner, as well as making a set of assumptions about what the future will look like and moving those assumptions forward.

Tucson Water has a pretty long history of water planning. In looking through some of our historical records, we found reference to a 1910 Plan and a 1932 Water Resources Plan that was done by what I think was then the young engineering firm of Black & Veech (ph.). But, the first one we were able to find is from 1948.

This is the report on Water System Investigations by Yost and Gardner Engineers out of Phoenix, and it was a pretty sophisticated look at the future water resource needs of the City of Tucson in 1948, and it contained a set of recommendations about how to reach - reach those needs; that the utility later followed one of the recommendations, for example, from the 1948 study was to look at Avra Valley as a future source of groundwater supply. The modern history of water planning in Tucson really starts with the 1990 Long-Range Water Plan, and it continues through the 2004 Water Plan, 2000 to 2050, and a recent update that was developed last spring by Tucson Water Staff.

And it's at this point that I think it's appropriate to give the recognition to the Tucson Water Staff that were intimately involved in the development of this Plan, Ralph Marra is here, Dennis Rule is sitting in the back row, Tim Tom (ph.), who used to work for Tucson Water was an integral figure in developing the Plan, and there's a wide variety of folks at Tucson Water who put Water Plan 2000 to 2050 together, and also the update. You'll see that there is a little difference in

these two Plans. The 1990 Plan was done by CHM Hill, an outside consultant, but internal Tucson Water resources were used to develop these later versions.

So, what - what's planning all about? Well, first, you have to establish a set of goals, or - or principles to drive your Plan. And, for Tucson Water, those goals and principles are generally consistent with the larger goals of the utility as a whole. First, it's absolutely imperative that we meet the water demand needs of our customers into the future. Second, that we use renewable resources in order to do so. Third, that we ensure that not only do we have a sufficient quantity of water to deliver to our customers, but also that the water we deliver to customers meets the water quality goals and standards, some of which are permissive, and some of which are mandatory and set by the Federal Government and the State.

Fourth - and this is especially important for - for the Tucson region - is to obtain sustainable pumpage. It's unlikely that Tucson Water will ever be at a state where it doesn't pump any groundwater at all, but it is important that if pumping is done that it be done in a sustainable manner.

Fifth, as we've talked about in the - in the financial presentation in August, it's important that we be able to manage the costs and the rate impacts of putting water to use in the future, and that's also important because if we spend all of our - our money and our efforts on developing water supplies and forget to maintain the system, or forget to meet our customers' expectations for service, then we've probably failed.

So, what are - were the key conclusions from 2004? Well, first of all, it became readily apparent that one of the things that the utility needed to do was increase demand management or conservation, and try to go after finding ways of reducing water demand to serve the same population as we move forward.

Second, again, you'll see this often through - through this process - and it's something we've talked about virtually every time that we've been here - and that is fully use existing renewable supplies.

Third, at some point, it's going to be necessary for us to acquire additional renewable supplies, and it's also important that we continue to discuss these issues with the community and keep moving forward.

In 2008, just four years after that first Plan, there was some significant differences already that made themselves apparent in just four years' time. The first thing we did in 2008 was update the population projections, and we'll get into that a little bit further when we talk about the Obligated Area.

Second, even between 2004 and 2008, we had updated and increased our Colorado River allocation largely as a result of the Indian Water Rights Settlements that took place at the end of last year - actually, the end of 2006.

Third, it became increasingly important after 2004 - this issue was just starting - but, by 2005 and 2006, it was clear that we needed to pay more attention to drought and shortage on the Colorado River, and also to be able to assess the impacts of climate change on the future Water Resource Portfolio for the utility.

In addition, we had been doing some substantial work on looking at what our customers expected of us in terms of water quality, and we're still working on the results of those decisions, but are prepared to start engaging in some dialogue with the community on that issue.

Finally, we have some - some potential changes in the Service Area size, which we accommodated in the 2008 Update, and we realized that conservation was going to play an increasing role in the size of our future demand.

One of the important things about Tucson Water's Plan is that we've tried to get away from the old way of planning, which is sort of one-dimensional; that is, you shoot for a particular target and you spend all your time and energy trying to get there. The main, almost invisible background of the 2004 Plan and the 2008 Plan is a reliance on what we call "Scenario Planning," and that means what we 're trying to do is find the elements that are common to all of, or most of, the possible outcomes, and then try to implement those elements that are - are shared in common and be able to maintain as much flexibility as possible as we move forward. So, Scenario Planning, rather than sort of picking a target and - and trying to go after it and, perhaps, being wrong, what Scenario Planning does is try to find common elements or areas where there is some consensus about where to move forward and still be able to maintain flexibility if things change in the future.

So, one of the first variables in any Water Plan is what's the area you're looking at? In the 2004 Plan, we were looking at more of a Long-Range Planning area that included what Tucson Water historically viewed as its potential Service Area, much to the chagrin I think of the Town of Marana and Oro Valley and a few other folks in the region. But, essentially, in the 2008 Update we're looking a much smaller area in terms of the geographical extent of the Planning Area. So, what you have here is this current and Obligated Area that we've been talking about since the beginning of June. The existing areas denoted in dark blue by where we have existing customers, and in the

light blue by the City limits and the Obligated Area where Tucson Water has legal obligations to provide service.

In addition, in the - in the 2008 Update, we also looked at a potential Service Area that's outlined in this diagram in light green, which includes areas generally south of the existing Service Area, and partially west, but largely recognizes that service in northwest Pima County is likely to be provided in the future by the Town of Oro Valley, the Town of Marana, or other water providers.

This is what the projected Service Area was in the 1948 Plan, and you can see that one of the mistakes they made in the 1948 Plan was limiting the Service Area for the City. This was the City limits in 1948, with some small area of potential service around it. The planners in 1948 predicted that by 1970 the City limits would include this area, essentially to Columbus, and - and ending just a little bit north of Fort Lowell. So, it's important that you get the potential area correct, or at least partially correct, because it makes all the difference in the outcome of the Plan.

In the - in the case of Tucson Water's 2008 Plan, the difference between the potential Service Area, which is outlined in the light green in the maps, and the Obligated Area, which is the dark blue and the light blue in the maps, is about 10%, so that by 2030 the population of the Obligated Area is expected to be about a million, and the population of the potential Service Area is expected to be about 1.1 million.

In - in the 2008 Update, there are - as Sharon just showed you - there are almost infinite possibilities for a Long-Range Plan, depending on how many different scenarios you want to consider, sort of like deciding how you want to order your Whopper. But, in - in this case, we looked at four and, basically, it's a combination of two different variables. One is: Are you going to look at the Obligated Area, or are you going to look at a larger potential Service Area? And are you going to look at those areas with additional conservation or without? That leads to what we call the four scenarios in the 2008 Plan. As Sharon showed you earlier, there - there are so many different ways that - that other potential outcomes could be combined. But, we felt like, based on the differences between 2004 and 2008, these were at least four likely places to look.

Well, what does - what does that do? When you combine the conservation assumptions with the population assumptions, you end up with, essentially, three different outcomes. Scenario A at the bottom is the outcome that has the Obligated Area plus conservation. The - the commonalities between Scenarios B and C are so much the same, that it was really not

important to graph the differences here. But, essentially, if you either decide to serve a larger area of population and conserve, or you decide to serve the same area of population and not conserve, you essentially get the same outcome. And, finally, Scenario D, if you decide to serve a larger area of population, and if you assume that that population is not going to make any conservation changes in the way they use water, you get a much higher demand scenario.

What were the variables that we considered in making the demand assumptions? Sharon talked about these a little bit earlier. In 2004, we used an assumption of 177 gallons per-capita-per-day. Of that 177, 163 is potable demand, and 14 is reclaimed. Of the 163 acre - gallons per day per person in potable demand, about 10% of that is lost-and-unaccounted-for water, about a quarter of it is commercial demand. Again, that - this tracks with the customer demographics presentation that we made earlier in June which shows about a quarter of our water usage occurs in the commercial sector, and about three-quarters of it occurs in apartments or houses. And that leaves a residential GPCD in the 2004 Plan of about 120 gallons per-capita-per-day.

In 2007, our actual GPCD has dropped dramatically. In 2007, we calculated our total GPCD at 166, and our residential gallons per-capita-per-day at 150, which brings - if you subtract out lost-and-unaccounted-for water, and assume approximately 35 gallons per-capita-per-day in residential use, you're getting residential per-capita use down close to 100 gallons per-capita-per-day.

