

City of Santa Fe, New Mexico

memo

Date: December 17, 2015

To: Public Utilities Committee
City of Santa Fe City Council

From: Caryn Grosse, Water Conservation Specialist 

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

RE: Initial Report on Resolution 2015-97 A Resolution Directing Staff to Research and Report on Development of a Rain Water Harvesting and Water Catchment Program Associated with Residential, Commercial and City-Owned Buildings and Property.

Background:

Resolution 2015-97 directed staff to research and report on ways to develop a water catchment program for rainwater falling on buildings within the City of Santa Fe, to report on what changes to the City's building codes are needed to encourage and make legal such a catchment program, to make recommendations as needed on contracting for services to explore such a catchment program, and to evaluate and develop incentives for residential, business and governmental building owners to participate in such a program. This memo is the initial report on the progress which has been made toward development of a rain water catchment program.

A goal for the City of Santa Fe is to be the "Conservation Capital of the Nation." To be the leader in water conservation, the City must keep up with "Cutting Edge" technologies, by adopting codes that permit additional uses of non-potable water, and by providing incentives which encourage residential, business and governmental building owners to utilize those technologies. The City has the opportunity to help stimulate the economy with incentive programs designed to meet the City's goals for water conservation.

In addition, the ability to capture and productively utilize rain water may increase the resiliency of the City's water supply during drought conditions by making an additional source of water available for non-potable uses.

Proposed Changes to Building Codes:

Please see Appendix B, Ordinance 2016-___ An Ordinance Amending Subsection 7-1.1 SFCC 1987 to Adopt the 2012 Uniform Swimming Pool, Spa, and Hot Tub Code, the 2012 Uniform Mechanical Code, and the 2012 Uniform Solar Code; Amending Subsection 7-1.1 SFCC 1987 to Adopt the 2012 Uniform Plumbing Code, as Amended by the State of New Mexico and the City of Santa Fe. This Ordinance is currently in the Committee Review process.

Adoption of the 2012 Uniform Plumbing Code, as amended by the State of New Mexico and the City of Santa Fe, will provide the necessary changes to building codes to allow for the installation, construction, alteration, and repair of rain water catchment systems intended to supply uses such as water closets, urinals, clothes washers, trap primers for floor drains and floor sinks, irrigation, and industrial processes, water features, cooling tower makeup and other uses.

Contracting for Services:

The incentives proposed can be handled by the current staff. As new technologies become available in the future, it may be necessary to work with a specialized consultant to determine which would be most appropriate for inclusion in the program. If a consultant is needed, the Governing Body will be apprised of the scope of work and the anticipated costs and possible funding sources.

Evaluate and Develop Incentives:

The intent of the Resolution is to increase the capture and utilization of rain water for non-potable uses indoors as well as for irrigation. At first glance, this would only seem to affect Rain Water Harvesting rebates, however, if rain water is to be used for toilets, urinals, clothes washers and other devices, then most of the current rebates should be reconsidered. Appendix A contains proposed rebate changes which replace and/or expand upon the current rebates offered based on their water savings potential. (The program is for the installation/retrofit of efficient technologies in existing buildings and does not apply to purchases for new construction and development.)

The proposed incentives change the rebate values for several devices, based on their water savings potential and the availability of newer, more efficient technologies. For example, the rebate for 1.28 gallons per flush (gpf) high-efficiency toilets has been decreased to encourage customers to choose more efficient technologies such as 0.88 gpf toilets, which will now have their own rebate based on the water savings potential over standard 1.6 gpf toilets. Rebates for other devices, which have so far been underutilized in Santa Fe but have the potential to produce significant savings, have been added or increased based on their water saving potential, i.e. pint flush and water free urinals.

Federal standards relating to clothes washing technology have changed since the last modifications to the clothes washer rebate. The proposed changes to the types and values of the clothes washer rebates are based on the changes in both Federal standards and the revised specifications for water efficiency created by EPA ENERGY STAR and WaterSense programs and the Consortium for Energy Efficiency (CEE), which reset the baseline water usage as well as establishing new standards of efficiency.

The proposed changes to the rebate values are based on the value of the water saved, with the exception of the proposed bonuses for maximizing water harvesting capacity based on roof size, and for re-plumbing existing buildings to utilize non-potable water for clothes washers, toilets, urinals, etc. Similar to trends in solar energy the proposed amounts of the bonuses, which are above and beyond the inherent value of the water savings, are intended to help drive early adaptation of new technologies and construction techniques by providing additional incentives to people considering substantial retrofit projects.

