



# Agenda

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## SANTA FE WATER CONSERVATION COMMITTEE MEETING CITY COUNCILORS' CONFERENCE ROOM

TUESDAY, DECEMBER 9, 2014

4:00 PM TO 6:00 PM

1. CALL TO ORDER
2. ROLL CALL
3. APPROVAL OF AGENDA
4. APPROVAL OF CONSENT AGENDA
5. APPROVAL OF MINUTES NOVEMBER 4, 2014 WATER CONSERVATION COMMITTEE MEETING
6. CONSENT-APPROVAL
  - A. WATER CONSERVATION & DROUGHT MANAGEMENT PLAN 2015 (Alan Hook for Laurie Trevizo)

### DISCUSSION ITEMS:

7. DROUGHT, MONSOON AND WATER RESOURCE UPDATE (Rick Carpenter, 10 minutes)
8. CLIMATE ACTION TASKFORCE (Councilor Ives, 10 minutes)
9. SANTA FE BASIN STUDY: PRELIMINARY FINDINGS AND FUTURE PLANNING (Andrew Erdmann, 10 minutes)
10. PROVIDING FOR SANTA FE BASIN'S FUTURE WATER SUPPLY NEEDS: REGIONAL RECLAIMED WASTEWATER FEASIBILITY STUDY (Bill Schneider, 10 minutes)
11. RESERVOIR IMPROVEMENTS (Alan Hook, 10 minutes)

### INFORMATIONAL ITEMS:

12. GROUP REPORTS FROM WATER CONSERVATION COMMITTEE INITIATIVES: (Councilor Ives, 30 minutes)
  - A. GROUP #3- WATER CONSERVATION CODES, ORDINANCES & REGULATIONS (10 minutes)
  - B. GROUP #4- REESTABLISH TREND OF NET ANNUAL REDUCTIONS IN PER CAPITA WATER USAGE AND IDENTIFYING LARGE WATER USERS (10 minutes)
  - C. GROUP #2- WATER CONSERVATION EDUCATION/OUTREACH (10 minutes)
13. (TIME PERMITTING) GROUP #5-DOMESTIC WELLS WITHIN CITY LIMITS (Stephan Wiman, 20 minutes)
14. (TIME PERMITTING) SANTA FE 2013 OSE GPCD CALCULATOR (Tim Michael, 20 minutes)

### MATTERS FROM STAFF:

### MATTERS FROM COMMITTEE:

### MATTERS FROM PUBLIC:

### NEXT MEETING – TUESDAY, JANUARY 13, 2015:

CAPTIONS: DECEMBER 23, 2014 @ 3 pm

PACKET MATERIAL: DECEMBER 29, 2014 @ 3 pm

ITEMS FOR NEXT AGENDA (if time does not permit):

- GROUP #5 DOMESTIC WELLS WITHIN CITY LIMITS (Stephen Wiman)
- SANTA FE 2013 OSE GPCD CALCULATOR (Tim Michael)

### 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.

WATER CONSERVATION COMMITTEE  
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DECEMBER 9, 2014

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Call to Order and Roll Call	The Chair, Councilor Ives at 4:00 pm in the City Councilor's Conference Room, called the Water Conservation Committee Meeting to order. A quorum was declared at roll call.	Page 2
Approval of Agenda	<b><i>Ms. Randall moved to approve the Agenda as presented, second by Ms. Piburn, motion carried by unanimous voice vote.</i></b>	Page 2
Approval of Consent Agenda	<b><i>Ms. McDonald moved to approve the Water Conservation &amp; Drought Management Plan 2015 for purpose of discussion, second by Ms. Randall. Ms. McDonald withdrew motion.</i></b>  <b><i>The Chair noted that this item was not approved by the WCC; it will go forward through the city process without a WCC recommendation.</i></b>	Page 3
Approval of Minutes, November 4, 2014 Corrections: Cheri Vogel – throughout minutes should be referred to as CR Vogel Consulting, LLC List Diana Catanach under staff in attendance list. #10: change setting to funding End of Paragraph: Allan is Alan Hook #12A: QWEL – (Qualified Water Efficient Landscapes)  Next training will be offered in March. Ms. Busher is welcome to register.  D: Water Fiesta, not River Fiesta.	<b><i>Ms. Piburn moved to approve the minutes as corrected, second by Mr. Roth, motion carried by unanimous voice vote.</i></b>	Page 3
City of Santa Fe Water Conservation and Drought	Informational, no formal action.	Page 3-4

Management Plan (Rick Carpenter)		
Consent Approval Water Conservation and Drought Management Plan 2015	<i>The Chair noted that this item was not approved by the WCC; it will go forward through the city process without a WCC recommendation.</i>	Page 4
Discussion Items Drought Monsoon and Water Resources Update Climate Action Task Force Santa Fe Basin Study: Preliminary and Future Planning Providing for Santa Fe Basin's Future Water Supply Needs: Regional Reclaimed Wastewater Feasibility Study Reservoir Improvements	<b>Informational and Narrated Power Point Presentations. No formal action.</b>	Page 4-5
Informational Items Group #1 Group #2 Group #3 Group #4 Group #5	No formal action, informational items. Group #5 – Point #4 to be discussed at next month meeting	Page 5-7
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**SANTA FE WATER CONSERVATION COMMITTEE MEETING  
CITY COUNCILORS' CONFERENCE ROOM**

TUESDAY, DECEMBER 9, 2014

4:00 PM TO 6:00 PM

1. CALL TO ORDER

The Chair called the meeting to order at 4:00 pm, City Councilor's Conference Room, Santa Fe, New Mexico. Roll call reflects a quorum.

2. ROLL CALL

Councilor Peter Ives, Chair  
Melissa McDonald  
Stephen Wiman  
Giselle Piburn  
Bill Roth  
Grace Perez, telephonically  
Nancy Avedisian  
Tim Michael  
Lisa Randall

Excused:  
Doug Pushard  
Karen Schmitt

Staff:  
Caryn Grosse, Water Conservation Specialist  
Robert Wood, Water Conservation  
Rick Carpenter, Water Conservation Resource Manager  
Andrew Erdman, Water Resources Coordinator  
Bill Schneider, Water Resources Coordinator

Others Present:  
Jim Lodes, Citizen  
Andy Otto, Santa Fe Watershed Association

3. APPROVAL OF AGENDA

No changes from staff or the committee.

***Ms. Randall moved to approve the agenda as presented, second by Ms. Piburn, motion carried by unanimous voice vote.***

4. APPROVAL OF CONSENT AGENDA

Mr. Wiman asked for a clarification between discussion items, informational items and needs action. This question was related to a request to have Well Permitting discussion on this month's agenda as an action item. Mr. Wiman would like, if time permits, for the discussion on well permitting to be heard today and placed on next month agenda as an action item.

Committee members noted that they would have appreciated receiving a word document of the City of Santa Fe Water Conservation and Drought Management Plan 2015 vs. a PDF. It would have facilitated any redlining much easier for feedback. Thank you for the suggestion.

It was clarified that Approval of this action item on the consent agenda constitutes approval of the Water Conservation & Drought Management Plan 2015.

***Ms. McDonald moved to approve the Water Conservation & Drought Management Plan 2015 for purpose of discussion, second by Ms. Randall. Ms. McDonald withdrew motion.***

***The Chair noted that this item was not approved by the WCC; it will go forward through the city process without a WCC recommendation.***

5. APPROVAL OF MINUTES NOVEMBER 4, 2014

Corrections:

Cheri Vogel – throughout minutes should be referred to as CR Vogel Consulting, LLC  
List Diana Catanach under staff in attendance list.

#10: change setting to funding

End of Paragraph: Allan is Alan Hook

#12A: QWEL – (Qualified Water Efficient Landscapes)

Next training will be offered in March. Ms. Busher is welcome to register.

D: Water Fiesta, not River Fiesta.

***Ms. Piburn moved to approve the minutes as corrected, second by Mr. Roth, motion carried by unanimous voice vote.***

6. City of Santa Fe Water Conservation and Drought Management Plan

Committee members were not pleased that their edits were not included, the consensus was that this item got pushed up against a deadline and the feeling is that professionally it does not reflect a good working process for comments and inclusion of input.

Mr. Jim Lodes, (Community) commented that he felt there was not a lot tied in to water supply and demand issue that you would see in the water plan. He reviewed the water plan for the city of Santa Fe where it showed that right now the city would be consuming 12,000 ac. ft. per year; in fact that would be for 5 years vs. 10 years. It was assumed that you were going to get 5500 ac. ft. from the Buckman Diversion, no comments whatsoever on the San Juan Water \_\_\_\_\_, how much of that 5500 ac. ft. was not known how much of that we could actually get. In 2019 it says we will run in to a water deficit yet it says with an enhanced water conservation plan it could extend out to 2021. If you look at the water plan now out to the end of study period it requires something in the range of about 1300 ac. ft. a year equivalent to enhanced water conservation. That is going to equate to another 10-20% reduction in perpetual consumption. Nothing in the water conservation plan talks about the reduction or any of these issues. Mr. Lodes stated that in reality the water plan needs to be completely redrafted to include current information; having the Water Conservation and Drought Management Plan 2015 be out there for 5 years is irresponsible. If this plan is passed it needs to be re-done next year in line with the Water Plan. The Water Conservation Plan does not indicate that things will be done differently. This plan does not show points of accountability or timelines of what is going to be done. Also, from an economic development standpoint there is concern regarding what the Water Plan reflects; community could react to the lack of water in 2019. The plan calls for 22,000 ac. ft. of potable water.

The Chair did not comment on Mr. Lodes comments and directed the question to Mr. Carpenter on the update of the different plans being referred to.

Mr. Carpenter stated that the Long Range Water Supply Plan is a living document; as things change the plan is updated. As data and statistics become available, the plan is updated. They are open on how to better marry with the Water Conservation Plan; he does not believe they are quite so disjunct; they are bridging the draft.

Ms. Perez commented that one of the sets of comments was related to goals in Section 5; goals need to be measurable. Not every comment could be incorporated, this particular needs to set measurable and quantifiable goals. Ms. Perez said it is ok to submit, as it is the Water Conservation Committee who needs to come up with goals to review on an annual basis and it could tie the two reports together.

Mr. Carpenter said that the Water Supply Plan is reviewed annually and they could tie the two reports together as well.