In 2030, under Scenarios A and C, Tucson Water assumed that the total gallons per-capita-per-day would be 165; 147 potable with 10% conservation. And in Scenarios B and D, Tucson Water assumed that there would be 179 gallons per-capita-per-day; 163 potable. And, essentially, the difference is if you spread the population out across a larger area, but you assume that the Reclaim System is serving approximately the same number of golf courses, you - you realize slightly higher usage on the Reclaim System.

Well, what's the outcome when you factor all those numbers together: population, projected demand, and water resources? You get a couple of different tables. This is the first one; this is Scenario A. Basically, the first water resources that - that we're graphing here is reclaimed water, and it's discussed many times during the previous few weeks. We assume, essentially, that reclaimed water will amount to between eight and 10% of our total water use as we move forward; that leaves potable demand below the line. By far the largest component of our future water supply is the Colorado River

allocation. And, again, this graph assumes that we will put our Colorado River water to use by 2015 or so, and we've actually been able to start recharging our full allocation as of this year.

One of the ways to look at that Colorado River resource is to assume that there may be some shortage on the river in the future, and just - this is just one way to graph it. One way to graph that shortage is to assume that there may be some shortage starting about 2025 or 2030 but, because of the shortage criteria that we've talked about extensively and, because of the Water Bank water that's available to the Tucson region, we think that the effects of the shortage on Tucson's Colorado River supply are likely not to occur before 2050, and that - for example, in this case, it's possible, and quite probable, in fact, that a shortage will be met by Water Bank water.

The next projected demand - and Sharon talked about this a little bit in - in her earlier presentation - is the 12,500 acre-feet of supply from the Central Arizona Groundwater Replenishment District. And if Tucson can put its CAGRD allocation to use in its recharge facilities and deliver it to its customer, it's using CAGRD water in - in a hydrologically-sustainable fashion; it's using CAGRD water as wet water and a component of its supply.

The next al- - the next water supply that we considered in putting these scenarios together is the incidental recharge of 4% that we've talked about several times during these presentations. And, finally, you get a groundwater supply that we intend to use for the next few years to bridge the gap between our past practice of relying on groundwater, and the future of using Colorado River as our main source of supply.

What does that get us? That gets us a renewable Water Supply Portfolio that extends - essentially extends throughout the duration of Tucson's existence as a city. You can maybe make some assumptions about large-scale droughts. You can make some assumptions, perhaps, about dramatic climate change, but those resources that we talked about earlier as part of Tucson's water renewable water checkbook, essentially, last forever. The Colorado River allocation is a secure allocation on the Colorado River water, the CAG- - the CAGRD allocation is secure, and the incidental replenishment credits we expect to continue for a long time. What this means is that if Tucson Water makes moderate changes in the area in which it provides service, and obtains moderate gains in conservation potential, that we will not exhaust that strong portfolio of renewable supplies until somewhere around 2032.

And one of the things to point out in - in this graph is that we have not graphed other resources to fill this gap, but when we talked about water resources on June 25th, you'll note that there are still groundwater credits that are available to the City of Tucson. We expect that, by 2020, that available portfolio of groundwater credits will be about three and a half million acre-feet, and that providers for Assured Water Supply purposes, a long-term supply of an additional 35,000 acre-feet per year of groundwater. There are also other available supplies that we'll talk about later in a few weeks that may be available to the region and to Tucson Water, in particular.

So, there's the fact that we show that in 2032 Tucson Water needs to acquire new renewable supplies doesn't mean that in 2032 Tucson Water has exhausted its Assured Water Supply Portfolio of water. And it's important to - in all of these scenarios, to remember that, as a municipal provider, Tucson Water is subject to the Assured Water Supply rules. And what that means is that the Assured Water Supply rules act as a break on increased demand. If Tucson ever exceeds its portfolio of Assured Water Supplies, the Assured Water Supply rules prevent subdivisions from taking place within Tucson Water's Service Area, and that means that future growth on Tucson Water's system is limited to smaller-scale lot split type subdivisions and/or future commercial build-outs that don't require subdivisions or - or Master Plan developments. So, the - the Assured Water Supplies act as a break to sort of bend this demand curve down toward the available portfolio resources that may be available at any given time.

This is what it looks like under Scenarios B and C. So, in - in Scenarios B and C, the assumption is Tucson Water hasn't done anything about either the size of the Service Area that it expects to serve, or about the demand that its customers use. And, in that case, the available portfolio of supplies starts to get difficult about 2022, and you have to bring those - that additional portfolio of supplies on earlier and use more of them in order to meet your future needs out to 2050.

And the worst-case scenario, or - or at least the - perhaps, what we might also think of as - in some cases, the - the most likely probable scenario if no one decides to do anything, is Scenario D, which means that the portfolio of - of readily-available Assured Water Supply starts to become difficult about 2017, and that Tucson Water would be required to use its long-term groundwater storage accounts and other resources earlier than otherwise.

Well, how did it all turn out for the 1948 Plan? In 1948, the planners expected that the city population in 1970 would be about 90,000, and that the total number of customers

served by the water utility in 1970 would be 117,000, and their maximum growth in 1970 was expected to be 157. You can see - here's 1950, 1960, 1970. By 1960, Tucson Water had served 171,000 people, so that dot goes about here. And by 1970, Tucson Water served 290,000 people, and that puts the dot somewhere up in the ceiling somewhere.

So, when we look at putting a Water Plan together, one of the - one of the easiest things to do, I think - and it's belied by Tucson's past history - is to assume that the growth will not come; that in 1948 it was almost inconceivable to assume that the City would grow beyond Columbus; that Wilmot and Kolb were, essentially, *terra incognita*, and it just didn' t happen that way.

So, a Water Plan, rather than just sort of putting it on the shelf, has to be looked at, has to be revised. The assumptions that one makes in putting a Water Plan together have to be constantly tested against the available data because, as you see from the 1948 Water Plan, one of the things that they looked at was electrical connections and telephone connections in the City of Tucson. And what the telephone connection data and the electrical connection data showed 'em was a future population increase that was far beyond what they expected.

Okay. Where does the City of Tucson fall with respect to other western cities? Well, what we tried to do here was take a look at kind of a grab sample of other western cities that are included in the - in the 2004 Plan - the - the Plan talks about the GPCD usage rates in some other western cities. And so if you take a look at the Water Supply Plans for those western cities, you start to see some interesting things happening.

This is the Water Supply Plan for the City of Phoenix, and this assumes from the City of Phoenix - it has a wide variety of different scenarios - this is the City of Phoenix's scenario with development occurring at about the same level of density that has occurred in the past in Phoenix, and with water use occurring about the same way that's occurred in the past in Phoenix. So, no dramatic changes in either population densities or conservation usage. And what that shows is the City of Phoenix starts to have a difficult time with its current supply of water by the year 2020.

Just to note, the City of Phoenix's residential GPCD in 2004 was 169, and that means if you add in a portfolio of commercial water, you add some reuse water and you add 10% lost-and-unaccounted-for water - which is a pretty standard figure across the water industry - Phoenix's total GPCD is probably somewhere around 220, plus or minus.

Here we go. This is Southern Nevada Water Authority - essentially, Las Vegas. Las Vegas doesn't have a whole lot left, and what this means is this - this is reflected in - in some of the urgent conservation measures that Las Vegas is implementing and in their willingness to seek water supplies far and wide to meet their future demands.

You can see, though, that the basic shape of - of this - of the - the Southern Nevada Water Authority's demand curve essentially looks like the difference between our Scenarios B and C and Scenario A. In other words, conservation, essentially gets you approximately 10% savings in terms of your Water Supply Portfolio. By the way, Las Vegas' per-capita residential GPCD in 2004 was 220 gallons per-capita-per-day, so that puts their total cumulative GPCD probably a lot higher than ours.

This is the City of Fresno and, if you look at Fresno, there are a couple of interesting things. First is their - they - their Water Supply Portfolio looks a lot like our Water Supply Portfolio from 20 years ago; lots of groundwater, very little surface water, and almost no reclaimed. The City of Fresno, again, has a normal projected year water demand, and projected demand without increased conservation. They've got some major infrastructure investments in their future. They've got some conservation potential. And, according to our 2004 Plan, the City of Fresno's GPCD in 2004 residential was 260 gallons per-capita-per-day, so it was about double the City of Tucson's.

