



Agenda

DATE 5/8/13 TIME 12:47 pm

PREPARED BY Brian Drypolcher

APPROVED BY [Signature]

SANTA FE RIVER COMMISSION

Thursday, May 16, 2013

6:00 – 8:00 p.m.

Downtown Public Library, Community Room, 2nd Floor

145 Washington Avenue, Santa Fe, NM

505.955.6840

1. ROLL CALL
2. APPROVAL OF AGENDA
3. APPROVAL OF MINUTES FROM APRIL 11, 2013
4. DISCUSSION/ACTION ITEMS
 - a. Information and Discussion: Presentation by Aaron Kaufman of Southwest Urban Hydrology; regarding the design, construction and function of storm water infiltration features, also known as green infrastructure for storm water management. (Aaron Kaufman and Brian Drypolcher)
 - b. Information and Discussion: Annual Report, Santa Fe River Target Flow Program. (Brian Drypolcher)
6. MATTERS FROM COMMISSIONERS, MATTERS FROM SUB-COMMITTEES
7. MATTERS FROM STAFF
8. CITIZENS COMMUNICATION FROM THE FLOOR

ADJOURN

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

**Index Summary of Minutes
Santa Fe River Commission
May 16, 2013**

<u>INDEX</u>	<u>ACTION TAKEN</u>	<u>PAGE(S)</u>
Cover Page		1
Call to Order/Roll Call	Call to order by Jerry Jacobi, Chair, at 6:00 pm. Meeting was held at the Public Library, Santa Fe, New Mexico. A quorum was declared by roll call.	2
Approval of Minutes April 11, 2013	<i>Mr. Ellenberg moved to approve the Minutes of April 11, 2013 as presented, second by Ms. Melinda Romero-Pike, motion carried by unanimous voice vote.</i>	2
Approval of the Agenda	Chair Jacobi added a C. to discussion items. <i>Mr. Ellenberg moved to approve the agenda as amended, second by Mr. Buscher, motion carried by unanimous voice vote.</i>	2
Discussion and Action Items a. Information and Discussion. Presentation by Aaron Kaufman of Southwest Urban Hydrology, regarding the design, construction and function of storm water infiltration features, also known as green infrastructure for storm water management. (Aaron Kaufman and Brian Drypolcher) b. Information and Discussion: Annual Report, Santa Fe River Target Flow Program. (Brian Drypolcher) (Computer presentation) c. Calle Deborah Bridge Update	Informational, no formal action.	2-6
Matters from the Commissioners	Informational	6
Matters from Staff	Informational and Staff	6-7

	Follow up for next agenda.	
Citizens Communication from the Floor	None	7
Adjournment and Signature Page	There being no further business to come before the Santa Fe River Commission, Ms. Romero-Pike moved to adjourn at 7:45 pm, second by Mr. Ellenberg, motion carried by unanimous voice vote.	7

SANTA FE RIVER COMMISSION

MINUTES

Thursday, May 16, 2013 - 6:00p.m. – 7:45 p.m.
Public Library, Santa Fe, NM

1. ROLL CALL

The meeting of the Santa Fe River Commission was convened by the Chair at 6:00 pm, Public Library, Santa Fe, New Mexico. A quorum was present at time of roll call.

Present:

Jerry Jacobi, Chair
Phillip J. Bove
Richard Ellenberg
John R. Buscher
Melinda Romero-Pike

Not Present

Dale Doremus, Excused
Sam Gerberding, Excused
Jim Cutropia, Excused

Others Present:

Brian Drypolcher – Staff Liaison
Eric Martinez, City of Santa Fe, Roads and Trails Division
Felicity Broennan, Santa Fe Watershed
Keir Carecci, Santa Fe County Staff
Tim Perez, Community Citizen
Elizabeth Martin for Fran Lucero, Stenographer

2. APPROVAL OF AGENDA

Chair Jacobi added a C. to discussion items.

Mr. Ellenberg moved to approve the agenda as amended, second by Mr. Buscher, motion carried by unanimous voice vote.

3. APPROVAL OF MINUTES FROM APRIL 11, 2013

Mr. Ellenberg moved to approve the Minutes of April 11, 2013 as presented, second by Ms. Melinda Romero-Pike, motion carried by unanimous voice vote.

4. DISCUSSION/ACTION ITEMS

- a. **Information and Discussion.** Presentation by Aaron Kaufman of Southwest Urban Hydrology, regarding the design, construction and function of storm water infiltration features, also known as green infrastructure for storm water management. (Aaron Kaufman and Brian Drypolcher)

Mr. Drypolcher introduced Aaron and reiterated that he felt the Commission would be interested in this presentation. Mr. Kaufman proceeded with his presentation. (Exhibit A)

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Aaron began his presentation talking about the grey infrastructure concerns. Talked about capturing run off and basically to restrict water between the soil surface. The hope is that it would go back to a pre-developing hydrology when more water is actually moving in to the ground. Typically hydrologist measure run-off with a hydro-net (shown on slide 1). Aaron said he gets excited about the potential for infiltration and re-charging ground water with these types of structures, but I can tell you it is probably the most over...it is not going to help as much we might help.

Brian Drypolcher: Ground water recharge.

Aaron: When you think about mostly ground water here is very different as described on the slide. The rate in which the water is going to be infiltrated into those soils is probably not going to recharging city wells at a rate that is going to help us. I am optimistic about the shallow ground water that these might provide particularly near banks, rivers or streams; this is _____ vs. standing vegetation.

Felicity Broennan: Is that true even in arroyos?

Aaron: The challenge with infiltration to ground water tables is you need to have the right kinds of soils. When you talk about next to roadways and things like that you typically have some compacted soils, so that is going to be restrictive download. Typically the evaporative pressures as well as the use of transportation of water by plants are going to be brought out at the surface area. It needs to make it at beyond at least 18" to get beyond evaporative pressures in the sun. Mostly we are talking about thousands of years in some cases to get down in to deeper places.

Leading back to the Santa Fe River, we are talking about a river to improve habitat along the streets and might actually be an opportunity to get the water to go towards irrigating the city river corridor. One of the less talked about benefits and I have talked about some of those heavy metals that originate from storm water. There is a term called fire remediation which is basically the first plant accumulating, degrading, breaking down, stabilizing different types of pollutants. Some of these pollutants like heavy metals are stored in plants. This is an emerging science; it is being used by mining companies, as far as treatment plants and roots. Some of the plants that are common to this area are grasses that are at the bottom of the basin, mass accumulators of heavy metal are sunflowers, honey locust and copper is one of the common heavy metals. Literature and references will be provided separate from this presentation.

In some cases variation of basins are being used to influence traffic in different areas. Talking at this scale, there are a number of different considerations that need to be made. One is the automobile and pedestrian traffic. Sight visibility, you don't want to be growing trees in front of stop signs. Another concern with these basins is crossing utilities. Soil type is another one, there are soils that are less permeable with large amounts of clay that is going to hold the water in the surface and prevent infiltration from occurring. Concern would be how much runoff is coming in to that area and type of zoning. Aaron provided information in his presentation on the Bio-retention basins. Basic considerations that you might need in putting a basin together, water coming off of a parking lot going in to sediment trap, typically we want basins to capture more than the 12" of the standing water depth. Again, engineering soils underneath, you get a lot more infiltration underneath there. With respect to the drainage area you need to consider how large the area is that is contributing water, typically one-quarter acre to 2 acres is the maximum is the area you would consider trying to capture in a basin. That would increase the frequency of the basins along the landscape rather than trying to fill larger basins to capture the huge fallings of water. I want to be clear that these are not detention pots, typically you will a detention pot in a

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large commercial parking lot where all of the water is sent to one specific deferred inundation for depression or landscape typically fenced in because of the travelling hazard and the outstanding water for long periods of time. The idea behind this is to keep creating small enough so water infiltrates within 24 hours.

