

*Presentation
Naples' City Council Workshop*

March 19, 2018

*Overview of the Recently Completed
Reclaimed Water
System Expansion
2012 - 2017*

Prepared by:

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Fort Myers, Florida 33919*



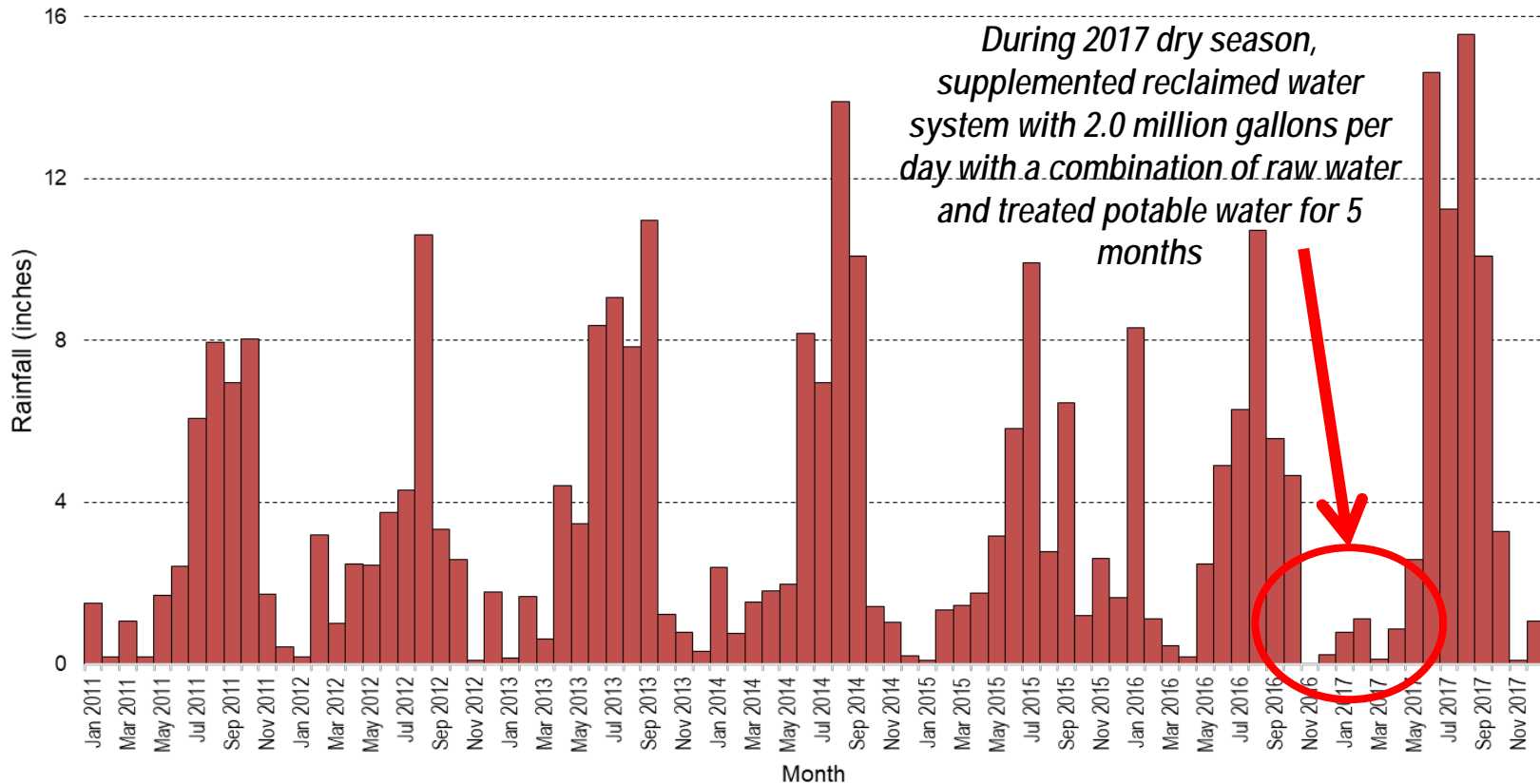
Agenda

- **Recent Operational Changes**
- 2012 Master Planning Efforts
- 2012 Reclaimed Water Expansion Plan
- Reclaimed Water System Expansion 2013 – 2017
- 2018 Master Planning Efforts
- Recommendations for Future Expansion



Sufficient Potable Water Supply during Dry Season

Monthly Rainfall Since January 2011



- During 2017 dry season, Golden Gate Canal level dropped below useable level
- ASR wells cannot keep up with extended dry season demand alone

Operational Changes during the Dry Season

- Reduced reclaimed water availability to bulk customers (golf courses)
- Reduced system pressure

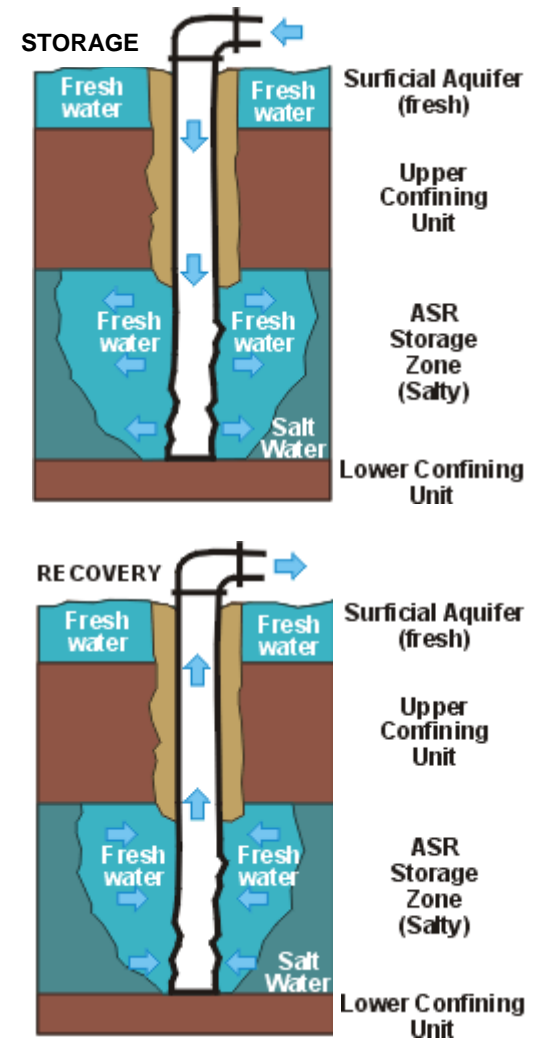


Potential Solution: Construct pipeline extension from the raw water main to the Golden Gate Canal pump station main

Should Reclaimed Water System Expansion proceed before supplemental water supply secured?

Aquifer Storage & Recovery (ASR) Well Update

- ASR wells 1-3
 - Drilled to a depth of 1,080 feet below the Drinking Water Supply
 - Expected recovery rate 5 to 10%.
 - Currently recovering 1.0 million gallons per day from the 3 wells
- ASR Well 4
 - Construction completed in 2017
 - Drilled to 640 feet within the Drinking Water Supply
 - Completed “short-term” cycle test authorized by FDEP
 - Short-term cycle test did not provided desired conclusion based on limited testing volume
 - Staff provided FDEP with summary report requesting additional cycle testing at a larger test volume
 - Recovery expected to be 40 to 60%



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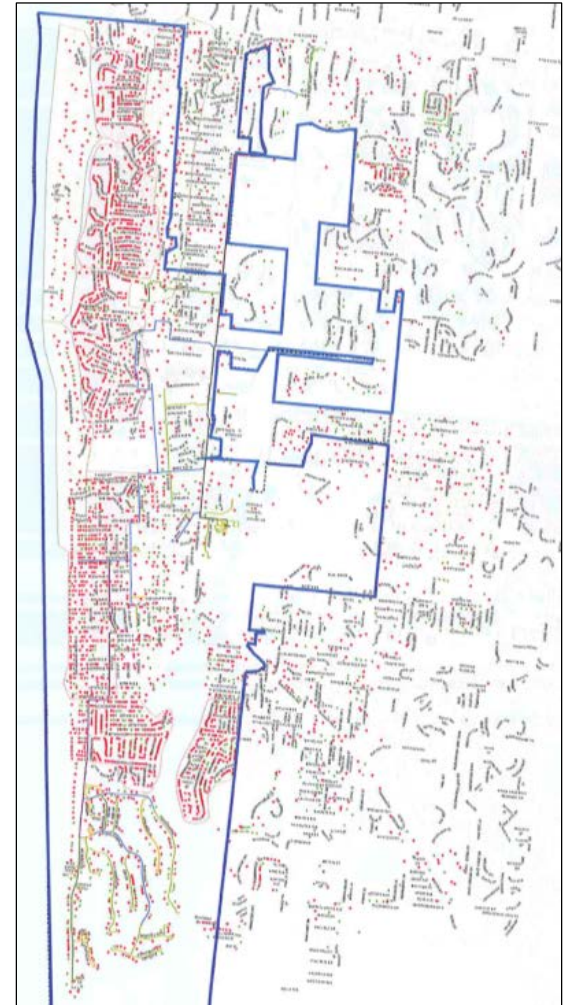
Distribute the highest amount of reclaimed water at the least cost



A key consideration was to establish a “backbone” reclaimed water transmission system capable of supporting future reclaimed water distribution system connections and fire flow capacity

Identification of “Large” Potable Water Users for Reclaimed Water Potential

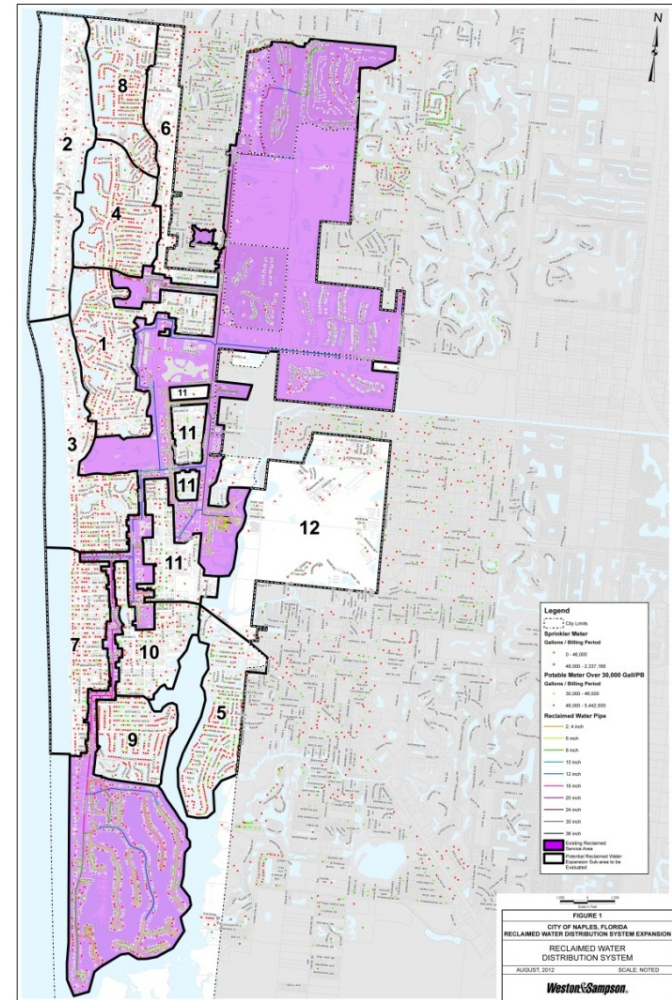
- Analyzed potable water records from 2007 – 2012
- Potable water meter consumption (gallons per billing cycle) was classified as follows:
 - Over 46,000 (red)
 - Under 46,000 (green)