Well, where are we? The - the common set of conclusions from the 2004 Plan and the 2008 Plan, and moving on to - to the future for Tucson Water is: Number one, continue to emphasize hydrologically-based water management; this is short for wet water. And, as we've talked about Tucson's Water Supply Portfolio, its customer demographics, and its infrastructure needs, Tucson Water has been active in trying to make sure that we're able to connect the Water Supply Portfolio that we have with our customers through wise infrastructure investments.

Number two, try to limit groundwater pumping to a sustainable rate so that we can have that bank of groundwater supply that's available to meet Tucson Water's needs in the future, whether those needs be - may be occasioned by drought, may be occasioned by unprecedented population growth, or by an unexpected unwillingness by our customers to conserve water at the forecasted rates. And that - when you limit your groundwater pumping to a sustainable rate, you also preserve the City's groundwater credits for the long term.

Finally, we've continued with efforts to try to make sure that as we change from a portfolio of groundwater to a portfolio of surface water that we continue to maintain our

water quality criteria and parameters so that the customers are satisfied with the water that we deliver.

And, finally, continue to fully utilize the City's Colorado River allocation by 2009. And one of the things that we have been reporting all along is that we have the infrastructure available now to do so and expect - I think it's now, I guess - Dennis, am I correct? Now we've placed our water order?

DENNIS RULE: Yes.

MR. AVERY: The water order for the City of Tucson has been placed for - in its entire allocation for next year.

We are also continuing to try to acquire additional renewable water supplies. As we've talked about on a few - on a few occasions earlier, the ADD water process is continuing to proceed in - in Phoenix, and Tucson Water Staff for their last week and also this week in participating in that ADD water stakeholder process.

Finally, invest in additional demand management and conservation. We've talked about this earlier but, as of last year, Tucson Water, through whatever reasons - and we still don't fully understand them - but Tucson Water customers over the last few years have, essentially, implemented the conservation measures in - in two or three or four years - depending on where you want to start the clock ticking - that the 2008 Plan assumed would occur by 2030. So, basically, we're almost 20 years ahead now if - if these recent reductions in Tucson Water's per-capita use continue, if they hold steady, we're essentially 20 years ahead on our water conservation projections from where we expected to be, even in the projections that we did this spring.

So, as you can - and as you - as you pay attention to the news, you can see the City of Tucson is ready to - has adopted a gray water ordinance, is preparing to adopt the rainwater harvesting ordinance, and is preparing to just begin to roll out the conservation programs that were contemplated that would occur in the 2004 Plan, and that were recently approved by the Mayor and Council as a consequence of that effort.

We - we are going to continue to evaluate effluent for future uses in - and especially in making sure that we have an abundant supply of effluent that's available for environmental and reclaimed water needs.

Number 9 - we've talked about this also before - continue shifting the cost of growth to new customers; that helps with a sustainable portfolio of water supplies and helps us to be able to meet our customer service needs and our existing maintenance requirements for the utility.

And, finally, continue to expand regional cooperation; that's what we hope we've been spending the last several months trying to do as part of this process.

So, here's some - here's some conclusions to think about: First of all, I want - as - as you do a Water Plan, one of the things that we rarely show is: What's the effect of the Assured Water Supply rules? And, as discussed earlier, what the Assured Water Supply rules is essentially start to reduce the slope of those demand curves as you get toward your Assured Water Supply obligation. So - so that - it might be easy to talk about the City of Tucson running out of water, or the Tucson Water Service Area running out of water, but the Assured Water Supply rules, essentially, as much as you can consider it to be regulatory pos- - regulatorily possible, prevent the City of Tucson's Service Area from running out of water. What the Assured Water Supply rules do is constrain growth if renewable water supplies or - and that portfolio of renewable water supplies or Assured Water Supplies is exceeded.

Number 2, continue planning for uncertainty to maintain flexibility. We've continued to do that, even after the 2004 Plan. The 2008 Update has some significant changes from the 2004 Plan. If that continue - and one of the things that we may need to do in the near future is try to figure out what's happening with our demand side. Are these changes in demand from Tucson Water's Service Area likely to continue? If so, you need to plan for those and you need to integrate those assumptions into a future plan.

Number 3, planning is a continuous process. Things change all the time. Last year at this time, it looked - the - the situation on the Colorado - Colorado River looked pretty dire; it looked to most people who had carefully considered these things that it was possible that a shortage would occur on the Colorado River in 2011. We had a lot of snow pack last year; that means that the possibility of a shortage on the Colorado River is essentially forestalled for another few years, just based on one year of snow pack.

And, finally, implement the common project elements identified in this Scenario Planning process, and Tucson Water has tried to do that over the last four years. The - the - the recent completion of SAVSARP, the effect that we're placing the water order for our entire allocation of Colorado River supply, and the increased efforts in conservation, and some of the outreach efforts that we've made in terms of water quality are all consequences of the Long-Range Plan. So, it's not enough to just plan, it's also important that you implement the elements of the Plan, even as you realize there's some uncertainty when you move forward.

With that, I'd be happy to take any questions.

(Applause.)

VICE-CHAIRMAN MARCELINO FLORES: Thank you, Chris. And I think we can also welcome Sharon back in case we receive questions regarding her presentation.

But, Bonnie first, then Sean.

MEMBER BONNIE POULOS: Chris, on the Planning and Zoning Commission and other places, we've been hearing projections that in 25 years, Pinal County - if they grow at the rate that they're projected to - will be larger than Pima County. If they go on their own path in terms of groundwater pumping and other uses of groundwater, will that affect the Tucson available water supply in the Tucson Basin? Will it affect, hydrologically, what happens to the groundwater we currently have and that we've currently banked? Does anybody know that?

MR. AVERY: I - I think it's fair to say the - there - there may be some effects near Pinal County, but the - the - and it's not so much Pinal County that matters for water-planning purposes; it's the Pinal AMA, which isn 't exactly concurrent with the Pinal County line. But, I do think it's fair to say - and I - there are a lot of people in the room who know the answer better than I do, so if Ralph jumps up or Dennis jumps up to throttle me, please take some heed from that - but, I think it's fair to say that Tucson's groundwater resources are located in - in such a way and such a location that it's highly unlikely that groundwater pumping in Pinal County can have an effect on us.

I do, however, think that, as we've tried to make this point before, in some ways all of us in - in the CAP Service Area, even Pinal County with what - what is, in my opinion, an absurd management goal, are connected to the Colorado River, and we are connected in some common way through the CAP canal to the same source of supply.

And so one of the concerns I think that can be shared about unbridled growth anywhere in Arizona is the pressure that it puts on the CAGRD and its portfolio of available resources, and the pressure it puts on Colorado River resources, or other resources that might be delivered through the canal.

VICE-CHAIRMAN MARCELINO FLORES: Okay. Sean, and then Bruce.

MEMBER SEAN SULLIVAN: I've got two questions for you, Chris. First, the - within the various scenarios, do the water portfolios that you spoke about give consideration to the - the effluent that would be needed in order to carry out the various riparian - riparian restoration projects that are being planned right now?

MR. AVERY: They do almost by a mission. If you - if you look at the current portfolio of water that we talked about from June 25th, you'll see a certain amount of effluent that's dedicated to the Reclaim System, and a certain amount of effluent that's dedicated to the Conservation Effluent Pool. If the reclaimed water use for the City of Tucson continues to grow at the rate we expect it to - that is, no sudden and dramatic increases in reclaimed water use, but fairly steady eight to 10% - then there is water available for the Conservation Effluent Pool.

To the extent that environmental use of - of effluent or reclaimed water starts to exceed the Conservation Effluent Pool, or starts to cut into the amount of water that's needed to supply the Reclaim System, then those assumptions will change, and the way you'll see it change is that the slope of that curve will increase, your - your - because we try to account for non-potable, as well as potable use in that GPCD calculation.

MEMBER SEAN SULLIVAN: Okay. And then moving on to future water supplies. Back when we first started, we had an official from CAP come in and give us his ideas on new water sources, which included cloud seeding, desalinization plants, and my favorite, bringing water from the Mississippi River over here.

Is Tucson Water looking at anything that the CAP is putting forward as real viable options for additional water sources?

MR. AVERY: I think it's fair to say that when - you can that when - when Tucson Water has put together both the 2004 Plan and the 2008 Plan Update, you can see that we've been very conservative about the portfolios of water that we're willing to commit to our - our Long-Range Plan.

