City of Santa Fe

Agenda

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SANTA FE WATER CONSERVATION COMMITTEE MEETING
CITY HALL - 200 LINCOLN AVE.
CITY COUNCILORS' CONFERENCE ROOM
TUESDAY, December 11, 2012
4:00 PM TO 6:00 PM

1. CALL TO ORDER

2. ROLL CALL

3. APPROVAL OF AGENDA

4. APPROVAL OF MINUTES SEPTEMBER 11, 2012 AND NOVEMBER 6, 2012 WATER CONSERVATION COMMITTEE MEETING

DISCUSSION ITEMS:

5. APPROVAL OF 2013 WATER CONSERVATION COMMITTEE MEETING CALENDAR (Laurie Trevizo) (5 minutes)

INFORMATIONAL ITEMS:

6. DEMAND ELASTICITY: A THIRD PARTY STUDY OF THE CITY OF SANTA FE, SPECIAL PRESENTATION BY JIM FRYER (Laurie Trevizo) (50 MINUTES)

MATTERS FROM STAFF:

7. CLIMATE CHANGE AND THE SANTA FE WATERSHED: A PRELIMINARY ASSESSMENT (Claudia Borchert) (20 minutes)

8. PRESENTATION ON THE DRAFT RECLAIMED WASTEWATER RESOURCE PLAN (Claudia Borchert) (20 minutes)

MATTERS FROM COMMITTEE:

9. SUMMARY OF WATER CONSERVATION COMMITTEE INITATIVES INCLUDING WATER CONSERVATION COMMITTEE DUTIES AND RESPONSIBILITIES (Councilor Ives) (20 minutes)

ITEMS FOR NEXT AGENDA – TUESDAY, JANUARY 15, 2013:

ADJOURN.

Persons with disabilities in need of accommodations, contact the City Clerk's office at 955-6520, five (5) working days prior to meeting date.

MINUTES OF THE
CITY OF SANTA FE
WATER CONSERVATION COMMITTEE
Tuesday, December 11, 2012
4:00 p.m. to 6:00 p.m.

1. CALL TO ORDER.

A meeting of the Water Conservation Committee was called to order by Councilor Peter N. Ives, Chair, at approximately 4:00 p.m., on December 11, 2012, in the City Councilor's Conference Room, City Hall, 200 Lincoln Avenue, Santa Fe, New Mexico.

2. ROLL CALL

Roll call indicated the presence of a quorum as follows:

MEMBERS PRESENT
Councilor Peter N. Ives, Chair
Melissa McDonald, Vice-Chair
Lise Knouse
Tim Michael
Doug Pushard
Lisa Randall
Karyn Schmitt

MEMBERS EXCUSED
Giselle Piburn
Stephen K. Wiman

MEMBERS ABSENT
Grace Perez

OTHERS ATTENDING
Laurie Trevizo, Water Conservation Manager
Melessia Helberg, Stenographer

There was a quorum of the membership in attendance.

3. APPROVAL OF AGENDA

MOTION: Doug Pushard moved, seconded by Lisa Randall, to approve the agenda as presented.

VOTE: The motion was approved unanimously on a voice vote.

4. APPROVAL OF THE MINUTES: SEPTEMBER 11, 2012, AND NOVEMBER 6, 2012, WATER CONSERVATION COMMITTEE MEETINGS

MOTION: Tim Michael moved, seconded by Lisa Randall, to approve the minutes of the meetings of September 11, 2012, as , and November 6, 2012, as presented.

VOTE: The motion was approved unanimously on a voice vote.

DISCUSSION ITEMS:

5. APPROVAL OF 2013 WATER CONSERVATION COMMITTEE MEETING CALENDAR. (LAURIE TREVIZO)

Ms. Trevizo reviewed the proposed 2013 Meeting Calendar, which is in the Committee packet.

MOTION: Melissa McDonald moved, seconded by Lise Knouse, to approve the 2013 Water Conservation Committee Meeting Calendar as presented.

DISCUSSION: Chair Ives said he will try to make the meeting on January 15th meeting, but he may be out of town. He said in his absence, Ms. McDonald, Vice Chair, can chair the meetings.

VOTE: The motion was approved unanimously on a voice vote.

INFORMATIONAL ITEMS:

6. DEMAND ELASTICITY: A THIRD PARTY STUDY OF THE CITY OF SANTA FE – SPECIAL PRESENTATION BY JIM FRYER. (LAURIE TREVIZO).

A copy of *The Demand Elasticity and Revenue Stability Project Interim Report for the California Department of Water Resources (9-28-12)*, is incorporated herewith to these minutes as Exhibit "1."

Mr. Fryer presented information via power point. Please see Exhibit "1," for specifics of this presentation.

The Committee commented and asked questions as follows:

- Mr. Michael asked if other groups in other parts of the country are doing similar things.

  Mr. Fryer said to his knowledge this is the first study that has done an in-depth run at this in this particular issue. He said there are related issues such as rate structure studies, and part of what they are collecting information on. He noted there have been a lot of those, as well as studies on savings from different kinds of conservation programs. He said this is a first effort in this regard in this level of detail.

  Mr. Fryer said he did a paper on it and presented it at a national conference in the late 1990s, speculating on some of these issues. He said some of the things that he speculated on were weather patterns, and they though they needed to look at this more carefully for a thorough analysis.

- Ms. Knouse asked how the Cities were selected, and the reason they selected Santa Fe over Albuquerque, or Boulder over Denver.

  Mr. Fryer said they had to meet certain criteria, and they had to want to participate, and had been implementing long-term conservation programs, and also that they could figure out how to put together a funding package to cover the city. He said they wanted a good range, and they felt that 7 cities were enough. He said they hadn't collected the data and didn't know what the 7 would tell them, so there was no picking and choosing cities which would support their conclusions. They are still in the process of collecting data at this point.

- Chair Ives noted there is a 41 year window for data, and asked if the 7 cities will be able to provide that data.

  Mr. Fryer said it has been challenging. He said most utilities have good data and readily available through billing systems. However, as you go further back there is software transition which can be a barrier to getting detailed water use data by customer class. He said as you get into the earlier 90s and late 80s, utilities didn't separate customer classes, and many were beginning to implement computer systems. He said much of the data wasn't digitized, and then they get into the "dusty binder" era of the project. He said they are finding a tremendous amount of interesting information in the old binders that have been stored away. He said the metrics of the 1970s, the information will be mostly total water use and production, as well as population and the number of accounts. In the 80s and 90s for most of the utilities they can get water use by customer class and by billing period as well as the number of accounts.

  Mr. Fryer said Santa Fe has a special challenge because of the institutional transition from PNM to the water utility, and there is a fairly big wall there to get past. He said he has been having discussions figuring how to get data from the earlier period, noting how much they can find is still a big question mark.

- Chair Ives asked if the report will provide an analysis of the impact that the primary goal referenced here, "... to identify the extent demand elasticity during a drought is influenced by demand management programs undertaken by urban water utilities prior to such events." He asked if the report actually will consider that across the different classes of uses in the target groups.

  Mr. Fryer said this is very much their intentions to the extent they can collect data to support that. He said "the jury is still out a little bit" as to how far back in time we can go, and he doesn't know how much they will succeed, just based on data limitations. He said they will at least be able to analyze for the last decade the trends and patterns by customer class. He said they are doing interviews to try to get a better sense of the community dynamics. He said they are using various methods beyond just water use history to get a handle on this issue, and the report will articulate what they find.

- Chair Ives what are the plans for peer review before the report is finalized.

  Mr. Fryer said the advisory group will be reviewing and providing input on the report. However, they also are collecting names of people who haven't been engaged in the project, some of their colleagues in the industry, for a fresh perspective to make sure they're aren't being too caught up in jargon, or they know what it means but no one else outside the project would know.

- Ms. Knouse said Mr. Fryer said Santa Fe is a funding partner, and asked how much Santa Fe is paying.

  Mr. Fryer said Santa Fe is the only one which isn't co-funding or has a wholesaler as a part of its water management providing funds. He said the Walton Family Foundation funds a lot of the work in the Colorado River Basin. He said all of the case studies are providing some in-kind help, doing queries of its billing systems, looking through the "dusty binders." He said if anyone has clippings or documentation regarding a previous drought, which they think would be valuable to include in the data they are to collecting to help to understand the picture here, they would welcome them. He said they would take digital copies or hard copies.

Mr. Fryer continued his review of Exhibit "1"

Mr. Pushard said this is going after single-family and not multi-tenancy which behavior patterns might be a lot different.

Mr. Fryer said they targeted single-family. However, due to the classifications of utilities, utility records aren't perfect in classifying them. In some cases, he thinks they probably are multi families, and they have a question to identify that, but there is a very small mix of multi-family.

Mr. Fryer asked if anyone objects if he records the discussion this evening, and if any direct quotes are used, the Committee members will have a chance to vet it.

- Chair Ives said there already is recordation of the meeting and accurate minutes of the meeting, although the minutes are summary and don't have every word spoken. He asked the Committee if there are objections to Mr. Fryer recording the discussion, and there were none.

- Responding to a question from Mr. Fryer, Chair Ives said his sense is that the people in Santa Fe are not tapped-out. He said while looking at water use and efficiency, we have been focused on efficiency as the motivating technique, rather than proclaiming "drought hard times" are coming. He said with climate change some of that likely will be shifting in our consciousness. His sense is that people can do more across all sectors of the economy. He said Santa Fe responds as a community to that kind of call.

- Mr. Michael said he has no basis, but he agrees with the Chair that they're not tapped out. He continued, "Although we aren't personally tapped out, we're getting close."

  Mr. Fryer said in the phone surveys there was a question early on for people to rank how much effort they have made to reduce water use – do they feel they did everything, did they do a few things, or could have done more, did they do a lot of things but not everything they could. They asked people to give them a sense of how much effort they made. He said later in the survey they had a list of 17 things and asked which ones their households do. Then they later asked, in a future if a more severe drought occurs than in the past, for those things you haven't done in the past, would you consider doing those. He found a lot of receptivity to doing things in the future that hadn't been done in the past. He said they will have some pretty good data on that. They haven't done a full analysis, but they did have questions exploring that.

- Mr. Pushard said it is interesting Mr. Fryer uses the word "drought," because in Santa Fe we have an emergency water ordinance which really is not related to drought. He 2012 was the biggest drought year in 10 years. He asked if people are thinking drought or City mandated programs.

  Mr. Fryer said there could also be a system failure at some point, so there could be a shortage.

- Mr. Pushard said this is when our ordinance would kick-in for sure.

  Mr. Fryer said in doing the quality control review of some of the telephone surveys, they told people at the beginning of the survey this survey for Santa Fe is about the period 2002 to 2006 when there was a water shortage and there were mandated restrictions. However, people told them Santa Fe has had droughts in recent years as well. He said the definition of drought could be "pretty messy." He said they did point out these were the years that there was a drought and a water shortage with mandated restrictions.

- Mr. Pushard said Albuquerque declares its restrictions on television, and people get that mixed up with Santa Fe.

  Mr. Fryer said people get drought information from the news media as well as from neighbors, but most said they got information on the water bills.

– Chair Ives asked if the report will analyze each of the 7 study areas independently and then look across them for more generalized conclusions.

Mr. Fryer said yes, both for the water use and telephone survey, there will be a profile for the individual case studies and our analysis, as well as a comparison identifying common trends, the differences and an analysis.

– Chair Ives asked if there will be an opportunity for Santa Fe to comment on the preliminary before the report is final.

Mr. Fryer said yes. There is a project representative from Santa Fe who is the designated contact for the project, which is Ms. Trevizo. He said they don't want comment coming from 4-5 sources which could be contradictory. He said it is the City's choice on how to handle that aspect.