Mr. Bove stated that a good example is the Whole Foods parking lot. We had a lot of conversations with them, they put cuts in the curbs but they didn't figure out tree wells so they never took in the water. This was a design that failed. Ms. Bove asked Aaron if he found that the City's designs are working now on this issue.

Aaron responded that he has not worked with the city long enough to say yes or no if they are working properly. If there are specific examples of places that there is concern, he shared information about his experience of going through the process of getting a permit at the La Farge Library, that was the Land Use Department and they actually doubled the size of the basins because they wanted to be capable of capturing a 2" slope and this means that the basins became twice as deep. I was not in full agreement, not only because of the standing water but because it dictates changes, the types of vegetation that you can get established there. That means that you have to put shrubs and other plants a little higher along the berms. It takes a lot more irrigation initially to keep those plants established. Sizing is important and there is benefit to putting smaller sizes in. Demonstration of a good curb cut is at the Santa Fe Community College.

Ms. Romero-Pike: In reference to Cerrillos Road where it references storm water between Richards and Carlos Rey; I know that before they did the last construction all that water would flood the entire road and then it would run off in to Siler Road and then run Agua Fria towards the SW and then dump in to the river.

Chairperson Jacobi expressed his thanks to Aaron on behalf of the River Commission for his detailed presentation.

Mr. Drypolcher commented about examples of how you can do drainage that Aaron showed in his presentation.

Mr. Ellenberg commented; "are you suggesting on your slide that we could put basins essentially all along the contour lines or is most of the water being run off particular pipes and we would have to do the basics to effectively on the river.

Aaron showed on his slide the outlets in to the river, the water is being taken in to these particular drained, piped on the rail and dropped into the river. There are opportunities along this section of the right of way to capture some of that water in the small basins before it enters in to there and addresses some of these fore-marked roots before it actually drops directly in to the small drain and directly in to the river.

Mr. Ellenberg stated that their charge and the River Fund restrictions really requires something that helps the river directly, so they probably need to do something where the basin that infiltrated in to the river, something like that.

Mr. Drypolcher said that the reduction of pollutants in the river is a benefit to the river. There are other benefits besides hydrating that have to do with reducing pollutants, reducing the sediment located on the river.

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Aaron: Strategically you are concerned about infiltration and benefitting the river, I think the shallow infiltration close to the river; you are going to see some benefits over time. I don't expect it to go 150 or 200 feet down in the ground, the channel following the river in that section is probably 18 to 20 feet down.

Mr. Ellenberg stated that if we are going to a demonstration project with the river fund, it has to be something that notices the impacts right along the river reasonably quickly so we can advertise it and use the project as an instructional method for how soon we could do the parking lot. I understand the arguments if you do it further where it has indirect effects but we have to explain the effects of this demonstration project. (Mr. Drypolcher referenced a slide showing the red zone, north side.)

Mr. Buscher stated that one way to address Mr. Ellenberg's concern is simply to put a retention area fairly close to the edge of the river and then you could have say some cottonwoods growing along there and if you actually put some measuring devices on how much water you are providing those trees you could compare that irrigation water to typical irrigation you would need for trees without the infiltration. You would be providing shade for the river; right now that is really a hot stretch of the river, there are not really a lot of trees. It wouldn't be very dramatic if you could get a few trees in there.

Aaron said that measuring soil moisture inside and outside of the basins to get an idea of changes would be a good step to compare and replace irrigation water.

- b. Information and Discussion: Annual Report, Santa Fe River Target Flow Program. (Brian Drypolcher) (Computer presentation)

Brian stated that we have a target flow program and welcomed feedback about how wonderful the river flow has been. He informed the commission that the river will probably get shut off on Monday. In the ordinance and administrative procedures for the target flow, staff is required to give an annual report that reports out on last year flows and coming years flows. Brian informed the commission that he went to the Public Utilities Committee to report and will be going to City Council at the end of the month and tonight providing a report to the River Commission. (Exhibit B – April 22, 2013 Memorandum to the Public Utilities Committee – Annual Report, Santa Fe River Target Flows.

Questions:

Mr. Ellenberg asked if the new plantings will have to be manually watered. Brian said it is a mile and 1/3 of plants, that manual watering will have some benefits. He did say that we are in bad need of rain, we will need a programmatic solution to water 1 ½ mile of plants. Last year was a bad year for moisture. There is an 80% survival rate of the willows that were planted last year. Cottonwoods that are 6' and 8' tall that are distressed, there has been a recommendation to cut them down by 6" to allow the roots to get stronger.

Mr. Bové asked how far down they had reached on Frenchy's. Brian said that they started on Friday, May 3rd, Saturday and Sunday (May 4-5) it was at 2cfs and Monday the 6th it was bumped up to 3cfs and by Tuesday evening it was at Frenchy's; the following Monday it was at 3cfs. 3cfs seems to become a magic number.

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- c. Calle Deborah Bridge Update – The Chair noted that this is an informational item and asked for a summarization of what has taken place. Mr. Drypolcher contacted the county staff to be here tonight; they thought it was a better idea for them to meet with counterpart city staff for the next week or two to reach a better mutual understanding of what we think is going on, what we can do better. Then County and City staff will be here for the next review to talk about the rural protection zone and the roadways down there and the rural communities concerns. Mr. Drypolcher will follow up to assure that this takes place at the next scheduled meeting.

Keir Careccio, Santa Fe County Staff: It was discovered that there was a hole in the pavement where a huge hole was found. They brought cement and filled it up. The beaver dams are causing too much water to accumulate. Felicity Broennan stated that this could become a public health issue. Felicity said that they wanted to inform the Commission and that the county is looking for ways to deal with this and most extremely of course what to do with the beavers, wondering what to do possibly putting a bridge up and over, reconstructing the bridge up there so there would be sturdy footing so it wouldn't be so vulnerable to the saturation. What they learned in having a 3-day closure to repair this hole, they met with quite a bit of low consumption. Mr. Drypolcher stated that they have a meeting scheduled with county staff. Mr. Careccio expressed his thanks for putting this on the agenda. Next meeting is June 13, 2013.

5. MATTER FROM COMMISSIONERS

The Chair asked from the last meeting it was discussed to invite Councilors Trujillo and Dominguez, no update.

6. MATTERS FROM STAFF

June 15th is a big event planned at W. De Vargas Park planned by Creative Santa Fe and many other organizations. It is the opening celebration for W. De Vargas Park. Part of the program is highlighting ideas about something called “positive plaza” about walkable communities. What kind of things can happen to better link the Railyard plaza with the Downtown plaza. The planning looks like a multi dimensional, splashy event starting at 4:00 pm and goes in to the evening.

Brian talked about the memo to give an award to an engineering firm for the design of river crossing at St. Francis and Alameda is going to Council and Public Works. The city will hire a design firm to design separately the crossing.

Change order to get the work done at Bishops Garden draw structure, it is on its way to purchasing to get approved to get a purchase order.

In the River Trail there are a number of places to improve the connectivity of Santa Fe River Trail; one at Alto Park, one at Frenchy's. There are a lot of connectivity pieces that are going out for design, but the bigger piece is the Santa Fe River Trail to St. Francis to Victoria Bridge and starting the design engineering for the trail underpasses at Guadalupe, Don Gaspar and Sandoval to bring the river trail in to downtown Santa Fe. The RFP is out.

Mr. Buscher asked what is the work at Alameda and St. Francis. Brian responded that the City Council approved \$2,000,000 to begin the work to take the Santa Fe River trail under St. Francis Drive. Thank you.

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Mr. Ellenberg asked; “what if we ask the council to consider a land use change so that all parking lots and those sorts of things below the river had to be done with purview such as the bricks used along the streets and _____. Brian asked for clarity, “something in the development code?” Mr. Ellenberg said yes for restructure and restoration.