One of my favorite ways to talk about it - talk about the issue is - and it - it may be something that you can enjoy or it may just not make any sense to you at all - but - but, I like to talk about it in terms of what I call "magic water." There's a difference between readily available water supplies that are sort of within our common experience would be available to us, and then there's magic water that just is kind of out there that, you know, towing icebergs down from Alaska. And - and it's important that you - that you - you also consider the technology and other things, because what was yesterday 's magic water might be tomorrow's water supply of the future.

But, I think it's fair to say that the - the Tucson Water portfolio that's in this Long-Range Plan is fairly conservative is based on actual water in the Colorado that's available to the CAP Service Area and, as we move through the ADD water process through the - some of the other allocations

through - as CAP moves toward developing other water resources then, as those look to become more certain and less magic, then you can incorporate them in future plans. But, Tucson Water's planning has been fairly conservative in that regard.

VICE-CHAIRMAN MARCELINO FLORES: Okay. Bruce?

MEMBER BRUCE GUNGLE: Chris, could you go back to your demand assumptions slide?

MR. AVERY: Sure. I'll try to do it fast here. Here we go.

MEMBER BRUCE GUNGLE: Too many (inaudible).

MR. AVERY: Yeah. There we go.

MEMBER BRUCE GUNGLE: You went by it. All right. I'm going to steal a little of Bob Cook's thunder here.

To get this calculation, you - the - the unknown actually in this equation isn't the demand or the population, it's the GPCD, and so that's based on those two items. What are you basing your population numbers on? How - how are those being calculated?

MR. AVERY: I'm glad you asked, 'cause I sort of forgot - I skimmed over that - and the reason is: We were - we - both the City of Tucson and Pima County Regional Reclaim - Regional Water Reclamation Department - almost got - I got it finally - used the same planning assumptions, and those are - are Pima County's Traffic Analysis Zone assumptions; it's a more sophisticated way of looking at population data than using census track data; it's not quite as sophisticated as some of the planning tools that might be expected to come out in the future, but it is a common set of data that are used to inform the region's Transportation Plan, the Wastewater Planning, and Water Planning all at the same time. And -

MEMBER BRUCE GUNGLE: So -

MR. AVERY: - basically, you overlay the TAZ projections and Tucson Water Service Area to get your expected population.

MEMBER BRUCE GUNGLE: So, are - are those related in any way to - to housing starts?

MR. AVERY: The - the TAZ projections, as I understand it, start with the latest census data, then - if you'll remember Dave Taylor's presentation - the - the Department of Economic Security also factors in some population projections, and then Pima County uses an analysis to look at where the population is expected to move in - in the future, and - and they essentially go to 2030.

MEMBER BRUCE GUNGLE: Right.

MR. AVERY: And that's why when you talk - when you look at, for example, our population graph, you see that we've got solid lines to 2030 -

MEMBER BRUCE GUNGLE: Right.

MR. AVERY: - and then dash lines after that, and that's because the TAZ analysis starts to break down after that 2030 point.

MEMBER BRUCE GUNGLE: Right. My - my concern is probably obvious - and it's the same that - that Bob's has been, which is that if - well, there's been some concern that the DES numbers have been inflated over the last few years and, if that's the case, then our GPCD number here is overly-optimistic for where we're at. So, that's - that's just -

MR. AVERY: We - we also look at - one of the ear- - one of the earlier graphs that we showed you in - on June 25th, though, showed our water uses per service, and that's - you know, that's a real number; that's our actual customers, and you take our actual number -

MEMBER BRUCE GUNGLE: Oh, right.

MR. AVERY: - of customers, existing meters, you divide by your water usage -

MEMBER BRUCE GUNGLE: Sure.

MR. AVERY: - and you get the same kind of dramatic decline.

MEMBER BRUCE GUNGLE: Yeah. Okay. Well, good.

I - I have a second one for you. A couple of places, including on your recommendations slide at the end, you used the term "sustainable" - in this case, it's limit groundwater pumping to sustainable rate -

MR. AVERY: Yeah.

MEMBER BRUCE GUNGLE: - and I - this is something that this Committee's going to have to grapple with at some time; what - what our definition of sustainable pumping is. What's yours in this case?

MR. AVERY: Our - our definition of - of sustainable is - is, essentially, that you can pump a supply of groundwater that's likely to be renewable in the future.

MEMBER BRUCE GUNGLE: So, Safe-Yield?

MR. AVERY: It's - it's - I - I think -

MEMBER BRUCE: Are you using it equivalently?

MR. AVERY: I think you're talking about a Safe-Yield concept. One of the reasons that we don't put the actual groundwater number in the Long-Range Plan is because there is - we - we tried to put that number in the 2004 Plan, and there's just some differences in opinions about what that number actually is.

So, the - the trick is: You try to limit it now, increase your - the one thing we can do is try to limit groundwater pumping now, and the way you do that is by using as much renewable supplies as you can, and - and then you look in

the future to see what you need once you start to get past the 2032 point, or the 2022 point, and - and see where you are.

MEMBER BRUCE GUNGLE: Right.

MR. AVERY: But, one of the things I can say is - is that we've grappled internally with this idea of sustainable, and you're going to be grappling with it -

MEMBER BRUCE GUNGLE: Yeah. Right.

MR. AVERY: - pretty soon here; it's not that easy -

MEMBER BRUCE GUNGLE: Yeah, if -

MR. AVERY: - to put a number on it.

MEMBER BRUCE GUNGLE: I - I - I think if - if you limit it to something like Safe-Yield, that's far too narrow, you know, for what we truly mean as a community by sustainable, because there are a lot more uses that, as a community, we feel water needs to be - be put to -

MR. AVERY: And I -

MEMBER BRUCE GUNGLE: (Inaudible; speaking over one another.)

MR. AVERY: - and I agree.

MEMBER BRUCE GUNGLE: Yeah. And one - one quickie at the end. Is this the same presentation you'll be giving at the AHS Chapter meeting in a week or two?

MR. AVERY: It - it's pretty close . . .

MEMBER BRUCE GUNGLE: Yeah. Okay. Thanks.

MR. AVERY: . . . with someone who knows a lot more about it.

MEMBER BRUCE GUNGLE: Yeah.

VICE-CHAIRMAN MARCELINO FLORES: John, and then Rob.

MEMBER JOHN CARLSON: I'm going to eventually bring Sharon in on this with a couple of questions, but you first. We're studying a bigger area than you cover, and I'm wondering about your - your - your relationships and your checking and - with the other water districts that's - that's within the scope of what we're looking at. Is there ongoing - I'm sure it is - but to what extent? Is there any differences? And you indicated that they were chagrined at you at one time, but whatever.

MR. AVERY: I think that there is some common elements between general water usage patterns in Tucson. Everyone's portfolio is a little bit different -

MEMBER JOHN CARLSON: Yeah.

MR. AVERY: - but, as - as this Committee - mine - my understanding is that, in this first phase, you're going to be looking at Tucson Water Service Area and Pima County's current Service Area for - for wastewater treatment and then, as - as the - as the process expands, you will bring in those other areas in a more comprehensive part of the study.

MEMBER JOHN CARLSON: Well, thank you. And - and, Sharon, it's incredible what you all are wrestling with, and I know it takes time and a lot of money, are you all limited by what you can do because of money now? And, again, are you at odds with Tucson Water on - or where are we on that? You have to constantly revise that stuff, and it might be where we got to end up in Phase 2. That's one reason I'm interested.

MS. MEGDAL: Well, if you're asking me. I can't speak on behalf of the University. Bonnie's also an employee at the University. Money is a limiting factor for us all, and - and that's why, you know, I pointed out that the study I did was funded through a consortium put together by the Metropolitan Pima Alliance. And what I didn't say then was a part of the - what generated the work, or the desire for me to help, was some people wanted some help in understanding that 2050 Plan. For example, that bar that was on that original one of reclaimed used, some people thought that that meant that was all the utilization of effluent that would ever occur, as opposed to the amount used through the Reclaimed System, you know, delivered to turf facilities. And so that study was done for $30,000; that's not a lot of money for, you know, to get a - get a report done and a - and a lot of follow-up.

And part of my job - I'm part of Arizona Cooperative Extension - and part of my job is to do education and outreach and take my work out, so these are the kinds of studies we like to do. I - I don't consider there - this being at odds. In fact, you know, I - I made my best judgments on assumptions. Some of them were different than the 2050 Plan, and I just felt gratified that the numbers 166 and 165 now, and that's pure chance. But, you know, we did think, "Let's be a little bit optimistic about per-capita demand." So, it 's not a - it wasn't ever us versus them, or anything like that; it was a matter of - we have some questions. "We" being some of the community folks. We'd like some help in answering them.