– Mr. Pushard said then we can expect to see something preliminary in February or in March for review.

Mr. Fryer said there will be something to see if they have an accurate picture of the problems, and then a draft report in March. They'll probably give 30 days or such for comment, and then they will incorporate those comments and do whatever follow up needs to be done and then issue a final report. He said the timetable for that hasn't been firmed up.

– Mr. Pushard asked what are the hypotheses for this study.

Mr. Fryer said the most fundamental is the demand hardening issue – is it real or not – what kind of elasticity are we likely to see, driven primarily by drought events, noting the economic cycle can impact that. He said it is also quantitative and qualitative and it's not truly a statistical setting, noting there are certain limitations.

– Chair Ives said there may be the opportunity to learn from the various communities.

Mr. Fryer asked about perceptions.

– Chair Ives said there are certain statistics that appear in the newspaper regularly, in terms of rainfall, water use and information on reservoir levels, and such. He said there is some information which is available to the public.

– Ms. Randall said with regard to the Schools, their trigger point was the operational budget, and had nothing to with the lack of water or concern for water, although individuals are concerned, but as a collective organization that wasn't their focus. The focus was how to divert money from utilities to the classrooms, but now is growing into a conservation focus perspective, because there is a deeper understanding about water limitations and being responsible stewards of a precious resources.

Mr. Fryer asked how many years ago that was.

Ms. Randall said the School has been cutting its operational budget for the last 5 budget cycles, and 3 years ago, it realized the utilities was a big chunk of money that could be pared down.

- Chair Ives said one of the first questions this committee took up is what do we mean by drought, and the discussion suggested that as many agencies as there are dealing with water issues, there are that many definitions what a drought might constitute. He said the focus of the State differs from the City, and from the County, as well as from the individual users. He said it would be good to have common standards so we could talk "apples to apples."

  [Mr. Fryer's comments here are inaudible because of the noise from the projector and that he was speaking softly.] How do you align the perception of the reality of what we have.

- Chair Ives said an effective way to get the message out is through articles in the newspaper, such as the one about a recent conference of the Neighborhood Law Center on the heels of a report in the paper about a 20% reduction in the San Juan/Chama usage that BOR was putting out based on the Colorado River flow. He said people have a general awareness of water in Santa Fe.

- Ms. Randall said we talk here about the "carrot and the stick" in terms of behavior and restrictions. She said in looking at reduction targets for the schools, people respond much better when we tell them the reasons, the consequences – if you tell them what you're wanting. She said in 2002-2006 she was doing landscaping, and she would have preferred working with her clients in terms of the water use target, rather than a restriction. The restriction didn't take into account the specifics of her particular work, noting if her clients had a use target or a controlled ceiling of use she could have managed the water budget in a more effective and efficient way for those properties.

  Mr. Fryer said, in general, utilities that have given targets, collectively, their customers have met or exceeded those targets in a drought event. He said that has been an interesting pattern they're seeing.

- Ms. Schmitt said if people feel there is a sacrifice across the board, as opposed to targeted industries or organizations, then they are more willing to share in the "pain." She said this has caused community conflict in the past.

- Mr. Pushard said there was controversy in Santa Fe, and landscaping and other businesses felt targeted with some of the water restrictions. He asked Mr. Fryer if he will have that granularity of detail in any of the case studies.

  Mr. Fryer said very few utilities code what types of industry are included, so there is a data limitation. He is trying to interview people in prominent industries, including landscaping, the Restaurant Association and such, but there is a data limitation which makes it difficult.

- Mr. Pushard asked if there is a landscape association they can interview.

- Ms. Schmitt said they formed the Santa Fe Water Coalition in 2001, and if there were to be restrictions again the same people probably would group together again to ensure our interests were being represented. She said she feels the City ordinance is so much better now than it was at that time. She was interested to read in the paper that the Ski Basin used 1 million gallons of water to make snow, and asked if that ever gets monitored. She said it is important that everybody is engaged.

- Ms. McDonald said the City has moved toward "we're not going tell you how to use your budget, there is an appropriate amount of water that you can use," which she thinks is the better way to go rather than targeting industry – people can make their own decisions as to how to use that water. She said, for example, she put her water into her vegetable garden, and sacrifice water use in other areas, such as washing the car. She said the amount of water allocated has to be fair.

  Mr. Fryer said some communities who have given water use reduction targets, typically do have some restrictions, water-wise type restrictions simultaneously.

  Mr. Fryer thanked Chair Ives and the Committee for the opportunity to make this presentation to this Committee, commenting it is helpful. He said they are still collecting data, but they will shut that off soon. He asked people who have information they would like to provide should do that as soon as possible.

- Chair Ives reiterated the Committee is interested in reviewing the report. He invited Mr. Fryer to sit in for the next agenda items which he might find interesting.

- Ms. Schmitt asked how many of the 7 municipalities have advisory groups such as this one.

  Mr. Fryer said most do, but there probably are 2-3 that don't.

MATTERS FROM STAFF

7. CLIMATE CHANGE AND THE SANTA FE WATERSHED: A PRELIMINARY ASSESSMENT. (CLAUDIA BORCHERT)

A Memorandum with attachments, dated October 30, 2012, to the Public Utilities Committee, from Claudia I. Borchert, Water Resources Coordinator is incorporated herewith to these minutes as Exhibit "2."

Mr. Michael said he was unsure where this is going and he didn't know what to make of it, so he has no framework to make a comment.

Ms. Borchert said this is a little outside her avenue of work, and it will go back to all of the people in the City that worked on climate change issues, including Katherine Mortimer, the Santa Fe Sustainable

Commission, Andrew Phelps, Emergency Response, Nick Schiavo who works on energy issues. There are quite a few people who approached the climate change issue from many different perspective, but until this report had not addressed the impacts in this way. It is now up to those working in those individual systems to "pick up the ball" and say here are the impacts and what is within my sphere to try to figure out the path forward based on the vulnerabilities and the recommendations from the climate change experts and the public. This is very much a first step, a preliminary assessment. It isn't a roadmap, it's not a plan, it's just a gathering of what we know, what has been done, what we think we should do and how we go about it.

Chair Ives asked who has participated, referring to page 3 where it spoke about "install solar panels over parking lots and elsewhere to reflect heat and produce energy." He agrees it's a good goal, but it doesn't have terribly much to do with the watershed. He said it indicates people have expanded the content beyond what he would describe as climate change and the Santa Fe watershed, unless the watershed is defining a particular geographic area. He said in many ways there are a lot of broad stroke ideas as opposed to trying to assess, for example, the reduction of 40% in surface water supplies. He said our response in each instance is something he believes would be helpful for future planning. He believes there is a need to state in a real and concrete way what some of the issues are, such as implications/impact of the Colorado River Basin study.

Ms. Borchert said this is the second part and they are doing exactly that. She said the first part was very qualitative. They had to balance the fact that they had this big workshop, people had ideas and wanted to be heard and it's important to be heard. There were a wide variety of ideas. She said this is the exciting part about tackling the water supply piece. She said we have a system simulation model which has a hydrograph from 1912 to 2005. They have taken the climate models, scaled them down and produced 5 different ranges of hydrograph targeting out to 2040 which frame the conditions we're likely to see for all of our surface waters – Santa Fe River and San Juan/Chama water – and how those play out against the 5 climate projections, to come up with how we best position our water supply portfolio to adapt to the range of conditions they see. She said phase 2 is going to be much more qualitative and they will have very clear recommendations will be the "marching orders" for the water utility for the next 10-20 years.

Mr. Pushard said he attended the workshop, which was good. He said gathering input and getting people engaged is an important part of process, but there was such a wide variety of interests. He said the title of the report is somewhat misleading. He said these are ideas for a sustainable Santa Fe, commenting it is much bigger than just water.

Ms. Borchert said it is much bigger than water, noting the watershed was meant to be a geographic boundary not a water boundary. She said they tried to take all the comments from the workshop, but then the experts used their knowledge and added to it – fleshed out certain areas. She asked if the title of the report should say "And the Santa Fe Basin," instead of "the Santa Fe Watershed.

Ms. McDonald said she could use basin or another word and then have a definition, commenting she should replace "watershed."

Mr. Michael said at some point the public is going to have to pay for this, and change its attitude in a lot of ways, because sustainability is far more important to us than a low water bill. He asked if this is overarching all these systems or how is that dealt with.

Ms. Borchert said the Resolution that started the climate change work, talked about revising the Long Range Water Supply Plan as well as public outreach and education. She said the City doesn't have a PIO and she's not a PIO. She said it is hard to implement the actions without educating the public and getting public buy-in and to want these changes to occur. She said there is a huge institutional problem in how do we do our work and do the education piece. She said how that is going to happen exactly is not clear to her. She is happy to take any suggestions in this regard. She said there have to be ways to get information to the public faster and reach a bigger audience that don't involve having public meetings and public workshops that take all day.

Chair Ives said the difficult part of getting information out on disasters is reaching children and women who stay at home. He said they can get information to civic leaders on a broad level. He said they are looking to the social media to get information out on disasters of epic proportions – tsunami, earthquake, volcano, floods, drought, but can be over-used if you aren't in an emergency context. He said he can see talking to the newspapers and posting more prominently a host of attributes – humidity, rain events, temperatures and such.

Ms. Randall said there are tons of teachers who use *The New Mexican* in their classrooms. She said City Solid Waste puts out the recycling full page which has "been the same for I don't know how long." She doubts people look at it anymore. She suggested a 1/4 page for that part, and dedicate the other 3/4 for climate change information, noting newspapers "are written for 8th graders."

Mr. Pushard noted the next steps, and asked who will be doing this and how it will happen.

Ms. Borchert said she is willing to "take this on," and she is working together with other people in the City. She said what seems to be lacking are the coordination and conversation. She said, within the next year, she will start having monthly brown bag lunches, of about an hour, which will be open to anybody to attend. She said it will be the beginning place for people to come who want to share what they're doing, get organized around what they're doing, to hear what's going on and how they can get involved – a coordinated effort where the key players share information with one another to avoid duplication of effort.

Chair Ives said it would be interesting if she would list blogs on some of the narrower topics in the community of the whole across the community after these meeting.

Ms. McDonald likes the blog suggestion from the brown bag lunches. She said a lot of people. She said it is a read blogs and will go back to it if it has updated information, and it's a good way to get information to a larger group of people who are trying to coordinate in this regard. She said although they read the blogs, they don't always comment, reiterating this an excellent suggestion to helping people to know what is going on. People could just list a paragraph about what they're doing, and then it's all catalogued and very easy to go back to.

Ms. Borchert said then there could be a brown bag water blog, or a brown bag restoration blog, commenting blogs aren't her area of expertise.

Ms. McDonald said it could be done by category so people can tag it. She said those organizations probably have a tech person that could set up the blog.

8. PRESENTATION ON THE DRAFT RECLAIMED WASTEWATER RESOURCE PLAN. (CLAUDIA BORCHERT)

A copy of the updated Memorandum, with attached Plan, dated December 5, 2012, to the Public Utilities Committee, from Claudia I. Borchert, Water Resources Coordinator, is incorporated herewith to these minutes as Exhibit "3."

Ms. Borchert presented information from her Memorandum of November 27, 2012. Please see this Memo for specifics of this presentation. She noted the rankings are on page 2.

Ms. Borchert said when this item went to the Public Utilities Committee last week, there was a strong sentiment that the City and County went together and made a line where the City's service line is, and it is the City's primary focus to make sure the people in that service area get the water they need. If people are outside that service area, which includes the polo fields and the downstream agriculture users, they need to be looking to the County to figure out a way to provide them water. She said she isn't saying that's the way the plan will end, because right now there is a good chunk of water going downstream, but this is the sentiment she kept hearing.