7. CONSENT-APPROVAL

A. WATER CONSERVATION & DROUGHT MANAGEMENT PLAN 2015  
(Alan Hook for Laurie Trevizo)

November 7, 2014 memo included in packet for WCC. The City Manager has indicated that the timeline is to get this plan to the OSE and Water Trust Board by January 2, 2015. (Exhibit A)

**DISCUSSION ITEMS:**

8. DROUGHT, MONSOON AND WATER RESOURCE UPDATE, Rick Carpenter

Mr. Carpenter provided the committee with a verbal report referencing his November 18, 2014 memorandum to the PUC and WCC. 39<sup>th</sup> Monthly Update on Drought and Water Resource Management. No questions from the committee members. (Exhibit B)

9. CLIMATE ACTION TASKFORCE, Councilor Ives

Task Force is up and running, work groups have been created.

Ms. Randall commented that there is an overlap on working groups and she would like to be assured that the works of the WCC comments are also recognized. Ms. Randall looks forward to collaboration vs. working in private forces.

Next meeting is scheduled for December 19, 2014. Ms. McDonald is also on the Task Force and commented that there are others who want to be assured that the work that has been done by this committee is included.

10. SANTA FE BASIN STUDY: PRELIMINARY FINDINGS AND FUTURE PLANNING Andrew Erdmann

**Power Point: Narrated by Andrew Erdman (Exhibit C)**

The purpose of this study is to assess how to meet future water demand assuming increased population and diminished surface water supplies.

Adaptations to Climate Change for the City and County

11. PROVIDING FOR SANTA FE BASIN'S FUTURE WATER SUPPLY NEEDS:  
REGIONAL RECLAIMED WASTEWATER FEASIBILITY STUDY, Bill Schneider

This project is on an 18-month cycle.

**Power Point Presentation narrated by Mr. Schneider. (Exhibit D-1 & 2)**

In terms of direct potable, no one in the state of New Mexico has done this; in Texas there are a few.

Mr. Roth noted that people are using potable water for their yards, and they should not.

Thank you to Mr. Schneider and Mr. Erdman for their presentations. The WCC would like to have them in attendance at future meetings for updates.

12. RESERVOIR IMPROVEMENTS, Alan Hook (Rick Carpenter)

Memo dated 11/24/14 provides Item and Issue, Background Summary and Recommendations by Alex Puglisi, Interim Manager, Source of Supply Section for the Water Division and addressed to the Public Utilities Committee. (Exhibit E-1)

Mr. Carpenter reported that due to the unanticipated problems during the draining of the reservoir completion is not expected until November 2015. The valves were not in good condition and it made it even harder for the divers to reach those key points.

It was asked if there are any credits due to this delay and Mr. Carpenter stated that there are not any credits.

The attached graph and chart outlines PUD's initial project treatment volumes for CRWTP in 2015 to utilize available water from the Santa Fe Watershed, as well as all other sources of water available to the City. (Exhibit E-2)

**INFORMATIONAL ITEMS:**

13. GROUP REPORTS FROM WATER CONSERVATION COMMITTEE INITIATIVES: (

A. GROUP #3 - WATER CONSERVATION CODES, ORDINANCES & REGULATIONS

Mr. Pushard has been working with Rep. Trujillo on legislation. Mr. Pushard is working on outdoor water conservation. Mr. Pushard will provide Rep. Trujillo the cost of outdoor water conservation and he would like as many examples from the WCC members who can contribute on cost. Mr. Pushard would like to have this information e-mailed to him by Friday, December 12<sup>th</sup>.

Mr. Roth offered information on Water Sense Fixtures and cost savings. The phasing is in line with the WERS number.

Councilor Ives asked if implementing an ordinance change should be directed indicating that only water sense appliances will be considered for rebate. In order to engage in continued water conservation it is important to educate the public and changeover the ordinances.

Councilor Ives looks forward to seeing the WERS tool at the next month meeting.

B. GROUP #4 - REESTABLISH TREND OF NET ANNUAL REDUCTIONS IN PER CAPITA WATER USAGE AND IDENTIFYING LARGE WATER USERS

Ms. McDonald reported that Ms. Randall shared what is being done at Santa Fe Public Schools related to reducing water use by optimizing water use by large water users. Members of this committee in addition to Ms. McDonald; Karyn Schmitt, Giselle Piburn, Tim Michael, Athena Busher. Consulting: Lisa

Randall (school reductions methods) and Nate Downey (Legislative) for bio info LinkedIn <http://permadesign.com/about>. POSAC continues to meet with the new parks Director Richard Thompson. POSAC is close to finishing Community Garden Assessment report for the Mayor and the City's Urban Agriculture policy group. Currently they are reviewing the drafts and will bring to the WCC for concurrence. Representatives also attended the Mayor's taskforce on Food, Land and Water.

Legislative: Participated in sustainable building tax credit meeting.

Ms. McDonald attended the American Society of Landscape Architects (ASLA) in Denver, Colorado. One of the things that continues to re-surface is the idea of Eco-Districts. She was not sure if the city of Santa Fe has considered this a planning entity, (she circulated a handout for the Board members to review) – attached. She is also researching what other cities are looking at Eco districts as a planning tool. This is a project that they did and was sponsored by the EPA. They are basically looking at how to incorporate storm water and grey water. They are collecting the water in LID measures and converting it to potable use. Ms. Ms. Donald urged that the WCC consider looking at this. There is one section on water demand and potable use. How do we get homeowners, landscape owners to understand and know this is a great resource and would like the WCC to have a role in this discussion? Eco districts could be a way to combine water and energy in a planning mechanism that might work for a lot of people. Looking at smaller entities and larger entities is very important.

#### C. GROUP #2- WATER CONSERVATION EDUCATION/OUTREACH

Mr. Michael and Ms. Perez reported – including information possibly on the upcoming WERS. Mr. Michael asked if they should know anything on the outdoor irrigation rebates. Ms. Grosse said that one application was received and it was withdrawn. There were no irrigation rebates for the 2014 season. Ms. Perez stated that the irrigation rebates was on a term and Mr. Wood reported that a decision has not been made if it will be extended.

#### 14. (TIME PERMITTING) GROUP #5-DOMESTIC WELLS WITHIN CITY LIMITS Stephan Wiman

- 1) Question on the sample letter, status. Staff reported that they will follow-up; last known it was in the City Attorney's office. The Chair would like to have it go out at the beginning of 2015.
- 2) Thank you from the Working Group on the work that has been done by the city on public information.
- 3) How many city permits have been issued and how does it break down with respect to development. If this is something that needs to be retrieved by the clerk's office, some of the members from the committee are happy to assist in looking up the records and files. Mr. Erdman said that since the beginning of the ordinance he has issued 6 permits; 4 are in the area that has been annexed.

Mr. Wiman asked if they are replacement wells or new well. Mr. Erdman responded that they are new wells. Basically the way they know they need a permit from the city is they go to OSE to get a domestic well permit and they are told about the city domestic well ordinance.

The Chair asked if an ordinance is needed to clarify the correlation between the OSE and the City. The Chair directed staff to work with Ms. Byers to draft language for an ordinance to clarify this matter. Timeline is that once the ordinance is drafted it would come to the WCC, next to City Council with an approximate 60-day turnaround time.

4) Point number 4 will be discussed at next meeting.

15. (TIME PERMITTING) SANTA FE 2013 OSE GPCD CALCULATOR, Tim Michael  
Defer to next meeting.

**MATTERS FROM STAFF:**

Note that in the electronic packet the caption schedule and meeting schedule for 2015 will require approval. Due to the holidays captions will be due by December 23<sup>rd</sup> or earlier. The Chair asked that the meeting dates sheet be sent to the WCC for review.

**MATTERS FROM COMMITTEE:**

THANK YOU TO THE WATER RESOURCES STAFF FOR ATTENDING THE MEETING.

Early bird registration for Xeriscape conference is coming up; Water Conservation office is the sponsor. Rate is \$425 up to Friday and the rate will go up to \$475 for registration.

**MATTERS FROM PUBLIC:**

NONE

**NEXT MEETING – TUESDAY, JANUARY 13, 2015:**

CAPTIONS: DECEMBER 23, 2014 @ 3 pm      PACKET MATERIAL: DECEMBER 29, 2014 @ 3 pm

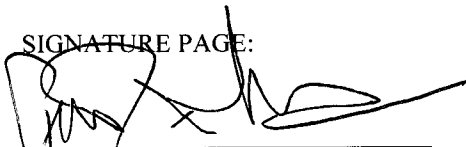

ITEMS FOR NEXT AGENDA (if time does not permit):

- GROUP #5 DOMESTIC WELLS WITHIN CITY LIMITS (Stephen Wiman)
- SANTA FE 2013 OSE GPCD CALCULATOR (Tim Michael)

**ADJOURN**

There being no further business to come before the Water Conservation Committee, the meeting was adjourned at 6:00 pm.

SIGNATURE PAGE:


  
\_\_\_\_\_  
Councilor Peter Ives, Chair  
\_\_\_\_\_  
Fran Lucero, Stenographer



# City of Santa Fe, New Mexico

# memo

**Date:** November 7, 2014

**To:** City of Santa Fe Public Utilities Committee  
City of Santa Fe Water Conservation Committee

**From:** Laurie Trevizo, Water Conservation Manager 

**Via:** Rick Carpenter, Water Resources and Conservation Manager   
Nick Schiavo, Public Utilities Department and Water Division Director 

**RE:** Water Conservation and Drought Management Plan 2015

**Background:**

State statute NMSA §72-14-3.2 provides that a municipality may submit a comprehensive water conservation plan including a drought management plan to the State Engineer by December 31, 2005, and that after that date, neither the NM Finance Authority nor the Water Trust Board shall accept a municipality's water or wastewater facility construction financial assistance application unless the application includes a copy of the municipality's water conservation plan. The NMOSE Permit # SP 2847-E for the Buckman Direct Diversion required that the City submit progress reports on their Water Conservation Plan on or before January 10, 2010 and every five years thereafter.

The City of Santa Fe Water Conservation and Drought Management Plan was adopted in 2005 (Resolution 2005-101) by the City of Santa Fe Governing Body and is to be updated on a five year cycle. Resolution 2005-101 also authorizes the City Manager, or his or her designee, to approve all future updates, addendums and appendixes, which reflect adopted ordinance or resolution changes or statistical facts, which are developed by staff.

The plan was initially developed to show that the City has met all the requirements of the State through approved ordinances, resolutions, and conservation programs. This plan was created as a living document and is to be updated with new ordinances and resolutions, and as well as new conservation programs, that have been developed and implemented since the last publication.

The *Water Conservation and Drought Management Plan 2015* is an update from Plans published in 2005 and 2010. It takes into consideration the recommended elements of the NMOSE's Technical Report #53, *New Mexico Water Conservation Planning Guide for Public Water Suppliers*, published in 2013.

