Southwest Metropolitan
Water and Sanitation District

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Capital Master Plan
2019 - 2028

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Table of Contents

Section		Page
1	**Master Plan Description**	
	Background	1
	Purpose	2
	Description of Capital Master Plan Projects	2
	Criteria for Rating Water and Sewer Main Rehabilitation and Replacement Projects	3
	Summary	5
2	**Summary of Costs for Proposed Capital Improvement Projects 2019 - 2028**	7
3	**Capital Improvement Project Descriptions**	8
3	**2019 – Water Projects**	
	CIP 19-1W S. Garland St. between W. Walden Ave. and W. Nova Pl. Water Main Replacement (Meadows Subdivision)	9
	CIP 19-2W S. Holland St. between W. Laurel Pl. to end of cul-de-sac Water Main Replacement (Meadows Subdivision)	9
3	**2019 – Sewer Projects**	
	No projects scheduled	10
3	**2020 – Water Projects**	
	CIP 20-1W S. Polo Ridge Dr. between Thoroughbred Run and the end of the cul-de-sac Water Main Replacement (Polo Reserve Subdivision)	11
	CIP 20-2W S. Kipling St. between W. Coal Mine Ave. and W. Fair Ave. Water Main Replacement	11

Section		Page

DRAFT

3	**2020 – Sewer Projects**	
	No projects scheduled	13
3	**2021 – Water Projects**	
	No projects scheduled	14
3	**2021 – Sewer Projects**	
	No projects scheduled	15
3	**2022 – Water Projects**	
	CIP 22-1W W. Walden Ave. between S. Independence Wy. and S. Hoyt Ct. Water Main Replacement (Meadows Subdivision)	16
	CIP 22-2W S. Holland Wy. between S. Garland Ct. and S. Garland St. Water Main Replacement (Kipling Villas Subdivision)	16
3	**2022 – Sewer Projects**	
	No projects scheduled	17
3	**2023 – Water Projects**	
	No projects scheduled	18
3	**2023 – Sewer Projects**	
	No projects scheduled	19
3	**2024 – Water Projects**	
	No projects scheduled	20
3	**2024 – Sewer Projects**	
	No projects scheduled	21
3	**2025 – Water Projects**	
	No projects scheduled	22
3	**2025 – Sewer Projects**	
	No projects scheduled	23
3	**2026 – Water Projects**	
	No projects scheduled	24
3	**2026 – Sewer Projects**	
	No projects scheduled	25
Section		**Page**
3	**2027 – Water Projects**	

DRAFT

No projects scheduled 26

3 2027 – Sewer Projects
No projects scheduled 27

3 2028 – Water Projects
CIP 28-1W S. Hoyt Ct. between W. David Ave. and Valve K15-16I Water Main Replacement (Meadows Subdivision) 28

CIP 28-2W Old Coal Mine Rd. between S. Kipling St. and W. Coal Mine Ave. Water Main Replacement 28

CIP 28-3W W. Brittany Dr. between S. Pierson St. and Valve N05-10I Water Main Replacement (Powderhorn Subdivision) 29

CIP 28-4W 9525 W. Coal Mine Ave. to Hydrant number K08-F19 Water Main Replacement (Dutch Ridge Subdivision) 29

3 2028 – Sewer Projects
No projects scheduled 30

4 Summary of completed capital improvement projects 31

5 Capital improvement project map 43

DRAFT

Southwest Metropolitan Water and Sanitation District
Capital Master Plan
2019 - 2028

BACKGROUND

Southwest Metropolitan Water and Sanitation District was organized in April 1961 to provide water distribution and wastewater collection and transmission services to properties located within the District boundaries. Since the formation of the District, over 168 miles of water mains ranging in size from four inches to twenty-four inches in diameter, 160 miles of sewer main ranging in size from eight inches to sixty inches in diameter, and one water pumping station have been installed by the District and private developers. Southwest Metropolitan has the responsibility for operation, maintenance, rehabilitation, and replacement of all wastewater collection and water distribution facilities installed by the District or conveyed to the District by private developers.

Southwest Metropolitan implemented an asset evaluation and management, and systematic rehabilitation and replacement program in 1989. Selection and prioritization of capital projects is updated and enhanced each year. A detailed, objective evaluation process has been developed by which every water main that has experienced at least one failure is analyzed and rated. Sanitary sewer assets are likewise evaluated based on age and condition as determined by the District's comprehensive video inspection program. The evaluation process and criteria used each year are described below.