It took - you know, that Plan was first released, it was in, like, March, 2004, that there was a luncheon right here at - is that the time, Ralph? Dennis? There was a - there was a luncheon, I think, right here at the Manning House at which the - the 2050 Plan was presented, and it probably took nine months or a year to work out the scope of work, and that's why it didn't get done till 2006.

But, if - if people would like the University to help, whether it's through the Water Research - Research Center or others, there are people there who would like to help, but it will take some resources.

MEMBER JOHN CARLSON: Yeah. Well, just for efficiency in the future - beyond me - I hope that - that somebody from

your outfit is practically sitting with City Water, and I hope somebody with City Water is practically sitting in yours just to make sure that fruition of ideas go back and -

MS. MEGDAL: Well - and we do have a lot of interaction, actually, that - I've - I've got to remind Chris that he said he'd write a paper with me together, and I've got to talk to him about that.

MEMBER JOHN CARLSON: Thank you.

VICE-CHAIRMAN MARCELINO FLORES: Rob?

MEMBER ROB KULAKOFSKY: I'm sure John will be happy to finance that study.

Just a couple questions. On your Demand Scenario Matrix, you have your Obligated Area and Potential Service Area and all that. Did you ever think about looking into the possibility of reducing the Obligated Area? And, if so, ways to come up with -

MR. AVERY: I never did.

MEMBER ROB KULAKOFSKY: - if not, why not?

MR. AVERY: And let me - let me say I've - it's - it's my opinion that the Obligated Area is a fairly certain obligation. The Obligated Area includes the City limits of the City of Tucson, which, as a matter of - of some long-standing law in the State of Arizona, the City's obligated to serve, as long as it continues as a water utility, and until it runs out of available supply. And it also includes an area where the City has long-term and - and pretty ironclad contracts to provide water service. So, looking at reducing the Obligated Area is something that would have to be done with - without the advice of legal counsel, at least current -

MEMBER ROB KULAKOFSKY: Right.

MR. AVERY: - legal counsel.

MEMBER ROB KULAKOFSKY: 'Cause, basically, I'm asking about de-annex- - de-annexation, and - and so you didn't look at that at all?

MR. AVERY: I think it's hard enough to annex; that the concept that we de-annex is just beyond the pail at this point.

MEMBER ROB KULAKOFSKY: Okay. Just - just thought I'd throw it out there.

The other thing is - it's probably an unfair question at this point because we've just had the gray water ordinance - but, what effect do you think the larger use of gray water for homeowners will have on the availability of effluent in the future? And, once again, I know it's a little unfair, 'cause you really know what's going to happen.

MR. AVERY: We - one of the outcomes from the 2004 Plan was the development of the Conservation Task Force that

resulted in generating some recommendations to the City about implementing a stronger Conservation Program and some specific demand management goals, and one of those goals was increasing the amount of gray water usage and low-flow fixtures, and some other things. And so included in those outcomes are some diminishment in available effluent from Wastewater Treatment Plants, and also diminished revenues in the future from water conservation. And so I think it's fair to say that the assumptions of that Task Force are that if gray water use is used to largely supplant outdoor irrigation that would otherwise be either part of the peak summer demand portfolio or, perhaps, something that reclaimed water might be used for in the future, that - that the effects are not significant.

But, again, one of the benefits of doing this Scenario Planning - and its kind of continuous planning - is that if you see some interesting things happening with gray water, then you can incorporate those interesting observations into - into the future variations of the Plan.

MEMBER ROB KULAKOFSKY: Thank you.

VICE-CHAIRMAN MARCELINO FLORES: Are there any other questions from Committee members?

I have a question for Sharon.

MS. MEGDAL: It's hard when you're tall and short using the same microphone.

VICE-CHAIRMAN MARCELINO FLORES: In - in your presentation in the Sensitivity Analysis, you - you had said that there was an assumption that we're going to be using all of our water in - in - in - in the Sensitivity Analysis but, you know, I - I got the feeling that there might be a limit out there in terms of how much water can actually be - be used.

Is there - is there a hydrological limit for how much can be, you know - of CAP water, renewable sources, can be brought into the region? I - I guess the - the question is, is like also: If - if we recharge to a point, will the river start flowing again, you know?

MS. MEGDAL: Well, that's better to ask of Ralph Marra than me because I'm not a hydrologist. But, I think what I was trying to convey is that the assumption behind that when I said, "You could use the water" is that you - actually, if you get the water to where the demands are, or you could treat the water so that it could be used, you know, we're not going to use all of the effluent on outdoor irrigation. I mean, nobody's proposing to do that. So, if you look at a scenario that includes utilization of effluent, that suggests that it' s either supplanting, as - as Chris suggested, some existing outdoor watering that's being done at the neighborhood level or household level, or it's being treated and recharged and then

delivered into the potable system. And these things take investments, you know, we don't - we're not a new community where you can double-pipe everything for, you know, purple and - and potable water. So, that's what I meant by it's assuming that we're using it in some manner.

And I'd leave it up to the Tucson Water people to talk about the - the recharge and recovery, but the fact - I would just offer the fact that they're recovering a whole bunch of what they're recharging makes it be a very stable process.

And in the other areas that I'm familiar with where recharge is going on, you know, water tables have been low and they're rising, but the Department of Water Resources watches that and if there's mounding, or things like that that occur, such as I think happened in Pima Mine Road, they'll slow down the recharge for a while, and so there's quite a bit of monitoring by the Department of Water Resources.

And, in fact, I think that's another important point to make: Is not only is the Assured Water Supply Program a heavily-regulated program - it is a regulatory program - but, the Recharge and Recovery Program is also a regulatory program; it requires permits; it's monitored annually and everything gets reported, so -

VICE-CHAIRMAN MARCELINO FLORES: Okay.

MS. MEGDAL: I don't, Chris, if you want to add anything to that.

VICE-CHAIRMAN MARCELINO FLORES: Okay. Bonnie?

MEMBER BONNIE POULOS: I'm not sure who to direct this to, but in light of recent economic situations, do any of the scenarios take into account whether or not the community, as a whole, will have the economic ability to make improvements and replace infrastructure? And, if not, are those things that can be incorporated into future scenarios about whether or not those funds will be available in order to be able to do those things?

MS. MEGDAL: Well, I can quickly say my analysis was not an economic analysis, so did not factor that, and I think Chris probably . . .

MR. AVERY: Yeah. Well, one - one of the components of - of the GPCD calculation - and - and we kind of use a larger number, 'cause we use a number that not only has residential but commercial and reclaimed - but the kind of hidden component of GPCD is lost-and-unaccounted-for water. And so if you fail to make those infrastructure investments so that you've got abundant main breaks, leaks, deteriorating piping, et cetera, then, theoretically, that failure to maintain your infrastructure is going to show up in lost-and-unaccounted-for water, or in some other way increase your GPCD. So, as long as you're keeping track of it and comparing your actual GPCD usage

rates with your projected GPCD - GPCD usage rates, then the planning should work.

And one of the things I want to point out - forgot to - when - when you look at that 1948 demand scenario, they used the GPCD in 1948 of 170. So, again, you're not talking about huge variations here in terms of - if you look at the 1948 Plan, they had a much higher peak-day factor, which means kinda we can all assume that what that means is they were irrigating more lawns in the summer, and probably had a lot fewer washing machines, dishwashers, et cetera, in their homes, but the GPCD in 1948 was pretty close to what it is today.

VICE-CHAIRMAN MARCELINO FLORES: Okay. Sharon, I understand you had a question for Chris?

MS. MEGDAL: Yeah. I had a question for Chris - and I'll try to ask it in a general way. Chris, when you had your slide where you showed the supplies and talked about the security of the supplies. You had that arrow going outward. And you made actually the same assumption I did and that was - is that the GRD is going to find the water to do its replenishment. And I just wondered, you know, if you feel comfortable in what supplies you think the GRD will use in the future, because - as I think probably has been discussed - and certainly I have concerns about the - the security of those future supplies to meet the replenishment obligation, and we're kind of all in this together with the other two counties in the GRD Service Area. So, I was curious if you had anything to say about that?

MR. AVERY: We - I think it's a fair assumption that the - the size of this GRD obligation is likely to remain intact in the future. The cost of that slice is what I think causes fear in the - in the - in the hearts of most people who think about CAGRD continuing to incur obligations without having the same kind of breaks on its future obligations that the Assured Water Supply rules impose on the municipal providers . . . and - and we expect anyone who might be a candidate for the CAP Board to seriously consider that issue.

