



Bond Issue Review & Trihalomethane Update

Historical Evaluation



- Customer Growth (1997 to 2007)
 - Residential increase of 3.1%
 - Commercial increase of 5.5%
- Trends
 - Per customer usage has decreased

Current & Future Water Production

Year	Current Average Day MGD	Current Peak Day MGD	Future Average Day MGD	Future Peak Day MGD
2002	12.45	19.09		
2003	13.07	21.35		
2004	12.79	17.52		
2005	13.83	23.69		
2006	13.91	22.56		
2007	13.69	23.83		
2008			14.62	24.55
2009			15.09	25.53
2010			15.58	26.56
2011			16.09	27.65
2012			16.62	28.80
2013			17.17	30.01
2014			17.75	31.30
2015			18.35	32.66
2016			18.97	34.09
2017			19.63	35.62
2018			20.31	37.23
2019			21.02	38.95
2020			21.76	40.77
2021			22.53	42.70
2022			23.34	44.76
2023			24.18	46.95
2024			25.06	49.28
2025			25.98	51.72
2026			26.93	54.41
2027			27.94	57.23
2028			28.98	60.25

Long Range Water Study

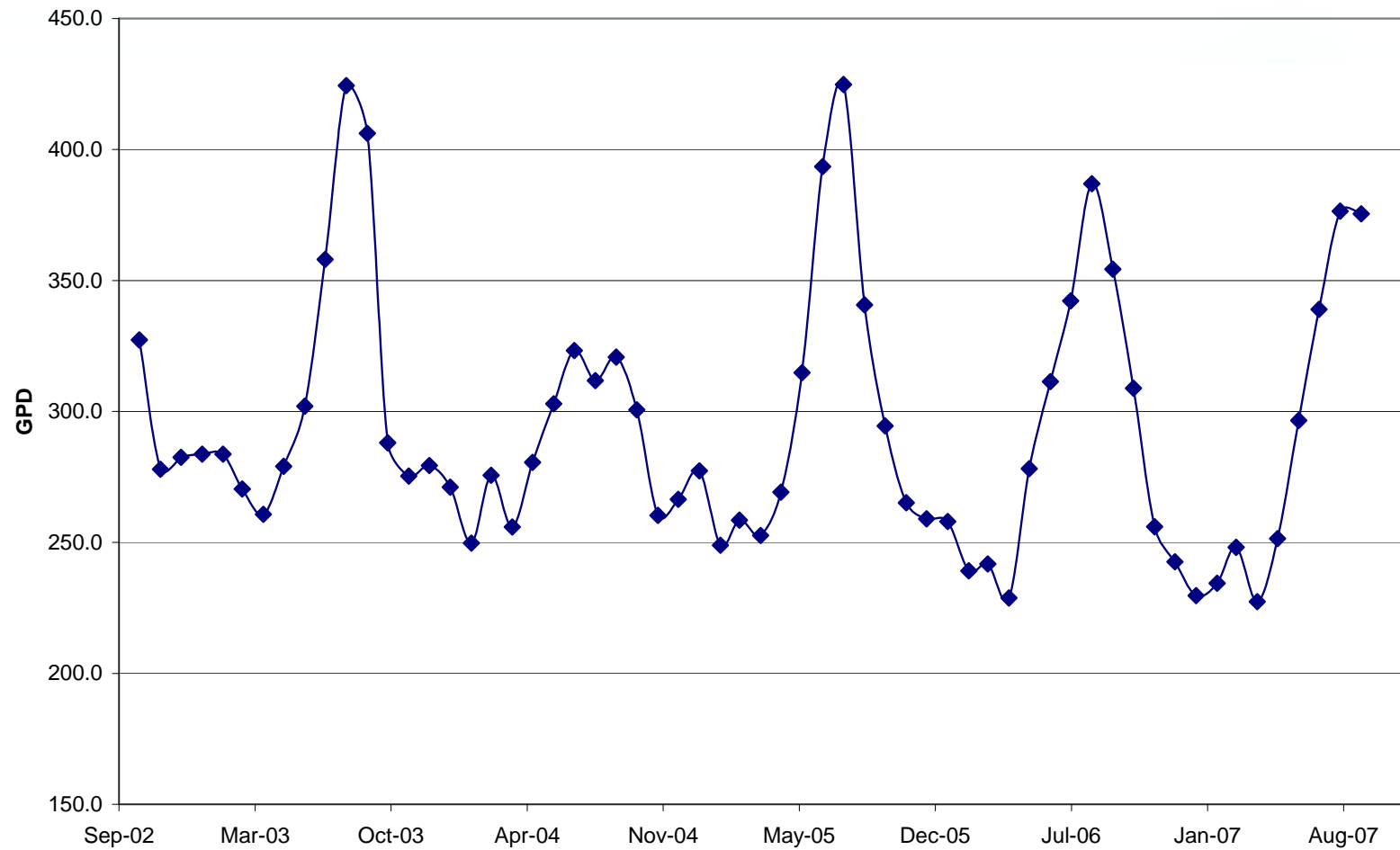


- Scope & Objectives
 - Historical Data Evaluation
 - Estimate Future Water Demands
 - Analyze 5-year CIP
 - Analyze Future Improvements
 - Summary Report

Trends for All Customers



Average Daily Consumption per Customer by all Customers
Includes Irrigation



Long Range Water Study

- Supply Side
 - Current 32 mgd McBaine Supply is projected to be maxed out by 2018
 - Decision will need to be made to change treatment process (sand filter to membrane) or add additional treatment plant at a new location.
 - Need a new pump station in the area south of Nifong between U.S.63 and Rock Quarry.