While the majority of the District's assets are well within their expected useful life, expansive soils, electrolysis caused corrosion, and normal wear have left some facilities in immediate need of rehabilitation or replacement. The capital improvement program provides a systematic method for scheduling the necessary system improvements.

The District performed and comprehensive sanitary sewer master plan to determine the adequacy of existing sewer interceptors to serve projected development within the District. Extensive historic wastewater flow data developed from the District's network of flow monitors was used to populate a sophisticated hydraulic model. In addition, future flow additions were projected using information received from all contributors to the Southwest Metropolitan sewer system. The results of the analysis predicted that all existing sewer interceptors have sufficient capacity to serve projected growth within the District's and contributors' proposed service boundaries.

In addition to confirming that existing water and sewer facilities have sufficient capacity to serve projected development, the District has determined that extension of existing facilities to serve undeveloped areas is also not necessary. Thus, the 2019-2028 master plan is limited to replacement and rehabilitation of existing facilities.

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PURPOSE

The purpose of the Capital Improvement Master Plan is to itemize and schedule water and wastewater facility expansion, rehabilitation, and replacement projects. The master plan enhances the accuracy and effectiveness of budgeting and cash flow analysis and allows the District to schedule future expenditures and determine appropriate levels of capital reserves. The program provides for long range planning of revenue sources used for infrastructure rehabilitation and repair revenues and avoids the potential for large annual fluctuations in revenue sources. The program further allows for planning and scheduling system replacements and rehabilitation on a consistent and level basis to match expected revenue levels.

One of the most beneficial aspects of the Capital Improvement Plan is that it allows the District to be proactive rather than reactive when dealing with rehabilitation needs. System modifications are prioritized so the facilities most in need of repair are corrected in a timely manner. This allows for minimizing operation and repair expenses and thus helps avoid unscheduled repair, replacement, and rehabilitation projects.

In summary, the Capital Improvement Master Plan has been prepared to increase the accuracy and reliability of budgetary and cash flow analysis and to improve both immediate and long-term facility and maintenance planning.

DESCRIPTION OF CAPITAL MASTER PLAN PROJECTS

The 2019-2028 Capital Master Plan proposes expenditure of $243,001 in 2019 and $1,963,594 during the entire ten-year planning period. Two capital water projects are scheduled for construction in 2019 at an estimated total cost of $243,001. The first project, CIP 19-1W, contemplates replacement of 701 feet of 12-inch ductile iron pipe with C900 DR14 PVC pipe and 40 feet of 6-inch ductile iron pipe with PVC pipe in S. Garland St. between W. Walden Ave. and W. Nova Pl. in the Meadows subdivision. Three electrolysis caused water main breaks have been experienced on this segment of pipe since 2007 with the latest occurring in 2018. The estimated cost of this project is $182,787 including engineering and contingencies.

The second water project planned for 2019 calls for replacement of 272 feet of 6-inch ductile iron pipe with 272 feet of 6-inch PVC pipe in S. Holland St. between W. Laurel Pl. and the end of the cul-de-sac. The estimated cost of Project CIP 19-2W is $60,214.

No sewer asset or equipment capital projects are schedule between 2019 and 2018.

Eight water facility replacement projects are scheduled for construction between 2020 and 2028 at an estimated cost of $1,720,593. Total footage of water main to be replaced is 5,012 feet. These projects will result in replacement of:

433 feet of 6-inch ductile iron pipe
152 feet of 8-inch ductile iron pipe
260 feet of 12-inch cast iron pipe

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830 feet of 12-inch ductile iron pipe
788 feet of 12-inch PVC
2,549 feet of 16-inch cast iron pipe

Water projects scheduled for construction after 2018 are subject to change due to the rating criteria explained above. Pipelines that do not experience continuing problems will likely be deprioritized for replacement at a later date or eliminated from the plan. Alternatively, pipelines that are on the plan and experience additional failures will be accelerated for replacement earlier than originally proposed.

The District currently has sufficient financial resources to complete all projects proposed in the 2019-2028 Capital Master Plan. Annual increases are proposed in the District's water and sewer service fee which is billed by Denver Water on customer water bills. The future adjustments will enable the District to match operating revenue with operating costs and therefore avoid depleting the District's capital reserve.