Create Zones to Evaluate Irrigation Water Usage for Reclaimed Water Potential

City of Naples, FL Potential Reclaimed Water Usage by Zones August 17, 2012				
Subarea	Sprinkler Meter Actual Use (MG per Billing Period ¹)	Potable Meters Actual Use Where no SP meter in place (MG per Billing Period ¹)	Projected Irrigation Usage From Potable (50% of Potable Meter) (MG per Billing Period ¹)	Sprinkler Meter + Projected Irrigation Usage (MG per Billing Period ¹)
1	3.88	36.03	18.01	21.89
2	16.18	9.86	4.93	21.11
3	9.52	20.72	10.36	19.88
4	2.51	31.90	15.95	18.46
5	4.42	26.94	13.47	17.89
6	11.70	11.53	5.77	17.46
7	4.76	24.54	12.27	17.03
8	2.78	26.45	13.22	16.01
9	1.71	23.87	11.93	13.64
10	5.02	12.78	6.39	11.41
11	3.05	15.17	7.59	10.64
12	4.68	4.48	2.24	6.92
TOTAL	70.20	244.27	122.13	192.33

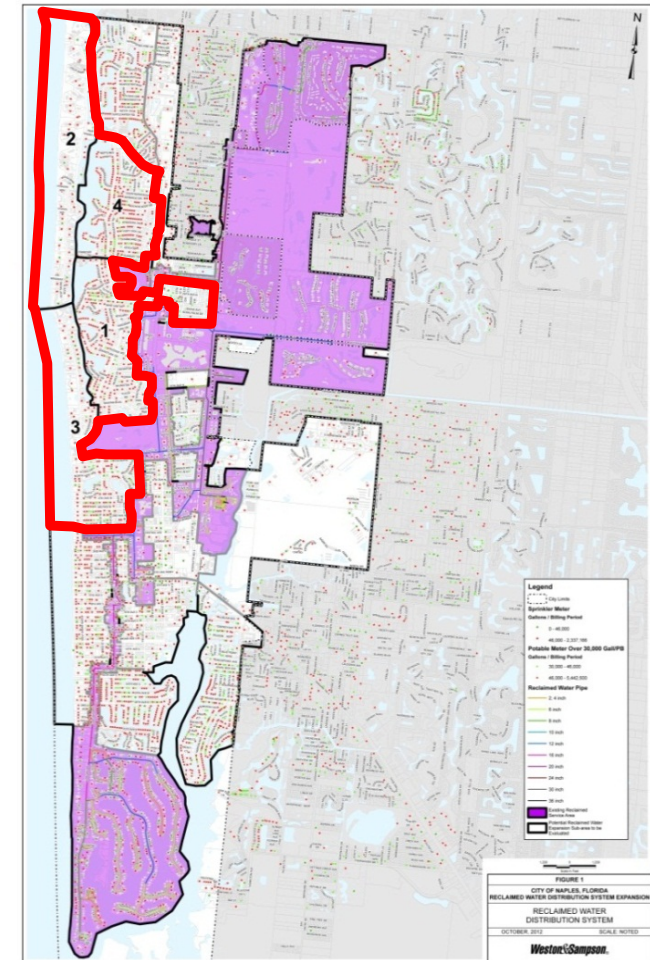
¹ NOTE: One billing period (cycle) represents approximately 60 days



Further Consideration of 4 Areas with the Highest Irrigation Water Demand

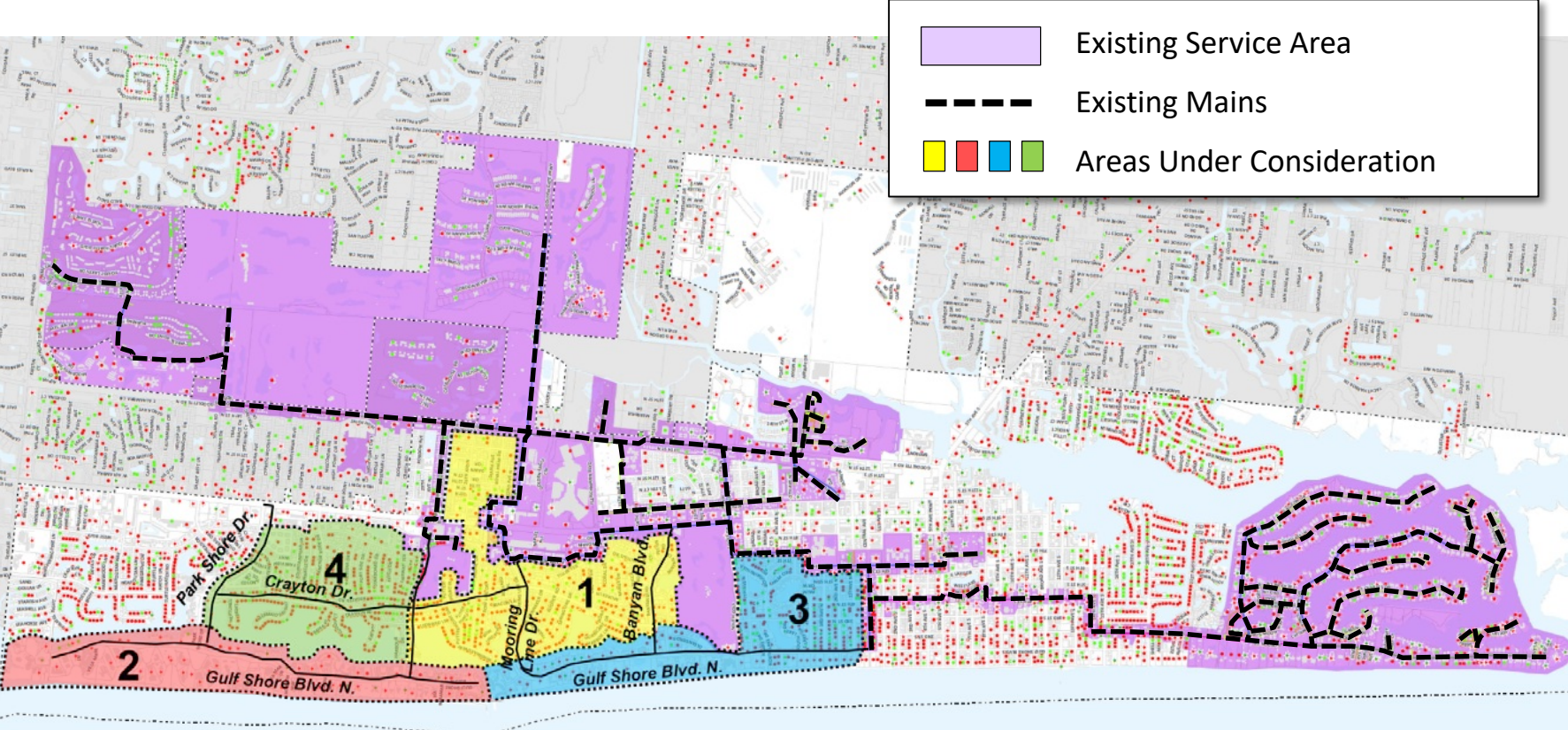
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2	16.18	9.86	4.93	21.11
3	9.52	20.72	10.36	19.88
4	2.51	31.90	15.95	18.46
TOTAL	32.08	98.51	49.26	81.34

¹ NOTE: One billing period (cycle) represents approximately 60 days

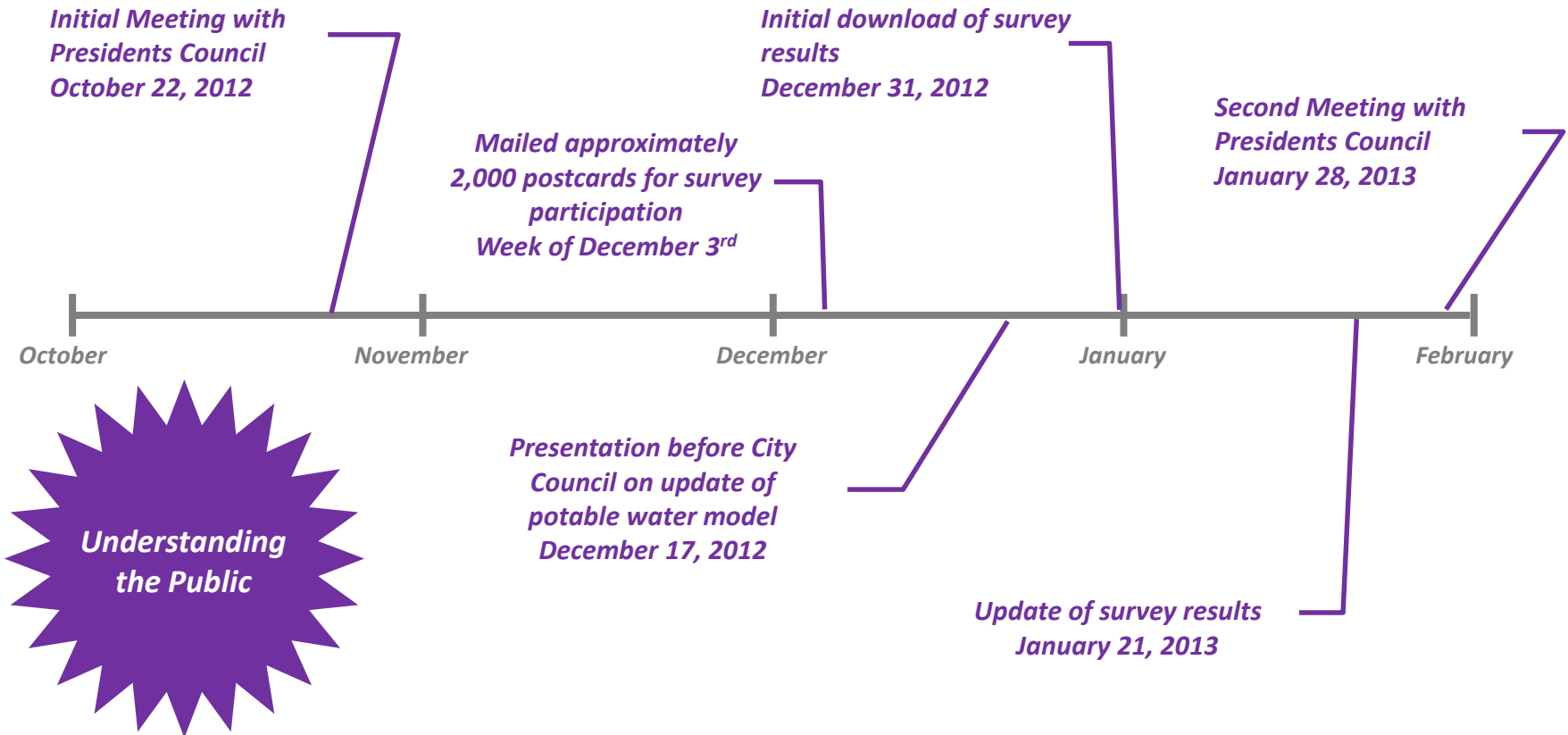


Reclaimed Water System

Existing & Areas Under Consideration



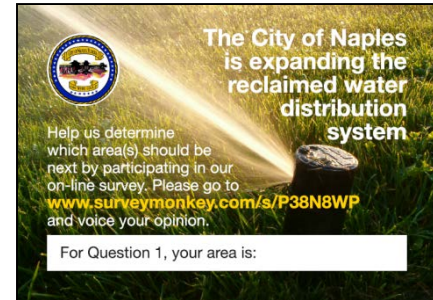
Public Outreach Timeline



Survey Results



www.surveymonkey.com/s/NaplesReclaimedWaterSurvey



Area	Postcards Mailed	As of December 31, 2012		As of January 21, 2013	
		Survey Participants	Percentage within Area	Survey Participants	Percentage within Area
1	852	59	6.9%	61	7.2%
2	126	24	19.0%	24	19.0%
3	460	33	7.2%	36	7.8%
4	577	46	8.0%	48	8.3%
Skipped Question		0		3	
TOTALS	2,015	162	8.0%	172	8.5%

Analyzing Survey Responses

Of those responding, the predominant consensus was either “definitely connect” or “seems like a good idea”