**Action Requested:**

Request approval of Water Conservation and Drought Management Plan 2015 and Appendices.  
Public Utilities Committee – 12/3/14  
Water Conservation Committee – 12/9/14


**Attachments:**

Water Conservation and Drought Management Plan 2015 and Appendices  
Resolution 2005-101

*Exhibit A*

# MEMORANDUM

**TO:** City of Santa Fe Public Utilities Committee  
City of Santa Fe Water Conservation Committee  
Buckman Direct Diversion Board

**FROM:** Rick Carpenter, Water Resources and Conservation Manager 

**VIA:** Nick Schiavo, Public Utilities Department and Water Division Director

**DATE:** November 18, 2014

**SUBJECT:** 39<sup>th</sup> Monthly Update on Drought and Water Resource Management

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## CURRENT UPDATE – GENERAL WATER RESOURCE MANGEMENT

As the Committee/Board is aware, our region is still suffering through a drought. Our region has gone through four consecutive years of record drought and heat. In fact, recent data suggests that this past summer was the hottest on record (June-August). This fourth consecutive year of drought has eased somewhat, but will still likely present significant challenges to all water purveyors, utilities, and irrigators going forward into the next year.

July/August/September yielded good summer rains due to a series of moist northeast cold fronts and monsoonal flow, but the monsoons generally exited by October. Many models are predicting the likelihood of a return of an El Nino weather pattern, 58% chance of normal to above normal precipitation (but down from 75% in earlier projections) over the next several months. This could mean good precipitation for the winter months (snow pack). El Nino seems to be weakening relative to early predictions, but normal to above normal snow pack is still likely this coming winter. The November 6, 2014 NOAA ENSO update states that:

*There is a 58% chance of El Niño during the Northern Hemisphere winter, which is favored to last into the Northern Hemisphere spring 2015. Similar to last month, most models predict El Niño to develop from October-December 2014 and to continue into early 2015. However, the ongoing lack of clear atmosphere-ocean coupling and the latest NCEP CFSv2 model forecast have reduced confidence that El Niño will fully materialize (i.e., at least five overlapping consecutive 3-month values of the Niño index at or greater than 0.5°C). If El Niño does emerge, the forecaster consensus favors a weak event.*

*Exhibit B.*

It is worth noting that City of Santa Fe has invested in a robust and diverse portfolio of four distinct water supply sources that allows for flexibility in meeting demand: Buckman well field, City well field, Canyon Road Water Treatment Plant on the Upper Santa Fe River, and the Buckman Direct Diversion on the Rio Grande. Supply from these groundwater and surface water sources are expected to be adequate in meeting local demands.

## **LOCAL CONDITIONS**

### **Source of Supply Utilization Summary**

October 2014

City Wells	58.33mg/m	179.01af/m
Buckman Wells	6.06mg/m	18.61af/m
CRWTP	49.99mg/m	153.43af/m
BRWTP	150.13mg/m	460.74af/m
Other Wells(Osage, MRC, etc)	0.18mg/m	0.56af/m

### **Upper Santa Fe River/CRWTP**

	Total Combined Reservoir Level	Santa Fe Snow Gage	Reservoir Inflow
November 17, 2014	9.30%	13.00 inches	0.65MGD
5-Year Average for This Date (2009 – 2013)	48.57 %	7.80 inches	1.49 MGD

As of November 17, total combined storage in Nichols and McClure reservoirs is 9.3% of total (or about 390 acre-feet of storage). Some flows have been by-passed due to construction on the new intake facilities. Minor inflows are expected to continue for the near future and so the reservoirs have been managed to allow for water treatment plant production, active construction, and draining/drying.

### **Buckman Regional Water Treatment Plant (BDD)**

Flows in the Rio Grande are relatively good for this time of year, and turbidity has been generally good. The BDD has been able to divert and treat as needed.

## **REGIONAL CONDITIONS**

### **Rio Grande Basin**

Surface flows in the Rio Grande and its tributaries through mid-Nov have been good. However, storage levels in regional reservoirs is still very low. A good snow pack this coming winter is essential if there is to be significant carry over storage in regional reservoirs for next high demand season.

UPDATE: Wild Earth Guardians (WEG) has either filed law suits or Notices of Intent (NOI's) against the US Army Corps of Engineers, Bureau of Reclamation, State of Colorado, State of NM, and MRGCD, citing endangered species act compliance concerns (SW willow fly catcher and silvery minnow). Other entities continue to contemplate the efficacy of filing as an "intervener" with the Court. The City of Santa Fe, Santa Fe County, and the BDD continue to be unnamed in the suits/NOI's, although there is some indication that imported SJCP water could become part of future legal proceedings.

Additionally, in October the federal government listed the yellow billed cuckoo as an endangered species in portions of the middle and upper Rio Grande basins. The cuckoo's habitat generally includes, but extends, the habitat already occupied by the flycatcher and minnow. The implications of this new listing by the federal government are currently be analyzed by staff and consultants. The Rio Grande meadow jumping mouse may also become listed by the federal government in the coming months. Jumping mouse habitat generally includes that of the cuckoo but also may include adjacent riparian meadows and wetlands further away from the wetted river flood plain. Updates will be provided by staff as necessary.

### **San Juan Basin**

It should be stressed that, conditions could significantly worsen for San Juan Chama Project deliveries next year, if the drought persists, due to a lack of carry-over storage in Heron Reservoir and other reservoirs in the system. Heron Reservoir is currently at a very low level. However, the San Juan Basin as well as the local Sangre de Cristo Mountains have already experienced several early and mid-November snow storms.

The Bureau of Reclamation has recently indicated that SJCP deliveries this year will be 89%. If deliveries end up for 2014 at 89% of total firm yield, then that would mark the first time since the inception of the SJCP Project that total firm yield deliveries were not completely met.

# EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

issued by

**CLIMATE PREDICTION CENTER/NCEP/NWS**  
**and the International Research Institute for Climate and Society**  
6 November 2014

## ENSO Alert System Status: El Niño Watch

**Synopsis:** There is a 58% chance of El Niño during the Northern Hemisphere winter, which is favored to last into the Northern Hemisphere spring 2015.

During October 2014, above-average sea surface temperatures (SST) increased slightly across the eastern half of the equatorial Pacific (Fig. 1). The weekly Niño indices were between +0.6°C (Niño-3.4 and Niño-1+2) and +0.9°C (Niño-3) at the end of the month (Fig. 2). Subsurface heat content anomalies (averaged between 180°-100°W) were largely unchanged (Fig. 3) even as a new downwelling Kelvin wave increased temperatures at depth in the central Pacific (Fig. 4). The monthly equatorial low-level winds were near average, although anomalous westerlies continued to emerge on occasion. Upper-level winds were also mostly average across the Pacific. The Southern Oscillation Index continued to be negative, accompanied by mostly average rainfall near the Date Line and suppressed rainfall over Indonesia (Fig. 5). Overall, several features across the tropical Pacific are characteristic of borderline El Niño conditions, but collectively, the combined atmosphere and oceanic state remains ENSO-neutral.

Similar to last month, most models predict El Niño to develop during October-December 2014 and to continue into early 2015 (Fig. 6). However, the ongoing lack of clear atmosphere-ocean coupling and the latest NCEP CFSv2 model forecast (Fig. 7) have reduced confidence that El Niño will fully materialize (at least five overlapping consecutive 3-month values of the Niño-3.4 index at or greater than 0.5°C). If El Niño does emerge, the forecaster consensus favors a weak event. In summary, there is a 58% chance of El Niño during the Northern Hemisphere winter, which is favored to last into the Northern Hemisphere spring 2015 (click [CPC/IRI consensus forecast](#) for the chance of each outcome).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site ([El Niño/La Niña Current Conditions and Expert Discussions](#)). Forecasts are also updated monthly in the [Forecast Forum](#) of CPC's Climate Diagnostics Bulletin. Additional perspectives and analysis are also available in an [ENSO blog](#). The next ENSO Diagnostics Discussion is scheduled for 4 December 2014. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: [ncep.list.ens0-update@noaa.gov](mailto:ncep.list.ens0-update@noaa.gov).

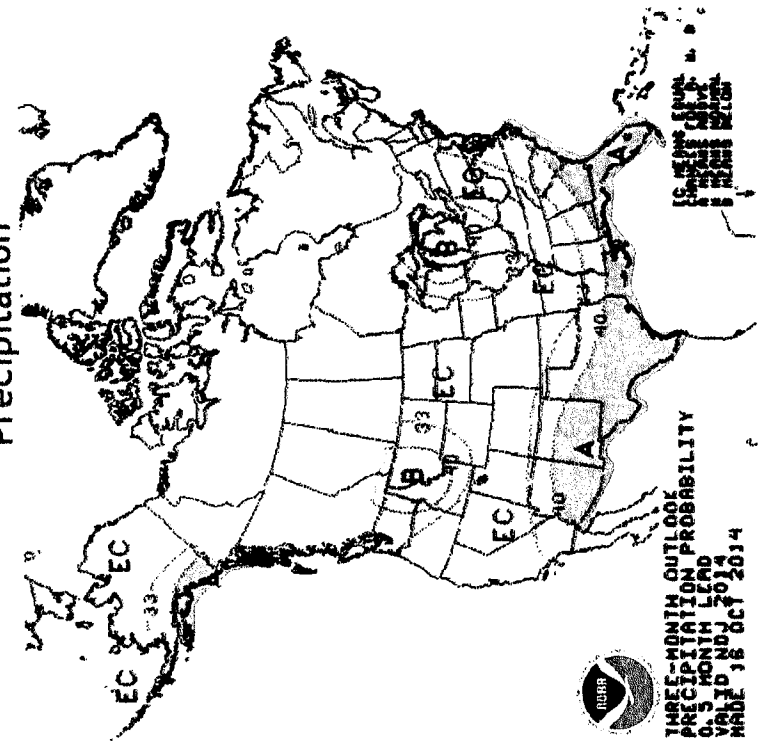
Climate Prediction Center  
National Centers for Environmental Prediction  
NOAA/National Weather Service  
College Park, MD 20740

# U. S. Seasonal Outlooks

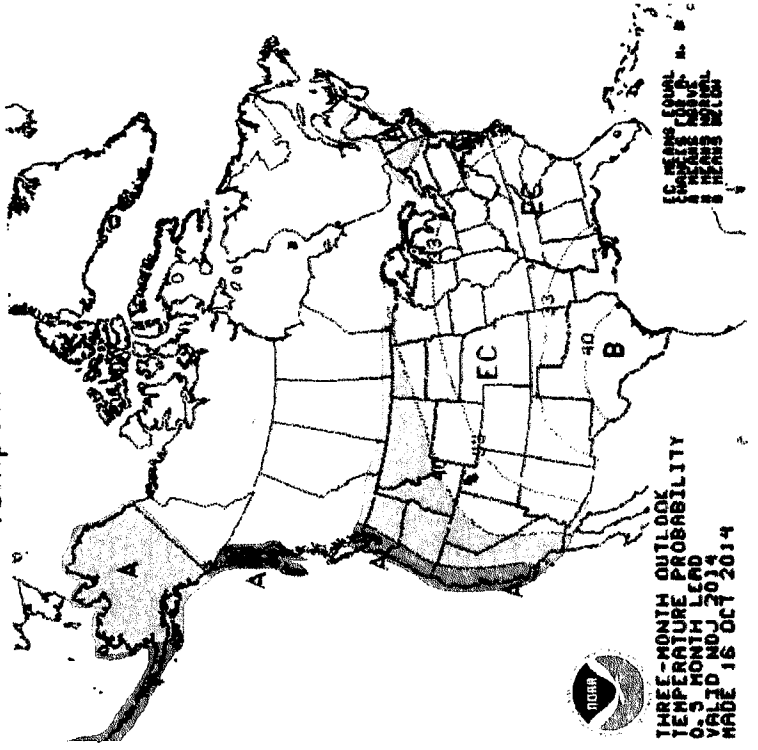
## November 2014 - January 2015

The seasonal outlooks combine the effects of long-term forecasts and shorter-range forecasts.