Brian said that to proceed with that the Commission would carry a message to the governing body to direct staff to explore to do something like that. Mr. Ellenberg would like this item placed on the agenda for next month meeting to discuss further and get more feedback from staff

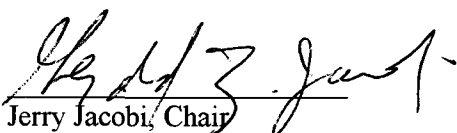
7. CITIZENS COMMUNICATION FROM THE FLOOR

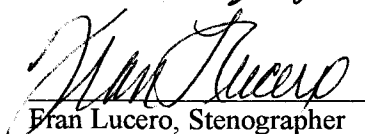
None

9. ADJOURN

There being no further business to come before the Santa Fe River Commission, Ms. Romero-Pike moved to adjourn at 7:45 pm, second by Mr. Ellenberg, motion carried by unanimous voice vote.

Signature Page:


Jerry Jacobi, Chair


Fran Lucero, Stenographer

Green Infrastructure

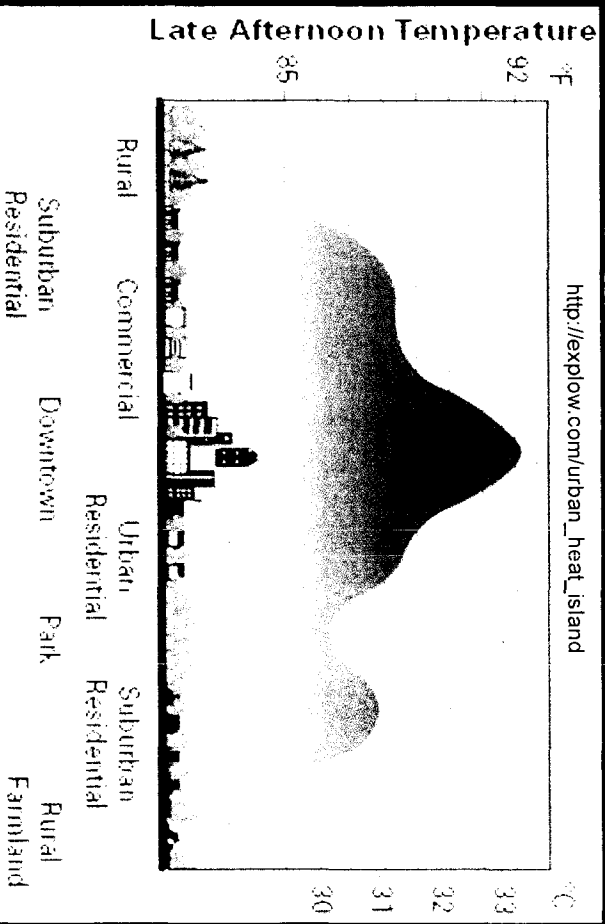
How Bio-retention Basins Can
Improve the Santa Fe River
Corridor



Southwest
Urban Hydrology

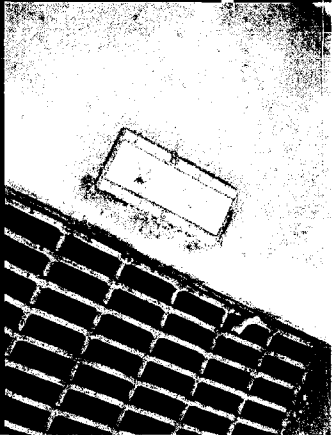
Grey Infrastructure Concerns

- Decreased infiltration & increased runoff
- Urban heat island effect
- Concentrated pollutant transport
- Expensive to build and maintain





Principal Stormwater Pollutants

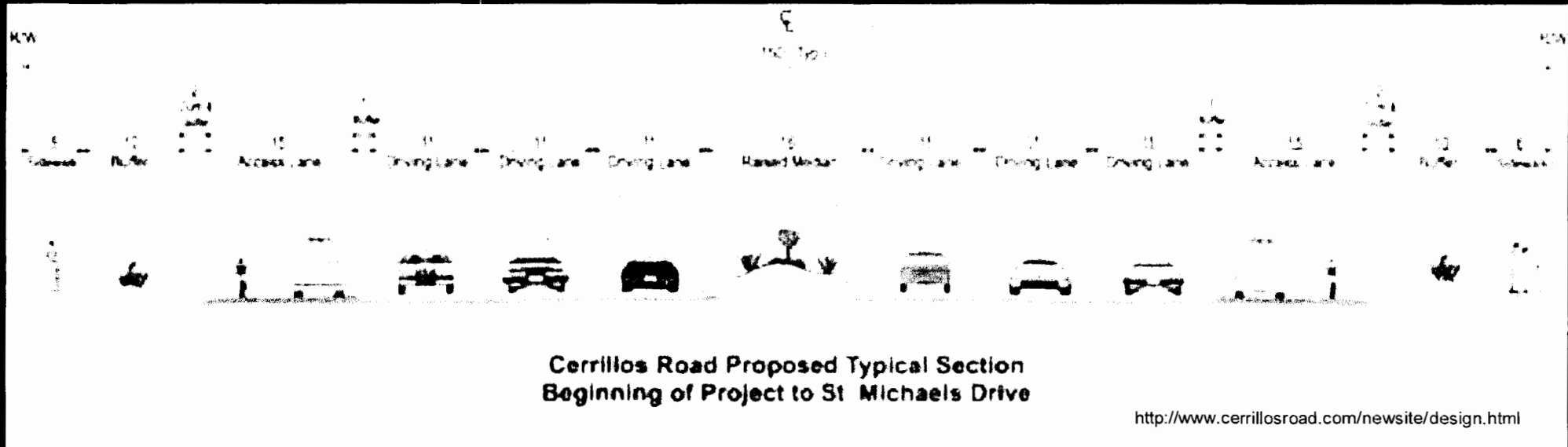


Category	Examples
Metals	zinc, cadmium, copper, chromium, arsenic, lead
Organic chemicals	pesticides, oil, gasoline, grease
Pathogens	viruses, bacteria, protozoa
Nutrients	nitrogen, phosphorus
Biochemical oxygen demand (BOD)	grass clippings, fallen leaves, hydrocarbons, human, and animal waste
Sediment	sand, soil, and silt
Salts	sodium chloride, calcium chloride

Heavy Metals in Las Vegas Stormwater

Metals	Freshwater Aquatic Life Acute Criteria (µg/l)	Freshwater Chronic Life Acute Criteria (µg/l)	Prince Street (µg/l)	National Avenue (µg/l)	Mills Avenue (µg/l)
Arsenic	340	150	21.4	15.2	22.5
Chromium	16	11	172	160	186
Copper	13	9	24.2	10.3	28
Lead	65	2.5	23.4	5	14.1
Zinc	120	120	318	122	180
TSS	45 mg/l	45 mg/l	350 mg/l	170 mg/l	301 mg/l

Cerrillos Road: Missed Opportunity



- \$13.1 million to fix section between Richards Ave and Camino Carlos Rey
- 1.2 miles (w/o bus and turn lanes) contribute > 2.5 million gallons/yr with average annual precipitation

"Parks Division Feels the Pinch"

By Julie Ann Grimm
The New Mexican

Santa Fe's recent series of water rate increases have helped put the city's own Parks Division in a financial crunch.

Despite upgrading irrigation systems in the last five years, the division is using 35 percent more water as it expands its network of parks and maintains newly refurbished landscaping along some roadways. As a result, the city is paying 48 percent more in water bills than in years past.

City parks director Ben Gurule said the cost of water for the Parks Division has been over budget for the last couple of fiscal years, and

CITY PARKS WATER USE AND COSTS

Fiscal year	Gallons used	Cost
2011-12*	109 million	\$1.6 million
2010-11	125 million gallons	\$1.7 million
2009-10	105 million gallons	\$1.4 million
2008-09	99 million gallons	\$1.2 million
2007-08	71 million gallons	\$829,000

*includes 14 new parks since 2007

it appears the expense will keep increasing.