CRITERIA FOR RATING WATER AND SEWER MAIN REHABILITATION AND REPLACEMENT PROJECTS

Water

An analytical, objective rating process has been developed to select and prioritize water and sanitary sewer main rehabilitation and replacement projects over the ten year planning horizon. Objective criteria used to evaluate water system facilities includes the following factors:

- Age of pipe
- Type of pipe
- Failure rate (timing and frequency of failures)
- Type and cause of pipe failures

The rating system is used to assign a certain number of points to each water system facility that has experienced at least one failure. The number of points applied by each rating factor is as follows:

Factor	Points Assessed
Age of pipe	One point for each year of service
Type of pipe	Each type of pipe is assigned a number of points based on likelihood of failure: cast iron - 75 points ductile iron - 50 points asbestos-cement - 50 points polyvinyl chloride - 50 points

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Failure rate	Each failure is assigned a number of points based on the age of the failure and type or cause of the failure (see Age of pipe failure and type of failure factors below)
Age of pipe failure	One year or less - 300 points 1-3 years - 275 points 4-5 years - 250 points 6-10 years - 150 points 11 years or greater - 125 points

Type of failure	beam break - 0.95 (multiplier) electrolysis break - 1.0 (multiplier)

An example of the application of the pipe evaluation rating system follows:

A 35 year old cast iron pipe with two electrolysis caused failures, one occurring in 1996 and one in 2000:

Age of pipe -	35 points
Type of pipe -	75 points
Failure rate -	250 points [1996 break = 125 points (age of break factor) x 1.0 (electrolysis break multiplier)] and [2000 break = 125 points (age of break factor x 1.0 (electrolysis multiplier)]
Total points -	360 points

Replacement and rehabilitation projects are prioritized and scheduled for construction based on the point value resulting from the evaluation rating process and supplemental evaluation criteria as explained later in this section. The scheduling criteria is as follows:

Rehabilitation - Replacement Scheduling Criteria

Year scheduled	Points
1	700 or more
2	665-699
3	630-664
4	595-629
5	560-594
6	545-559
7	530-544
8	515-529
9	500-514
10	475-499

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In addition to the pipe evaluation rating criteria, the District also considers subjective, supplemental factors that may modify capital project scheduling. These factors include:

- Number and type of customers affected by water outages
- Hydraulics (encrustation of pipe interior)
- Water quality
- Criticality (impact on reliability of water systemCost of pipeline failure - either experienced or potential costs for repairs and property damage
- Coordination with highway and transportation authorities

Sewer

Sanitary sewer pipelines are rated during routine, preventive television inspections. Pipelines deemed to be at risk of failure or stoppage despite increased preventive maintenance, or determined to be a source of infiltration or exfiltration are scheduled for rehabilitation or replacement within a three year timeframe. Other pipelines that are damaged yet can continue to provide reliable service with increased preventive maintenance are scheduled for rehabilitation or replacement in later years based on the extent of damage and potential for failure.

SUMMARY

The capital financial requirements for rehabilitation or replacement of existing infrastructure are rising as Southwest Metropolitan's facilities age and deteriorate. The District's sewer transmission (interceptor) network is extensive and serves a significant area consisting of Southwest Metropolitan, Ken Caryl Ranch Water and Sanitation District, Grant Water and Sanitation District, Meadowbrook-Fairview Metropolitan District, and portions of the Platte Canyon Water and Sanitation District, Columbine Water and Sanitation District, and City of Littleton. Replacement or rehabilitation of these sewers has cost millions of dollars over the past five years. The backbone sewer infrastructure has been rehabilitated or replaced and its useful life has been extended 50 years. The majority of the District's sewer collection system remains in good shape, and as shown in the current capital master plan is not expected to require renewal within the next ten years.

The District's water distribution system will necessitate additional attention in the future as significant portions of the system approach the end of its reliable, useful life. It is extremely important that the District maintain a proactive facility maintenance program and comprehensive long-range capital improvement program to detect and repair all District owned infrastructure as necessary.