### Precipitation



### Temperature



# SANTA FE BASIN STUDY

## Adaptions to Climate Change for the City & County

Dagmar Ellwellyn

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THE UNIVERSITY OF TEXAS AT AUSTIN

### BACKGROUND & PURPOSE

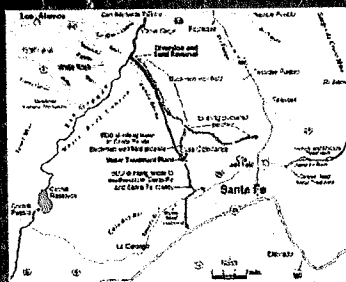
Climate change, in concert with human development and other impacts, may alter many aspects of life in the Santa Fe basin, including the availability of water, human quality of life, food security, and the ecosystem. The Santa Fe basin's water supply is limited and vulnerable to projected changes. The surface water supply in the area, which is dependent on seasonal snowpack and runoff conditions, is highly variable, and can be unreliable. The groundwater is pumped from aquifers that are slow to recharge. The population continues to grow, and needs continue to expand. In response, the City and the County have been working for a more resilient, sustainable, and innovative water supply system for many years.

The Basin Study described here, which is a partnership between the City and County and the Bureau of Reclamation under Reclamation's WaterSMART Program, is the latest effort to strengthen Santa Fe's water management. The study area is the Santa Fe Watershed, and other components of the water supply for the City and County.

The purpose of the study is to evaluate the likely impacts of climate change on water supply and demand in the Santa Fe study area, as well as to evaluate the extent to which changes in water availability will impact fish and wildlife habitat, including riparian species, water quality, and flow and state of riparian vegetation. The study is consistent with Reclamation's Basin Study Framework and Section 10101 of the Federal SECURE Water Act of 2009.

The goal of this project is to complete water supply and demand and the assessment of climate change impacts on the water supply of the

### SANTA FE WATER SUPPLY



SOURCE OF SUPPLY	TYPE	DESCRIPTION
San Juan River	Surface	San Juan River
Rio Grande	Surface	Rio Grande
San Juan Reservoir	Surface	San Juan Reservoir
Rio Grande Reservoir	Surface	Rio Grande Reservoir
San Juan Aquifer	Groundwater	San Juan Aquifer
Rio Grande Aquifer	Groundwater	Rio Grande Aquifer

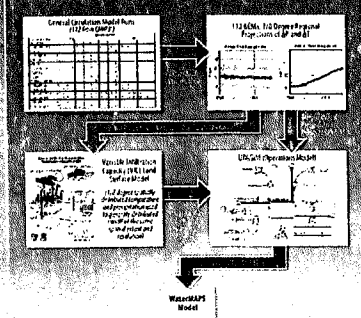
### APPROACH

The study partners evaluated the impact of climate change on water supply and demand, and wanted to develop adaptation strategies. A public forum was also convened, and a report was generated that summarized other potential impacts in the watershed and strategies to minimize those impacts. The impacts on the City and County's municipal water supply portfolio were also evaluated using climate projections developed by Reclamation, the water operations model URGSIM, and the city's Water Management and Planning Simulation (WaterMAPS) model. The goals of the project were:

- Identify trends in water use (e.g., increases in demand due to increased temperatures).
- Identify likely water supply gaps (the difference between projected supply and projected demand) during the planning period (through 2055), under projected management, population, development, and climatic conditions.
- Evaluate a range of adaptation portfolios for addressing the projected supply gaps in terms of cost, technical feasibility, public acceptance, permitting/regulation, and availability of funding.
- Evaluate the reliability of individual adaptation strategies (e.g., conservation or water rights acquisition).

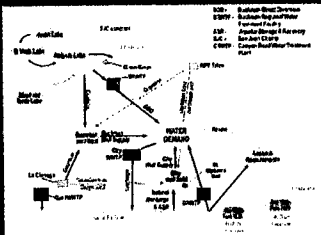
### SIMULATED CLIMATE PROJECTIONS

Projections of climate change impacts on Santa Fe's surface water supply were developed by Reclamation and Santa National Labs to support this study. This process involved a complicated sequence of data processing and modeling steps including General Circulation Models (global climate models or GCMs), Statistical Downscaling, Land Surface and rainfall runoff modeling (Variable Infiltration on Capacity Model), transpiration, and basin-scale water operations modeling (URGSI). The 12 GCM runs produced were grouped into five categories, of which three were chosen for this study to bracket the range of conditions: Warm-Wet, Hot-Dry, & Central Tendency. The output from URGSIM for these three categories was used as the inputs for WaterMAPS.



### WATERMAPS ANALYSIS

A general water management simulation, Santa Fe's WaterMAPS model simulates the water supply and demand in the Santa Fe study area, as well as the extent to which changes in water availability will impact fish and wildlife habitat, including riparian species, water quality, and flow and state of riparian vegetation. The study is consistent with Reclamation's Basin Study Framework and Section 10101 of the Federal SECURE Water Act of 2009.



10% probability that there will be a decrease of 1.2% in the amount of water available in the Rio Grande watershed.

### WATER SUPPLY GAP

The study of Santa Fe basin's projected water supply and demand, under various climate change scenarios, was evaluated in the Basin Study. This was a combination of future demand projections, future water supply projections, and future climate change and self-supplied limitations on groundwater recharge.

#### CLIMATE CHANGE SCENARIO

ANNUATED HISTORIC TENDENCY CENTRAL TENDENCY WARM-WET HOT-DRY

Scenario	1981-2010	2011-2040	2041-2070
Central Tendency	1.00	1.00	1.00
Warm-Wet	1.00	1.00	1.00
Hot-Dry	1.00	1.00	1.00

### ADAPTION STRATEGIES & EVALUATION

ADAPTION STRATEGY TECHNICAL APPROACH

Reclamation's Basin Study Framework and Section 10101 of the Federal SECURE Water Act of 2009.

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### RANKINGS & CONCLUSIONS

The ranking process for the Santa Fe Basin Study was based on scoring each climate adaptation portfolio with respect to four climate criteria: Portfolio 1, 2, and 3 were eliminated based on reliability criteria. The climate criterion of the highest ranked portfolio was projected to be the most reliable. This suggests that the City and County focus efforts to use reclaimed water from both the City wastewater treatment plant and the County's Quilley wastewater treatment plant. The three highest ranked portfolios also show the maximum number of adaptive strategies demonstrating the value of a multi-faceted approach to addressing climate change adaptation goals for the Santa Fe region.



### FUTURE STUDIES

The study of Santa Fe basin's projected water supply and demand, under various climate change scenarios, was evaluated in the Basin Study. This was a combination of future demand projections, future water supply projections, and future climate change and self-supplied limitations on groundwater recharge. The study of Santa Fe basin's projected water supply and demand, under various climate change scenarios, was evaluated in the Basin Study. This was a combination of future demand projections, future water supply projections, and future climate change and self-supplied limitations on groundwater recharge. The study of Santa Fe basin's projected water supply and demand, under various climate change scenarios, was evaluated in the Basin Study. This was a combination of future demand projections, future water supply projections, and future climate change and self-supplied limitations on groundwater recharge.

Exhibit C

## Preliminary Task and Schedule for Santa Fe City-County Reclaimed Water Feasibility Study

Task	Start Date	End Date	Task	Description	% Complete	Notes
a	01-Nov-14	31-Dec-14	Develop SOW	Contract RFP/RFB	0%	1
b	01-Dec-14	25-Feb-15	RW FS Contract	Award/Kickoff	0%	2
c	01-Mar-15	01-Jun-15	Data Compilation	Updated System Model	15%	3
d	01-Jun-15	01-Sep-15	Reclaimed Water (RW) Alternatives	RFC, DP, IDP, ASR1, ASR2	35%	4
e	01-Sep-15	31-Dec-15	WaterMAPs Modeling	Programming Alternatives	60%	5
f	01-Jan-16	01-Mar-16	RW Alternatives Evaluation	Triple Bottom Line Assessment	85%	6
g	01-Mar-16	01-Apr-16	Reporting	Text and Figures	95%	7
h	01-Apr-16	30-May-16	Report Review Cycle	Final Report	100%	

### Notes

- 1 18-month project lifecycle very aggressive for engineering firm with no Cosf water system experience, Stella-WaterMAPs programming skills critical
- 2 Cosf procurement process and BOR involvement
- 3 Cosf WWTP Master Plan (2015), City-County production/discharge data, GIS maps
- 4 Public perception, easements, permits, adjudication, RW contracts \*, EPA water quality, USACE wetlands
- 5 Storage capacity, storage regulations, seasonal water availability vs peak demands, reliability factors
- 6 Cost vs Societal vs Environmental: La Cienega, Direct Potable, Beaver Pond Wetlands,
- 7 Tight schedule, concurrent review cycle permissible?