"We continue to grow," he said. "We continue to add parks and add arterial landscapes ... and we are scrutinizing every drop that we put down."

Water rates in the city have climbed 8.2 percent each of the last

five years due to phased increases to help the city finance a major expansion of its water-supply facilities. Compounding that hike for park managers is an accompanying tiered rate structure that affects big water users like city parks. The

Please see **PARKS**, Page A-4

“We had five years of 8.2 percent rate increases, which is substantial for anybody. The parks have been hit the same way any of our customers have.” **Brian Snyder**, utilities department director

Green Infrastructure

- Constructed features that use living, natural systems to provide environmental services:
 - Capture, clean and infiltrate stormwater
 - Shade and cool streets and buildings
 - Create wildlife habitat
 - Improve commerce
 - Calm traffic
- Examples: Bio-retention Basins, Urban Forestry, Green Roofs, Wetlands, etc.

Bio-retention Basins

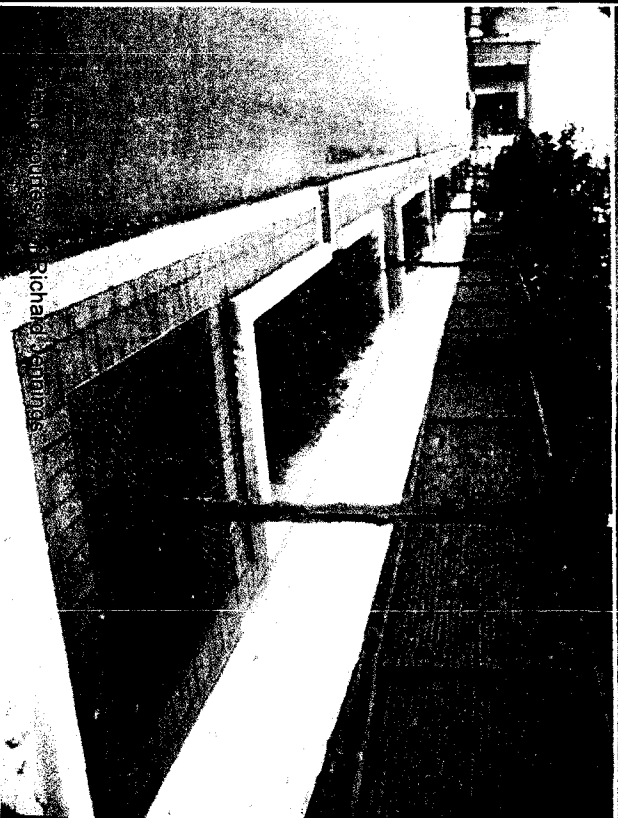
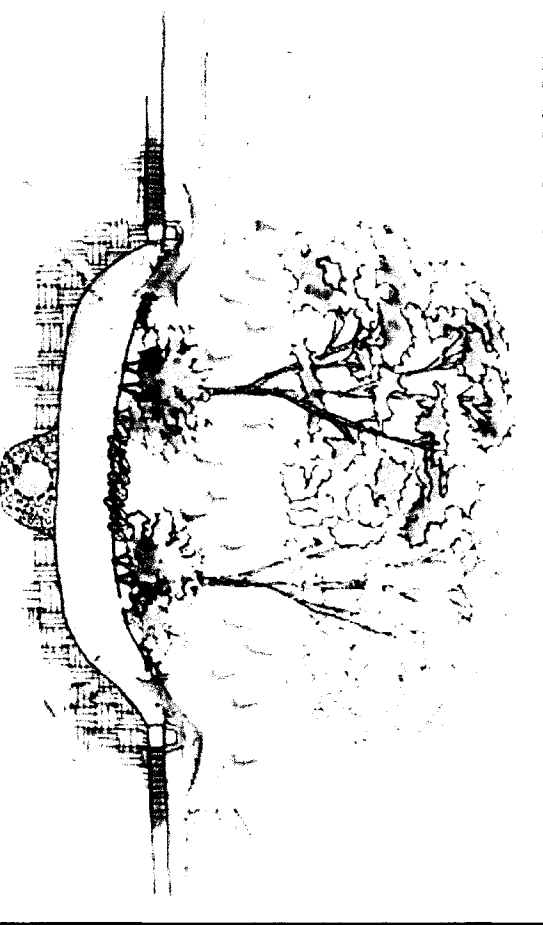
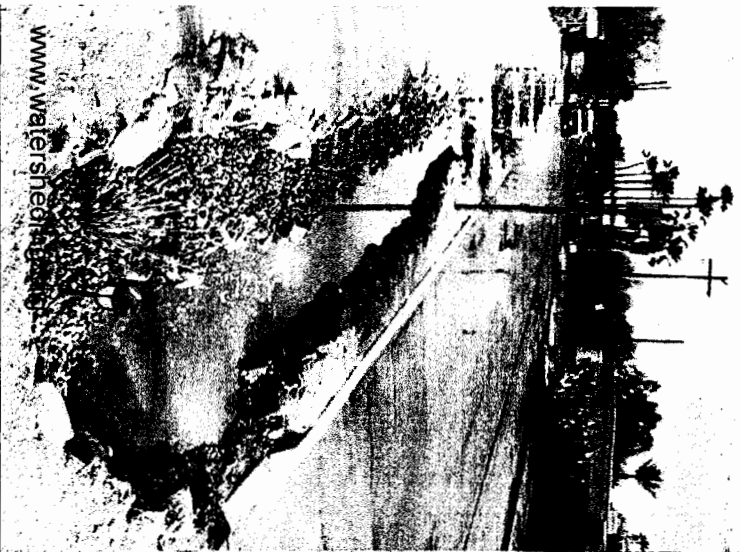


Photo courtesy of Richard Jennings

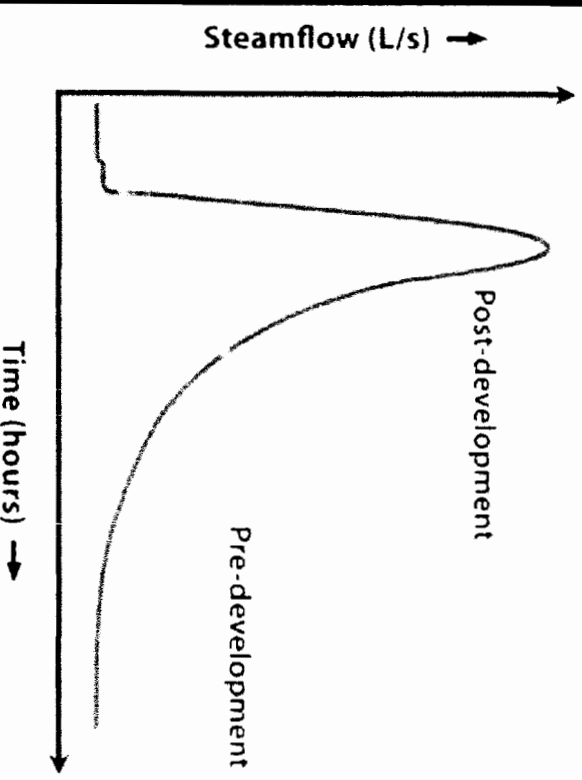


<http://hpi.green.com/category/sustainable-site-strategies/bioretention/>



- # Capture Runoff
- Mimics pre-development hydrology
 - Increases infiltration and groundwater recharge
 - Passive irrigation