-  Definitely Connect
-  Seems Like Good Idea
-  Want to Learn More
-  Seems Like Bad Idea
-  Absolutely Not
-  Already Have Service



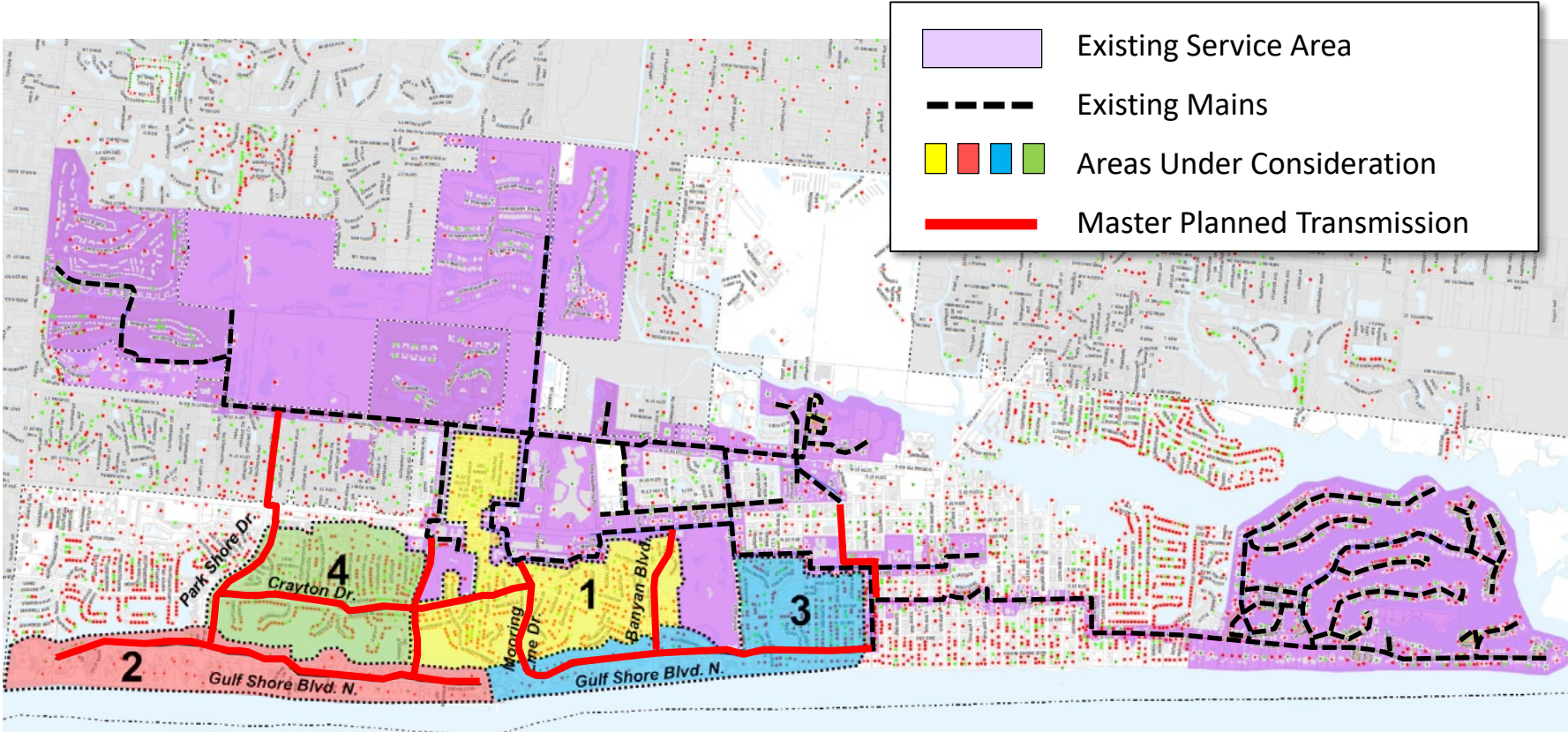
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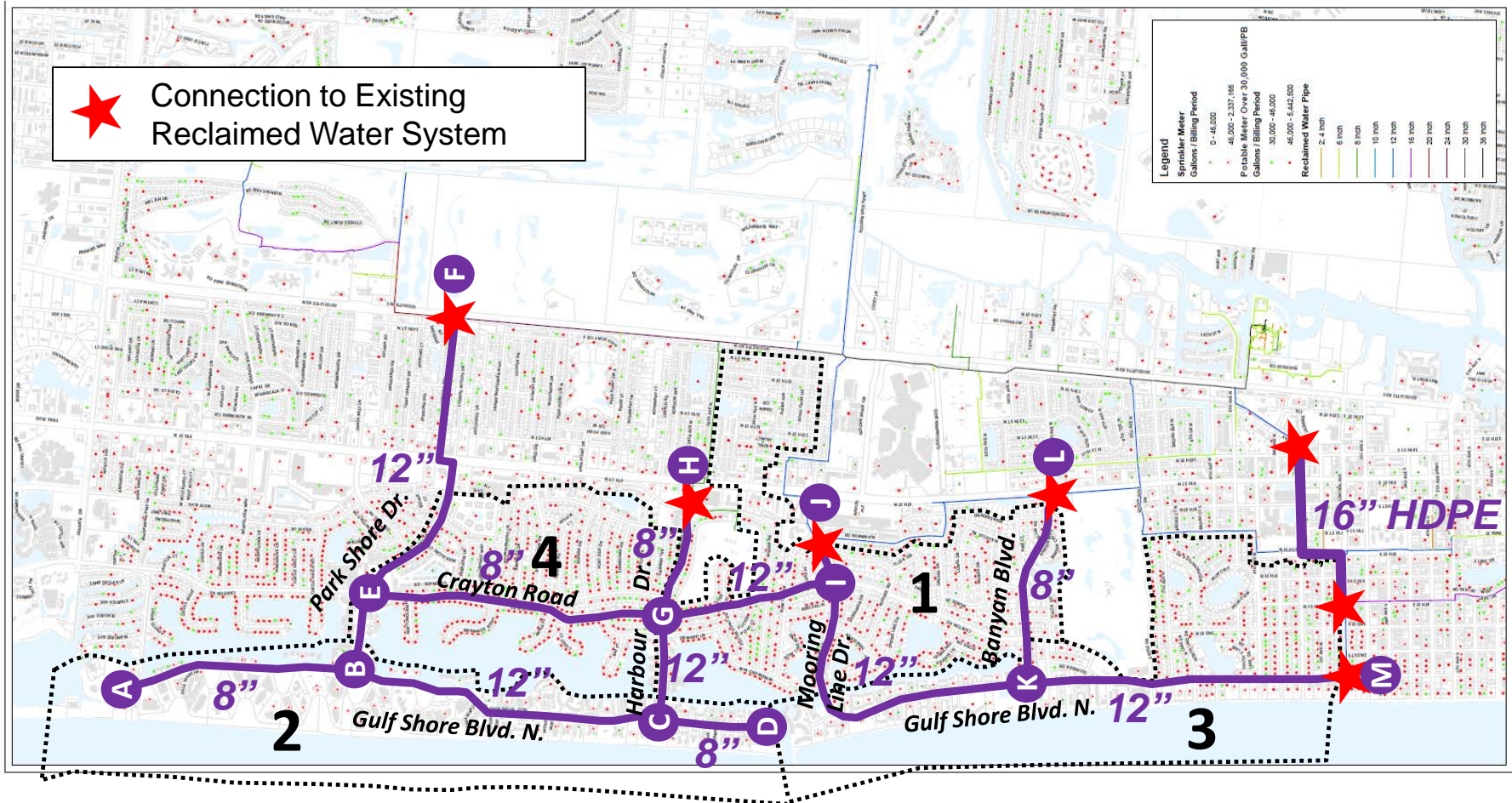


Reclaimed Water System

Existing & Areas Under Consideration



Preliminary Transmission Alignment



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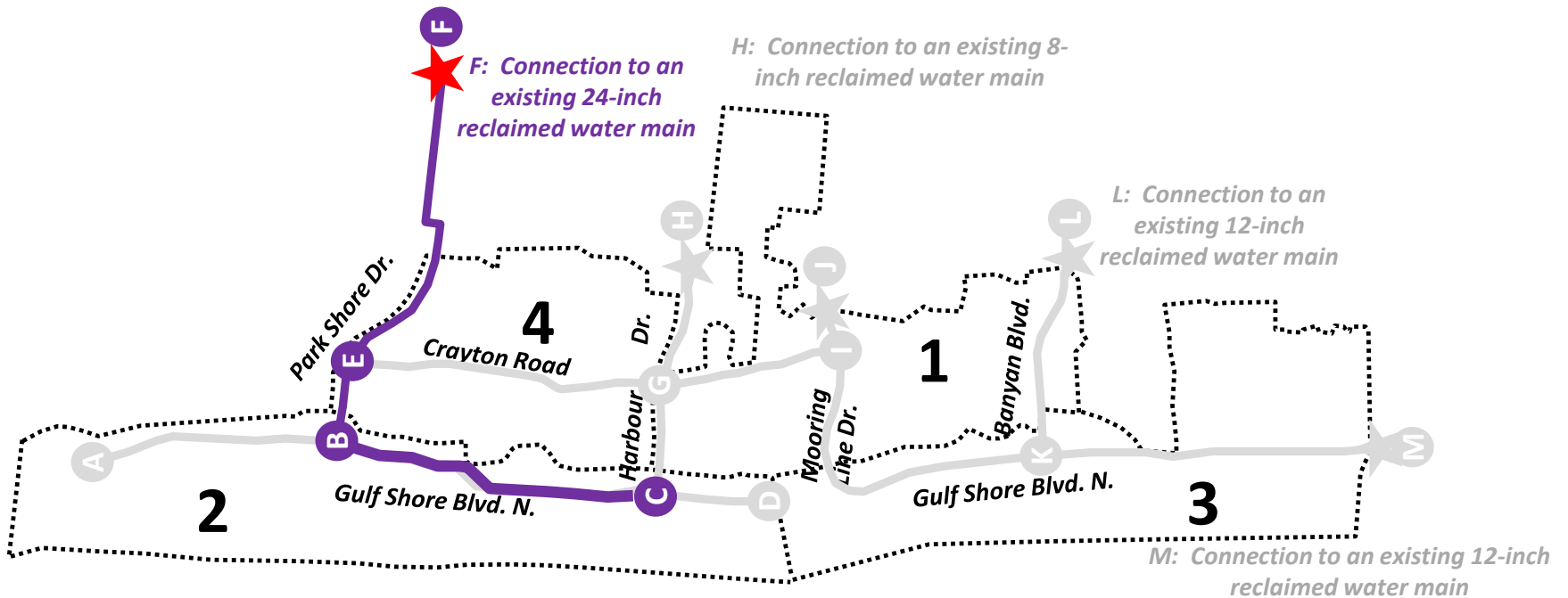
Reclaimed Transmission: Phase 2