Exhibit D-1

## Task A: Statement of Work

subTask	Start Date	End Date	Task	Description	% Complete	Notes
1	01-Nov-14	31-Dec-14	SF WWTP Upgrade/Master Plan	Identify Water Quality from WWTP	75%	1
2	01-Nov-14	31-Dec-14	Identify current and future RW requirements	RW contract obligation/Basin Study Results	75%	2
3	01-Nov-14	31-Dec-14	Preliminary RW Reuse Alternatives (hybrids)	Re-evaluate (seasonality, demands)	75%	3
4	01-Nov-14	31-Dec-14	Lessons Learned	Meetings (El Paso, Corollo, Ruidoso)	50%	5
5	01-Nov-14	31-Dec-14	SF City and County 'Integration'	Land use, regionalization, planning	50%	
6	01-Nov-14	31-Dec-14	Legal obligation to SF River effluent	Identify quantities of discharge	50%	
7	01-Nov-14	31-Dec-14	Regulatory requirements	ASR, IDP/DP, RFC OSE NMED	50%	
8	01-Nov-14	31-Dec-14	Critical Review of RW FS Reports	Identify key elements of FS for SOW	50%	

- Shannon Jones/Brian Romero interviews, HDR Report
- Basin Study Draft Final, Model sensitivity to Population, SWANN PARK
- RW most available in winter when demand is lowest, blending requirements
- Jemez y Sangre Planning, County long term plans for WWTP near SFCC, Public Outreach
- SF Reclaimed Water Plan 2013 Assumptions, Marcos Martinez legal opinion
- Domestic Well impacts, monitoring requirements
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# Effluent Reuse 2013 Monthly Totals (MG)

2013	INFLUENT Flow MG Monthly Totals	Las Campanas Flow MG Monthly Totals	SF Country Club Flow MG Monthly Totals	Santa Fe Horse Park Flow MG Monthly Totals	SF Downs Flow MG Monthly Totals	Standpipe/ Process Flow MG Monthly Totals	Caja Del Rio Flow MG Monthly Totals	Marty Sanchez Flow MG Monthly Totals	Sports Complex Flow MG Monthly Totals	NM Game and Fish Flow MG Monthly Totals	US Forest Service Flow MG Monthly Totals	Total Users Flow MG Monthly Totals	SF River Flow MG Monthly Totals	TOTAL FLOW MG Monthly Totals
Jan	167.14	0.00	0.00	0.00	0.00	1.16	0.08	0.00	0.00	0.00	0.00	1.23	168.44	169.67
Feb	155.42	0.00	0.00	0.00	0.00	1.41	0.17	0.06	0.00	0.00	0.00	1.63	151.45	153.08
Mar	176.54	0.00	7.26	0.00	0.00	2.43	0.22	3.62	0.01	0.08	0.00	13.61	158.26	171.87
Apr	173.25	0.00	12.50	0.00	4.91	4.20	0.40	24.68	7.37	0.07	0.15	54.28	105.47	159.75
May	181.79	0.00	15.20	0.00	6.75	4.93	0.78	26.40	8.01	0.05	0.16	62.29	105.16	167.46
Jun	173.63	0.00	11.67	0.00	7.65	5.47	0.61	31.66	9.24	0.18	0.23	66.70	90.97	157.67
Jul	180.57	0.00	13.72	0.00	6.81	3.36	0.36	19.78	8.33	0.07	0.12	52.53	109.69	162.22
Aug	183.44	0.00	8.63	0.00	5.03	3.51	0.28	22.04	8.86	0.11	0.00	48.46	117.24	165.70
Sep	173.68	0.00	5.43	0.00	3.51	1.43	0.13	12.10	3.93	0.06	0.03	26.62	132.97	159.59
Oct	175.06	0.00	5.22	0.00	3.51	2.19	0.14	9.28	3.52	0.07	0.18	24.10	136.56	160.67
Nov	161.94	0.00	2.03	0.00	0.00	0.66	0.08	0.77	0.00	0.03	0.18	3.76	160.23	163.99
Dec	172.06	0.00	0.00	0.00	0.00	0.48	0.05	0.00	0.00	0.00	0.00	0.52	169.49	170.01
Total	2074.52	0.00	87.65	0.00	38.17	31.22	3.28	150.38	49.28	0.72	1.05	355.75	1605.92	1961.67

# Effluent Reuse 2013 Monthly Totals (Acre-Ft)

2013	INFLUENT Flow Acre-Ft Monthly Totals	Las Campanas Flow Acre-Ft Monthly Totals	SF Country Club Flow Acre-Ft Monthly Totals	Santa Fe Horse Park Flow Acre-Ft Monthly Totals	SF Downs Flow Acre-Ft Monthly Totals	Standpipe/ Process Flow Acre-Ft Monthly Totals	Caja Del Rio Flow Acre-Ft Monthly Totals	Marty Sanchez Flow Acre-Ft Monthly Totals	Sports Complex Flow Acre-Ft Monthly Totals	NM Game and Fish Flow Acre-Ft Monthly Totals	US Forest Service Flow Acre-Ft Monthly Totals	Total Users Flow Acre-Ft Monthly Totals	SF River Flow Acre-Ft Monthly Totals	TOTAL FLOW Acre-Ft Monthly Totals
Jan	512.94	0.00	0.00	0.00	0.00	3.54	0.24	0.00	0.00	0.00	0.00	3.78	516.93	520.71
Feb	476.97	0.00	0.00	0.00	0.00	4.33	0.51	0.18	0.00	0.00	0.00	5.01	464.78	469.80
Mar	541.77	0.00	22.27	0.00	0.00	7.44	0.67	11.10	0.04	0.24	0.00	41.76	485.68	527.44
Apr	531.67	0.00	38.35	0.00	15.08	12.90	1.23	75.74	22.62	0.22	0.45	166.59	323.68	490.27
May	557.89	0.00	46.66	0.00	20.72	15.13	2.39	81.02	24.58	0.17	0.50	191.17	322.73	513.90
Jun	532.84	0.00	35.81	0.00	23.46	16.80	1.89	97.16	28.34	0.54	0.70	204.71	279.17	483.87
Jul	554.15	0.00	42.09	0.00	20.90	10.30	1.09	60.69	25.56	0.21	0.37	161.21	336.61	497.82
Aug	562.97	0.00	26.48	0.00	15.44	10.77	0.86	67.64	27.20	0.33	0.00	148.72	359.78	508.50
Sep	533.01	0.00	16.66	0.00	10.77	4.39	0.40	37.12	12.06	0.19	0.10	81.69	408.07	489.76
Oct	537.25	0.00	16.02	0.00	10.77	6.71	0.42	28.48	10.82	0.21	0.55	73.97	419.09	493.06
Nov	496.96	0.00	6.24	0.00	0.00	2.03	0.25	2.36	0.00	0.10	0.55	11.53	491.73	503.26
Dec	528.04	0.00	0.00	0.00	0.00	1.47	0.14	0.00	0.00	0.00	0.00	1.61	520.14	521.75
Total	6366.47	0.00	250.57	0.00	117.14	95.87	10.07	461.50	151.23	2.21	3.22	1091.76	4928.39	6020.15

06/10/2014

Exhibit D-2

# City of Santa Fe, New Mexico

# memo

**DATE:** November 24, 2014

**TO:** Public Utilities Committee Members

**VIA:** Nick Schiavo, Interim Public Utilities Department and Water Division Director *NSA*

**FROM:** Alex Puglisi, Interim Manager, Source of Supply Section

## ITEM AND ISSUE:

In conjunction with the second phase of Nichols and McClure Reservoirs Intake Tower Rehabilitation Project, the Public Utilities Department-Source of Supply Section will continue to manage remaining reservoir storage levels and SF River flows to ensure that the City can beneficially utilize as much of its surface water diversion rights as practicable. In Spring and early Summer 2014, McClure Reservoir was used to contain the majority of runoff from the Santa Fe watershed. Reservoir storage levels approached 80% at that time. Releases were then conducted from the reservoir to fill the previously-emptied Nichols Reservoir, treat 1.2 to 6.0 million gallons per day (MGD) at the Canyon Road Water Treatment Plant (CRWTP) providing drinking water to the citizens of Santa Fe, or released for Living River Ordinance flows, the Annual Fish Derby and irrigation flows.

The Source of Supply Section managed the releases of the water stored in McClure Dam over Spring/Summer 2014 to maintain and ultimately eliminate storage in the reservoir in a manner that maximized all practicable beneficial uses of the City's Santa Fe River surface water diversion rights.

## BACKGROUND AND SUMMARY:

The Source of Supply Section started discharging 5.0 MGD from McClure Reservoir to the Santa Fe River on March 19<sup>th</sup> in order to increase the level of drinking water treatment at the CRWTP to 3.0 MGD, meet the projected start date for rehabilitation of the McClure Reservoir Intake Tower Project, lower McClure storage levels down to acceptable levels in preparation for remaining Spring 2014 runoff, and provide irrigation flows. Three of the 5.0 million gallons per day (MGD) in initial flows were diverted to treatment at the CRWTP with 2.0-2.6 MGD sent daily to Acequia Madre and Acequia Cerro Gordo, and other irrigation systems, ranging from 180,000 gpd daily, to over 2.8 MGD during four days of the week.

As Spring and Summer 2014 progressed, releases from McClure Dam were increased to pre-calculated maximum volumes in order to meet the Office of the State Engineer (OSE) Dam Safety Guidelines for the safe draining and filling of reservoir impoundments. Releases from Nichols peaked in the months of May and June when Living River and irrigation releases were in effect and tapered off from that peak until McClure reservoir was emptied to the 84 ft. valve level during the last week in October. Any water released from McClure above the volume undergoing treatment by the CRWTP during this time period were utilized for Living River Ordinance flow releases, irrigation deliveries, and the refilling of Nichols

*Arch. Mike F. - 1*

Reservoir. Any remaining stored water McClure Reservoir was completely transferred into storage at Nichols on October 31, 2014.

CRWTP has operated at approximate levels of 1.2 -5.0 MGD during CY 2014 depending on water quality and the quantity of the water in storage at Nichols. All efforts were made to conduct releases in a manner which will minimize the loss of stored water as the result of water quality degradation. Such degradation was hastened by lower reservoir storage pool depths, warm summer temperatures, rapid growth of algae, and the higher levels of organic matter and sediment in flows being released from the upstream McClure Reservoir. The construction update from the Department's engineering staff on today's agenda provides more detail on the status of the Nichols and McClure Reservoir Intake Tower Improvements Project and the proposed milestones for completion.