<http://www.learnnc.org/lp/editions/mudcreek/6394>

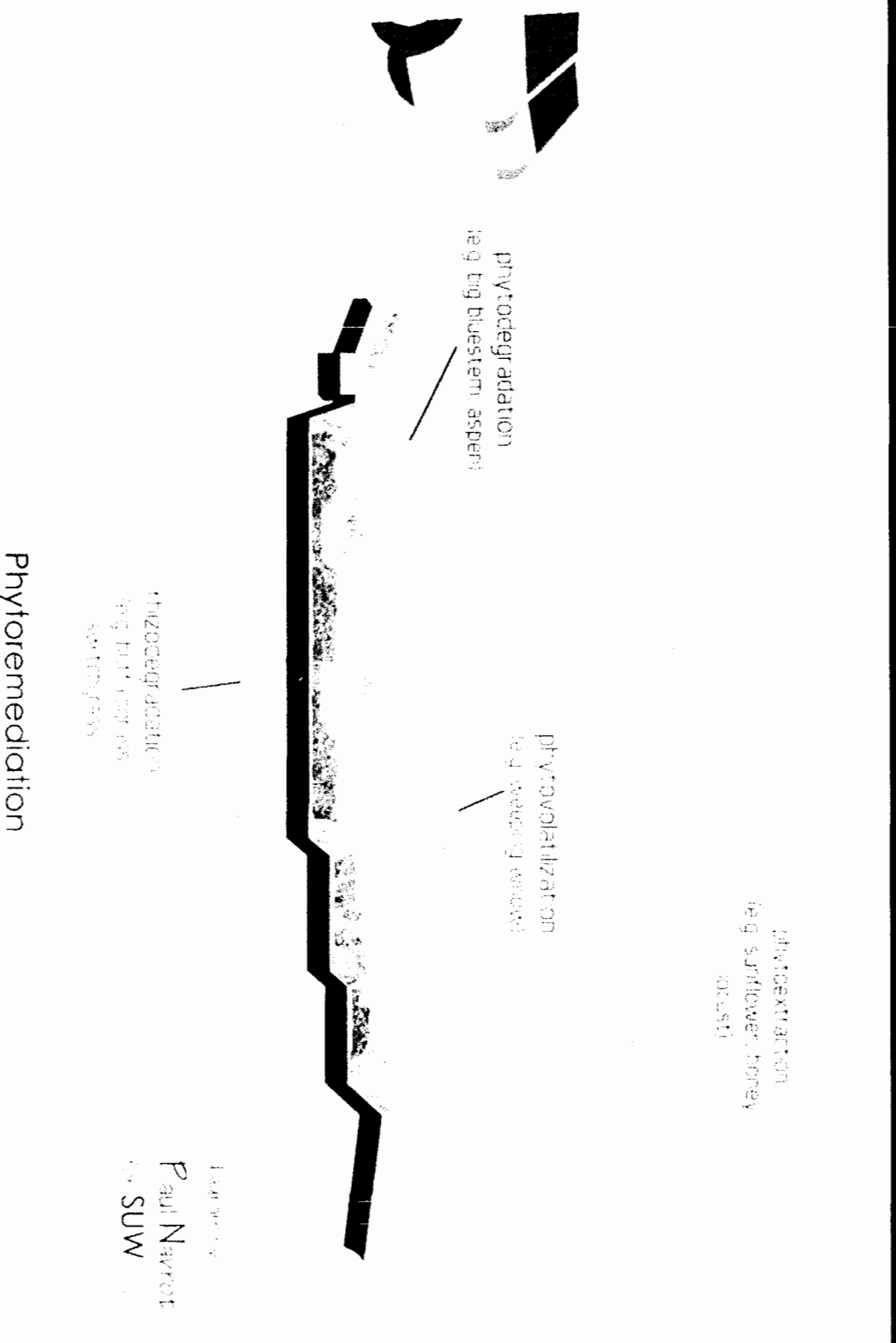


Passive Irrigation for Plants

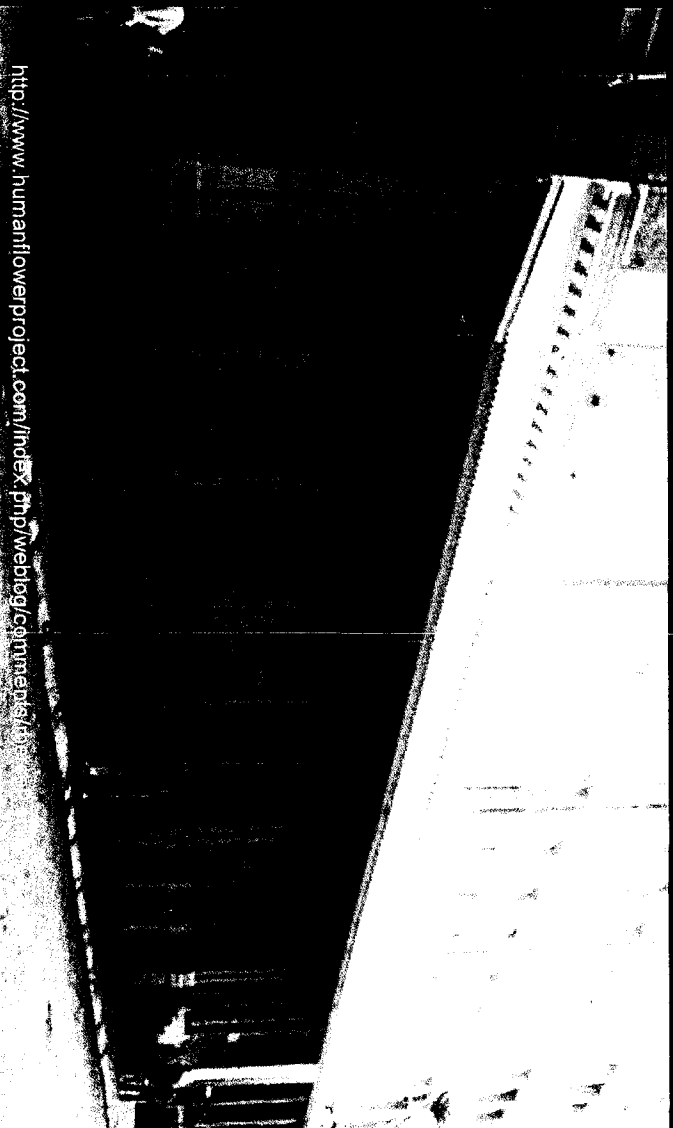
- Shades and cools
- Habitat creation
- Pollutant uptake