Chair Ives said he understands the County is looking at implementing an entirely new water plan.

Ms. Borchert said she asked the PUC if the ranking felt right to them. She said ultimately it is up to them to decide if the ranking is right, and they might, for example, decide the most important item is the downstream users. She said it is perfectly appropriate for them to alter this plan. She said the ranking methodology may not have been able to capture all the different considerations an elected official has to consider in making choices in allocating a resource.

Mr. Michael asked if the downstream users have rights to the water.

Ms. Borchert said no, and the owner is the producer of the artificial water coming from a man made facility. She said before the water is released into the river, water belongs to the City. She said she noted La Cienega is having conversations with its newly-elected State Representative to change the State Statute. She said we want to pay attention to that and have conversations with her about that, and if she would be willing to hear our position on that as well.

Ms. Borchert said there is a question of age of water rights, noting there are very old water rights downstream, but she doubts any are older than 1609, which is the priority date claimed by the City. She

said there are many complicated issues. She said one of the next steps in the Plan is to convene a ½ or 1 day workshop to look all of the different legal positions – we have our attorney making this legal assertion and we can and hear from the OSE and the attorneys advising the downstream users – at least try to have a conversation to share where the legal positions come from. She said it's hard to move forward without the certainty of knowing how it's going to play out.

Ms. Borchert said the good news, from her perspective as a water person, is this portfolio. She said when you turn to the 2020s, which is the timeframe within which we will need a new future water supply, "there's a lot of water." She said, "All of this water which is shown in blue, the larger dark blue chunk, is all water available for water supply – 2,200 afy. It is water that you can still meet all these uses that are important to you, and you take the water in what we call the shoulder months, the non-top-irrigation months and divert it for water supply. And one of the recommendations for this plan is to do a feasibility study next of the ways in which you could turn this in the future water supply. Do you want to run it down a pipe that goes down to the Rio Grande following the Buckman Direct Diversion easement, drop it into the Rio Grande and then divert an equal drop and pump it back up again. Do you want to store it in the aquifer and pump it back out again, or do you want to do some additional treatment and then add it to the stream that is currently already getting treated at the Buckman Regional Water Treatment Plant and have that be an additional source of supply."

Ms. Borchert said this is still "very draft," and she hasn't included all the comments from people from the draft on the web. She noted there is a full version of the report on the web. She will be having public meetings, and going to other committees, noting she is trying to wrap this up in two months. However, if you haven't had a chance to look at it, you could attend the public meetings, talk to her off-line or read it and send her your comments, noting there are lots of avenues for all kinds of input in the next 2-3 months.

Chair Ives said previously, we've talked about updating the TEMP, and he wants to make sure it has been recrafted as the Reclaimed Wastewater Resource Plan.

Ms. Borchert said this is correct. She said the industry standard is to talk about it as reclaimed wastewater, because it's reclaimed and has a lot of uses as such, and "treated effluent" doesn't capture that it has a lot of value. She said this is pretty much "nuts and bolts," although there is a broad brushed strategy section, Section 8 of the report, which also is in the packet, which talks about the strategies that we should be considering – use it as a water supply, measure it. She said the numbers around the use right now aren't very good, optimize it, use it more efficiently, do park irrigation efficiency studies, encourage distribution through low energy systems using renewable energy to distribute it and so on.

Chair Ives asked if it is safe to say that the two most readily relatively new sources of supply will be reclaimed wastewater and water harvesting – rain or stormwater runoff.

Ms. Borchert said yes, plus more water conservation which is an important new source of supply. She noted that 21% of our June supply is met by reclaimed wastewater, but annually it has dropped to the teens. Without that supply, we would be pumping the aquifer more or getting more water from Buckman, whatever the source.

Ms. Schmitt said she has been spending more time at the MRC because her son plays soccer. She said, sitting at this table, she has heard we have really wonderful, high quality, reclaimed wastewater. She said her son tells her it smells terrible sometimes out there. She asked the reality. She said Ms. Borchert is talking about potable water from this which concerns her.

Ms. Borchert said it would have to be treated additionally before it became potable. She said it meets Class 1-B wastewater standards. She said it isn't just her writing this plan and there is a working group which has been meeting monthly, and this plan is the product of those efforts. One of the people in the group is a highly qualified wastewater engineer. She said in general, the EPA has no regulations that regulate the reuse of wastewater. The various states have their own set of regulations which are not uniform across the board. She said, "Yes, we're regulated by the State and we meet all of the State requirements. It doesn't necessarily mean there's not a certain risk associated with the exposure of reclaimed wastewater. And the people who use it have to follow requirements, like there should be no ponding the water, that's a big non-no. You have to make sure you only irrigate during times when people are not around, like at nighttime."

Ms. Schmitt said the MRC is a very popular place right now, and there are lots of people out there.

Ms. Borchert continued, "And so that's something that is kind of one of the next steps, is to kind of look at, really more conversations with the users, especially our own City facilities which are in different departments, for them to make sure they understand the need for them to employ best management practices around how they use this effluent, to reduce the risk of exposure to all people who recreate in the area."

Ms. Schmitt said these kids are all over the MRC.

Ms. Borchert said she created the water budget for the MRC based on past use, but they have a bunch of backfields they haven't kept up. She said conversations with the MRC indicates they would like its water budget increased to make sure they can bring all those fields back to the level of fields to which people are used to playing.

Ms. Borchert said the recommendation from this Committee has gotten no traction from public officials, which is the idea that people who recreate in places where reclaimed wastewater is used pay for it. She noted the Country Club which is partly public gets it for free.

Chair Ives thanked Ms. Borchert for her presentation.

MATTERS FROM THE COMMITTEE

9. SUMMARY OF WATER CONSERVATION COMMITTEE INITIATIVES INCLUDING WATER CONSERVATION COMMITTEE DUTIES AND RESPONSIBILITIES. (COUNCILOR IVES)

Chair Ives said it is important to address where we are with reclaimed wastewater issues as well as climate adaptation. He said these presentations and the ones last meeting, were significant to this Committee defining the water conservation issues. He said we will now be able get into these issues in a more focused manner to accomplish what we want to accomplish.

ITEMS FOR NEXT AGENDA – TUESDAY, JANUARY 15, 2013

Ms. Schmidt said she would like something about the new automatic water meter readers, so we can have that discussion.

Chair Ives said the City has looked at a new type of meter and have talked about allocation of funding.

Ms. Trevizo noted there is a pilot project, but that's all, and she thinks the discussion has been about the status of the pilot project.

Mr. Pushard wants an agenda item to talk about the structure of the meetings, noting there has been no time for matters from the Committee, and the last item on the agenda is input from the Committee. He said we now have subcommittees and we want to hear from those.

Chair Ives said the way this will be addressed, is there will be a section for committee reports.

Ms. Trevizo said she spoke with the City Clerk, and the structure of the agenda is created via resolution, and the agenda is written that way. She said when we are ready to report, those items can be moved up when there something for the packet and a status.

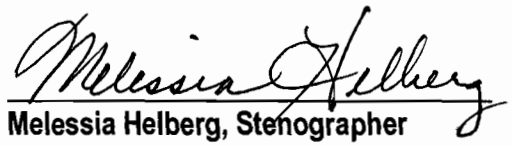
Mr. Pushard said then that would go in the information section, versus Matters from the Committee, which would move it up on the Committee Agenda.

Chair Ives said he will be asking committees to submit the reports in writing so there will be an opportunity to read it before the meeting.

ADJOURN

There being no further business to come before the Committee, and the Committee, having completed its agenda, adjourned the meeting at approximately 6:10 p.m.

Peter N. Ives, Chair



Melessia Helberg, Stenographer

The Demand Elasticity and Revenue Stability Project

Interim Report for the California Department of Water Resources

(9-28-12)

Project Goals

The project goal is to identify the extent demand elasticity during a drought is influenced by demand management programs undertaken by urban water utilities prior to such events. This includes assessing if the long-term demand management programs resulted in decreased, increased, or no significant impact on the ability and willingness of urban water users to achieve additional demand reduction during subsequent drought events. The project is designed to provide guidance for water planners in determining acceptable levels of shortages during future drought events, and how to optimize water shortage contingency plans for fairness and for minimizing economic impacts. The study will also provide guidance for water utilities to adequately plan for revenue instability that may result as a consequence of short-term droughts and water shortages.

Project Tasks

Project tasks include:

- Selection of case studies
- Obtain water use records from case studies and develop water use profiles
- Obtain water conservation program records and develop conservation profiles
- Characterize climate, collect data and conduct an assessment on annual weather conditions
- Obtain data and conduct assessment of demographics and trends
- Obtain data and evaluate economic patterns and trends
- Design and conduct random phone surveys of residential customers for each case study utility
- Conduct interviews of utility staff and management
- Conduct interviews of community leaders and media members

For each case study, these tasks allow analysis of drought circumstances and customer perceptions of and behavioral responses to drought, achieved water savings during drought events, remaining water conservation measures available for future drought events, and customer receptivity to conservation effort in future drought. Revenue implications of fluctuating demand will also be evaluated. As the data collection and analysis is completed for each case study, the case studies will be compared to evaluate similarities and differences, and apparent drivers of the similarities and differences.

An in-depth final report will discuss the methodology, data sets, analysis, findings and recommendations.

Case studies

Urban water utilities throughout the Western States were contacted and evaluated for viability and interest in participating in the project. The following criteria were used to select the final list of case studies.

Exhibit "1"

- The utility had a history of implementing long-term water conservation programs
- The service area experienced one or more droughts with a water shortage in last decade
- The utility was expected to have adequate water use records needed by the project
- The utility expressed interest in participating and working with the project team to provide data and records needed

A total of 7 case studies were selected including:

City of Petaluma, Northern California
City of Santa Rosa, Northern California
Irvine Ranch Water District, Southern California
Monte Vista Water District, Southern California
City of Boulder, CO
San Antonio Water Service, TX
City of Santa Fe, NM

Status

Most of the necessary data are in hand, but we are still addressing some important data gaps for the seven case studies. As data sets accumulate, the project team is shifting more focus to the analysis and the water use patterns and trends emerging from analysis of the data sets.

General preliminary trends and patterns

These are very preliminary and very general findings. They reflect the trends and patterns emerging from the residential phone surveys, and review and analysis of presently available water use data. Some data gaps are still being addressed and more detailed analysis will subsequently occur which is expected to expand, and may alter or refine these very preliminary findings.

Water users obtain information about drought events from a wide range of public sources. The information provided by utilities may influence, but does not appear to dominate the drought situation messages received by local water users.

During drought, water users employ a wide range of indoor and outdoor conservation measures to save water. Some measures are long-term or permanent such as toilet or clothes washer replacements. Other measures are more behavioral. The behavioral conservation measures may experience water savings decay during a future series of relatively wet years.

Most water users appear to be receptive to trying new short-term and long-term conservation measures during drought periods.

Collectively for a service area, water users typically meet or exceed conservation goals during drought events when given an actual target.

Most customers have some awareness of and would consider doing additional conservation measures during a more severe future drought.

By a large margin, the residential phone survey respondents were more interested in reducing ongoing water bill costs compared to paying for new projects that would provide full supply reliability in drought years. This was also true for the case study that has been the most drought impacted in recent years, with 2011 as the most serious of numerous recent drought years.

Water rates appear to be an important factor influencing reduced water use in recent years. The impact of water rates appears to have exceeded the related but separate impact the recent recession had in reducing water use. This may reflect the substantial increases in water rates that have occurred for many of the utilities in recent years.