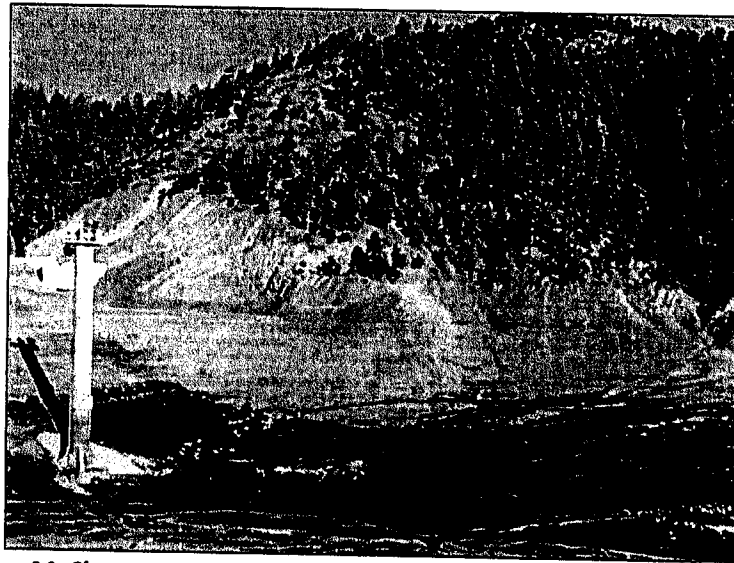
**RECOMMENDATION:**

The Public Utilities Department will release all anticipated Spring/Summer 2015 inflows to McClure Reservoir into storage at Nichols Reservoir or to treatment at the Canyon Road Treatment Plant and river delivery obligations during the remaining term of the Reservoir Tower Reconstruction Project. All upper watershed flows into the McClure Reservoir at this time will be directly released into the SF River through the former McClure Reservoir Intake Tower outlet pipe. The attached graph and chart outlines PUD's initial projected treatment volumes for CRWTP in 2015 to utilize available water from the SF watershed, as well as all other sources of water available to the City.

**McClure & Nichols Reservoirs Infrastructure Improvements CIP Project No. 3038**  
**Construction Update**  
**November 18, 2014**

The intake tower for Nichols Dam was substantially completed last May and is in service. Final completion of work at Nichols Dam will be done during a 3 week scheduled shutdown of the Canyon Road Water Treatment Plant between November 17 and December 12, 2014. This work includes the cleaning and patching of the outlet conduit (5 foot diameter tunnel beneath the dam that is approximately 480 feet long); replacement of 4 inch irrigation pipe that feeds the Acequia Del Llano; installation of handrail inside the new intake structure, installation of a 3 inch vacuum breaker, and minor punch list items.

RMCI completed dewatering of McClure Reservoir on October 31, 2014 with Santa Fe River flow going directly into the McClure outlet conduit. Demobilization of the dewatering pumping equipment followed.



**McClure Reservoir Dewatered. Santa Fe River is flowing into the outlet conduit and through the dam. 11/6/2014**

A Notice to Proceed with McClure Reservoir construction was issued to RMCI on November 7, 2014 rather than on September 2, 2014 as originally anticipated. RMCI will start work when they determine weather conditions are suitable to make sustained progress. It is anticipated that RMCI will mobilize for work on or about March 2, 2105. The RMCI contract completion date has been extended 154 calendar days to November 27, 2015.

The Source of Supply section will manage the Santa Fe Canyon watershed supply so the maximum amount of runoff will be utilized for treated water supply, acequia deliveries, and Living River releases. This will be done by carefully managing Nichols Reservoir storage and coordinating water supply with the Buckman Direct Diversion project so that the maximum amount of Santa Fe Canyon watershed runoff is used.

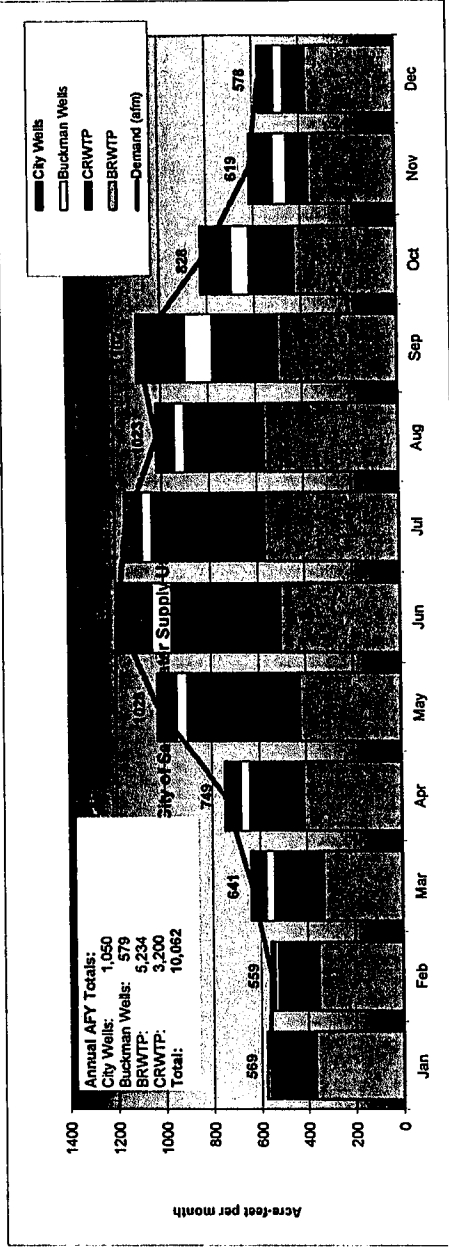
*Exhibit E-2*

These fields can be manipulated.

Annual use by supply			Actual
BRWTP	5230	5234	
CRWTP	3500	3200	
SF Well	0	0	
Other	1322	1616	
Total			10052
Annual use by supply			AFY
BRWTP	5234	8434	
CRWTP	3200	1050	
City Wells	1050	1629	
Buckman Wells	579		
Total			10062

Assumptions:  
 Average to Above Average Watershed Yield  
 SF Well not on in 2015  
 City to use most of SJC water rights of 5230 af  
 Other wells fill in only as needed after max sw use  
 1,000 ac-ft for SF River  
 Demand is primarily CitySF plus 100 af for SFCounty (when BDD is down)  
 Daily demand will be derived by taking monthly and dividing by # of days in the month, not by looking at five-day rolling average of historical demand  
 City growth rate is 0.5% per year  
 BDD production may be periodically shut down because of high turbidity in the Rio Grande  
 CRWTP needs to operate higher in May to July to meet a large portion of daily demands until McCune Reservoir comes online.  
 Focal Points:  
 Increased SJC use during Jun-Sept  
 BDD max day not to exceed off-peak power pumping time

2015	Demand		Demand		Seasonal Demand Factor	BDD		CRWTP		SFWell		Other Wells		Buckman Wells		City Wells	
	mgd	af	mgd	af		mgd	af	mgd	af	mgd	af	mgd	af	mgd	af	mgd	af
Jan	6.0	18.3	185	569	0.68	3.9	118	2.0	62	0	0	2	7	0	0	0	20
Feb	6.5	20.0	182	559	0.67	4.0	116	2.0	56	0	0	10	31	4	11	7	20
Mar	6.7	20.7	209	641	0.77	3.5	109	2.2	68	0	0	32	99	12	36	21	63
Apr	8.1	25.0	244	749	0.89	4.5	135	2.5	75	0	0	34	105	12	38	22	67
May	10.8	33.2	335	1028	1.23	4.5	140	5.0	155	0	0	41	124	15	45	26	80
Jun	13.0	39.8	389	1194	1.42	5.5	165	5.0	150	0	0	74	227	27	82	47	145
Jul	12.2	37.4	378	1159	1.38	8.0	188	3.5	109	0	0	37	113	13	43	26	77
Aug	10.8	33.0	334	1023	1.22	6.0	185	3.0	90	0	0	104	319	37	115	67	204
Sep	12.0	36.7	359	1102	1.32	5.5	165	2.0	62	0	0	67	205	24	74	43	131
Oct	8.7	26.7	270	828	0.99	4.6	141	1.0	30	0	0	52	158	19	57	33	101
Nov	6.7	20.6	202	619	0.74	4.0	120	1.0	31	0	0	35	107	13	39	22	69
Dec	6.1	18.7	188	578	0.69	4.0	122	1.0	31	0	0	527	1616	159	579	360	1050
AVG			3275	10050			1705	5234	1043	3200	0						





## Design at an Ecodistrict Scale can Change Washington, DC's Landscape

### Presenters

Elizabeth Miller, ASLA, National Capital Planning Commission  
Diane Sullivan, National Capital Planning Commission  
Otto Condon, AIA, ZGF Architects, LLP

ASLA 2014 Annual Meeting and EXPO



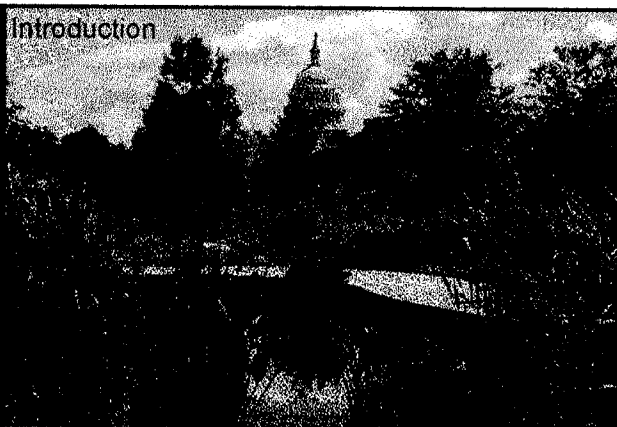
## Learning Objectives

1. Discover how Ecodistrict planning and design can achieve greater environmental and economic results.
2. Learn about Washington, DC's unique approach to stormwater management regulations and incentives.
3. Gain insight on how these new approaches are shaping the public realm and infrastructure projects and the opportunities and challenges to overcome.
4. Understand the application of these new approaches through three case studies: 19<sup>th</sup> Street NW, Minnesota Avenue, and 10<sup>th</sup> Street SW in the SW Ecodistrict.