Bio-remediation of Stormwater



Improves Commerce and Calms Traffic



<http://www.humanflowerproject.com/index.php/weblog/comments/>



<http://www.planning>

for 2010's

line

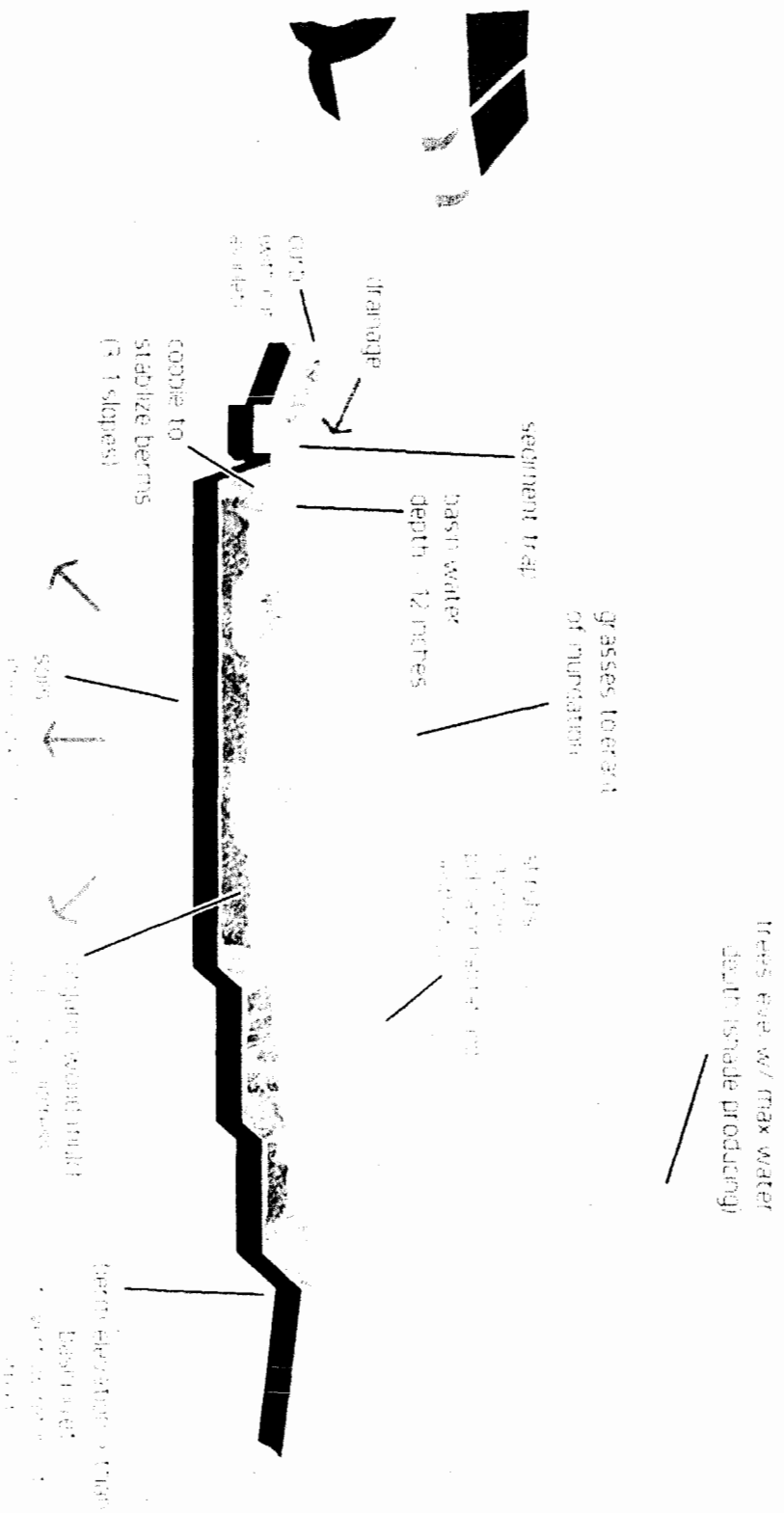


<http://npgreen.com/2010/02/>

Basin Design Considerations

- Automobile and pedestrian traffic
- Sight visibility in right-of-way
- Utilities
- Soil type
- Runoff (amounts, direction, velocity)
- Zoning
- Right-of-way (width, street shape, sediment/pollutant sources, etc)

Basin Design Considerations



Basic Basin Design Considerations

Paul Navrot
SUW

Basin Design Considerations

- Drainage Area
 - How much impervious area?
 - What is the condition of the drainage surface?



Basin Design Considerations

- Inlets
 - Cores
 - Narrow cuts
 - Wide cut
 - Flush or level cut



Basin Design Considerations

- Sediment traps
- Splash pads

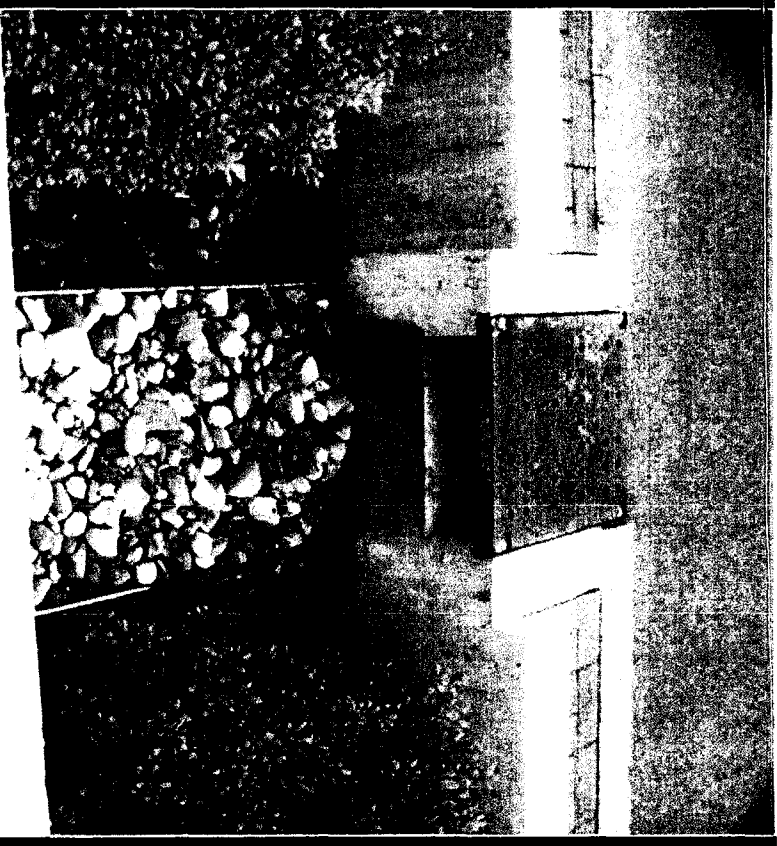


Photo courtesy of Richard Jennings

Basin Design Considerations

- Outlet
 - Overflow
 - Return flow



MacAdam, J. 2010. Green infrastructure for southwestern neighborhoods. Watershed Management Group. pp. 47

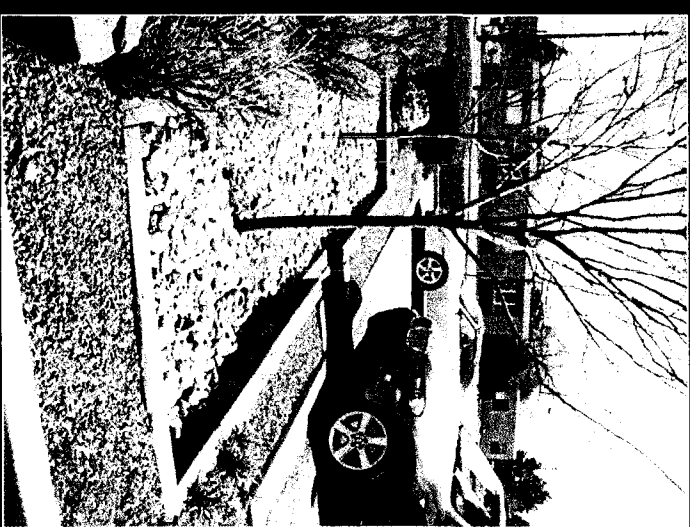


Photo by Brad Lancaster, HarvestingRainwater.com



Basin Design Considerations

- Depth and volume
- Materials
 - Cobble vs. Mulch Bottoms
 - Soil vs. Concrete Berms



Location Strategies for Basin Implementation

- Before storm drains that lead to river or arroyos
- Phytoremediation species near automotive shops/heavy traffic
- Streets parallel to channels to improve shallow groundwater
- Parking lot alternatives to detention ponds



Opportunities for Bio-Retention Basins in Santa Fe?