Recommendations:

1. Adoption of the 2012 Uniform Plumbing Code, as amended by the State of New Mexico and the City of Santa Fe, which will update building codes to allow for the installation, construction, alteration and repair of rain water catchment systems.
2. Approval of the proposed rebate changes and authorization of the Public Utilities Division Director to approve future changes to the rebate program when the proposed changes are based on the value of the water savings, which will allow the rebate program to be more responsive to new standards and technologies.

Attachments:

- Appendix A Proposed Rebate Changes, November 30, 2015
 Appendix B Ordinance 2016-___ An Ordinance Amending Subsection 7-1.1 SFCC 1987 to Adopt the 2012 Uniform Swimming Pool, Spa, and Hot Tub Code, the 2012 Uniform Mechanical Code, and the 2012 Uniform Solar Code; Amending Subsection 7-1.1 SFCC 1987 to Adopt the 2012 Uniform Plumbing Code, as Amended by the State of New Mexico and the City of Santa Fe.

Proposed Rebate Changes

11/30/2015

1 acre foot = 325,850 gallons - 1 acre foot value = \$15,000

Residential Use (single-family, multi-family, mixed use, and churches)

Rebate	Rebate \$	Water Saved (gpy)	Water Saved (afy)	Water Saved (gpd)
^{1a} Tier 2 or 3 High-Efficiency Clothes Washer	285	6,224	0.0191	17.053
^{1b} Energy Star High-Efficiency Clothes Washer	236	5,111	0.0157	14.002
² 1.28 High-Efficiency Toilet (HET)	57	1,226	0.0038	3.359
^{2a} 0.88 High-Efficiency Toilet (HET)	128	2,759	0.0085	7.559
³ Rain Barrel (50 - 99 gallon)	12	250	0.0008	0.685
³ Rain Barrel (100 - 199 gallon)	25	500	0.0015	1.370
³ Rain Barrel (200 - 499 gallon)	50	1,000	0.0031	2.740
⁷ Water Harvesting System (500 + gallon)	Varies			

^{1a} Water saving based on integrated water factor of 3.2 for HEWM and 9.5 for conventional WM, average 6.3 loads per week, and 19 gallons saved per load with 3 ft³ capacity

^{1b} Water saving based on integrated water factor of 4.3 for Energy Star and 9.5 for conventional WM, average 6.3 loads per week, and 15.6 gallons saved per load with 3 ft³ capacity

² Water saving based on replacing 1.6 gpf, 5.0 flushes per person per day, average Santa Fe household 2.1 persons, flushes per year 3,833, saving per flush 0.32 gallons

^{2a} Water saving based on replacing 1.6 gpf, 5.0 flushes per person per day, average Santa Fe household 2.1 persons, flushes per year 3,833, saving per flush 0.72 gallons

³ Water saving based on average 5 rain events per growing season

⁷ \$0.25 per gallon of capacity (cistern size), plus applicable bonuses.

Bonus 1 \$0.125 per gallon for maximizing storage capacity to accommodate total roof collection area during a 2" rainfall (total gallons = Roof SF x 2 x 0.623)

Bonus 2 of \$0.25 per gallon for plumbing to use rainwater for toilets, clothes washers, urinals, per city code (2012 UPC as adopted) in addition to maximizing capacity

(bonus 1) for a possible total rebate of \$0.625 per gallon.

Commercial Use (restaurants, offices, retail, and schools)

^{4a} Flushometer Valve HET	400	8,760	0.0269	24.000
^{4b} Tank Type HET	200	4,380	0.0135	12.000
^{4c} Hotel/Motel HET	25	560	0.0017	1.534
⁵ Water Free Urinal	630	13,688	0.0420	37.501
^{5a} Pint Flush Urinal	550	11,977	0.0368	32.814
⁶ Commercial Process Efficiency (CPE)	Varies			
⁷ Water Harvesting System (500 + gallon)	Varies			

^{4a} Water saving based on replacing 1.6 gpf, 75 flushes per day, flushes per year 27,375,

Appendix A

saving per flush 0.32 gallons

^{4b.} Water saving based on replacing 1.6 gpf, 37.5 flushes per day, flushes per year 13,688

saving per flush 0.32 gallons

^{4c.} Water saving based on replacing 1.6 gpf, 4.8 flushes per day average

flushes per year 1,752, saving per flush 0.32 gallons

^{5.} Water saving based on replacing 1.0 gpf, flushes per day 37.5, flushes per year 13,688,

savings per flush 1.0 gallons

^{5a.} Water saving based on replacing 1.0 gpf, flushes per day 37.5, flushes per year 13,688,

savings per flush 0.875 gallons

^{6.} Water saving based on whichever is less, water saved @ \$15,000 per acre foot, or

50% of installed cost

^{7.} \$0.25 per gallon of capacity (cistern size), plus applicable bonuses.