Year: 2013 – 2014

Contractor: Danella Utility Construction

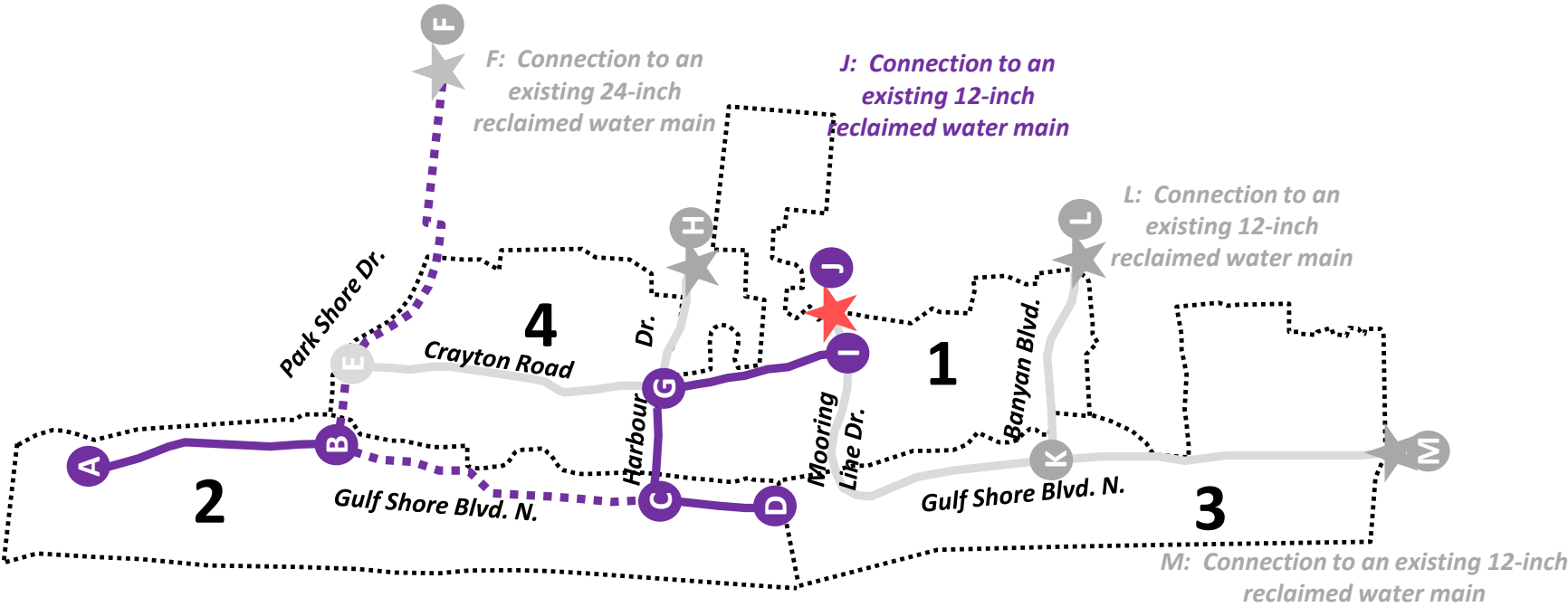
Final Construction Cost: \$ 2,439,313

SFWMD Matching Grant: \$ 750,000



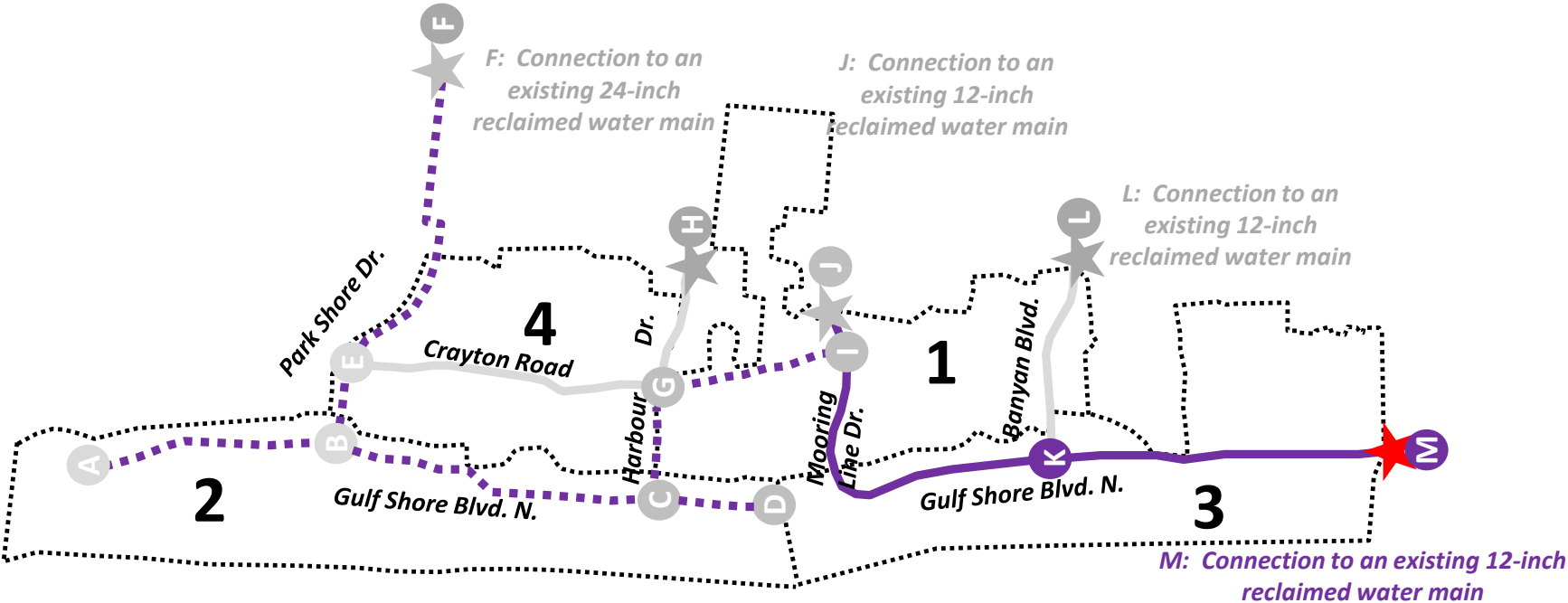
Reclaimed Transmission: Phase 3

Year: 2014 – 2015
Contractor: Kyle Construction
Final Construction Cost: \$ 2,404,759
SFWMD Matching Grant: \$ 1,000,000



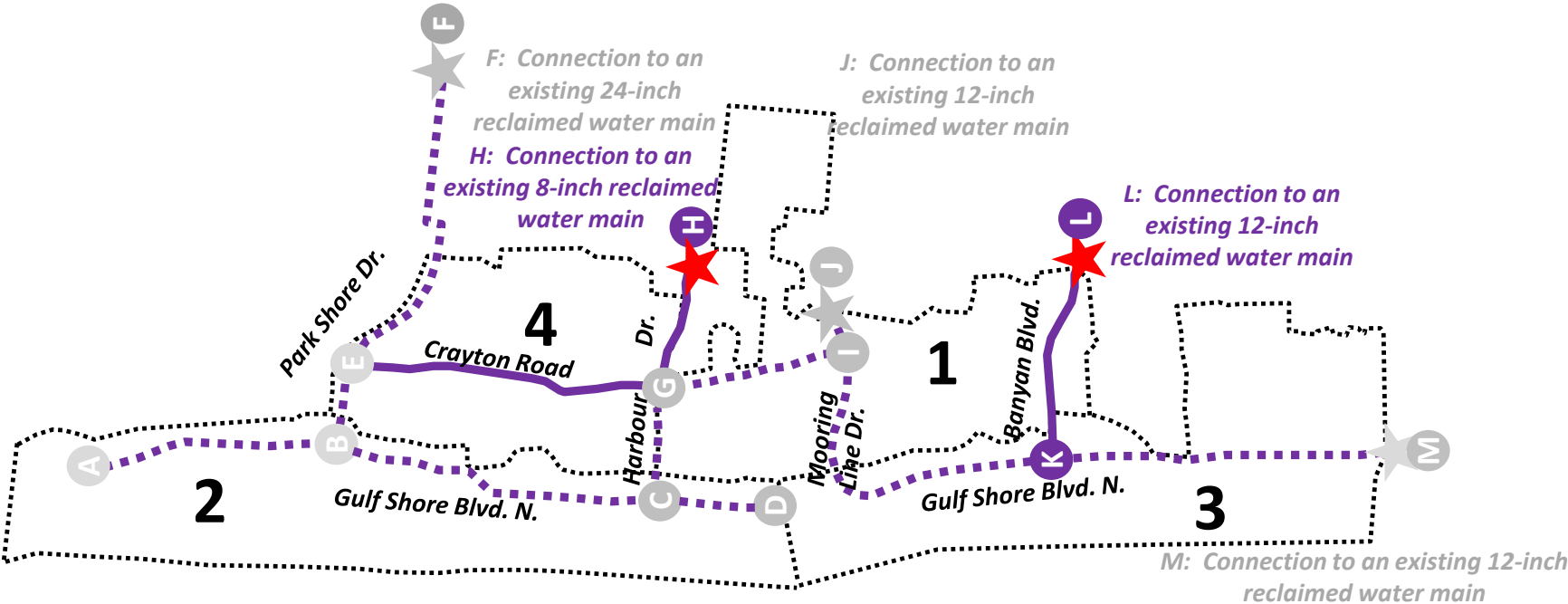
Reclaimed Transmission: Phase 4

Year: 2015 – 2016
Contractor: D.N. Higgins
Final Construction Cost: \$ 1,990,921
SFWMD Matching Grant: \$ 738,600

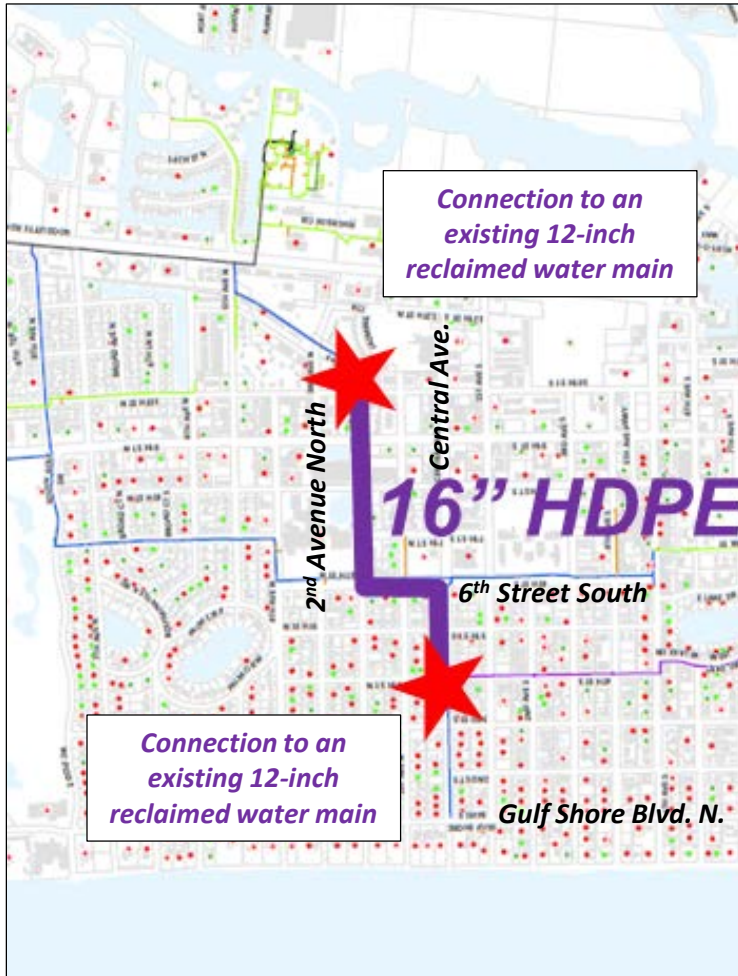


Reclaimed Transmission: Phase 5

Year: 2016 – 2017
Contractor: Kyle Construction
Final Construction Cost: \$ 1,722,620
SFWMD Matching Grant: \$ 430,655



Reclaimed Transmission: “Missing Link”



Year: 2014

Contractor: Andrew Site Work

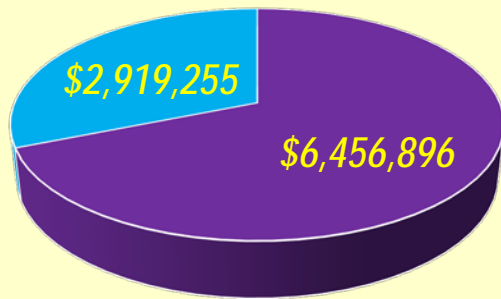
Final Construction Cost: \$ 818,537

SFWMD Matching Grant: \$ 0

Based on the computer model analysis, this interconnect was necessary to improve reclaimed water flow conditions to southern portion of the service area.