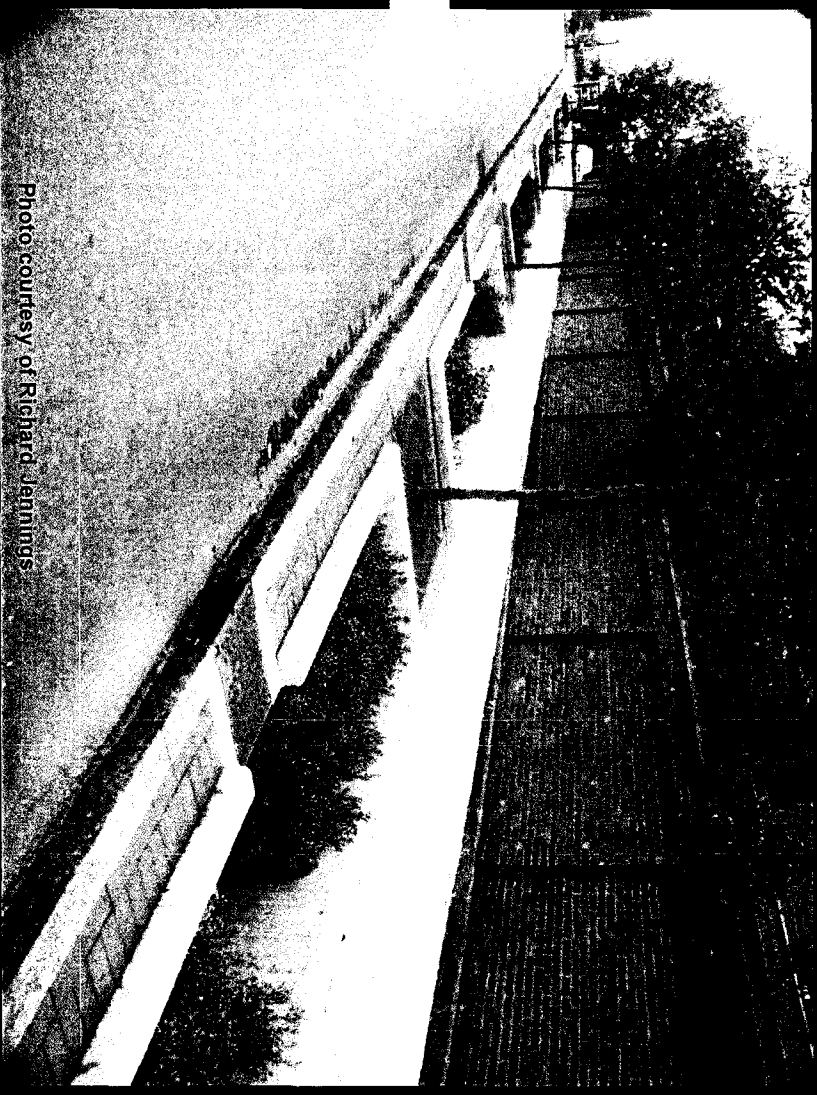


Photo courtesy of Richard Jennings

Basin Development Example

- Site analysis
 - Quantity of runoff, canopy cover, utilities, etc.
- Basin Design
 - Number of basins, basin capacity, vegetation type, etc.
- Implementation
 - Excavation, planting, mulching, etc.





$33,500\text{ft}^2 \times 0.75 \text{ ft/yr} \times 7.48 \text{ gallons/ft}^3 \times 80\% = 150,348 \text{ gallons/yr}$

Plant Species

Common Name (Scientific Name)	Contaminant Addressed	Notes (e.g. Native to NIM, Invasive, Drought Tolerant, Habitat Value)
Big bluestem (<i>Andropogon gerardi</i>)	Hydrocarbons; Copper	Native; Moderate water; 6 feet tall; Plant in water collecting low spots
Little bluestem (<i>Schizachyrium scoparium</i>)	Hydrocarbons	Native; Low water; Deeply rooted; Beautiful fall color; 2-3 feet bunchgrass
Indiangrass (<i>Sorghastrum nutans</i>)	Hydrocarbons	Native; Minor-low food value for terrestrial birds; Moderate water; 6-7 feet tall
Fringed sage (<i>Artemisia frigida</i>)	Hydrocarbons; Copper	Low growing native with silver-grey foliage; Low water; Can be invasive in disturbed soils (e.g. overgrazed)
False indigo (<i>Amorpha fruticosa</i>)	Lead, Perchlorate	Native; Moderate water; Attracts bees
Sunflower (<i>Helianthus annuus</i>)	Arsenic, Chromium, Copper, Lead, Zinc, etc.	Native; Low water; Low food value for small mammals and terrestrial birds
Three-leaf sumac (<i>Rhus trilobata</i>)		Native; Good fall color; Berries attract birds
Western catalpa (<i>Catalpa speciosa</i>)	Lead; Cadmium	Native
Honey locust (<i>Gleditsia triacanthos</i>)	Lead	Native; Low food value for large mammals, Tolerant of salt

Bio-Retention Basin Concerns and Research Needs

- Soil moisture retention
- Basin longevity and maintenance
 - Pollutant accumulation
 - Sediment, elms
- Stormwater pollutant assessment for major drain outlets along river



Green Infrastructure:

How Bio-retention Basins Can Improve the Santa Fe River Corridor

Aaron Kauffman

Southwest Urban Hydrology LLC

Resources and links:

Davis, A. P.; Shokouhian, M.; Sharma, H.; and Minami, C. 2001. Laboratory study of biological retention for urban stormwater management. *Water Environment Research*, 73(1): 5-14.

Davis, A. P.; Shokouhian, M.; Sharma, H.; Minami, C.; and Winogradoff, D. 2003. Water quality improvement through bioretention: Lead, copper, and zinc removal. *Water Environment Research*, 75(1): 73-82.

Hsieh, C. and A. P. Davis. 2005. Evaluation and optimization of bioretention media for treatment of urban storm water runoff. *Journal of Environmental Engineering*, 131: 1521-1531.

MacAdam, J. 2010. Green infrastructure for southwestern neighborhoods. Watershed Management Group. pp. 47→ Excellent manual that covers design considerations developed/used around Tucson, AZ. http://watershedmg.org/sites/default/files/greenstreets/WMG_GISWNH_1.0.pdf

2011. Barriers and gateways to green infrastructure. Clean Water America Alliance. pp. 38→ <http://www.uswateralliance.org/pdfs/gireport.pdf>

2010. The value of green infrastructure: A guide to recognizing its economic, environmental and social benefits. Center for Neighborhood Technology. pp. 74→ Evaluates multiple GI techniques to assist city planners. <http://www.cnt.org/repository/gi-values-guide.pdf>

City of Santa Fe, New Mexico


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DATE: April 22, 2013


TO: Public Utilities Committee

VIA: Brian Snyder, Public Utilities Department and Water Division Director


Isaac J. Pino, P.E., Public Works Department Director

Eric Martinez, P.E., Roadway & Trails Engineering Division Director 

Lercy Pacheco, River, Watershed and Trails Section Supervisor

FROM: Brian Drypolcher, river and watershed coordinator 

ITEM / ISSUE:

Annual Report, Santa Fe River Target Flows: Annual report for "target year" activity from April 15, 2012 to through April 14, 2013; and anticipated activity for the target flow year of April 15, 2013 through April 14, 2014.

Pursuant to the Target Flow Ordinance (Ordinance #2012-10) and the Target Flow administrative procedures (City Resolution #2012-28), staff is directed to provide the governing body with an annual report that describes Target Flow operations and flow volumes for the preceding year, plus the planned Target Flow hydrograph for the coming year.

REPORT FOR THE TARGET YEAR ENDING APRIL 14, 2013:

Santa Fe River Target Flows begin in mid-April and continue throughout the year until the following April (the "target year"). For example, the 2012 Santa Fe River target flow allocation began on April 15, 2012 and concluded on April 14, 2013.

The river flows are administered under the terms of the City's "Target Flow" ordinance in support of the Living River Initiative (Ordinance #2012-10). The ordinance provides that 1000 acre feet of water will be made available to deliver river water through the city and beyond. In years when the forecast for the runoff from mountain snows falls below 75% of the annual average, river flows are scaled downward. This past target year, the runoff from mountain snows was forecast to be at about 60% of average. Consistent with the Target Flow guidelines, river flows were scaled downward to match the forecast and the river water commitment was capped at 600 acre feet for the year.