VICE-CHAIRMAN MARCELINO FLORES: Well, we've entertained a longer time period for questions from the Committee. Are there any other questions from Committee members?

We'd like to open up the questions for any public. If you would please come up to the microphone. We - we made up some time. We lost some time. If you could please ask a straightforward question and see - see if we could -

TRES ENGLISH: Sure.

VICE-CHAIRMAN MARCELINO FLORES: - stay within a minute.

TRES ENGLISH: Okay. My name is Tres English. And I had several questions. I'm unclear of - of some of the things that we talked about this evening. You referred to "12,500 acre-feet" that had something to do with the Assured Water Supply and Tucson's obligation, and could you just sort of review that a little bit?

MR. AVERY: Yeah. Sure. If you look at these numbers, the way they stack out is this is Tucson Water's CAP allocation, 144,000 acre-feet. This is 12,500 acre-feet of CAGRD obligation that the City of Tucson obtained by contract from the Central Arizona Groundwater Replenishment District - thanks - Dennis, raise your hand, this is - this is yours - thanks to Dennis' foresight, the City of Tucson obtained in 1997.

TRES ENGLISH: Is that water that's in addition to our - Tucson Water's ob- - application?

MR. AVERY: Yes, it's a different portfolio of water than - than is obtained through the CAP subcontract; that's designated in the green.

TRES ENGLISH: Okay.

MS. MEGDAL: And if I could just add - this may be a little bit of - kind of education, because this is kind of past history - but, when the City of Tucson turned off direct delivery and that was in, what? 1993, and the rules - the Assured Water Supply rules were approved in 1995, and folks had to come in pretty soon after that with their request to be designated under those rules. And so Tucson Water, at that time, joined the Central Arizona Groundwater Replenishment District, as did Metro and most of the other municipal - large municipal water providers because the - if you remember, the CAGRD, by rule, that establishes that your water use will be consistent with the management goal, because the GRD has that obligation to replenish. Unlike some of the water providers, the - the City's agreement at that time was very special; it had some minimums and it had that maximum of 12,500 acre-feet of a replenishment obligation; that's, I believe, the maximum that the City could ever ask the GRD to replenish. And, in the Assured Water Supply calculations, when they did that at ADWR - which I wasn't part of that at all - they included that. So, that's included in the number - what is it? 183,000 or 4,000 of the - of the Assured Water Supply includes 12,500 acre-feet that the GRD would be obligated to replenish.

TRES ENGLISH: Okay. But, just to clarify: That 12,500 is wet water that is in addition to Tucson's CAP share?

MR. AVERY: Yes, and that's why we've -

TRES ENGLISH: Okay.

MR. AVERY: - included it in this pretty conservative portfolio of supplies.

TRES ENGLISH: The second thing is the issue of this sustainable pumpage. To me, for it to be sustainable it means that over time, as you either take more or less out of the ground, that your net pumpage is zero; that's the only thing that's sustainable?

MR. AVERY: And - and that's

TRES ENGLISH: It's - or is there a difference between that and your definition?

MR. AVERY: When we talk about sustainable pumpage, we understand it's difficult to define it, and that's why we didn't put it in the - we didn't put it in this - this scenario. If you look -

TRES ENGLISH: Okay. If you have a net pumpage, if you're continuing to draw water out of the groundwater table, that's not sustainable.

MR. AVERY: Okay. Let me - let me - let me try to explain this the way I think about it and see if it works. This is what I think most people would consider sustainable pumpage and that is: The 4% incidental recharge that's granted by DWR, assuming that 4% of the water we deliver to our customers recharges the aquifer through irrigation, other uses, et cetera. In - in addition then, there's some number - probably greater than zero and less than, let's say, 50,000 acre-feet a year that could be pumped from Tucson's local aquifers and - and available groundwater supplies that equals more or less on a long-term rolling average the amount of natural recharge that occurs in those aquifers; that's a different number than the amount of credits in Tucson's groundwater account; that's a different number than you get in terms of Assured Water Supply purposes; and it's not a number that - that you can identify readily. You put five hydrologists in a room, and - and a lawyer and you'll get seven different opinions.

TRES ENGLISH: Get six different opinions, right.

MR. AVERY: So, that's one of the reasons why, when we did the 2008 update, we took it out; it's not - it doesn't exist; it's invisible. There's groundwater pumping here and invisible here and that's because, for the short-term, the - the importance for us is not so much trying to figure out how much water you can pump in 2020 - in 2035 or 2045 and be sustainable for the short-term. The goal is to try to in- - decrease the amount of this blue transition water that you're delivering to your customers, because the less water you pump here, the more water you have here.

TRES ENGLISH: Okay. All right. Thank you.

VICE-CHAIRMAN MARCELINO FLORES: Thank you. Again, for the sake of brevity, a question, please.

ALTERNATE MEMBER BOB COOK: Yeah, I've got a couple questions. You mention that in recent years we're seeing actually a slight per-capita decrease in consumption?

MR. AVERY: Yeah, it's right here.

ALTERNATE MEMBER BOB COOK: Okay. So, how much of that would you account for - for the impact of rate increases?

MR. AVERY: We - we talked about this extensively this summer among Staff and, when we modeled what was happening to our GPCD rates, there are a couple of different models that we look at. One is a basic economic price elasticity model; it failed to predict this dramatic decline. One was a temperature-based model. In other words, in the past, if you've got a certain number of days over 100 degrees consecutively with no rainfall, we saw a response in our peak day; that didn't happen this summer. When we tried to model for expected conservation increases, you know, replacing older fixtures with newer fixtures, new housing stock versus old housing stock, it didn't match up.

The - the best guess that we have among Staff - and there's some variations between Staff on what they think is more important or less important - but, the best consensus among Staff is that there are two factors: Number one, we see this pattern occurring across the west; it happened permanently in Denver after 2002 - and I was reading some articles online just the other night - they're looking - they - they think that their conservation patterns and their use patterns had never changed so dramatically after the 2002 drought, that they're reformulating their projections for the future.

So, one is that we think long-term water consumption patterns are changing across the west as people become aware of the issue, and we also think the economy has to play some role in it, but we don't know. We - we've looked at it a couple of different ways, but to answer your question succinctly, the - the price elasticity models that we have used in the past successfully to predict water demand don't predict what's going on over the last couple years.

ALTERNATE MEMBER BOB COOK: Okay. Thank you. You showed the projected demand in Phoenix, comparing it to some of the other cities, and I noticed that their demand curve actually flattens out. Are they anticipating a build-out of population, or -

MR. AVERY: No.

ALTERNATE MEMBER BOB COOK: - are they looking at some other phenomena that you're not looking at?

MR. AVERY: When you look at Phoenix - and, first of all, Phoenix, unlike the City of Tucson, Phoenix does not provide water outside the City limits. So, you - you reach, you know, when you - when residential development occurs in the City of Phoenix, you're - you're finished.

ALTERNATE MEMBER BOB COOK: So, it's a build-out.

MR. AVERY: But - but, one of the other - one of the assumptions that we didn't put up here - 'cause there are a lot of 'em, and you can fine 'em readily on the web - is - is there were some assumptions in Phoenix that density of development would occur at a higher rate than past historical pattern and, when that happens, their demand curve, it becomes steeper. You know, if you assume that the City of Phoenix has a certain areal extent that's not going to expand, but there are going to be a lot more four-story condominiums built in the City of Phoenix, then their demand curves go up, even though their GPCD may come down.

ALTERNATE MEMBER BOB COOK: Okay. You - you point out that - or it was noted that approximately 10% of our water is lost-or-unaccounted-for, is that a long-term trend?

MR. AVERY: That's remained fairly consistent throughout the department for the last couple of decades, and it's fairly consistent with the - the patterns of other water utilities in the country, actually 10% lost-and-unaccounted-for water, we're moderately to, you know -

ALTERNATE MEMBER BOB COOK: Oh, yeah.

MR. AVERY: - to better in terms of comparison with other -

ALTERNATE MEMBER BOB COOK: Yeah, I understand -

MR. AVERY: - water utilities.

ALTERNATE MEMBER BOB COOK: - the dynamics of, say, of Philadelphia compared to Phoenix.

MR. AVERY: Yeah.

VICE-CHAIRMAN MARCELINO FLORES: Bob - Bob, can I interrupt? How many more questions do you have and -

ALTERNATE MEMBER BOB COOK: Two.