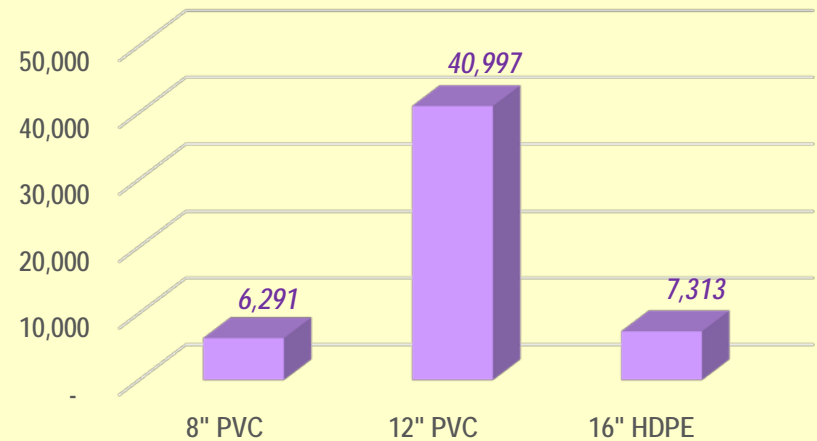
Reclaimed Transmission: Summary

Total Construction Cost: \$9,376,151



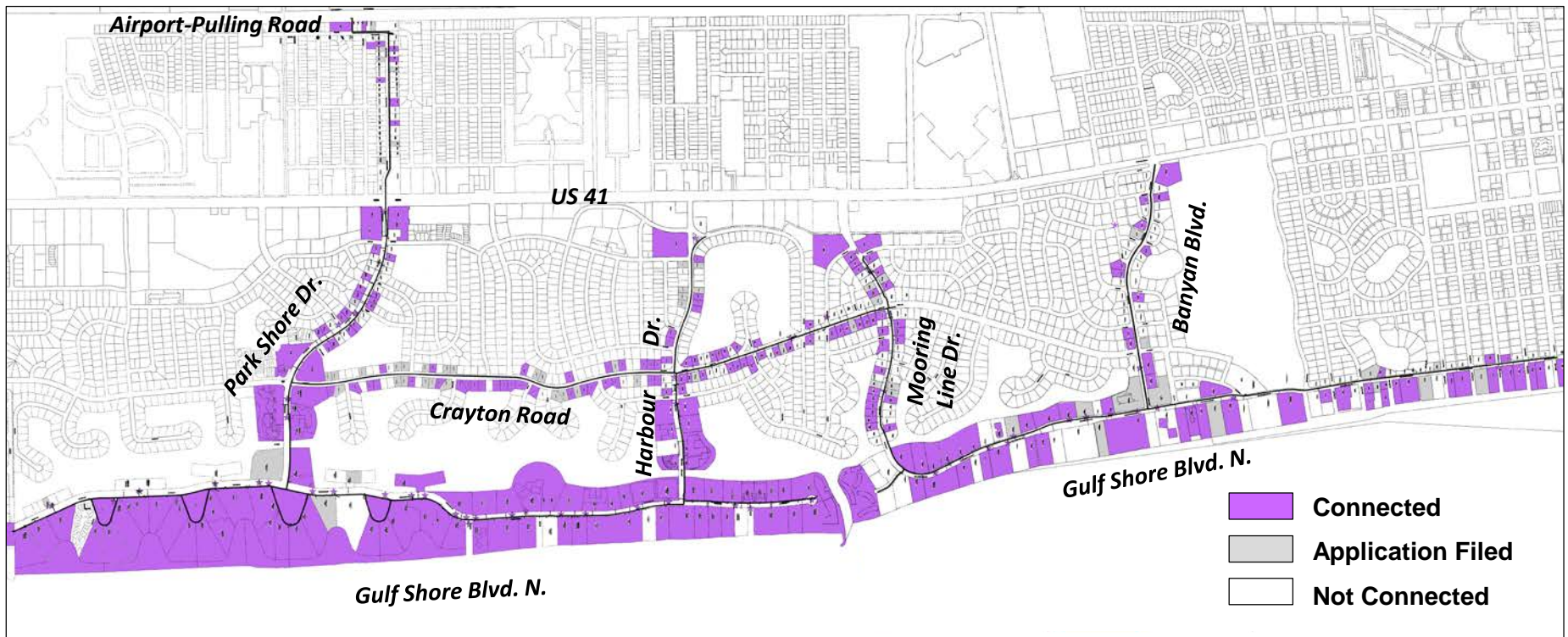
■ City of Naples ■ SFWMD

Reclaimed Water Main: 2013 - 2017



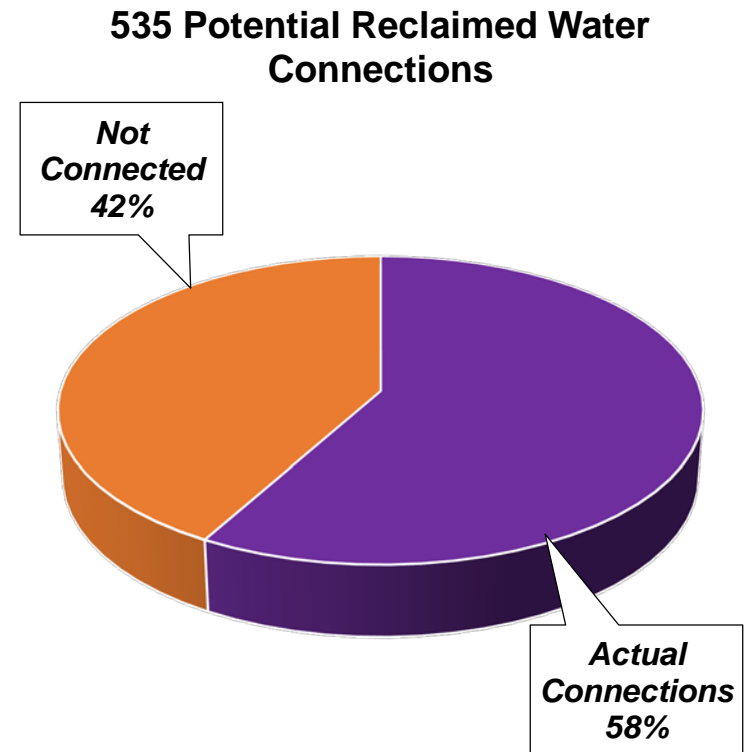
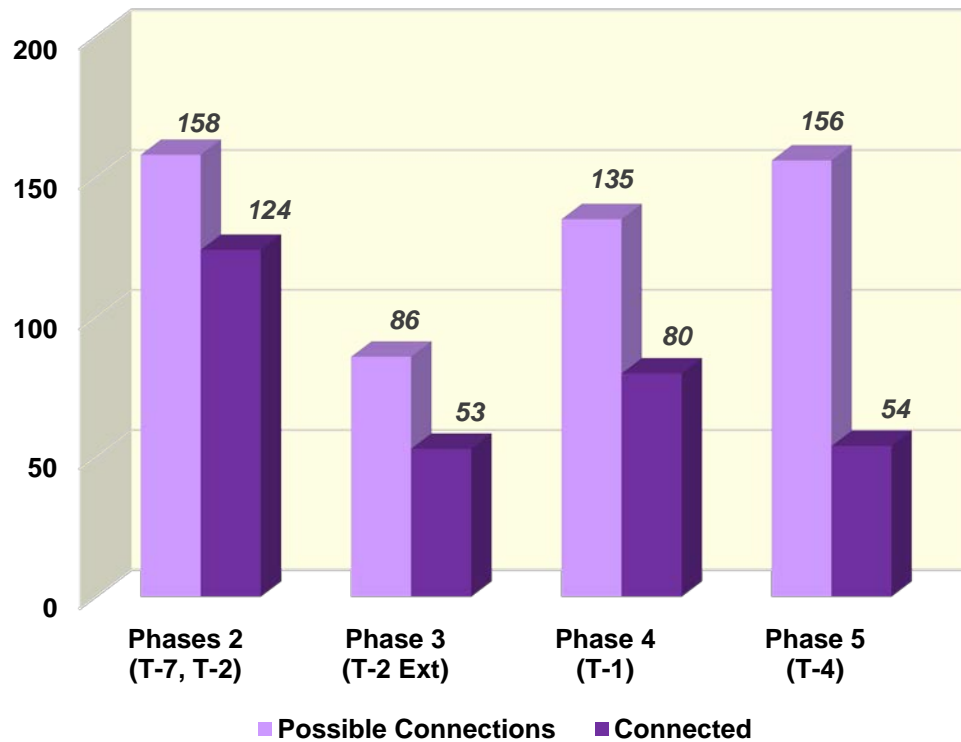
Reclaimed Transmission: Metrics

Reclaimed water connections through February 2018



Reclaimed Transmission: Metrics

Recent 5-Year Expansion Project

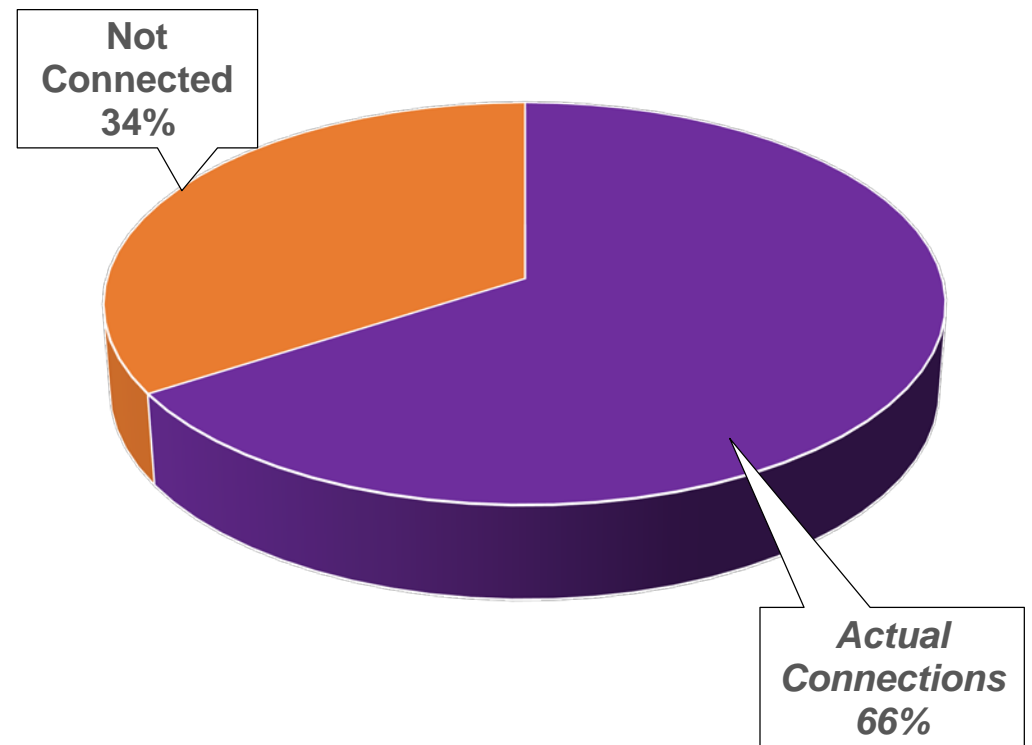


Reclaimed Transmission: Metrics

City-wide

The City's entire reclaimed water system, including the most recent expansion, has 1922 potential connections.

All reclaimed water connections are voluntary.