Total water use presently ranges from about 100 to 200 gallons per capita per day (gpcd) for the case studies in this project and most urban water utilities. Some experts are now suggesting normal interior water use may decline to as low as 40 gpcd for areas that become fully saturated with present day water efficient appliances.

Given present day water use levels, urban water utilities may experience significant demand elasticity during future drought events when water users are motivated to embrace new water saving technologies and behaviors. Water use rebounds after future droughts are likely to be more modest than the rebound that occurred after the 1976-77 drought- of- record in California when most water savings was based on short-term conservation measures.

Many utilities appear to be experience problems archiving data when new billing system software is adopted. Detailed historic water use records may be lost or become very difficult to access for years preceding a billing system software upgrade. These lost records may be important for many water management policy questions. More care in archiving water use records so that they are available for policy analysis would be beneficial for policy analysts. Fortunately, the Public Water System Statistics reports compiled and archived by DWR have been helpful in bridging some of the data gaps.

Remaining Tasks and Schedule

- Finalize data acquisition
- Compare phone surveys responses to water use patterns for the respondents
- Case study comparison analysis
- Evaluate revenue implications of project findings and viable policy responses
- Develop draft and final reports

Revised findings and recommendations are expected in early 2013 and project completion is expected in May, 2013.

Project Contact

Jim Fryer
Environmental Scientist/Project Manager
jfryer.iwrca@gmail.com

Summary Description:

Demand Elasticity and Revenue Stability Project

Background

Many urban water purveyors in California and other drought prone states once had the luxury to plan drought year supplies to fully meet average year demand, providing a system with little water shortage risk in all but the most extreme drought years. However, given numerous modern pressures including ongoing population growth and development, increased emphasis on environmental protection, competition between agencies for available water supplies, and increasing uncertainty with respect to climate change, this is no longer the case for many agencies. As a result, many agencies now evaluate and include acceptable levels and frequencies of water shortages as a fundamental component of water supply reliability planning. The ability and willingness of water users to reduce consumption during drought or other short-term shortage is critical to this planning process but is difficult to determine.

It is widely assumed by many water planners that conservation programs implemented before a drought or other short-term shortage diminish the ability of water users to further reduce water demand during subsequent shortages. This phenomenon, often labeled demand hardening, has undermined the attractiveness of long-term demand management programs for many water supply planners. There is a further concern that implementing water efficiency programs can make it more difficult for an agency to respond to reduced water allocations and deliveries during serious water shortages compared to other agencies.

The existing literature on this subject is very limited and provides little practical guidance for water planners. However, some water management experts suggest that the concern over demand hardening may be exaggerated. Water savings from some long-term conservation programs may not achieve full potential in non-drought years. The full potential may become apparent only when measured during a drought period when water users fully employ their new conservation technologies and management practices. In this view, many of the presently unmeasured impacts of long-term conservation programs may balance or exceed the assumed effects of demand hardening.

The willingness and ability of customers in services areas with aggressive, long-term demand management programs to further reduce water use during occasional short-term shortages is an issue of fundamental importance in water supply planning. It has major implications on the need, cost and timing of new water supply development and serious implications for agency revenues during drought and non-drought years. It also has important implications regarding the allocation of water for critical environmental needs during drought periods.

Despite the importance of this issue, the literature is exceptionally sparse on this subject, and potentially misleading. However, California and other states have now experienced several drought periods since implementation began of modern, long-term demand management programs. The data necessary for a thorough analysis of demand elasticity during droughts can now be obtained. Many recent newspaper articles in California report water use reductions for some areas in both northern and southern California exceeded the expectations of water agencies. Some of these areas were known to be very active with long-term water conservation programs before the recent drought began. This suggests that the issue of demand hardening and demand elasticity during droughts is not adequately understood. A credible study that contributes to an improved understanding of this complex issue would greatly benefit water managers and the public.

Study Goal

The goal of the study is to identify the extent demand elasticity during a drought is influenced by demand management programs undertaken by water agencies prior to such events. This will include determining if the long-term demand management programs resulted in decreased, increased, or no significant impact on an agency's and their customers' ability and willingness to achieve additional demand reduction during subsequent drought events. The study will also seek to determine the impact on drought period demand elasticity of specific types of long-term demand management programs and how this relates to different customer classes. The study will provide guidance for water planners in determining acceptable levels of shortages during future drought events and how to optimize water shortage contingency plans for fairness and for minimizing economic impacts. The study will help water utilities adequately plan for revenue instability that may result as a consequence of short-term droughts and water shortages.

Study Design

The proposed study will have quantitative and qualitative components.

We will utilize a screening process to select appropriate water agencies for in-depth case studies. These will include agencies that have faced droughts or short-term water shortages but also have implemented significant long-term demand management programs. We envision selecting 5 to 7 case studies representing different regions, different mixes of customer classes, and different drought or shortage severities.

The case studies will include several components:

1. Interviews of senior water agency staff to understand how they went about dealing with the drought
2. Collection of information about the types of demand management programs undertaken by the test agencies
3. Collection of customer class billing records and monthly water production data spanning enough years to define base year demand and projected impact of the demand management programs over time, and a bottom up analysis of expected water use with fully efficient fixtures and different behavioral patterns.
4. Estimation of achieved savings during the drought as a result of agency calls for restrictions on water use (by customer class, data permitting) as well as impact of external influences such as widespread press reports of drought and water shortages.
5. Assessment of how the customers of these agencies responded to calls for drought-related water use restrictions via stakeholder interviews. These may include a variety of water agency personnel, local newspaper editors, local chambers of commerce, and notable citizen activist groups. Local newspaper reports about these issues as they appeared during the drought event will also be examined for additional insights. If necessary, random telephone surveys of some customer classes may be employed. Targeted phone surveys of known conservation program participants also may be conducted.
6. A bottom up analysis of likely water use with fully efficient fixtures and different water savings behavioral patterns to help define a potential range of elasticity in future events and likely water use outcomes given a range of drought severities.

We will carefully consider the following key questions as we conduct the analysis. In service areas with aggressive long-term conservation programs and where per-capita consumption has generally dropped over time, how have customers reacted to rationing during more recent shortages? Compared to earlier shortages, did customers cooperate and respond less or more when asked to further curtail

their water use? What other factors, such as economic conditions and or demographic trends, may have affected water use during the study period and what are the relative impacts of these? Given the historic water use data, and data from the attitude and behavioral survey, how much more water could users still save, with varying degrees of effort, if another drought or serious shortage were to occur in a given service area? What were the financial and programmatic impacts of demand fluctuations and what are viable planning and policy approaches to minimize undesirable revenue impacts.

Timeline
Once the project is started, we expect approximately 8 months of data collection, analysis, and draft and final report development.

Preliminary Budget Estimate
We anticipate a cost of about $25,000 per case study, depending on availability of data sets on water use patterns, historic and recent weather conditions, public media messaging on drought/water supply conditions, and the need for telephone surveys to determine customer perception of droughts and behavioral responses. We expect 5 to 7 case studies in the final mix and anticipate co-funding them through a mix of agency contributions and grants.

We project an initial budget estimate of approximately $125,000 to $175,000, depending on number of agencies participating and evaluated as case studies, availability of existing data sets, and the need for outside public opinion surveying subcontractor.

Project Team
James Fryer, Anil Bamezai and Mary Ann Dickinson are key project developers and participants. Others may be added in various roles in an advisory group as agencies are recruited for the project.

We will submit the draft report to qualified peer review and address comments and feedback in developing the final report.

A subcontractor may be utilized for conducting public opinion surveys in the case study service areas.

Additional Information

Please contact James Fryer at 650.580.5790, or jfryer.iwrca@gmail.com

(6-15-11)

City of Santa Fe, New Mexico

memo

DATE: October 30, 2012

TO: Public Utilities Committee

VIA: Rick Carpenter, Water Resources and Conservation Section Manager RC BKS
Brian K. Snyder, Public Utilities Department and Water Division Director BKS

FROM: Claudia I. Borchert, Water Resources Coordinator CB

RE: Climate Change and the Santa Fe Watershed: A Preliminary Assessment

Item and Issue: Climate Change and the Santa Fe Watershed: A Preliminary Assessment

Included in this PUC packet is the executive summary and the table of contents of the *Climate Change and the Santa Fe Watershed: A Preliminary Assessment*. To save resources on a draft report, the rest of the assessment is available on line at www.cityofsantafe or can be provided on a CD upon request.

Highlights of the report:

- Section 2 summarizes the current state of the climate change science for our watershed.
- Section 3 captures the process of the workshop, and the subsequent activities that lead to this assessment.
- Section 4 describes the vulnerabilities of our watershed, grouped by water supply, ecosystem, agriculture/food security, land use/quality of life, energy, transportation, economic, and sociological systems.
- Section 5 is perhaps the most important section because it identifies 1) what can be done to adapt to projected climate change impacts and 2) what activities, and they are numerous, are currently being undertaken throughout the watershed. The list of activities, largely gathered from the public at the workshop is impressive, but likely incomplete.
- Appendices record the content of the presentations given by experts at the workshop and the feedback gathered from the workshop attendees. The expert presentations and other information related to this project are also available on the City's website at http://www.santafenm.gov/index.aspx?NID=2577.

Background

As directed by Resolution 2011-17 *A Resolution Directing Staff To Prepare Revisions To The City's Long Range Water Supply Plan For the Governing Body's Review With A Special Emphasis on Climate Change*, staff has been analyzing how projected climate change impacts will affect our watershed in general and water resources specifically. Through the Santa Fe Basin Study, as part of the Bureau of Reclamation's (Reclamation) WaterSMART Program Initiative, the City teamed with

Exhibit "2"

Santa Fe County and Reclamation to hold a public workshop on climate change (March 6, 2012) and produced this preliminary assessment.

The second part of the Basin Study will update the water resources system simulation model (WaterMAPS) to include Santa Fe County water utility and to incorporate information that account for the projected climate change impacts on stream flow, temperature, precipitation and evaporation. The result of the Basin Study will determine to what extent projected climate change impacts will modify the current estimated "gap" between water supply and water demand and whether the solutions from the City's current Long Range Water Supply Plan (2008) and the County's 40-year Water Plan are adequate to meet the multiple future water challenges presented by climate change.

Next Steps and Schedule:

November 2012

- Seek comments on assessment from Sustainable Santa Fe Commission, the Water Conservation Committee, River Commission and Santa Fe County Commission
- Finalize assessment
- Issue press release on assessment
- Post final assessment on City's website

December 2012

- Create a polished flyer based on the assessment's executive summary
- Seek governing body approval of CDMSmith contract for Part 2
- Circulate final assessment to workshop attendees
- Initiate monthly Climate Change brown bag lunch discussions

January 2013

- Begin Phase 2 work and analysis

August 2013

- Update to PUC on progress

April 2014

- Final draft of region's water supply plan to PUC, other recommended committees and the City Council for approval, and Board of County Commission, if desired by County staff.

Requested Action:

Staff is seeking any feedback from the PUC on the assessment before finalizing it. Staff can incorporate suggestions submitted through November 26th, 2012.