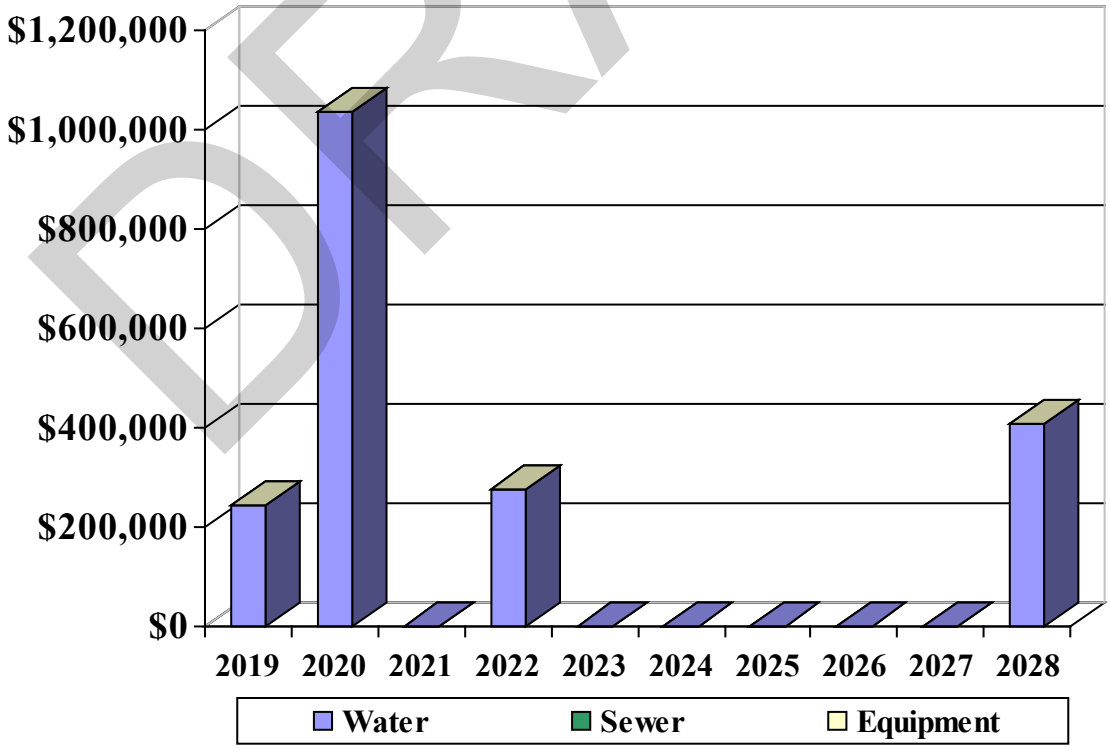
The Capital Improvement Master Plan is intended to be a dynamic document. The proposed construction, rehabilitation, and replacement schedule will be reviewed annually and adjusted to reflect changes in development patterns, and infrastructure deterioration and failure. The Master Plan will be submitted to the Board of Directors for review and discussion in conjunction with the annual budget and ten-year financial plan.

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SECTION 2

SUMMARY OF COSTS FOR PROPOSED CAPITAL IMPROVEMENTS FOR THE YEARS 2019 - 2028

Year	Water	Sewer	Equipment	Totals
2019	$ 243,001	$ 0	$ 0	$ 243,001
2020	$1,035,288	$ 0	$ 0	$1,035,288
2021	$ 0	$ 0	$ 0	$ 0
2022	$ 277,920	$ 0	$ 0	$ 277,920
2023	$ 0	$ 0	$ 0	$ 0
2024	$ 0	$ 0	$ 0	$ 0
2025	$ 0	$ 0	$ 0	$ 0
2026	$ 0	$ 0	$ 0	$ 0
2027	$ 0	$ 0	$ 0	$ 0
2028	$ 407,385	$ 0	$ 0	$ 407,385
TOTALS	**$1,963,594**	**$ 0**	**$ 0**	**$1,963,594**



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SECTION 3

WATER SYSTEM, WASTEWATER COLLECTION SYSTEM AND EQUIPMENT IMPROVEMENT, REHABILITATION, AND REPLACEMENT PROJECTS PROPOSED FOR CONSTRUCTION BETWEEN 2019 - 2028