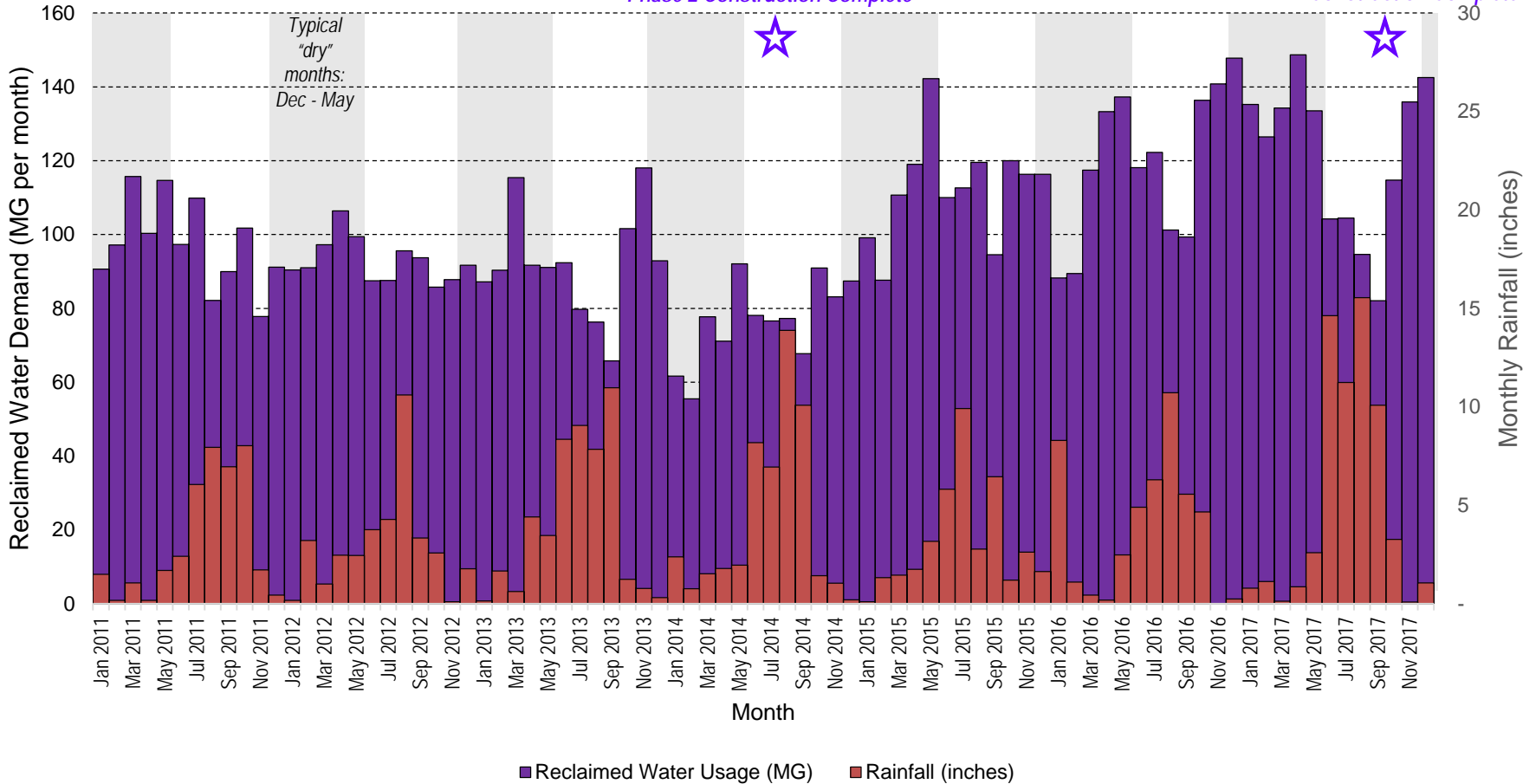
Reclaimed Transmission: Metrics

System-wide Reclaimed Water Usage vs. Rain

(excluding bulk customers - i.e. golf courses)

Phase 2 Construction Complete

All Construction Complete

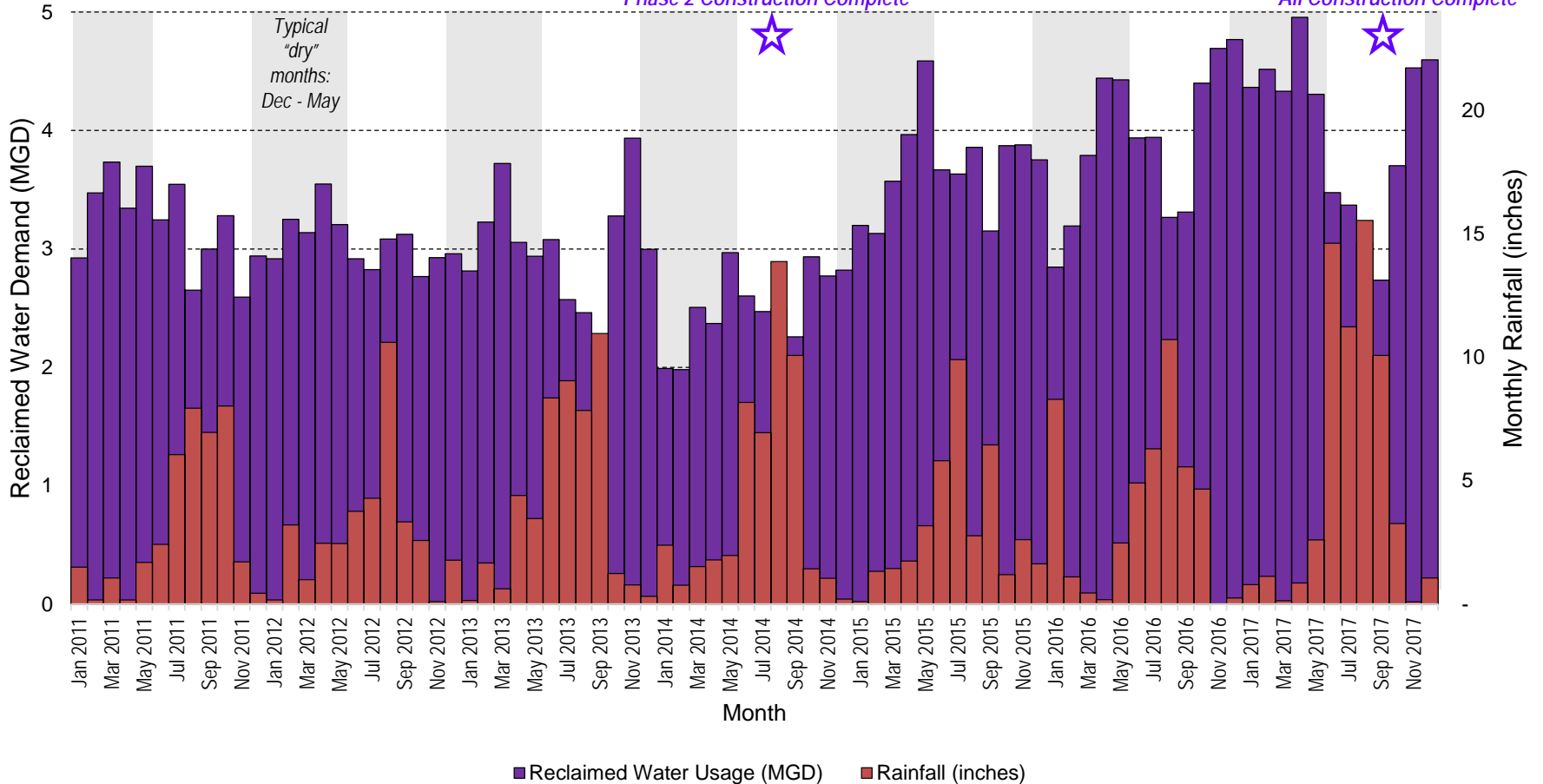


Reclaimed Transmission: Metrics

System-wide Reclaimed Water Usage vs. Rain (excluding bulk customers - i.e. golf courses)