October, 2012

Climate Change and the Santa Fe Watershed: A Preliminary Assessment

Bureau of Reclamation WaterSMART Program Initiative

Prepared for:

Bureau of Reclamation **City of Santa Fe** ***Santa Fe County***

Prepared by:

Amy C. Lewis, Hydrology and Water Planning

And

ISET

Karen MacClune *and Kari Tyler*
Institute for Social and Environmental Transition

In cooperation with
Claudia Borchert[1], Dagmar Llewellyn[2], Karen Torres[3],

1 City of Santa Fe, 2 Bureau of Reclamation, 3Santa Fe County

Acknowledgments

The authors would like to thank the experts that presented at the Santa Fe Watershed Climate Change Workshop and provided the foundation for the summary of the projected climate change impacts in this assessment. Their presentations are available at: http://www.santafenm.gov/index.aspx?NID=2577. Reviewers of the document who, in part, provided information on existing actions in the Santa Fe watershed are also appreciated: Jan-Willem Jansen of Ecotone, and Craig O'Hare and Duncan Sill of Santa Fe County, Brian Drypolcher and Katherine Mortimer with the City of Santa Fe, Louise Pape with the Sustainable Santa Fe Commission, and Jonne Hower, Amanda Erath and Dave Truman, with the Bureau of Reclamation. Thanks the City of Santa Fe for providing the venue for the workshop and for the 120 members of the community that participated and offered their insights on the vulnerabilities of their systems.

Table of Contents

Appendices

Appendix A. Workshop agenda
Appendix B. Workshop participants
Appendix C. Summary of climate science presentations
Appendix D. Proposed actions

List of Figures

List of Abbreviations

Basin Study = Santa Fe Climate Change Basin Study
City= City of Santa Fe
County = Santa Fe County
FDSI = Forest Drought Stress Index
gpdc = gallons per capita per day
NDVI = Normalized Difference Vegetation Index
NMED = New Mexico Environment Department
OSE = New Mexico Office of the State Engineer
Reclamation = U.S. Department of the Interior Bureau of Reclamation
SFWA = Santa Fe Watershed Association
SJC = San Juan-Chama Project
SWQB = Surface Water Quality Bureau
TNC = The Nature Conservancy
USGS = U.S. Geological Survey
WaterSMART = Sustain and Manage America's Resources for Tomorrow

Executive Summary

Climate change is projected to have profound impacts on the Santa Fe watershed. The degree to which we will gracefully weather and adapt to the impacts will largely be determined by the preparations we engage in today. This preliminary assessment, collaboration among the City of Santa Fe, Santa Fe County and the Bureau of Reclamation, investigates how projected climate change impacts may influence some of the key natural and human systems in our watershed. The assessment also explores the adaptive actions that we, as stewards of this watershed, may consider implementing and details many of the ongoing activities that will increase the resiliency of our community.

CLIMATE CHANGE IMPACTS

Climate change has already begun and will continue to worsen. While exactly how the multiple changes will evolve is not totally certain, the experts in the field are confident in projecting, at a minimum, the following impacts to our watershed:

- Increased temperatures;
- Diminished snowpack and earlier spring melt of existing snowpack;
- Reduced stream flow due to greater evaporation rates and water use by plants;
- Earlier stream flow peak (from earlier snowmelt) and dampened peak flows;
- Drier mid- to late-summers;
- More severe and frequent droughts;
- Increased fire activity and risk of catastrophic fire; and
- More intense precipitation events resulting in increase peak storm flows, greater magnitude and frequency of flooding, higher erosion rates, more sediment transported by storm flows.

VULNERABILITIES

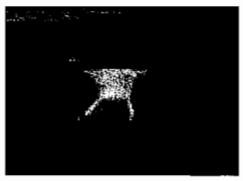
Through an interactive, public workshop held in Santa Fe on March 6th, 2011, the community and climate change adaptation experts identified the vulnerabilities of water supply, ecosystems, agriculture, land use and quality of life, energy, transportation, economic, and sociological systems. Even though each of these systems inherently overlaps with others and the boundaries are constructs, the systems approach allows us to focus on the most critical aspect of each. A summary of the vulnerabilities are briefly described below:

Water supply: decreased surface water availability; increased water use; unsustainable groundwater use; storage insufficient to capture storm events; debris flows triggered from catastrophic-fire causing loss of storage capacity; degradation of water quality; more frequent restrictions from Rio Grande Compact; increased competition over resource; less groundwater recharge.

Ecosystems: forests vulnerable to insects, fire, and desiccation; less available water; higher water needs; incursion of invasive species; habitat degradation from storms, flooding, erosion, and lack of water; loss of fisheries, upland forests, and grasslands; post-fire forests being replaced by grasses and shrubs, not the original native trees.

Agriculture: reduction in available water supply; increased crop water demand; greater divergence between highest stream flows and when water is needed for irrigation; increased damage to crop from pestilence, high winds, violent rain storms, and flooding; increased pressure to transfer agricultural rights to urban areas; rural-urban conflicts over water and water rights; failure of genetically engineered crops; reduction in viable grasslands for cattle; livestock reduction and mortality from extreme weather conditions and rising cost of feed; increasing food prices.

Land use and quality of life: increased water needs for green spaces; increase of urban flooding; reduction in quality fishing opportunities; reduction in length of skiing and rafting seasons; diminished hiking, biking, and hunting opportunities due to fire; poorer air quality; increased heat stress in elderly, the infirmed, and infants from higher summer daytime and nighttime temperatures.



Energy: increased competition for water with energy production of water-intensive coal, natural gas and nuclear; less hydropower production; reduction in solar production because of higher temperatures and more air particulates; increased energy consumption during the summer and extreme cold weather events; reduced power and gas reliability during extreme conditions.

Transportation: increased interruptions from dust storms, intense rains, and smoke; failure of infrastructure (paved roads, bridges, culverts, rails) designed for less extreme conditions; more difficult flying conditions under higher temperatures.

Economic: tourism and population growth may decrease if climate conditions are unfavorable (e.g. too hot, not enough snow, smoky); insurance premiums may rise for services impacted by natural hazards; cost of energy and water may increase as each becomes more expensive to acquire and transmit.

Sociological: limited local and regional governmental resources to provide emergency services for increased severe weather events; maladaption of institutions inflexible to rapidly changing conditions; disruption in cultural identities and traditions.

The value of identifying vulnerabilities lies in finding adaptation actions that will address vulnerabilities and thereby increase the watershed's resiliency. While it may seem daunting to

face the long and sobering list of liabilities, a silver lining exists. First, most of the adaptation actions fall into the "no-regrets" category - meaning that the benefits of the proposed activities render adaption worthwhile, regardless of the future conditions. Second, the Santa Fe community has collectively already engaged in a number of actions that have already increased the ability of our collective watershed- humans included- to respond and adapt to projected changes.

The recommended adaptation activities listed below are limited to those that have not, to some degree, been implemented. Current ongoing efforts are listed in the following section and their continuation is also advised.

RECOMMENDED ADAPTATION ACTIVITIES

- Improve ecosystem biodiversity.
- Manage and plan restoration holistically.
- Design or modify bridges and culverts to handle higher intensity runoff events.
- Incorporate urban agriculture in water and land use planning.
- Cultivate climate appropriate crops.
- Transfer water from agriculture to urban during drought for limited-term.
- Adjudicate Santa Fe basin water rights.
- Provide incentives and programs to significantly reduce high water users.
- Augment potable water supplies with reclaimed wastewater.
- Increase water storage capacity.
- Require pervious pavement where appropriate.
- Decentralize energy infrastructure.
- Municipalize energy system.
- Expand water harvesting techniques.
- Install solar panels over parking lots and elsewhere to reflect heat and produce energy.
- Establish a climate-change targeted monitoring system.

CURRENT ACTIONS

FOREST THINNING
RECLAIMED WATER USE
RIPARIAN RESTORATION
STORM-FLOW MANAGEMENT
SEED SOVEREIGNTY
WATER SUPPLY PLANNING
EDUCATION AND OUTREACH
LAND PRESERVATION
DROUGHT MANAGEMENT PLANS
EMERGENCY RESPONSE CAPACITY
CONJUNCTIVE USE OF WATER
WATER FOR ECOSYSTEMS
IMPROVED WATER QUALITY
DOMESTIC WELL RESTRICTIONS
LOCALLY-SOURCED FOOD
IRRIGATION EFFICIENCY
URBAN FORESTS
LOCAL AND RENEWABLE ENERGY
ARROYO STABILIZATION
ENERGY-WISE BUILDING CODES
SMALL-SCALE LAND SHAPING
PUBLIC INVOLVEMENT
PRESERVATION OF GREEN SPACES
WATER CONSERVATION
REGIONAL COOPERATION
MONITORING
RANGELAND IMPROVEMENTS
STORM-WATER RETENTION
ART-INSPIRED ACTIONS
AQUIFER STORAGE / RECOVERY
URBAN GARDENING
WATER DEMAND MANAGEMENT

NEXT STEPS

While the recommended adaptations are longer-term goals, the list below identifies small incremental steps that will begin to position our community for the projected future.

- Develop a GIS-based watershed-wide map for tracking existing action in all sectors or systems. The map will help prioritize the areas where further action is needed.
- Enhance and use water resources dynamic system simulation model (WaterMAPS) for sound and adaptive water management.
- Develop and/or coordinate community-inclusive, interagency, intergovernmental, watershed-wide, technical advisory committees that focus on specific sectors or systems. These committees may increase communication and coordination among existing efforts to enhance effectiveness; develop more detailed visions, strategies and recommendations; implement activities; and/or track progress. For best results, these advisory committees need to work closely with existing 'umbrella' organizations like the Sustainable Santa Fe Commission, and other existing planning and emergency groups.
- Monitor key climate-change impacted parameters (temperature, precipitation, temperature extremes, and storm events) so that the picture of impacts and emerging trends can be identified.
- Implement the water-related recommendations that will result from the next part of the Santa Fe Climate Change Basin Study.
- Request that all governmental actions consider the impact of a bill, resolution or contract on mitigation and adaptation of climate change before approval is granted, much as a Fiscal Impact Report (FIR) is used to consider the financial implications of proposed actions.
- Seek funding opportunities to implement recommendations made in this assessment.
- Develop comprehensive public education program to teach the community, agency staff, and elected officials about the potential impacts of climate change and provide opportunity for collaborative citizen engagement.

City of Santa Fe, New Mexico

memo

DATE: December 5, 2012

TO: Public Utilities Committee

VIA: Brian K. Snyder, Public Utilities Department and Water Division Director
Rick Carpenter, Water Resources and Conservation Section Manager

FROM: Claudia Borchert, Water Resources Coordinator

RE: Discussion of the draft Reclaimed Wastewater Resource Plan (RWRP)

Item and Issue: Draft Reclaimed Wastewater Resource Plan

Included in this PUC packet is the Executive Summary, the Table of Contents, the three Reclaimed Wastewater (RW) portfolios and the Strategies/Implementing Actions (Section 8) from the draft *Reclaimed Wastewater Resource Plan.* To save resources on a draft report, the rest of the plan will be emailed to PUC members separately and is available on line from the Reclaimed Wastewater Resource Plan page at: http://nm-santafe.civicplus.com/index.aspx?nid=2576.

Guide to the plan:

- Section 2 discusses the current management and regulatory environment of RW and recognizes the potential risk associated with exposure to RW.
- Section 3 identifies the assumptions embedded in the plan.
- Section 4 describes the 40-year projections of RW availability.
- Section 5 lists the RW use options, identifies the associated RW flow budgets and estimates the value of the resource use.
- Section 6 analyzes and ranks the RW options based on criteria and a methodology approved by the governing body in May 2012.
- Section 7 builds three temporal (present, near-future and 2020s) RW portfolios based on the order established in Section 6.
- Section 8 lays out RW strategies and associated implementing actions.
- Appendices: Supporting documentation including a letter from the Santa Fe River Traditional Communities Collaborative, two resolutions from the Santa Fe County Commission, the scoring, and the initial options list.