ASLA 2014 Annual Meeting and EXPO



## Introduction

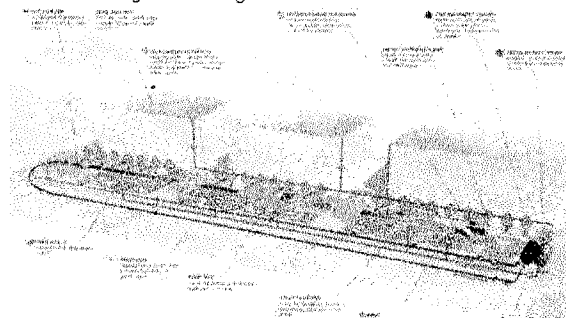


ASLA 2014 Annual Meeting and EXPO



## Why District-Scale Stormwater Management?

- Increases Sustainability Results
- Greater Financial Incentives
- Knits the neighborhood together



## District Incentives: 2) Stormwater Credits

➔ Untapped Market for Financing for Projects

### Off-Site Retention Registry: SRCs for Sale

Project Name	Location	Volume (MG)	Price (\$/MG)	Total Price (\$)
Project A	Location A	1.0	\$10.00	\$10.00
Project B	Location B	2.0	\$15.00	\$30.00
Project C	Location C	3.0	\$20.00	\$60.00
Project D	Location D	4.0	\$25.00	\$100.00
Project E	Location E	5.0	\$30.00	\$150.00
Project F	Location F	6.0	\$35.00	\$210.00
Project G	Location G	7.0	\$40.00	\$280.00
Project H	Location H	8.0	\$45.00	\$360.00
Project I	Location I	9.0	\$50.00	\$450.00
Project J	Location J	10.0	\$55.00	\$550.00
<b>Total (10 projects)</b>		<b>60.0</b>	<b>\$35.00</b>	<b>\$2,100.00</b>

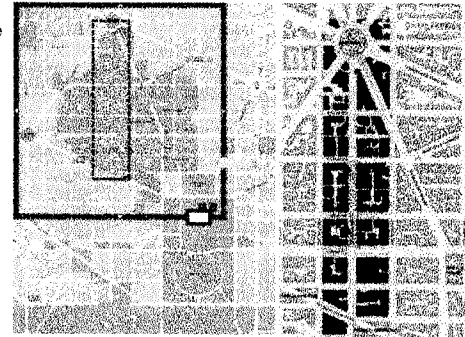
### Final SRC Sale Prices

Project Name	Volume (MG)	Price (\$/MG)	Total Price (\$)
Project A	1.0	\$10.00	\$10.00
Project B	2.0	\$15.00	\$30.00
Project C	3.0	\$20.00	\$60.00
Project D	4.0	\$25.00	\$100.00
Project E	5.0	\$30.00	\$150.00
Project F	6.0	\$35.00	\$210.00
Project G	7.0	\$40.00	\$280.00
Project H	8.0	\$45.00	\$360.00
Project I	9.0	\$50.00	\$450.00
Project J	10.0	\$55.00	\$550.00
<b>Total (10 projects)</b>	<b>60.0</b>	<b>\$35.00</b>	<b>\$2,100.00</b>



## 19th St NW – Surgical LID

Golden Triangle  
Business  
Improvement  
District



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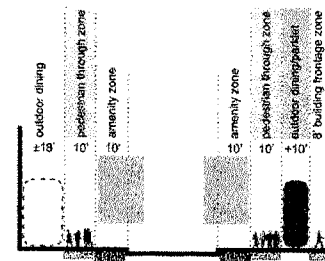
## Today



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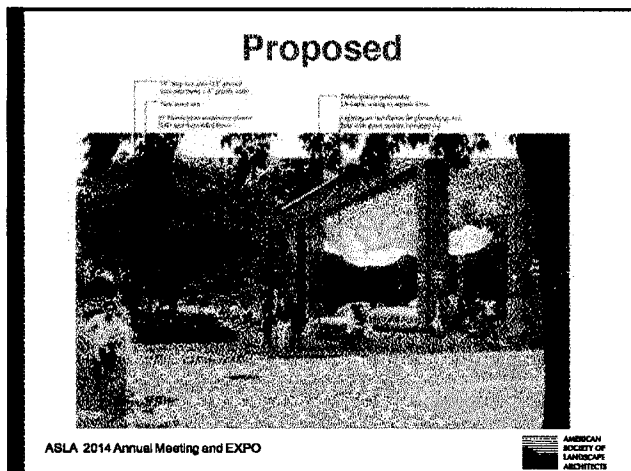
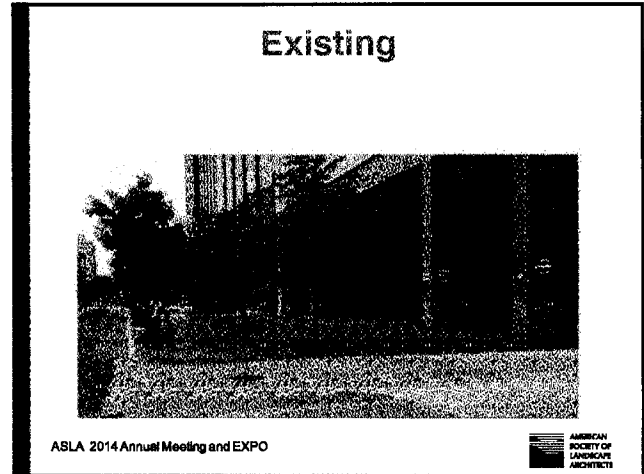
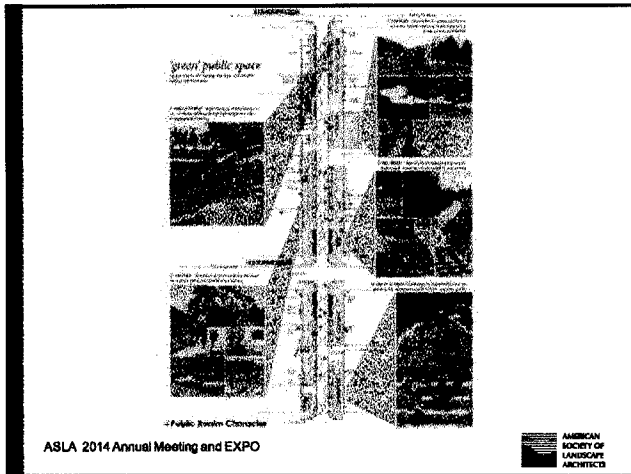
## Design Concept



Refined concept

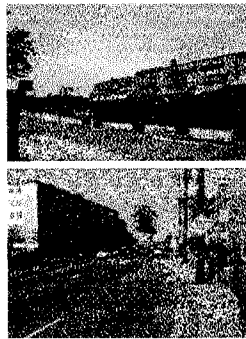
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## Minnesota Ave NW – Goals

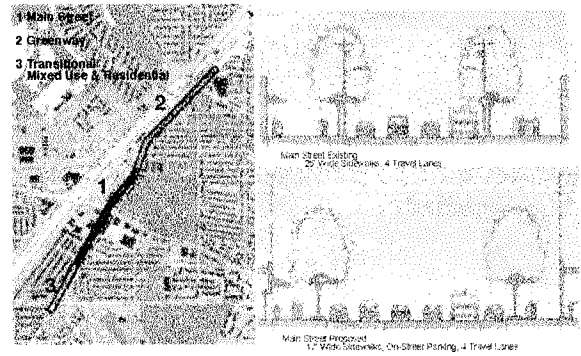
1. Support and enhance the economic viability and expand community livability by improving the retail environment, residential quality of life, and open spaces.
2. A landscape/streetscape design that will enhance the neighborhood downtown retail district and special nodes.
3. An environmental uniqueness to provide for a safe, inviting, and interesting public realm that supports diversity in use and activities.
4. To promote sustainable mobility through the emphasis of pedestrian, bicycle, transit modes of transportation, while accommodating the needs of vehicular traffic.



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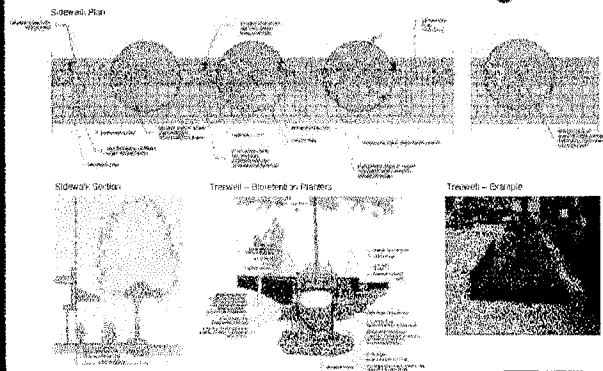
## Minnesota Ave NW – Framework



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## Minnesota Ave NW – Design

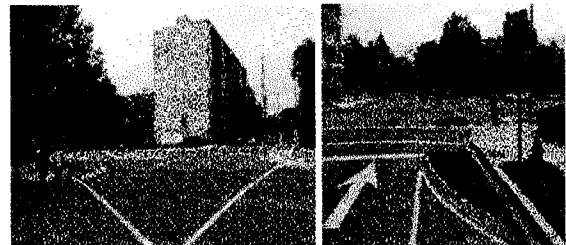


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## 15<sup>th</sup> St NW – Safety LID

- Purpose
  - Intersection improvement for pedestrian safety
  - Permanent improvements to replace temporary construction

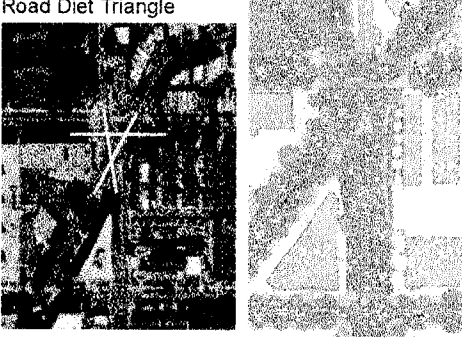


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## 15<sup>th</sup> St NW – Concept

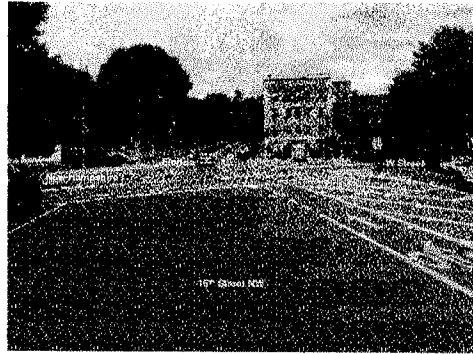
Road Diet Triangle



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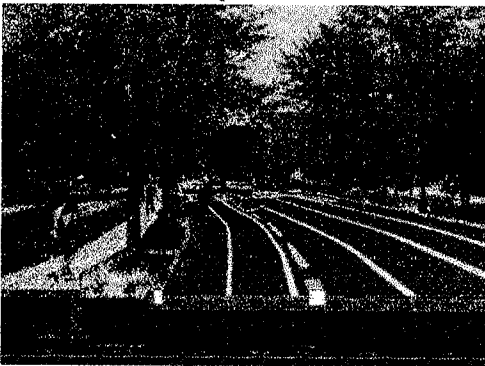
## Today



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## Proposed



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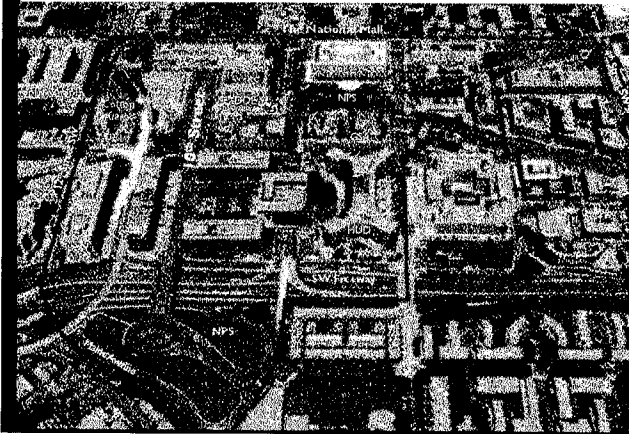