Phase 2 Construction Complete

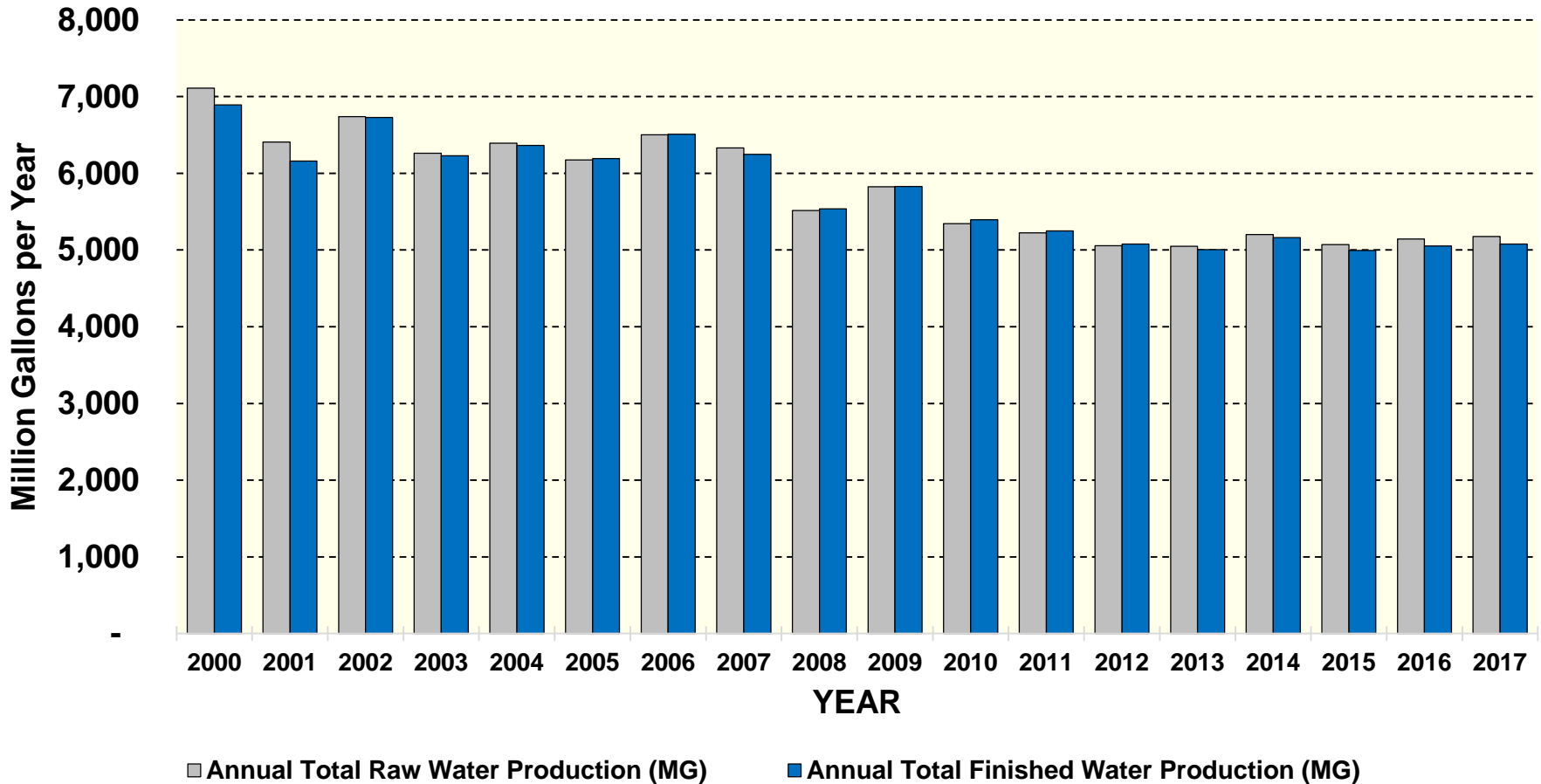
All Construction Complete



Reclaimed Transmission: Metrics

Potable Water Production: Raw and Finished

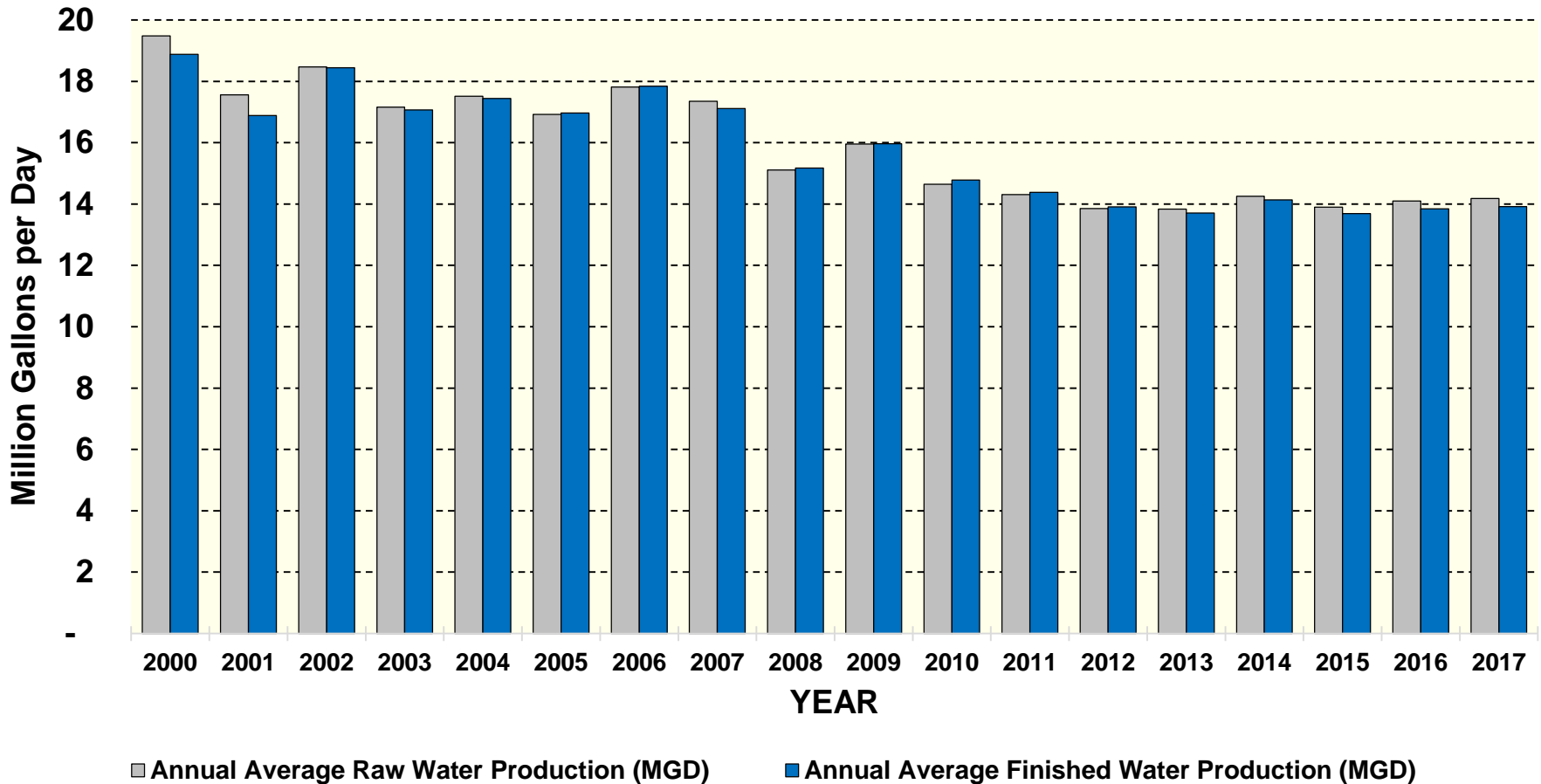
Source: City of Naples Water Treatment Operations



Reclaimed Transmission: Metrics

Potable Water Production: Raw and Finished

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Reclaimed Transmission: Metrics

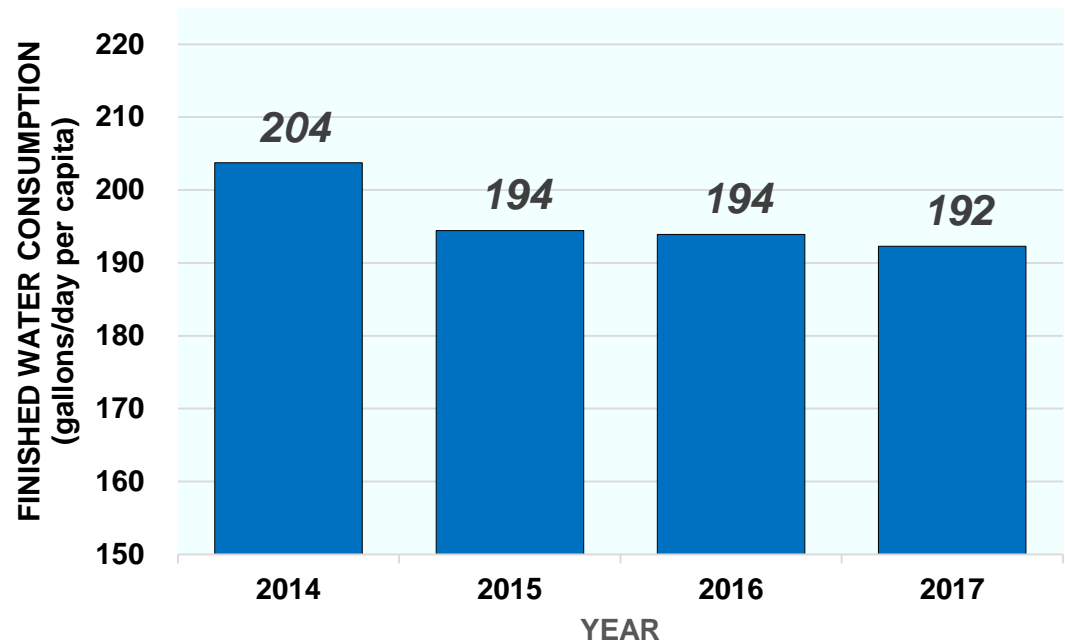
Excerpts from Naples Water Use Permit, page 4/13, issued by SFWMD on June 21, 2010

*“...projected population 67,403 and a per capita use rate of 273 gallons per capita day (gpcd),
The per capita rate has historically been as high as 372 gpcd in 1984, and varied above 300 gpcd during the 1980s.”*

South Florida Water Management District Population Projections (Provided to City)

- 2014: 69,397
- 2015: 70,385
- 2016: 71,372
- 2017: 72,360

Finished Water Per Capita Consumption
(based on service population projections provided by SFWMD)

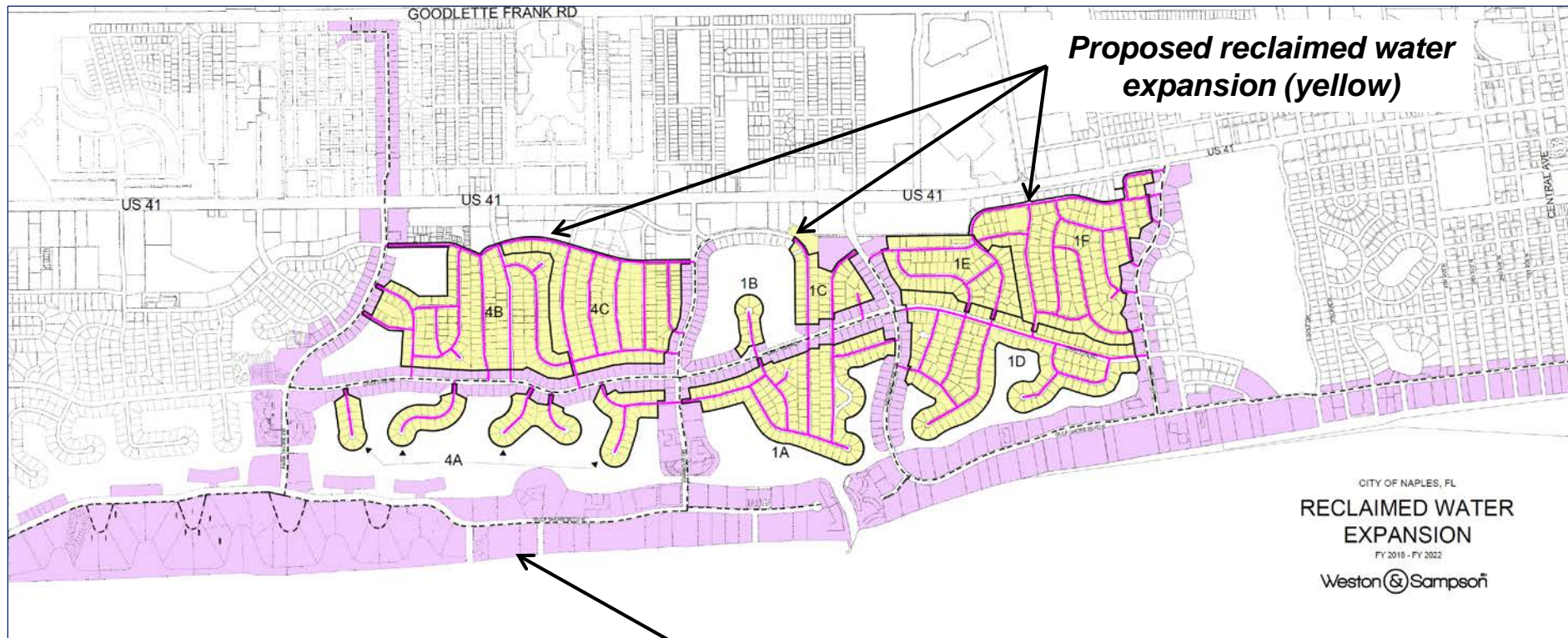


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Continuation of 2012 Reclaimed Water Expansion Efforts

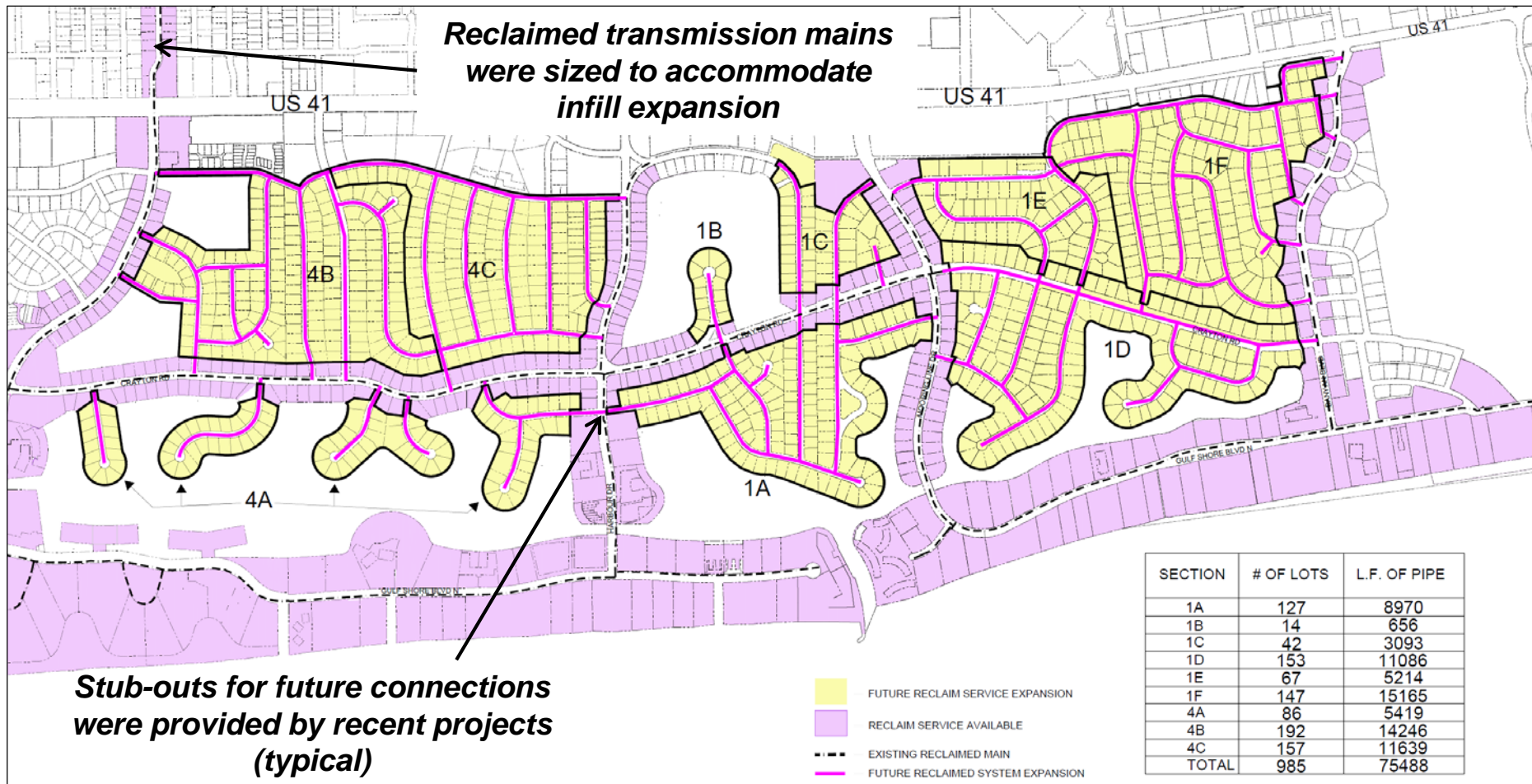


Proposed reclaimed water expansion (yellow)