VICE-CHAIRMAN MARCELINO FLORES: Two more.

ALTERNATE MEMBER BOB COOK: These are actually short questions. I'm not giving the long answers.

VICE-CHAIRMAN MARCELINO FLORES: Okay. Thank you.

ALTERNATE MEMBER BOB COOK: One of the - one of the reasons for - for lost-and-unaccounted-for water is the fact that we have deferred maintenance issues.

What is the - the estimated cost of our deferred maintenance budget, and how does that compare to our annual capital improvement plan for water?

MR. AVERY: We talked about that a little bit in the first part of July. But, essentially, we think that we could, you know, readily double our CAP and try to deal with it, so another $10 or $20 million a year.

The question is in terms of conservation: How much do you get in return for spending the - the dollars? And we're trying now to spend the money in the most efficient places possible. One of those is meters, in making sure that we replace meters because, as they become older, they - they dial down in favor of the customer and we think that . . . unfortunately. So, one of the - we're - we 're trying to make prudent infrastructure investments to try to reduce lost-and-unaccounted-for water, and that's a significant component of the 2008 Update to the Plan.

ALTERNATE MEMBER BOB COOK: Okay. The CAGRD is - is undergoing a process now that may - may change some of the rules. Have you included that - anticipated any rule changes in your scenarios -

MR. AVERY: No.

ALTERNATE MEMBER BOB COOK: - with a - with a - with - with reference to the way new developments are permitted?

MR. AVERY: We - we haven't.

ALTERNATE MEMBER BOB COOK: Okay. My last question is really - 2010 census is coming up -

VICE-CHAIRMAN MARCELINO FLORES: That's -

ALTERNATE MEMBER BOB COOK: Huh?

VICE-CHAIRMAN MARCELINO FLORES: That's a third question. I thought you said two.

MEMBER JOHN CARLSON: You said two.

VICE-CHAIRMAN MARCELINO FLORES: Go ahead.

ALTERNATE MEMBER BOB COOK: Okay.

VICE-CHAIRMAN MARCELINO FLORES: Please - brief -

ALTERNATE MEMBER BOB COOK: 2010 census is coming up in a year; it's within the - it's within the time period of this -

MR. AVERY: Yeah.

ALTERNATE MEMBER BOB COOK: - particular study. Are you going to recalibrate your population projections based on those counts?

MR. AVERY: When the 2010 census comes out, it will affect Pima County's TAZ projections. When those TAZ projections change, that will affect our population data.

ALTERNATE MEMBER BOB COOK: Okay. Thank you.

VICE-CHAIRMAN MARCELINO FLORES: Thank you, Bob. Other questions from the public? And - and then we still have the Call to the Audience to go to, so are there any questions first?

TRACY WILLIAMS: Yeah, one question. Thank you. Mr. Chair, I'm interested in Chris' response to the Painted Hills and Tumamock area. I've been privileged to receive an email from Council Member Regina Romero saying, essentially - and this is a lay person's interpretation - we're not going to give the developer the water for that land. We're going to try to use our City water as a leverage to not give 'em water. Is that really going to work so that we can preserve that land as it was set aside in the Pima County bond election years ago? So, I'm seeing a lot of neighbors out in the Tucson Mountain very encouraged by her effort to preserve that land, but knowing what I know about water and the CAGRD, it doesn't seem like that is actually going to happen. Could you explain what's going on there, please?

MR. AVERY: From Tucson Water's perspective - we have seen a copy of the letter from the Ward 1 Office, and from Tucson Water's perspective, what the - Council Member Romero was asking for is that water usage be - be conforming with, in this case, the City's General Plan so that when the City's General Plan designates areas as open space, or having large habitat potential, that the water usage patterns or predictions, the transportation patterns and predictions also track that.

And you're seeing some of that start to happen with Pima County's Conservation Land System. We're working within the City on an Update to our General Plan, and I read Council Romero's Memo as requesting, at least in part, that we, as a City, synchronize our General Plan with our Water Resources Portfolio, our transportation portfolio, our neighborhood portfolio, et cetera. And from - from my perspective being able to integrate water usage and the General Plan in - in some concerted planning effort is one of the ways to deal with some of the issues that are posed by the City limits Obligated Area issued that we've talked about several times during this process.

And I think that there's some role for this Committee to play in that sort of ongoing effort to try to integrate the County's Comprehensive Plan, the City's General Plan, and these particular resources. That's not an exact answer to your question, Tracy, but it's as close as I'm going to get in a public forum.

VICE-CHAIRMAN MARCELINO FLORES: Yeah. Okay. So, how many questions do we have our there remaining? Just one question each, please.

COLETTE ALTAFFER: Okay. I'm going - I'm going to try and roll all this into one question.

VICE-CHAIRMAN MARCELINO FLORES: Okay.

COLETTE ALTAFFER: Bear with me. I'm just sort of -

VICE-CHAIRMAN MARCELINO FLORES: Can you state your name?

COLETTE ALTAFFER: This is Colette - Colette Altaffer.

Just sort of some red flags that are showing up in some of this stuff. When we talk about water conservation, no mention is made of the fact that our entire sewer system is operating at a water deficient of 4.9 million gallons, and every time we take potable water - every time we take gray water out, we're substituting potable water back in. My understanding, of course, is that that is based in part on the way we designed the system. We designed it so that it would have a certain amount of water and work in conjunction with gravity, so we can't really change that, and I didn't see that mentioned.

As far as replenishment goes, we have been told by some of the people from CAGRD that they have more replenishment obligations today than they have water to fill those obligations, and I didn't see that mentioned.

And then, as far as the Assured Water Supply designation in the Third Management Plan, there is a footnote indicating four communities throughout Arizona did not meet their Assured Water Supply designation, one of which was Marana, and the response was to allow Marana to continue to grow - or extend the Plan for another ten years. So, saying that that somehow is a break didn't seem to work there.

And it seems, finally, the big Achilles heel in all of this are the two dams that form Lake Meads (sic) and Lake Powell, and we all know that dams eventually silt up and, eventually, we can't use them. And what I'd like to know - and see whether we can find this information - is: Do we know how much longer we have on those dams and, if those dams were to go tomorrow, what kind of a population could we support?

MR. AVERY: Okay. I'll try to get those questions in order, and I think I'm - I might miss one in the middle. But, in terms of the - the sewer flushing program from Pima County, I can say that 4.9 million gallons is about 15 acre-feet, and we are trying to work with Pima County to try to get a reclaimed connection to their service yards so that even if you can't ensure that all of the water that Pima County uses is potable or is reclaimed that at least some of it is.

Second, in terms of the CAGRD, I think - well, as I talked to you about before, I think it's more likely that the CAGRD water will become very expensive than that it will disappear in any substantial way, because some of the economics that we talked about earlier about how municipal and industrial interests generate large economic returns per volume of water delivered compared to other users of water in - in Arizona.

In terms of Lake Powell and - and Lake Mead in the silting, again, one of the benefits of doing Scenario Planning and Long-Range Planning, and doing it on an almost continuous basis is that when anomalies start to show up, like storage capacity in those Colorado River reservoirs, you can adapt your Plan to deal with it.

And, finally, in - in the absolute worst-case scenario, dam failure on the Colorado River, or some other dramatic catastrophe on the Colorado River, I'd like to remind the Committee and the public that the City of Tucson and, indeed, most of the water providers in the Tucson area still have access to a relatively clean, relatively abundant, relatively secure source of groundwater.

Now, you don't want to do that forever, but in the case of - of - of a critical situation on the Colorado River, you could certainly use those groundwater supplies that we've been trying to preserve as a bridge toward whatever uncertain future might be out there. And, again, that's what Scenario Planning allows you to do, and that's what reducing groundwater pumping today allows you to do in terms of preparing for the future.

Did I get all your questions? Marana.

VICE-CHAIRMAN MARCELINO FLORES: Marana.

MR. AVERY: I think that the point is with the Assured Water Supply rules is that if you ask someone from Prescott whether the Assured Water Supply rule consequences are severe, they will tell you that they are. There the - the new subdivisions in Prescott have dropped dramatically since their designation was essentially revoked for that AMA, and there was an effluent credit sale out of Prescott largely intended to provide a renewable source of water for some new development that - that went for - I think it was $67 million for a few thousand acre-feet. Yeah, it - it was a fairly astronomical sum, again, leading to kind of a general conclusion that, as water becomes scarce, it's more likely that the price goes up dramatically before it goes out - away altogether.