Bonus 1 \$0.125 per gallon for maximizing storage capacity to accommodate total roof collection area during a 2" rainfall (total gallons = Roof SF x 2 x 0.623)

Bonus 2 of \$0.25 per gallon for plumbing to use rainwater for toilets, clothes washers, urinals, per city code (2012 UPC as adopted) in addition to maximizing capacity

(bonus 1) for a possible total rebate of \$0.625 per gallon.

CITY OF SANTA FE, NEW MEXICO

BILL NO. 2016-__

INTRODUCED BY:

Councilor Patti Bushee

AN ORDINANCE

AMENDING SUBSECTION 7-1.1 SFCC 1987 TO ADOPT THE 2012 UNIFORM SWIMMING POOL, SPA, AND HOT TUB CODE, THE 2012 UNIFORM MECHANICAL CODE, AND THE 2012 UNIFORM SOLAR CODE; AMENDING SUBSECTION 7-1.1 SFCC 1987 TO ADOPT THE 2012 UNIFORM PLUMBING CODE, AS AMENDED BY THE STATE OF NEW MEXICO AND THE CITY OF SANTA FE.

BE IT ORDAINED BY THE GOVERNING BODY OF THE CITY OF SANTA FE:

Section 1. Section 7-1.1 SFCC 1987 (being Ord. No. 2008-1, §3 as amended) is amended to read:

7-1.1 Adoption of Codes.

A. For the purpose of regulating the erection, construction, enlargement, alteration, repair, moving, removal, conversion, demolition, occupancy, equipment, use, height, area, unobstructed maintenance of required yards, and maintenance buildings or structures within the planning and platting jurisdiction of the city, the following provisions and codes are adopted by reference and incorporated as fully as if set out

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1 herein unless otherwise amended by the city:

- 2 (1) Section 14.5.1 New Mexico Administrative Code (NMAC) General Provisions;
- 3 (2) Section 14.5.2 New Mexico Administrative Code (NMAC) Permits;
- 4 (3) Section 14.5.3 New Mexico Administrative Code (NMAC) Inspections;
- 5 (4) 2009 International Building Code (IBC) as amended by the state of New
- 6 Mexico construction industries division referred to as the 2009 New Mexico
- 7 Commercial Building Code (NMAC 14.7.2);
- 8 (5) 2009 International Residential Code (IRC) as amended by the state of New
- 9 Mexico construction industries division referred to as the 2009 New Mexico
- 10 Residential Building Code (NMAC 14.7.3);
- 11 (6) 2009 New Mexico Earthen Building Materials Code (NMAC 14.7.4);
- 12 (7) 2009 New Mexico Non-Load Bearing Baled Straw Construction Building
- 13 Standards (NMAC 14.7.5);
- 14 (8) 2009 New Mexico Energy Conservation Code (NMAC 14.7.6);
- 15 (9) 2009 International Existing Building Code as amended by the state of New
- 16 Mexico construction industries division referred to as the 2009 New Mexico
- 17 Existing Building Code (NMAC 14.7.7);
- 18 (10) 2009 New Mexico Historic Earthen Buildings Code;
- 19 (11) [~~2009~~] 2012 Uniform Plumbing Code as amended by the state of New Mexico
- 20 construction industries division referred to as the [~~2009~~] 2012 New Mexico
- 21 Plumbing Code (NMAC 14.8.2) and as amended in Section 7-1.8 SFCC 1987;
- 22 (12) [~~2006~~] 2012 Uniform Swimming Pool, Spa, and Hot Tub Code Phase III as
- 23 amended by the state of New Mexico construction industries division referred
- 24 to as the [~~2006~~] 2012 New Mexico Swimming Pool, Spa, and Hot Tub Code
- 25 (NMAC 14.8.3);

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1 (13) ~~[2009]~~ 2012 Uniform Mechanical Code as amended by the state of New
2 Mexico construction industries division referred to as the ~~[2009]~~ 2012 New
3 Mexico Mechanical Code (NMAC 14.9.2);

4 (14) ~~[2006]~~ 2012 Uniform Solar Code as amended by the state of New Mexico
5 construction industries division referred to as the ~~[2006]~~ 2012 New Mexico
6 Solar Energy Code (NMAC 14.9.6);

7 (15) 2014 National Electrical Code as amended by the state of New Mexico
8 construction industries division [~~when adopted by the State of New Mexico~~]
9 and referred to as the 2014 New Mexico Electrical Code (NMAC 14.10.4).
10 [~~Until such time, the 2011 National Electrical Code as amended by the state of~~
11 ~~New Mexico referred to as the 2011 New Mexico Electrical Safety Code shall~~
12 ~~apply~~]; and

13 (16) 2012 National Electrical Safety Code as amended by the state of New Mexico
14 construction industries division as [~~adopted~~] amended by the state of New
15 Mexico and referred to as the 2012 New Mexico Electrical Safety Code
16 (NMAC 14.10.5);

17 B. Any person violating or failing, neglecting or refusing to comply with the provisions of
18 the codes set forth in paragraph A. above or this chapter shall be punished as provided for
19 in Section 1-3 SFCC 1987.