Background

The process of updating the RWRP began in May 2011. The need germinated from the governing body's interest in allocating RW to new uses (e.g. Southwest Area Node Park and Tierra Contenta purple pipeline) at the same time that Santa Fe River downstream users became concerned by a significant reduction in the available stream flow. Furthermore, the projections and allocations of

Exhibit "3"

available RW made in the 1998 Treated Effluent Management Plan (TEMP) were based on gallon per capita of 170 (today the City's gpcd is 107).

To understand the RW concerns, analyze the resource constraints, and develop RW use recommendations, a "working group" (approved by the PUC) of diverse community stakeholders has been convening monthly, including representatives from the City's Wastewater Division, the City's Park and Open Space Division (river and golf course staff), the City's Water Division staff, Santa Fe County, the Wastewater Reuse Advisory Task Force (WRATF), the La Bajada irrigation community, Santa Fe Watershed Association, Jemez y Sangre Regional Water Council, Espanola Basin Regional Issues Forum, The Club at Las Campanas, and civil engineers. The RWRP is the product of this effort.

Key Policy Decisions

Ranking of RW Options:

A key decision is whether to accept the prioritization of RW options (third column) that resulted by applying the approved criteria (ensure community acceptability, improve water supply reliability, protect the environment, manage costs) and the associated performance measures (Section 6 of the RWRP) and then prioritizing non-discretionary uses (the uses ranked '1') and the current municipal uses (ranked 4-8).

Option Number	Option Name	Ranking with Required Uses and Past Policy	Ranking from Weighted Criteria
13	BW Permit Compl.	1	1
14	USFS Livestock Water	1	12
8	SF Country Club GC	1	15
1	MRC	4	3
10	On-demand Sales	5	6
12	Landfill	6	7
7	Marty Sanchez GC	7	9
2	SF Downs	8	11
15	Future Water Supply	9	2
3	SWAN Park	10	4
11	NM Game & Fish	11	5
4	SW Irrigated Parks	12	8
5	Downstream SF River	13	10
6	Upstream SF River	14	13
9	SF Equestrian Center	15	14

Note: The weighted rankings shaded show a change in ranking of at least 3 positions.

While the ranking method is designed to be impartial and reflect the values of the governing body and the community, this is the opportunity for the elected officials to inject preferences that may not be adequately reflected in the chosen screening method. Any changes to the ranking above will also impact the attached RW current, near-future and 2020s portfolio.

Downstream Santa Fe River

This analysis *estimated* the RW flow budget of the Downstream Santa Fe River from 0.5 million gallons pre day (mgd) in the winter to three (3) mgd in the summer. In 2012, a minimum of two (2) million gallons was released to the Santa Fe River. The RW allocation can be modified, depending upon what objectives the flow is trying to achieve (e.g. for viable agriculture, the amount may not be enough; for preservation of the Rural Protection Zone, the quantity may be too much). Any increase in the RW budget during the summer will result in a reduction in one or several of the currently higher-ranked RW uses.

Value of RW

The working group collectively agrees that RW is vital to helping Santa Fe met its current water supply needs. In an effort to promote conservation of the resource, treat the RW users equally, shift the cost of using RW to those the benefit from its use, and to generate revenue to offset RW production or to implement the recommendations of this plan, they recommend that all users of RW pay equitably for the resource.

Future Potable Water Supply

The analysis indicated that future potable water supply is important; the option ranked 6th before the RW options were rearranged to prioritize non-discretionary requirements and current municipal uses. If the RWRP is approved in it current form, over 2,000 acre-feet of RW is available for future potable water supply. This represents 75% of the year 2045 'gap' identified in the City's 2008 Long Range Water Supply Plan.

Next Steps and Schedule:

December 2012-January 2013

- Seek comments on assessment from the Water Conservation Committee and the River Commission
- Post draft report on the City's website
- Hold final public meeting

February 2013

- Seek approval of final draft RWRP from PUC, other committees and commissions, and the City Council

March 2013

- Implement recommended actions

Requested Action:
Staff is seeking feedback on the draft RWRP and the policy decisions embedded therein. Specifically:

- Does the ranking of RW uses on page 2 of this memo appropriately reflect the direction of this governing body?
- Does the RW allocation for Downstream Santa Fe option reflect the direction of the governing body, recognizing that it cannot be fully met during June under the current use prioritization?
- Does the governing body wish to initate the analysis to determine a rate for all RW users?
- Does the governing body wish to pursue the use of RW as supplemental potable water supply source?

REPORT

City of Santa Fe

Reclaimed Wastewater Resource Plan

December, 2012

Table of Contents

Executive Summary

Reclaimed wastewater (RW) is a vital water resource and helps the City of Santa Fe meet its current water supplies needs. It also may play a critical role in meeting future potable water supply needs. The need for this Reclaimed Wastewater Resource Plan (RWRP) arises from the circumstance that currently **not enough RW is produced during the peak summer irrigation months to meet all desired uses.** This shortfall will be exacerbated in the future, if the City decides to provide RW to anticipated uses that are not current users. To reach this conclusion, broad-brushed assumptions were made about the amount of RW 'needed' for the Santa Fe River. Not only have the Santa Fe River water rights not been adjudicated, the objectives for the river flows are ill-defined, the river system flow dynamics are poorly quantified, and the conditions of the river are continually changing in large part because of beaver activity.

Since the adoption of the previous RW plan (the Treated Effluent Management Plan, TEMP) in 1998, the quantity of available RW has been reduced by 29% because of the City's comprehensive indoor water conservation programs (Figure 2) at the same time that RW use has more than doubled (Figure 2). Based on the City's average production of 1,838 million gallons per year (5,640 acre-foot/year) over the past five years, this RWRP assumes that 1,825 mg/yr (5,600 af/yr) and 152 mg/mo (467 af/mo) of RW is available (Section 3) at a steady daily and monthly rate.

This RWRP considers the City's RW needs currently and through the 2020s. RW availability use is projected for a 40-year period. The roadmap of implementation actions will require multiple years to realize, depending upon available resources. However, the methodology used within this plan can be applied in the future when water resource circumstances arise that were not contemplated herein; as such, the plan has been constructed as a living document.

The RW use options considered in this analysis include current uses: direct sale for dust control and other construction purposes; irrigation of municipal recreational fields at the Municipal Recreational Complex (MRC) and the infield at Santa Fe Downs; irrigation of the Marty Sanchez Links de Santa Fe and the Santa Fe Country Club golf courses; dust control at the regional landfill; watering livestock on the Caja del Rio; irrigation of the education-scape at the New Mexico Game and Fish facility; and for Santa Fe River flows downstream of the City's wastewater treatment plant to support the ecosystem and local agriculture (Section 4). The analysis also includes potential future uses: irrigation of the turf at the Santa Fe Equestrian Center (also a previous use); irrigation of the Southwest Area Node Park; irrigation of turf at schools, the library and other open space along the Southwest Sector effluent pipeline; offsetting the surface water depletions in the La Cienega area caused by the City's pumping of the Buckman well field; piping RW upstream to the Santa Fe River; and future potable water supply (Section 4).

For this analysis, an annual, monthly and maximum peak daily flow budget for all of the RW uses was determined, either based on past usage, contracts, requests, or estimates (Section 4). The options were ranked according to criteria and methodology (Section 5) approved in May 2012, by the Governing Body. Using the ranking methodology and then prioritizing uses that are not discretionary, the options order as follows (the first three retain the same ranking,

because no distinction is made within these uses required by permits or contracts):

1. Buckman Well Field Permit Compliance- 33 mg/yr; 100 af/yr
1. US Forest Service Livestock Water – 1 mg/yr; 4 af/yr
1. Santa Fe Country Club Golf Course- 130 mg/yr; 400 af/yr
4. Municipal Recreation Complex – 46 mg/yr; 140 af/yr
5. On demand Sales for Dust Control, Construction, etc – 31 mg/yr; 95 af/yr
6. Dust Control at Regional Landfill – 4 mg/yr; 12 af/yr
7. Marty Sanchez Links de Santa Fe Golf Course – 127 mg/yr; 390 af/yr
8. Recreational Infield at Santa Fe Downs – 39 mg/yr; 120 af/yr
9. Future Potable Water Supply – approximately 717 mg/yr; 2,200 af/yr
10. Southwest Area Node Park - 19 mg/yr; 57 af/yr
11. New Mexico Game and Fish Educational Landscape – 2 mg/yr; 5 af/yr
12. Southwest Area Irrigated Parks and Open Space – 41 mg/yr; 126 af/yr
13. Downstream Santa Fe River – 600 mg/yr; 1,843 af/yr
14. Upstream Santa Fe River – 177 mg/yr; 543 af/yr
15. Santa Fe Equestrian Center – 41 mg/yr; 127 af/yr

***** Note: The presented RW budgets are subject to verification*

These option rankings and their monthly RW flow budgets were then compared to the available RW (Section 6) to see if all or only some of the RW needs could be met. The ranking was performed in three different time frames - 'current', 'near-future', and 2020s - so that only those projects relevant to the different timeframes were included within them (Section 6); some RW projects, for example, will not be shovel-ready for five years; others no earlier than ten years. The same ranking method used herein can be used in the future, should new RW alternatives not considered herein emerge and need to be compared to those evaluated herein.

This analysis showed that all but two of the 'current' RW options can be met with the available RW at this time (Figure 9); the exception is that there are insufficient flows to meet the Downstream Santa Fe River alternative estimated three mg/d target flows in June and that insufficient RW exists to meet the Santa Fe Equestrian Center RW requests in May, June and July. In the near future (approximately 2018), the shortfall in RW will be even greater: using the Plan's criteria and ranking method, the Downstream Santa Fe River, the Santa Fe Equestrian Center, and the Upstream Santa Fe River option do not have adequate supply during the summer months.

By the 2020s, when the infrastructure and permits to use RW for potable supply may be ready, no RW is available for the SF Equestrian Center or the Upstream Santa Fe River, and there continues to be insufficient RW to meet the June target flows of three mg/d for the Downstream Santa Fe River. By the 2020s, using the RW that is not needed during the irrigation season, the Plan calculates that approximately 717 mg/yr (2,200 af/yr) of RW will be available for potable supply.

RW is a valued resource. This plan reiterates the recommendation of the 2003 Wastewater Reuse Advisory Task Force that all the users of the RW, municipal, non-municipal, and commercial facilities alike, pay for their RW use (Section 8.2). As a result, all RW users are

treated equitably and RW users have incentive to use the resource more efficiently. Additionally, the costs associated with using the RW resource shifts to those that benefit from the RW use (e.g. sport recreationalists, golfers) and the RW becomes a municipal asset that can help pay for wastewater treatment and/or to implement strategies identified in this plan.

The above ground use of the RW is currently regulated by the New Mexico Environment Department (NMED) through discharge permits. The City's wastewater treatment plant produces Class 1B wastewater, as defined by the NMED Ground Water Quality Bureau Guidance: Above Ground Use of Reclaimed Domestic Wastewater, which can be used for irrigating turf provided that public physical exposure to RW is avoided through access controls, application methods, and setback distances. While the requirements set forth in this guidance document are considered protective of public health and the environment, the water quality standards and requirements may change in the future at which time treatment processes may need to be added or enhanced. Although the current regulations provide safeguards, inappropriate use of RW may result in exposure risk.

To guide current and future decision-making regarding RW, this RWRP identifies the following strategies (Section 8), grouped into water supply, economic, water quality, operational/management, stewardship, and green themes. Section 8 also lists proposed implementing actions associated with each strategy.

Water Supply:
- Use RW as a non-potable water supply.
- Use RW to meet Buckman Wells permit offset requirements.
- Use RW to meet some of the City's future potable water needs.
- Measure RW production and use.