Long Range Water Study

- New elevated water tower in Prathersville area.
- Distribution Side
 - New 24" main east of U.S. 63 from Maplewood area to Hillsdale PS
 - New 16" main to Prathersville area

Trihalomethane Update University's Research



- Trihalomethane Formation Potential
 - Test for Total Organic Carbon & Bromide
 - Data available in 60 days
- Treatment Process
 - Results will determine if treatment changes need to be made
- Distribution System
 - Results will determine if water flow changes need to be made

Trihalomethane Update



DNR compliance sample

- Waiting on results from May tests

Suggested Immediate Actions

- Have permission to coordinate flushing lines every 30 days in a few areas with high THM levels to increase water flow
- Change discharge permit for back-wash water

Disinfection Process Possibilities



- Need research results to determine new treatment techniques
- Too early to estimate which option to use and the costs
- Depending on the need for a new treatment option, could use bond contingency funds

Disinfection Process Possibilities



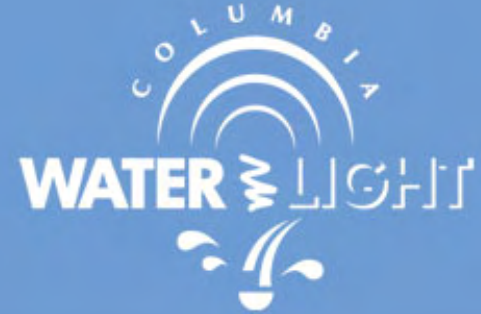
Chlorine

- Excellent disinfectant
- Residual amount remains in water throughout distribution system to block bacterial growth

Chloramine

- Add ammonia after chlorine
- Reduces effectiveness of chlorine but residual amount persists
- Could create other disinfection byproducts

Disinfection Process Possibilities



Ozone

- Generate ozone on site
- Good disinfectant but no residual to fight bacteria in the distribution system
- Some by-products are created. Can cause biofilm problems in the distribution system
- High capital and operating costs
- Gases released during process have to be treated before being released into the atmosphere

Disinfection Process Possibilities



Ultraviolet Light

- Good disinfectant but no residual to fight bacteria in the distribution system
- No known by-products
- High capital costs and replacement bulbs are expensive
- High operating costs, including large electric consumption

2003 Water Bond – Breakdown of Major Projects

Production Related Projects	
8 Million Gallon Addition to Water Treatment Plant - completed	\$8,731,400
Well #15 - completed	\$350,000
Aquifer Storage Project #2 - completed	\$400,000
36" Transmission Main from McBaine to Columbia - completed	\$7,038,600
36" Well Supply Main - completed	\$2,300,000
Water Supervisory and Data Acquisition System - completed	\$450,000
Total - Production	\$19,270,000
Annual and Other Projects	
Paint Shephard Water Tower - completed	\$310,000
North East Pressure Zone – in progress	\$4,059,000
Highway Crossings – waiting on development	\$250,000
Close Loops - completed	\$300,000
Main Relocations for Streets & Highways – completed in 2008	\$1,045,000
Fire Hydrant & Valve Replacement - completed	\$580,000
New & Replace Services - completed in 2008	\$945,000
Upgrade Downtown 4" Mains – completed in 2008	\$510,000
Main Replacements – completed in 2008	\$601,000
Total - Annual and Other	\$8,600,000
Total of 2003 Water Bond Project Funding	\$27,870,000

2008 Water Bond Issue Proposal

Improvement Projects

(Improvement Projects)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
Back-Up Generators for ASR's and Pump Stations						\$500,000	\$500,000
New Well Metering	\$150,000						\$150,000
16" Mains South of Nifong	\$450,000						\$450,000
Drill Alluvial Well #16	\$315,000						\$315,000
Paint Water Treatment Plant Basins	\$600,000	\$300,000					\$900,000
Drill Alluvial Wells 17 & 18		\$700,000					\$700,000
Subtotal	\$1,515,000	\$1,000,000	\$0	\$0	\$0	\$500,000	\$3,015,000

2008 Water Bond Issue Proposal

Fire Flow Projects

(Fire Flow Projects)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
Cliff Dr - Hawthorne to University - Close Loops	\$50,000						\$50,000
Rosemary - College to William - Main Replacement	\$184,800						\$185,000
Country Club Dr - Old 63 East - Main Replacement	\$208,000						\$208,000
Walnut - William to Old 63 - Main Replacement	\$142,500						\$142,500
Anthony St - College to William - Main Replacement	\$195,000						\$195,000
Wilson Av - East of College to William – Main Replacement	\$120,000						\$120,000
Providence Rd - Locust to Elm - Main Replacement	\$90,000						\$90,000
Rangeline St & Smith St - Main Relocation	\$32,000						\$32,000
Cliff, Univ, Hilltop, Hawthorne, Rock Hill - Main Replacement	\$370,000						\$370,000
Providence at Douglass HS - Main Replacement	\$62,000						\$62,000
Washington - Hickman to Wilkes - Main Replacement	\$160,000						\$160,000
Subtotal	\$1,614,300	\$0	\$0	\$0	\$0	\$0	\$1,614,500