VICE-CHAIRMAN MARCELINO FLORES: One last question from the public, and then we'll move into Call to the Audience. Call to the Audience is limited to three minutes. We have one speaker card thus far. If there are any others, please (inaudible).

CINDY BREWER: Okay. Thank you. My name is Cindy Brewer, and I have a three-part question in the area of water harvesting and conservation. One, I - I attended a wonderful presentation of Sustainable Tucson which, I understand, you - most of you people also heard from a retired couple who moved here five years ago that used to work with the Museum of Natural

History in New York and then traveled the world. And, when they came back, they built a home with a 5,000-square-foot roof and a - and a 26,000-gallon cistern. Their demonstration proved to me that enough - oh, so with their 26,000-gallon tank, they had enough water to have for their own personal needs, for their swimming pool, for their garden, and it even overflowed at times. So, to me it's quite fascinating; it essentially says that all of us, under the skies of Tucson, receive enough water wherever we are, at any given year, to sustain our own needs.

So, my question in - in number one has to do with: Does this inspire the City of Tucson in any way to dream and consider about what comes to us naturally along those lines?

And, number two, you know, I had a conversation about cisterns with Mayor Walkup sometime back and he, essentially, said, "Well, the City of Tucson is a cistern" and, you know, all this water that comes to Tucson, and making it sound like it just could be harvested in this cistern.

And I've since learned that really only - and you - you can tell me - maybe from you people I learned this - I'm not sure - but that only 10% of that water are we able to capture and 90% of it flows through to God only knows where, maybe you know where. I don't know where. And what can be done to harvest this water?

You know, an engineer I knew - I know who recently moved here from Alaska talks about, you know, creating dams along some of these arroyos that we have to save the water there. I understand Reid Golf Course has a retention basin to prevent flooding in that Arroyo Chico Neighborhood, et cetera. And so could we possibly do more to retain the water in the rivers? Number two.

And, number three, I, as a citizen, I don't, you know, feel that I'm hearing so much about water conservation on a daily basis, you know, how I take my showers. How I water my garden. Am I using effluent water from my washing machine, and all those kinds of things. And it seems to me a - a lot more could be done, unless, you know, I'm just walking through the world, you know, missing whatever's being done here. So, I would like to hear a lot more about the subject of water conservation.

MR. AVERY: You're going to get that opportunity in a couple weeks when we talk about water conservation in some detail.

In terms of rainwater harvesting, I think the answer is that rainwater harvesting has become more prominent in recent years in - and the City of Tucson, and other water providers in the region, are a lot more conversant with rainwater harvesting

issues now than we were a decade ago, and - and we have included in a previous presentation the fact that we think rainwater harvesting will be an important component of our water supply future in this town.

The example of - of living uniquely off of rainwater without potable water supplies is yet another illustration of the fact that some of the water resource issues that we have are susceptible to being solved with the application of a lot more money. If you look at the - the cost for those rainwater harvesting systems, amortize it in a mortgage, et cetera, those rainwater harvesting systems, you know, could cost somewhere in the neighborhood of several hundred dollars per month in terms of capital costs per - per homeowner.

The City of Tucson's, you know, average residential water bill is somewhere in the neighborhood of $20 to $25 a month. So, when you increase the amount of money that you're willing to pay for water supply by order of magnitude, the amount of options that are available to you in terms of solving the problem also probably increase by an order of magnitude or more.

And, finally, in terms of conservation, one of the outcomes of the 2004 planning process was the recognition that there needed to be increased emphasis placed on conservation, and you're starting to see that in the 2008 Update and in the new Water Conservation Programs that were approved last spring by the Mayor and Council, the conservation surcharge that was approved by the Mayor and Council, and in the rainwater and gray water harvesting ordinances that the City just adopted, or is in the process of adopting shortly.

VICE-CHAIRMAN MARCELINO FLORES: Okay. We're going to move to Call to the Audience. But, before we do that, can we please give a round of applause for our presenters?

(Applause.)

VICE-CHAIRMAN MARCELINO FLORES: Also, Committee members, thank you for - for letting me go over. This is my first rodeo.

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CALL TO THE AUDIENCE

VICE-CHAIRMAN MARCELINO FLORES: Call to the Audience, we have Tracy Williams, and it's a subject regarding privatization of water.

To the extent possible, can you limit your - your time to three minutes or so?

TRACY WILLIAMS: Yes, Mr. Chair. My name is Tracy Williams, and I'm a lifetime resident of Tucson. I've got a couple of housekeeping issues this evening, and one is I'm really glad to see everyone here in light of the national issues going on; it shows me how critically important this is to Tucson, and I'm glad I wasn't the only one here tonight.

Reading the newspaper, I see that Pima County has a sewer cam that is in its three - third year of visiting the sewers and taking pictures; it's a ten-year program and Mr. John Warner is the Director of Wastewater Reclamation Department's Conveyance whatever Division.

I think we need to know what's going on with the camera. So, I'd like to have that put up on the board, please, Melaney, so that we can get an update of what we are seeing with the sewer cam. And if you could, please, put Colette's question regarding the dams and the issues on that infrastructure, since we go back to our original mission here, which is infrastructure, and I think the dam issue deserves some attention so we know how those structures are doing.

Also, for Chris, for your magic water and the same newspaper, same page, we find that Mars finds more signs of water. So, add Mars, Chris, to your list of magic water. And I'd like to see Larry Dozier up there with his dozers harvesting it and shipping it back. So, that's a cartoon for Fitzsimmons, if anybody knows Fitzsimmons for me.

Regarding the privatization issue. I receive a lot of emails from people all over this region saying, "What's going on with these meetings you're going to, Tracy? And here's some emails about what's happening in the rest of the country." And I'm very concerned about this trend I'm seeing with the comments, which is water, and that's a resource that we all have for our - our life. And I would like to suggest that this Committee make this assumption that we are not leaning towards the planning and eventual privatization of water, and I hope that becomes one of your recommendations that: No way. We do not want to give up our control of this natural resource to any privates, and that also hooks us up with the idea of the regionalization idea. And I hope we include that as a recommendation that we do not regionalize water, and that finishes me for tonight.

VICE-CHAIRMAN MARCELINO FLORES: Thank you, Tracy. Thank you everyone for your patience.

I've received one more Call to the Audience request. Tres English, demand versus need.

TRES ENGLISH: Thank you, Mr. Chairman. I just wanted to make a comment that - from my perspective. The - the basic presumption underlying, basically, the whole work of this Committee is deeply flawed at a very important level, and it relates specifically to the discussion tonight. All the discussion tonight is about demand for water. Demand is an economic term; it is a combination need or want, combined with money.

There is another word that I have never heard used in any of our discussion of water and that's: What is need? What do we need our water for? If we don't need our water for anything, we can conserve - you know, 165, 150 gallons per person per day are large numbers; I mean, that's a lot of water. If we don't need it for anything. If we don't need it for consumption of any - of any purpose, we could probably decrease that by a factor of ten without any real technical problems.

So, underlying all of the discussion that we have here, is an assumption that the need for water really isn't - doesn't exist. What we have is demand, and we can reduce that demand by conservation measures, by increasing the amount we charge for water, a variety of things of that nature.

From my perspective, we have desperate needs for water, which may actually mean that our per-capita water use needs to increase, not decrease because, as I look at it, we need to provide at least a basic subsistence of food supply here in Tucson; that's a consumptive water use. If we are going to provide emergency food, basic food supplies, things of that nature. If we are going to have industries that are capable of meeting some of our corn, industrial needs, and other things of that nature, we may not be able to reduce water per-capita. We may actually need to increase it.

So, at some point, I would really like to hear a discussion of what are our needs for water? Because I have never heard a discussion of that.

VICE-CHAIRMAN MARCELINO FLORES: Thank you. Any other members with a Call to the Audience?

(No response.)

VICE-CHAIRMAN MARCELINO FLORES: Is there a motion to adjourn?

UNIDENTIFIED MEMBER: Yes, there is.

VICE-CHAIRMAN MARCELINO FLORES: Thank you guys for . . .

(Conclusion of meeting.)

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CERTIFICATE

I hereby certify that, to the best of my ability, the foregoing is a true and accurate transcription of the audio recording of (Call to the Audience) of the City/County Water & Wastewater Study Oversight Committee Meeting held on October 2, 2008. Transcription completed: October 13, 2008.

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DANIELLE L. KRASSOW-TISDALE