Economic:
- Value RW as a municipal asset.
- Use RW to generate revenue.
- Seek financial assistance to implement recommendations of this plan.

Water Quality:
- Produce high quality RW.
- Minimize the public health risk in land application of RW.

Operational:
- Optimize existing RW delivery capacity.
- Develop necessary and equitable contracts, resolutions, and ordinances.
- Determine shortage sharing and emergency guidelines.
- Build a RW reserve into RW allocation.

Stewardship:
- Provide adequate flows to the Santa Fe River.
- Collaborate and coordinate with downstream agricultural communities and other stakeholders.

Green:
- Use RW efficiently.
- Use low or renewable energy sources for RW transmission and distribution.
- Build resiliency and adaptation into RW planning and management.

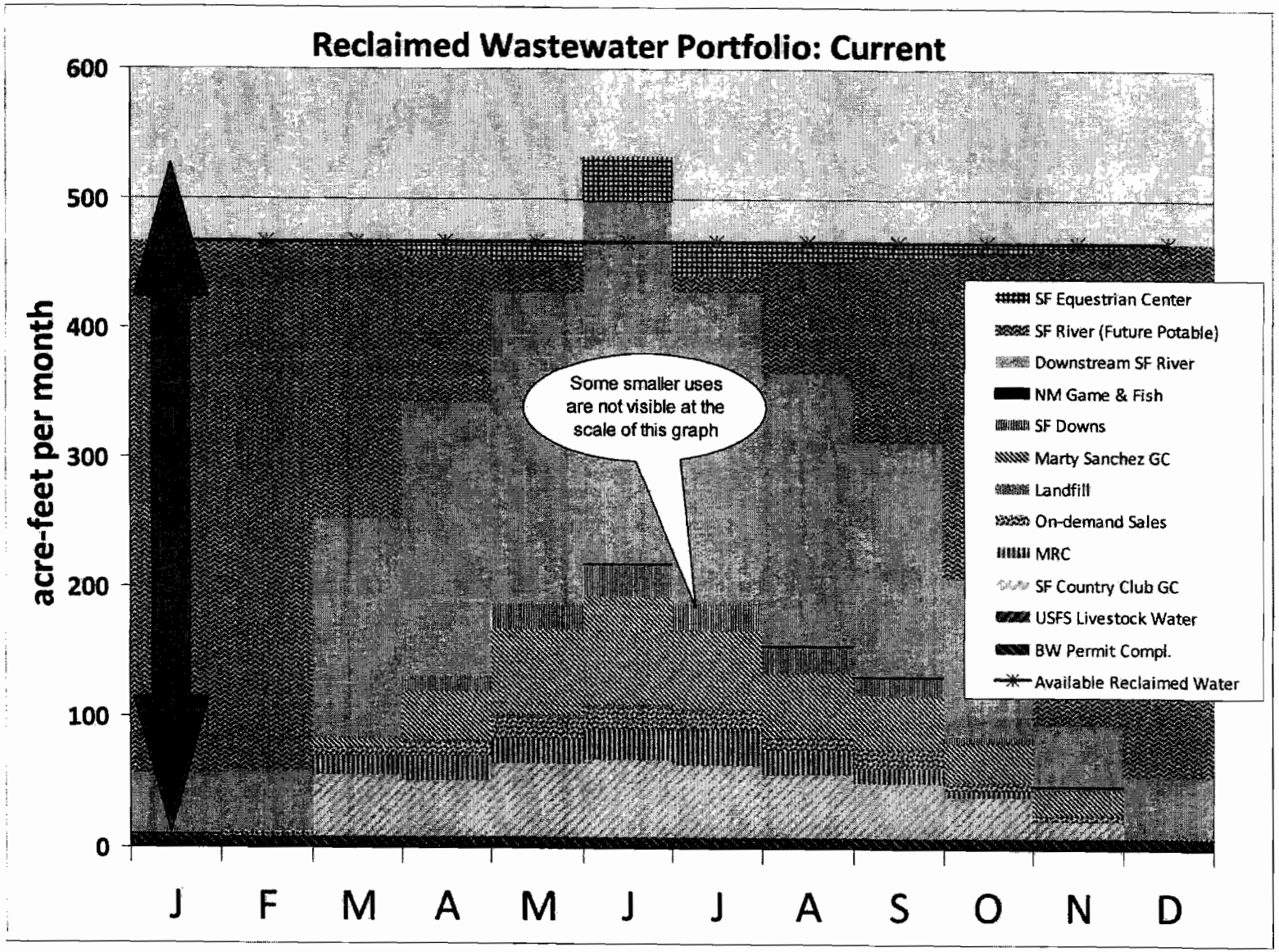


Figure 10: Current Reclaimed Wastewater Portfolio

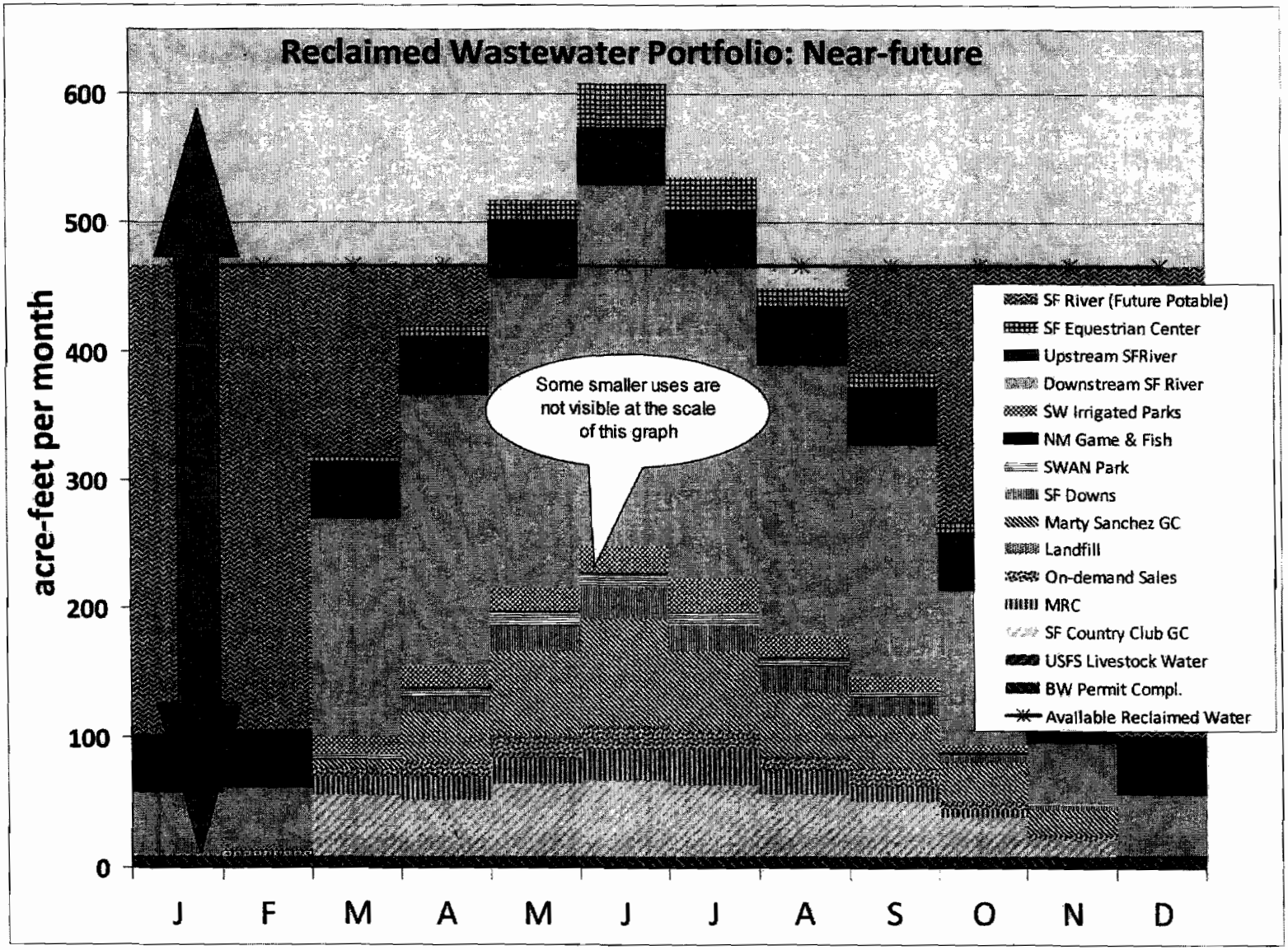


Figure 11: Near-future Reclaimed Wastewater Portfolio

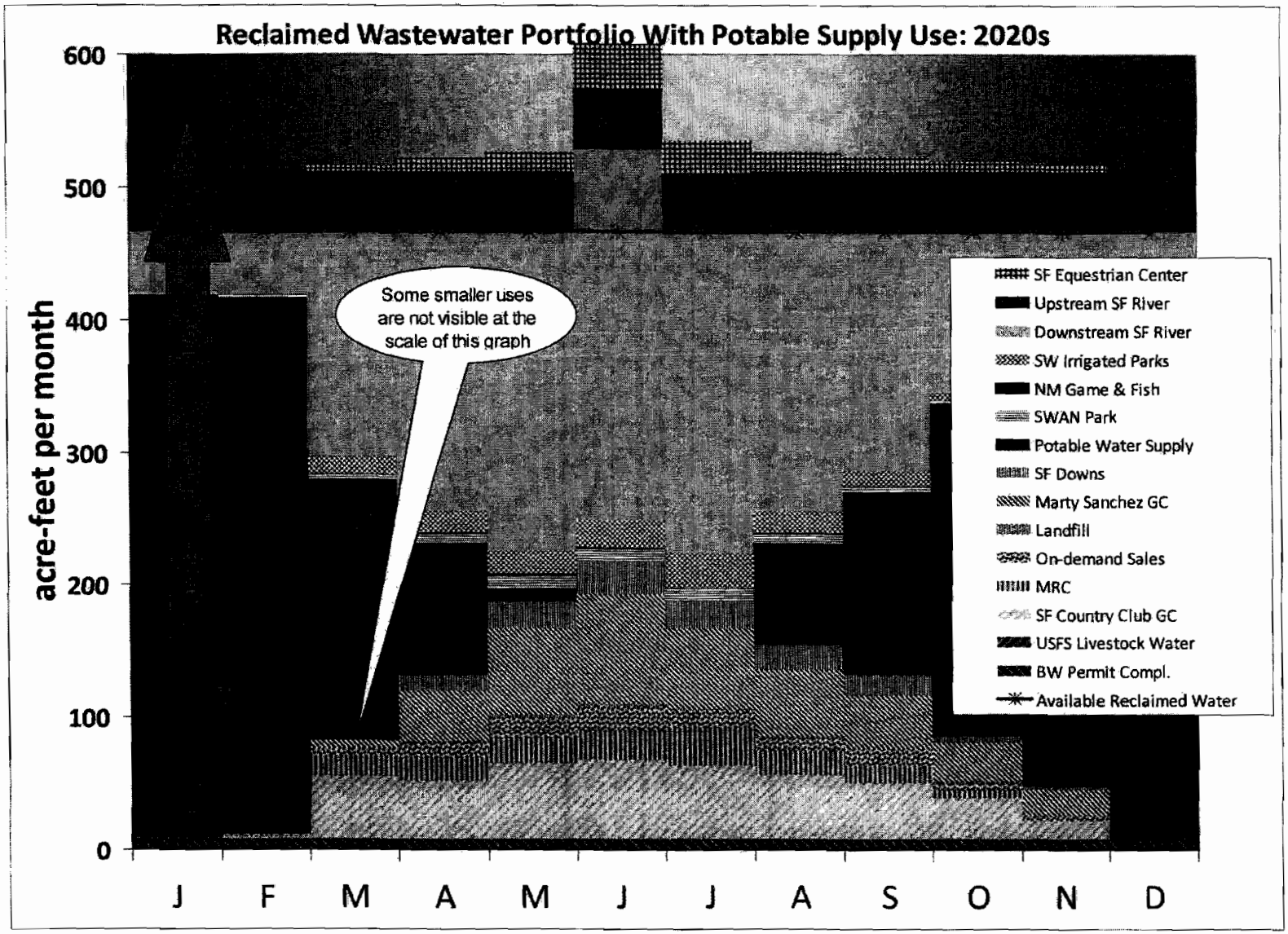


Figure 12. 2020s Reclaimed Wastewater Portfolio

8 Reclaimed Wastewater Resource Strategies and Implementation Actions

Based on the findings of this Plan, the City establishes the following strategies related to the use of RW currently and in the future. The strategies are grouped into the following themes: water supply, water quality, economic, operational and management, 'green', stewardship. Although the policies are categorized under these headlines, they are often interrelated.