It is important to note that the other determinant of river flows administered through the Target Flow program is the concept of the "bypass constraint." The administrative procedures for the program define the bypass constraint as follows:

“bypass constraint”: an operating principle that requires the rate at which water is passed through the outlet works of Nichols Reservoir dam is always equal or less than the stream inflow at the ‘above McClure’ gage.

In other words, at any given time, the volume of Nichols Reservoir outflow administered for the target flows is not allowed to exceed the volume of inflow at the city's upper reservoir (McClure Reservoir).

The purposes of the target flows are to help support the river's green corridor of trees, grasses and other plants; to support healthy wildlife habitat; and to add the beauty of free-flowing water to the parklands along the river. Other benefits of maintaining a vegetated, green river corridor include shading and cooling of the urban environment; supporting plants that convert carbon dioxide into oxygen; and helping to clean storm water runoff and control erosion.

During the past year, staff engaged in a range of activities such as establishing the annual hydrograph for target flows; monitoring flows for time and distance traveled within the river channel; and record-keeping of target flow volumes. The Target Flow hydrograph has also been administered to provide flows that “support community events scheduled along the Santa Fe River” as provided for in the ordinance.

2012 – 2013 Summary and Highlights:

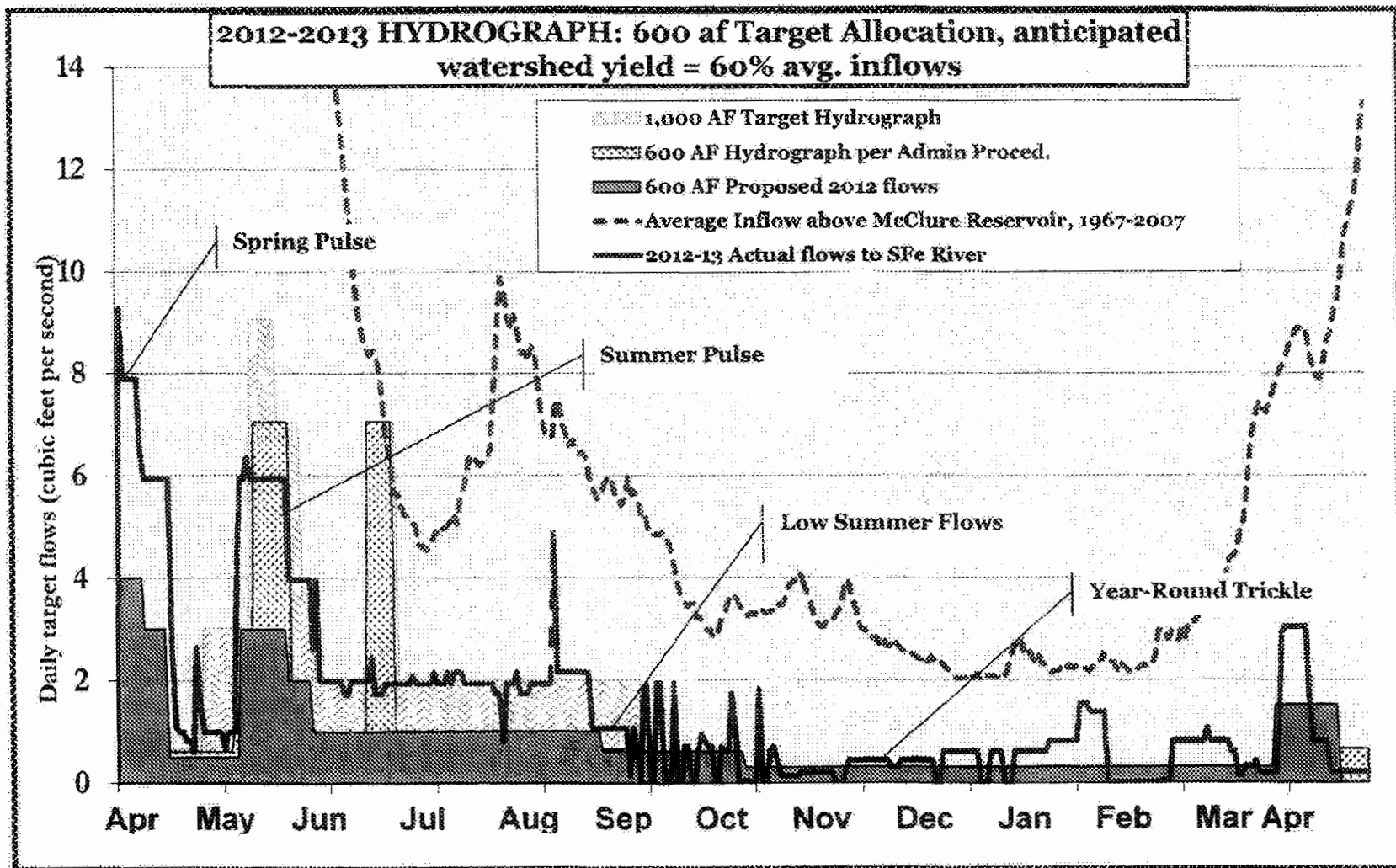
- 1) The year-end total of river flow provided via the target flow program was approximately 542 acre feet. This is 58 acre feet short of the planned flows.
- 2) In addition to providing sustained target flow levels throughout the year (in the 0.5 to 1.5 cubic feet per second range), two “pulses” of greater volume were provided. Each of the two pulses was programmed to provide enough volume and duration of flow to send water as far as the river section near Frenchy's Park and a bit beyond. Flow volumes were approximately four cubic feet per second (4cfs), for the period of April 16 through April 28; and approximately 3cfs for the period May 22 to June 5.
- 3) In addition to the general objectives for the river flows (e.g., supporting plant life and wildlife along the river corridor, local ground water recharge, maintaining attractive aesthetics within the Santa Fe River parklands and open space), two additional, key objectives were met:
 - providing irrigation waters for new riparian plantings along the river restoration project between Camino Atre and Frenchy's Park;
 - providing river flows during the grand opening event for the river improvement project and the new 1.3-mile segment of the Santa Fe River Trail. The opening event took place on April 28, 2012.
- 4) Due to the bypass constraints (see above) and the seasonal reduction of system inflows early in the season, the city was not able to attain the full, desired target flow bypass quantity of 600 acre feet (actual annual flow amounted to about 542 acre feet).

REPORT FOR THE TARGET YEAR APRIL 15, 2013 THROUGH APRIL 14, 2014 **(THE YEAR AHEAD):**

The Natural Resources Conservation Service forecasts that this year's runoff for the Santa Fe River watershed will be 32% of the thirty-year average (approximately 1,210 acre feet for April through July). Using the formula for scaling target flows based upon anticipated watershed yield, this year's target flow cumulative quantity will be set at 320 acre feet.

A number of considerations will determine the nature of the hydrograph (the programming for the timing and volume of the flows) that will be developed for this year's flows. At least two crucial infrastructure projects are underway or planned within the river channel. These projects will require that the river channel be as dry as possible during construction. One project is for the replacement of the main pipe that runs from Nichols Reservoir to the city's water treatment plant on Upper Canyon Road. The other project is for the stabilization of the grade control structure on the Santa Fe River east of Delgado Street. It is staff's intent to work around the timing of the work taking place within the channel and implement target flow releases as opportunities for in stream flows present themselves. A preferred timing of flows is attached – the planned hydrograph for 2013 to 2014 – actual flows will be adapted and will take place as circumstances allow.

Attachments: Hydrograph showing 2012 – 2013 planned and 2012 – 2013, actual
 Hydrograph for 2013 – 2014, planned



2013 PLANNED HYDROGRAPH: 320 af Target Allocation, anticipated watershed yield = < 32% avg. inflows