## Scaling up to the Ecodistrict Approach

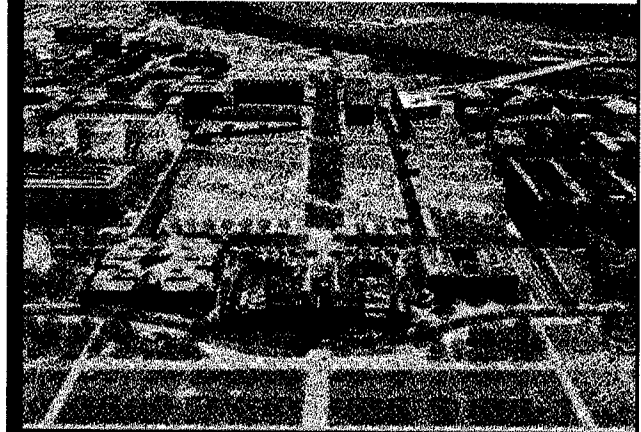
SW Ecodistrict



## The Study Area



## Planning Approach



## Water Goals

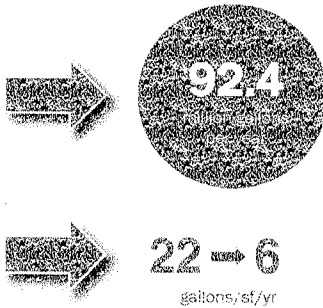
### Stormwater

Retain/Reuse the rainfall from 80% of the flow. (1.7" Storm Event).

and

### Potable water

Reduce municipal potable water use to 70% of what is used now.



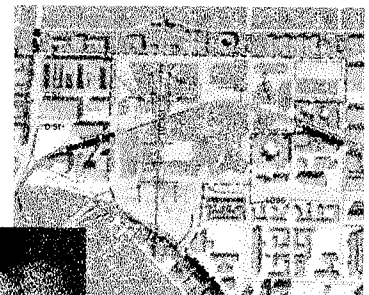
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## Goals/Strategies

### District Scale Water Systems

Large tanks (under 10<sup>th</sup> Street) could hold enough stormwater to provide 71 percent of the total water used in the ecodistrict.



10th Street cross section with below ground tanks



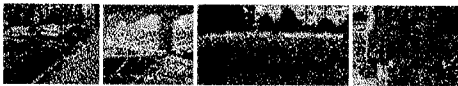
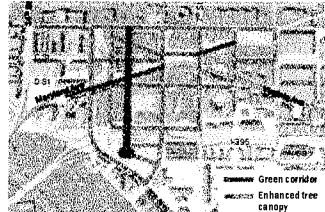
## Urban Ecology Strategies

### Green Street Infrastructure

- Green roofs
- Edible rooftops
- Green walls
- Rain gardens

### Block/District Strategies

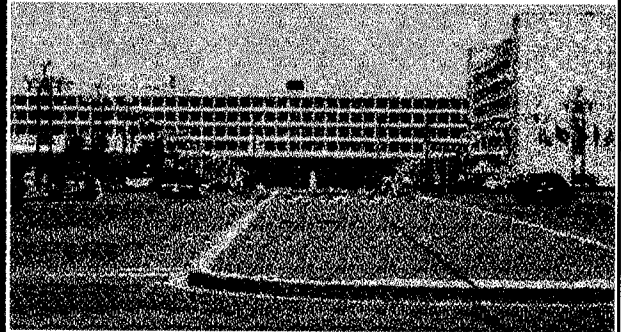
- Native vegetation
- Healthy soils
- Shade trees
- Pervious areas



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## 10<sup>th</sup> Street, SW

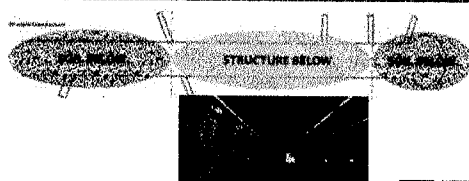
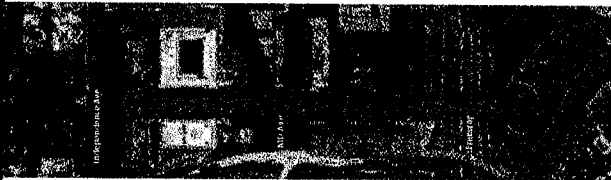


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## Existing Conditions

### Design Parameters – A Street & 3 Bridge Structures

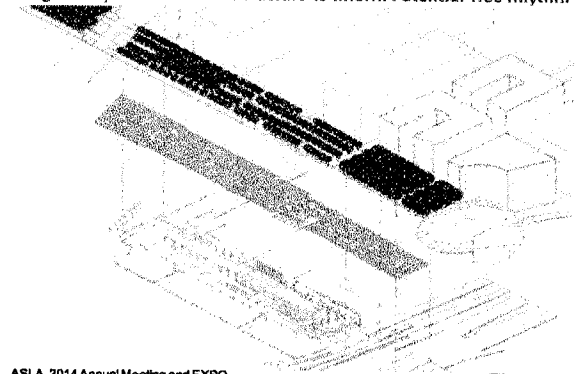


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## 10<sup>th</sup> Street – Concept Study

### Design Analysis – Evaluated Structure to Inform Potential Tree Rhythm

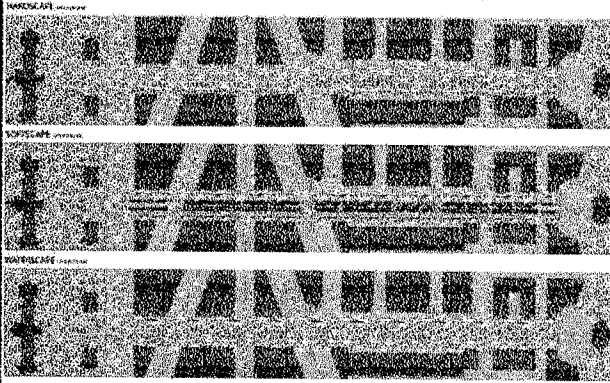


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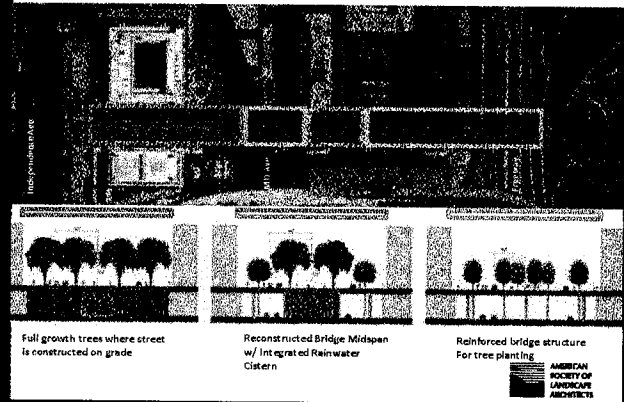
## 10<sup>th</sup> Street – Concept Study

### 3 Preliminary Design Approaches – Hardscape, Softscape, Water



## National Mall to the Waterfront

### Maximize Tree Canopy



## National Mall to the Waterfront

### 10<sup>th</sup> Street SW – An Urban Garden Promenade Ground Plane

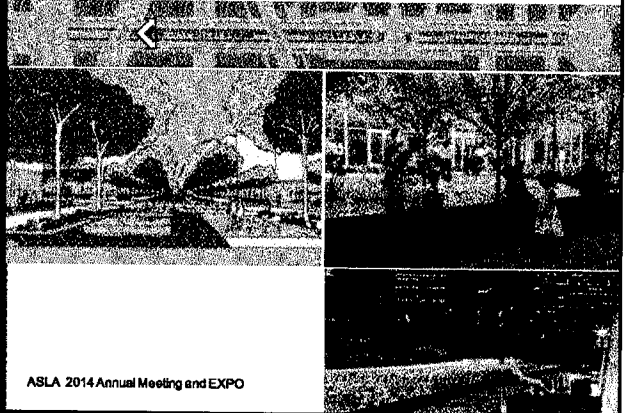


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## National Mall to the Waterfront

### An Urban Garden Promenade – Garden Room

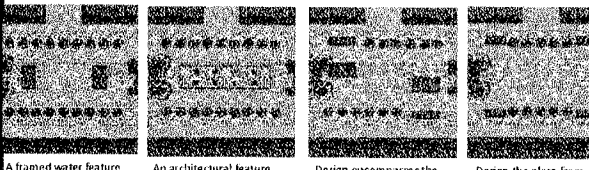


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### National Mall to the Waterfront

#### The Urban Plaza

There are a variety of design strategies for the Plaza at the peak of the street:



- A framed water feature in the median
- An architectural feature in the median
- Design encompasses the Right-of-way
- Design the plaza from building to building

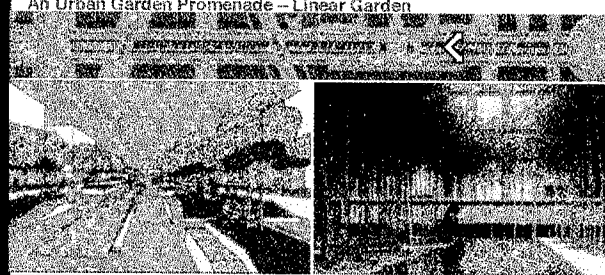
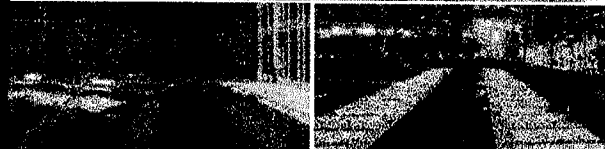


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### National Mall to the Waterfront

#### An Urban Garden Promenade – Linear Garden

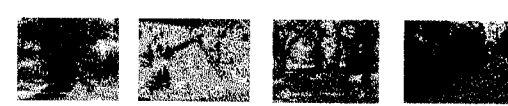



### Stormwater Infrastructure Study

#### Modeled Green Areas for Water Reduction



- Flow Through Swale 20% Reduction
- Flow Through Planter 20% Reduction
- Roof Intensive 40% Reduction
- Roof Extensive 100% Reduction



- Tree Reduction 15 cfi/year
- Impervious 0% Reduction
- Compacted 20% Reduction
- Natural 40% Reduction

Based on DDOE Stormwater Guidebook

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