8.1 Water Supply Theme

Use RW as a non-potable water supply. The City will continue to use RW as a water supply source. Currently 1.34 mgd (1,500 af/yr) of the City's 10.3 mgd (11,500 af/yr) annual demand (about 13 %) is met by RW, and as much as 17% is supplied during summer months. The supply is used for irrigating recreation turf (playing fields, golf courses, etc), construction, dust control, and with additional treatment could supplement potable drinking sources in the future.

Implementing Actions:

- Use the methodology herein to allocate RW supplies if and when they exceed the amounts assumed in this plan.

Use RW to meet Buckman Wells permit offset requirements. The City will work with the OSE to use released RW to offset the surface water impacts caused by groundwater pumping from the Buckman well field.

Implementing Actions:

- Provide OSE with hydrologic evidence of how the discharge of RW meets Buckman well field permit conditions.

Use RW to meet some of the City's future potable water needs. The City will use RW to meet some future potable water supply needs and recognizes that expeditious implementation of this RW use has hydrological and ecological benefits to the region's water supplies.

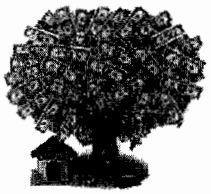
Implementing Actions:

- Conduct a feasibility analysis of the options and timing for using RW for potable supply (e.g. return flow credit pipeline to the Rio Grande, direct use with treatment, or aquifer storage and recovery).
- Determine water right requirement to use RW for potable use.
- Secure necessary water and environmental permits.
- Design and construct the chosen RW potable supply option.

Measure RW production and use. The City will accurately track RW production, use, and Santa Fe River discharges.

Implementing Actions:

- Develop a program to more accurately quantify RW use. The program may include RW meter reading and calibration requirements, standard RW recording and calculation procedures, and additional meters.
- Build a cooperative RW meter calibration program wherein qualified Public Utilities staff members calibrate meters of RW users for a nominal fee.
- Annually calculate unaccounted RW and if necessary identify ways to reduce RW losses.



8.2 Economic Theme

Value RW as a municipal asset. Currently, water and wastewater rate payers subsidize non-paying RW uses. As was recommended in the 2003 WRATF report, an equitable economic model entails all facilities benefiting from the RW paying for the use of the resource.

Implementing Actions:

- Require all RW users to pay equitably for the resource.

Use RW to generate revenue. Currently, the City's wastewater users through their payment of wastewater rates fund the collection and production of RW. The current RW pricing is not consistent (varies from no charge to $3.20 per 1,000 gallons of RW). Revenues collected by the sale of additional RW could be used to further defray treatment costs. One of the largest RW revenue sources, Las Campanas Golf Course, will no longer be paying $300,000 to $400,000 annually to the WWD beginning in 2012. Figure X graphically displays the revenues that could be obtained if only 50 percent of the RW was purchased at the $3.03/1,000 gallon rate, the recent revenues from Las Campanas and the anticipated revenues for all other sources.

Implementing Actions:

- The true cost and value of RW should be identified. Determine the historic, current and future capital cost for producing RW, managing RW use, the RW opportunity cost (either the market value or the value to City for other uses), and the RW economic value. Include factors like cost avoidance, recreational and environmental services, and aquifer sustainability.
- Determine a RW rate structure that considers the various economic factors above. The rate factor may differ for different types of users (municipal, regional governmental, federal government, commercial, etc.0, but the program should be systematic and transparent rather than arbitrary.
- Seek compensation for RW released to the Santa Fe River explicitly for the benefit of users downstream.
- Claim and market the RW stored in the aquifer near the WWTP from RW passively infiltrating via the Santa Fe River.

Seek financial assistance to implement recommendations of this plan. Many of the implementing actions in this Plan require financial resources to implement. Some funding may be available within current City departmental budgets; much will need to be secured through local, state, federal and non-profit organizations grants and loans.

Implementing Actions:

- Seek grants and low-cost loans to implement the recommendations herein from federal (e.g. Bureau of Reclamation Title 16, WaterSMART program), state (e.g. Water Trust Board, 319) and non-profit (e.g. River Network) sources.

8.3 Water Quality Theme

Produce high quality RW. The City's WWTP produces RW that meets the state regulatory requirements and federal guidelines. Periodically and as needed, the WWTP upgrades its processes and facilities to meet new regulatory requirements and enhance the quality of RW produced. The development of membrane filtration technologies over the past 10-years has resulted in a movement towards higher quality RW effluent.

Implementing Actions:

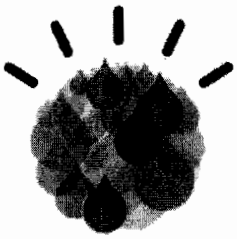
- Monitor the development of RW discharge standards in other states and monitor EPA's adoption of more stringent guidelines in the future.
- In order to better assure meeting bacteriological discharge requirements and to minimize potential adverse health effects due to exposure of RW, consider appropriate advanced treatment technologies or improvements to the multi-media filtration and disinfection unit operations. This would also permit the WWD RW to meet Class 1A Reclaimed Wastewater rather than the current Class 1B standard.
- Support existing household pharmaceutical disposal program to decrease pharmaceutical products in the City's wastewater, RW, and Santa Fe River.

Minimize the public health risk in land application of RW. Because of inherent RW exposure risk, federal and state regulations dictate under what conditions RW can be used for irrigation. While the WWD produces RW and is required to meet the conditions of the discharge permit, the division does not oversee the land application

Implementing Actions:

- Cooperate with RW land applicators to assure discharge permit compliance.
- Review and update protocols and Best Management Practices for municipal entities that irrigate with RW.
- Collect and centralize use data, compliance reports and other RW use related documents from municipal RW users.
- Add release of liability statements into contracts with non-municipal RW irrigators.

8.4 Operational and Management Theme



Optimize existing RW delivery capacity. Currently, no standard operating procedure exists on how to allocate daily RW among the users. Additionally, some key infrastructure may assist in the ability to meet multiple, often competing demands for RW. Enhanced management allows better use of the resource.

Implementing Actions:

- Develop an RW diversion and delivery protocol identifying which users can divert when, how much, and for how long.
- Conduct a RW infrastructure improvement study to determine how existing or new RW infrastructure can be optimized to best supply existing and future (e.g. SWAN Park) RW users.
- Consider how increased storage (e.g. the 2 million gallon RW tank), other infrastructure improvements, automation, variable frequency pumping, etc. can be used to achieve equity, timing, and shortage-sharing objectives.
- Identify if the Las Campanas RW pipeline can assist in creating system redundancy or optimization and seek necessary use agreements.

Develop necessary and equitable contracts, resolutions, and ordinances. Current RW users receive RW under varying circumstances, rates, and conditions.

- Unify contract provisions, renewal processes, and RW rates.
- Seek compensation for all RW use. In instances where the municipality or another entity does not pay for RW, recognize the value of the RW being provided
- Streamline process for short-term contract renewal.
- Seek short-term, non summer month RW contracts.

Determine shortage sharing and emergency guidelines. Currently, no guidelines exist on how to curtail RW during shortages or emergencies, as recommended within the WRATF Final 2003 Report. Additionally, no provisions exist for back-up water supply for some uses.

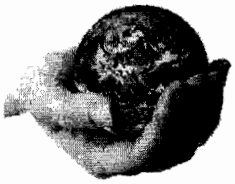
Implementing Actions:

- Develop criteria, strategies, processes, and protocols for addressing shortages, water quality changes, back-up supplies, and emergencies to better adapt to future conditions.
- Revise RW use agreements to include sharing shortage parameters, water quality constraints, and other circumstances of non-diversion.

Build a RW reserve into RW allocation. A RW water reserve would help mitigate the natural daily and seasonal fluctuations that occur in RW production. The reserve would also provide some water for unforeseen conditions.

Implementing Actions:

- Allocate between 1-5% of the total monthly RW and/or RW storage to a reserve account, perhaps storing water in the regional aquifer



8.5 Stewardship Theme

Provide adequate flows to the Santa Fe River. The City recognizes the environmental, recreational and water quality services provided by the Santa Fe River and specifically the Santa Fe Rural Protection Zone.

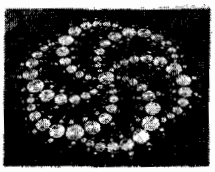
Implementing Actions:

- Determine the minimum and target flow requirements to maintain the ecological services provided by the Rural Protection Zone.

Collaborate and coordinate with downstream agricultural communities and other stakeholders. The City recognizes that the RW from the WWTP provides water that downstream agriculture has become dependent upon since natural spring flows in the area have decreased.

Implementing Actions:

- Provide WWTP output data regularly to interested parties.
- Collectively develop and implement a stream flow monitoring program to better understand water budgets in the La Cienegilla, La Cienega, and La Bajada region.
- Convene a public workshop with water right experts to develop a common understanding of the water rights issues and to better understand the City's legal obligations.
- Develop an operating arrangement with daily, monthly and annual stream flow targets, within the adopted RW priority system.
- Participate in planning processes of area communities, encourage rural-urban relationships, and seek multi-party win-win solutions to issues identified.



8.6 Green Theme

Use RW efficiently. Like all others water resource, RW is precious. By using RW efficiently, the number of RW uses can expand.

Implementing Actions:

- Initiate a required irrigation efficiency analysis for each RW user. Consider the efficacy of converting irrigated recreational areas to artificial turf and the use of more advanced irrigation technology.
- Institute annual, monthly and daily water budgets and maximums for each RW user and, to the extent possible, define the use quantity, either by contract or governing body action.
- Provide incentives and resources for RW users to increase efficiency.

- Identify locations where irrigation of RW can be reduced or eliminated (e.g. implementing more efficient irrigation systems, by monitoring application rates by evapotranspiration (ET) or by artificial turf replacement)

Use low or renewable energy sources for RW transmission and distribution. Some RW uses can be served primarily via gravity. Others require some or significant pumping. As little energy as possible should be used to transmit RW from the WWTP to its use location.

Implementing Actions:

- Size infrastructure to optimize energy use.
- Promote RW uses that require less transmission power.

Build resiliency and adaptation into RW planning and management. While RW production is relatively immune to the impacts of climate change, RW irrigation demand will likely increase under hotter and drier conditions. The management of RW needs to plan for, adapt, and thus become more resilient to projected climate change effects.

Implementing Actions:

- Determine projected climate change impacts on RW demand and build into RW budgets, management, and operations procedures.
- Bank excess RW in local aquifers, particularly during the fall and spring shoulder months and throughout the winter.