20 C. A copy of the codes set forth in paragraph A. and this chapter shall be kept on file in the
21 office of building inspections, and shall be at all reasonable times available and subject to
22 inspection.

23 D. The codes set forth in paragraph A. shall be effective [~~July 1, 2011~~] ten (10) days from
24 the date of adoption of this ordinance. Upon request of the applicant, applications for
25 permits submitted before [~~December 31, 2011~~] September 1, 2016 may be issued in

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1 compliance with the prior codes.

2 E. ~~[Should the codes adopted in paragraph A. above not be current with the latest codes~~
3 ~~adopted by the state of New Mexico construction industries division, the city shall~~
4 ~~automatically apply the latest codes adopted by the state.]~~

5 **Section 2. Section 7-1.8 SFCC 1987 is amended to read:**

6 **7-1.8 Amendment to Sections 710.0 and 710.1 of the Uniform Plumbing Code;**

7 **Requirements For Sewer Backwater Valves.**

8 A. Section 710.0 of the Uniform Plumbing Code shall be renamed:

9 **710.0 Drainage of Fixtures Located Above the Main Street Level or Located below the**
10 **Main Sewer Level.**

11 B. Section 701.1 of the Uniform Plumbing Code shall be deleted and the following
12 substituted:

13 **710.1 Backflow Protection.** Installation of a backwater valve, to prevent sewage from the
14 main sanitary sewer backing up into the ~~[private]~~ sanitary sewer service lines due to cleaning
15 or plugs in the sanitary sewer main, is required for all new construction connecting to a public
16 or private sanitary sewer collection system and for all replacements or repairs made to an
17 existing ~~[private]~~ sanitary sewer service ~~[lateral]~~ line. Backwater valves shall be accessible
18 for routine inspection and service and the installation shall allow the working components of
19 the devices to be quickly and easily serviced. The maintenance of the backwater valve and
20 ~~[private]~~ sanitary sewer service line and appurtenances shall be the sole obligation of the
21 property owner. The City of Santa Fe shall be under no obligation to ascertain that the
22 backwater valve or ~~[private]~~ sanitary sewer service line and appurtenances continues in
23 operating condition. Cleanouts for drains that pass through a backwater valve shall be clearly
24 identified with a permanent label stating "backwater valve downstream". A list of approved
25 backwater valves shall be prepared by the City of Santa Fe Wastewater Management Division

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1 and Inspection and Enforcement Division [~~on a yearly basis~~].

2 **Exception:** Property owners are exempt from the requirement to install a backwater device
3 on their [private] sanitary sewer service line when the property meets each of the following
4 three conditions as certified by a licensed architect, engineer or surveyor:

- 5 (1) That a manhole without a locking cover exists upstream of the point where the building's
6 sanitary sewer service line connects to the main sewer line; That the elevation of the top
7 of said manhole is a minimum of two (2) feet below the lowest plumbing fixture drain in
8 the building; and That said manhole is in an area with relatively low likelihood of a
9 vehicle or other object being in a position to prevent the manhole cover from discharging
10 sewage as intended.

11 **Section 3. A new section 7-1.9 SFCC 1987 is ordained to read:**

12 **7-1.9 [NEW MATERIAL] Amendment to Sections 1702.9 of the Uniform Plumbing**
13 **Code; Non-Potable Rainwater Catchment Systems; Design and Installation.**

14 A. Section 1702.1 of the Uniform Plumbing Code shall be deleted and the following
15 substituted:

16 **1702.1 General.** The installation, construction , alteration, and repair of rainwater catchments
17 systems intended to supply uses such as water closets, urinals, clothes washers, trap primers for
18 floor drains and floor sinks, irrigation, and industrial processes, water features, cooling tower
19 makeup and other uses shall be approved by the Authority Having Jurisdiction.

20 B. Section 1702.9.1 of the Uniform Plumbing Code shall be deleted and the following
21 substituted:

22 **1702.9.1 Outside Hose Bibbs.** Outside hose bibbs shall be allowed on rainwater piping
23 systems. Hose bibbs supplying rainwater shall be marked with the words: "CAUTION: NON-
24 POTABLE WATER, DO NOT DRINK" and Figure 1709.9 and shall be fitted with a lock.

Appendix B

1 APPROVED AS TO FORM:

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KELLEY A. BRENNAN, CITY ATTORNEY

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25 *M/Legislation/Bills 2016/Uniform Plumbing Code Adoption*