2008 Water Bond Issue Proposal

School Fire Flow Projects

(School Fire Flow Projects)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
Jefferson Junior High School	\$355,175						\$355,125
West Junior High School	\$277,200						\$277,200
West Blvd Elementary School	\$222,750						\$222,750
Field Elementary School	\$225,225						\$225,225
New Haven Elementary School	\$113,750						\$113,750
Ridgeway Elementary School	\$113,750						\$113,750
Subtotal	\$1,307,850	\$0	\$0	\$0	\$0	\$0	\$1,307,800

2008 Water Bond Issue Proposal

Distribution System Flow Projects

(System Flow Issues)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
24" Transmission Main – North Section	\$630,000	\$3,865,000					\$4,495,000
24" Transmission Main – South Section	\$370,000		\$4,500,000	\$1,839,000			\$6,700,000
Highway 763 & I-70 - Close Loops	\$378,000						\$378,000
Providence & Stewart - Close Loops		\$100,000					\$100,000
Stadium & Bernadette - Close Loops		\$114,000					\$114,000
Route PP – Main Upgrade to 12" Main		\$1,170,000	\$1,170,000				\$2,340,000
Heller Road (East) – Upgrade to 16" Main			\$200,000	\$3,065,000			\$3,265,000
University Ave - Ann St to Rock Hill - Close Loop			\$97,650				\$97,650
Gillespie Bridge Rd - Limestone to Longview - Close Loop			\$66,300				\$66,300
Fairmont Dr - Fieldcrest to Parkridge - Close Loop			\$26,250				\$26,250
Hackberry – Upgrade to 12" Main						\$600,000	\$600,000
Smith Dr - Silver Thorne to Scott Blvd - Close Loop				\$285,000			\$285,000
Ground Storage at Hillsdale PS	\$1,240,000						\$1,240,000
Subtotal	\$2,618,000	\$5,249,000	\$6,060,200	\$5,180,000	\$0	\$600,000	\$19,707,200

2008 Water Bond Issue Proposal

Reliability, Business Loop 70, and Other Projects

(Reliability Projects)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
Water Treatment Plant Transformers & Switchgear Upgrade -		\$160,000					\$160,000
Valve Additions On Broadway			\$150,000				\$150,000
Subtotal	\$0	\$160,000	\$150,000	\$0	\$0	\$0	\$310,000
(Bus Loop 70 Projects)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
Bus Loop 70 Main Replacement - Jackson to Jefferson	\$260,000						\$260,000
Bus Loop 70 Main Replacement – Old 63 to Eastwood		\$935,000					\$935,000
Bus Loop 70 Main Replacement – Jefferson to Providence					\$660,000		\$660,000
Subtotal	\$260,000	\$935,000	\$0	\$0	\$660,000	\$0	\$1,855,000
(Other Projects)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
Broadway Main Replacement - Garth to West Blvd		\$730,000					\$730,000
Subtotal	\$0	\$730,000	\$0	\$0	\$0	\$0	\$730,000

2008 Water Bond Issue Proposal

Annual Projects

(Annual Projects)	FY09	FY10	FY11	FY12	FY13	FY14	TOTAL
Close Loops				\$250,000	\$250,000		\$500,000
Main Relocate/Replace for Street & Highway	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$600,000	\$3,100,000
Fire Hydrants & Valve Replacements	\$200,000	\$200,000	\$250,000	\$250,000	\$250,000		\$1,150,000
Differential Payments	\$200,000	\$100,000	\$100,000	\$100,000	\$200,000	\$100,000	\$800,000
Main Replacements	\$0	\$750,000	\$750,000	\$750,000	\$750,000	\$750,000	\$3,750,000
Subtotal	\$1,000,000	\$1,650,000	\$1,700,000	\$1,950,000	\$2,050,000	\$1,550,000	\$9,300,000

2008 Water Bond Issue Proposal – Category Totals

Improvement Projects	\$3,015,000
Fire Flow Projects	\$1,614,500
School Fire Flow Projects	\$1,307,800
Distribution System Flow Projects	\$19,707,200
Reliability Projects	\$310,000
Bus Loop 70 Projects	\$1,855,000
Other Projects	\$730,000
Annual Projects	\$9,300,000
Total for Projects	\$37,839,500
Contingency & Cost of Issuance	\$1,100,000
Total Bond Proposal	\$38,939,500

Debt Service Rate Increases



- FY09 – 1.5% (After Voter Approval)
- FY10 – 1.5% (Plus 3.5% Prior Bond)
- FY11 – 5%
- FY12 – 5%
- FY13 – 5%
- FY14 – 5%