Properties served by most recent reclaimed water expansion (purple)

CITY OF NAPLES, FL
RECLAIMED WATER
EXPANSION
FY 2016 - FY 2022
Weston & Sampson

Continue Infill Reclaimed Water Connections into Zones 1 and 4



Preliminary Opinion of Probable Costs

Item Description	No. of Lots	Qty.	Unit	OPINION OF PROBABLE CONSTRUCTION COSTS				Survey & Engineering Contingency @ 15% (based on average cost of construction)	Sprinkler Meter + Projected Irrigation Usage	
				Unit Cost ^{1,2,3} Lower Range (\$ per linear feet of street)	Unit Cost ^{1,2,3} Upper Range (\$ per linear feet of street)	Price Lower Range	Price Upper Range		(Gallons per Billing Period)	
									Per Lot	Per Zone
YEAR 1										
Zone 1A	127	9,000	LF						39,800	5,055,000
Zone 4A	86	5,400	LF						39,300	3,380,000
Subtotal - Year 1	213	14,400	LF	\$ 189	\$ 253	\$ 2,728,100	\$ 3,637,400	\$ 477,400		8,435,000
YEAR 2										
Zone 4B	192	14,300	LF						39,300	7,546,000
Subtotal - Year 2	192	14,300	LF	\$ 189	\$ 253	\$ 2,709,100	\$ 3,612,100	\$ 499,400		7,546,000
YEAR 3										
Zone 1B	14	700	LF						39,800	557,000
Zone 1C	42	3,100	LF						39,800	1,672,000
Zone 4C	157	11,600	LF						39,300	6,170,000
Subtotal - Year 3	213	15,400	LF	\$ 189	\$ 253	\$ 2,917,500	\$ 3,890,000	\$ 510,600		8,399,000
YEAR 4										
Zone 1D	153	11,100	LF						39,800	6,089,000
Zone 1E	67	5,200	LF						39,800	2,667,000
Subtotal - Year 4	220	16,300	LF	\$ 189	\$ 253	\$ 3,088,000	\$ 4,117,300	\$ 540,400		8,756,000
YEAR 5										
Zone 1F	147	15,200	LF						39,800	5,851,000
Subtotal - Year 5	147	15,200	LF	\$ 189	\$ 253	\$ 2,879,700	\$ 3,839,400	\$ 503,900		5,851,000
Grand Total - 5 Years	985	75,600	LF	Sub-total (rounded to nearest \$100)		\$ 14,322,400	\$ 19,096,200	\$ 2,531,700		38,987,000

¹ Size of main subject to model evaluation of system. Unit cost based on 8-inch main.

² Includes fittings, valves, fire hydrants

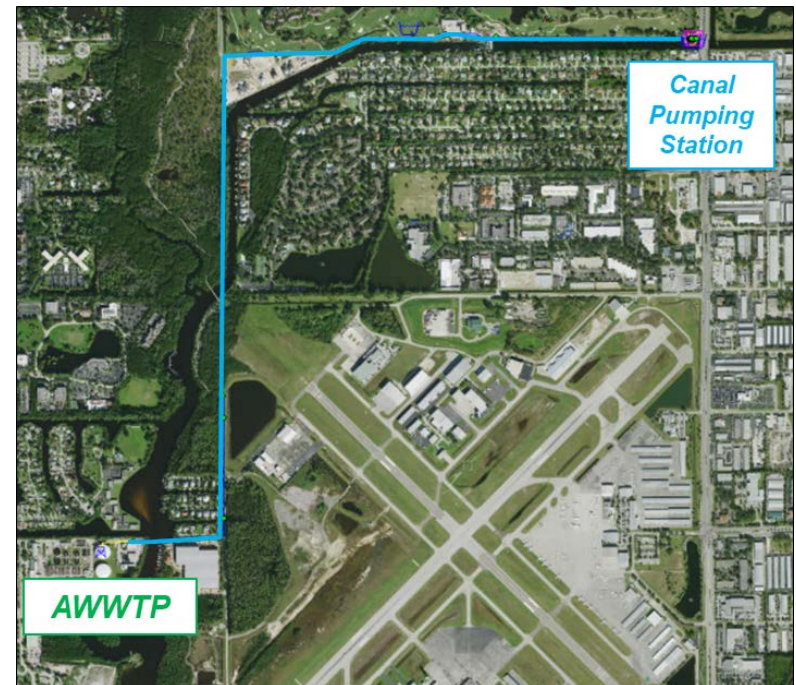
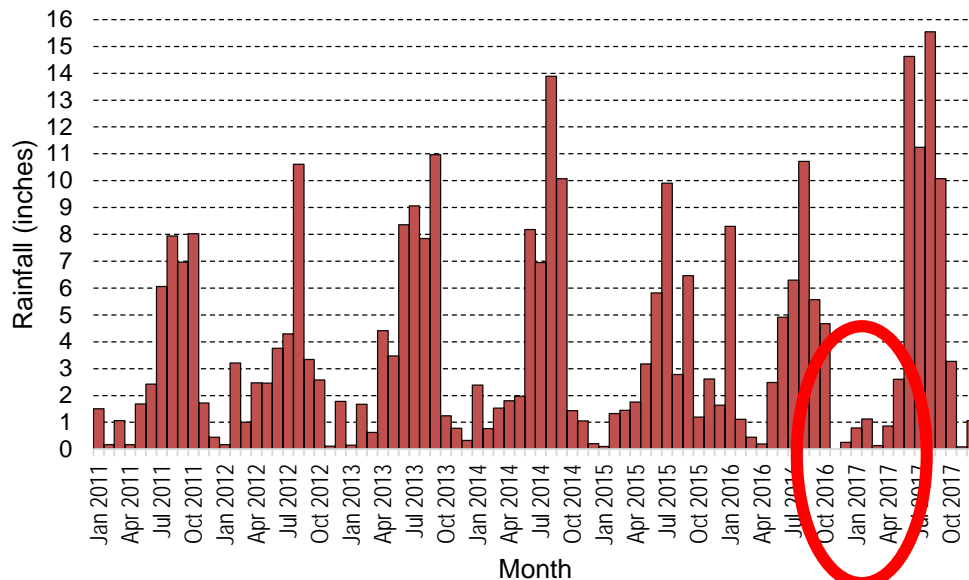
³ Includes contingencies for Construction (25%)

Approximately 650,000 gallons per day

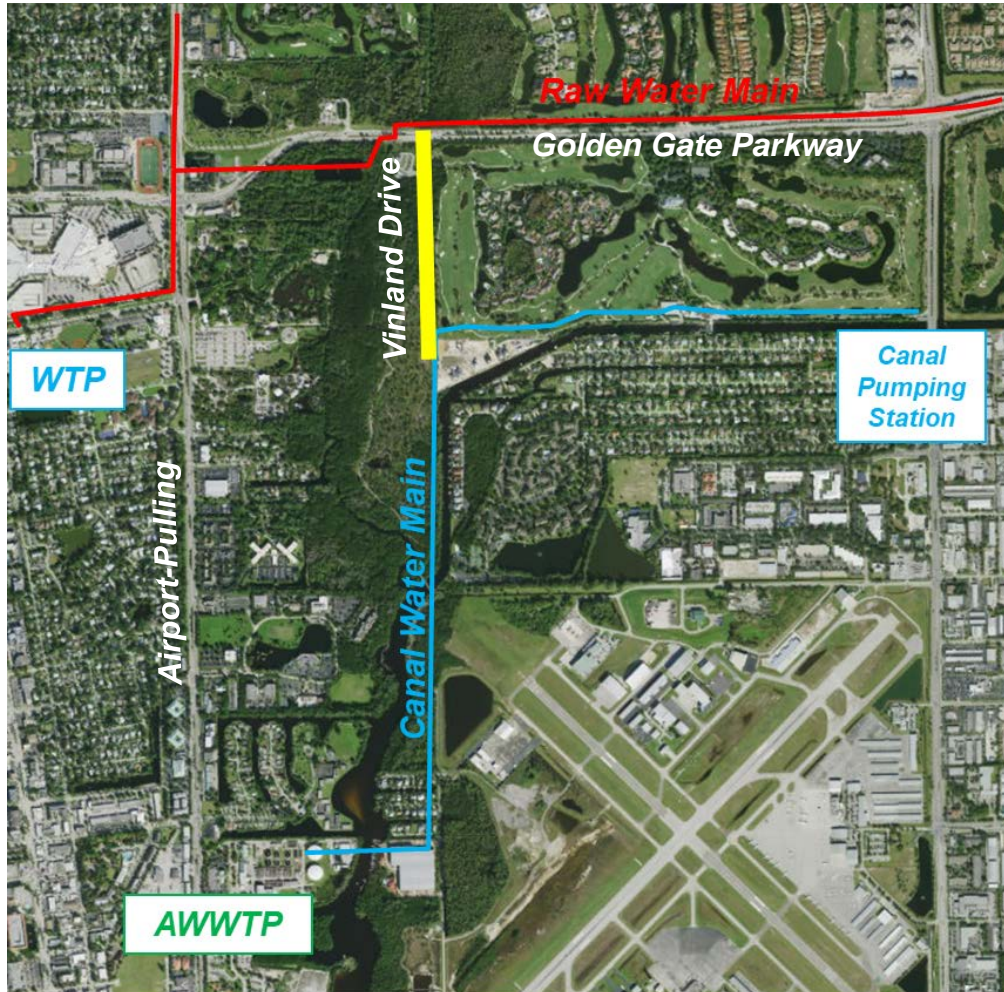
Secure Reclaimed Water Source Reliability

Due to drought conditions in Spring 2017, the City experienced a deficit of approximately 2-MGD of canal water used to supplement existing reclaimed water customers.

Monthly Rainfall: 2011 - 2017
(Measured At Naples WTP)



Conceptual Source: Raw Water



- Connection from Raw Water Main to Canal Water Main (yellow)
- Approximately 2,400 LF of 18-inch main
 - Sized for 3 MGD flow based on computer model analysis
- Opinion of probable project cost (including contingencies): \$1.2M
- Subject to regulatory permitting requirements

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Recommendations

- Secure additional 3-MGD of source water to supplement the existing reclaimed water sources.
- If desired by the City Council, proceed with continued expansion of the City's reclaimed water system, similar to the previous expansion program
 - Phase the work over a 5-year period
 - Construct approximately \$3M to \$4M of reclaimed water distribution mains per year (or as recommended by the City's rate consultant)