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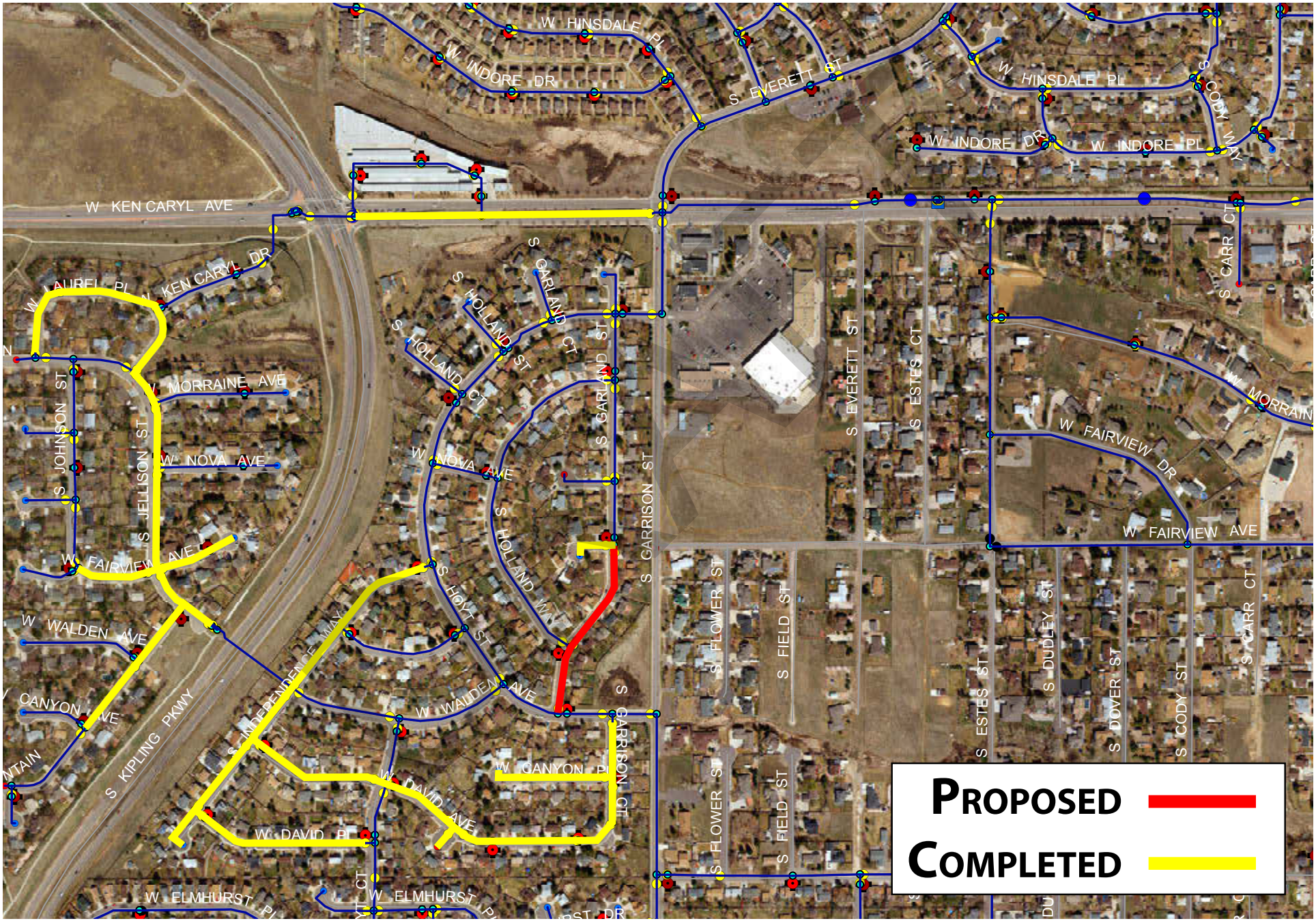
2019 Capital Improvement Projects
Water

Project:	**CIP 19-1W**		
Location:	S. Garland St. between W. Walden Ave. and W. Nova Pl. (Meadows Subdivision)		
Description:	Replace 701 feet of 12-inch ductile iron pipe with 701 feet of 12" PVC pipe and replace 40 feet of 6-inch ductile iron pipe with 40 feet of 6-inch PVC pipe.		
Date Installed:	1978		
Rating:	815 points (three electrolysis breaks)		
Cost:	Construction:	$ 144,495	
	Engineering (10%)	$ 14,450	
		$ 158,945	
	Contingencies (15%)	$ 23,842	
		$ 182,787	

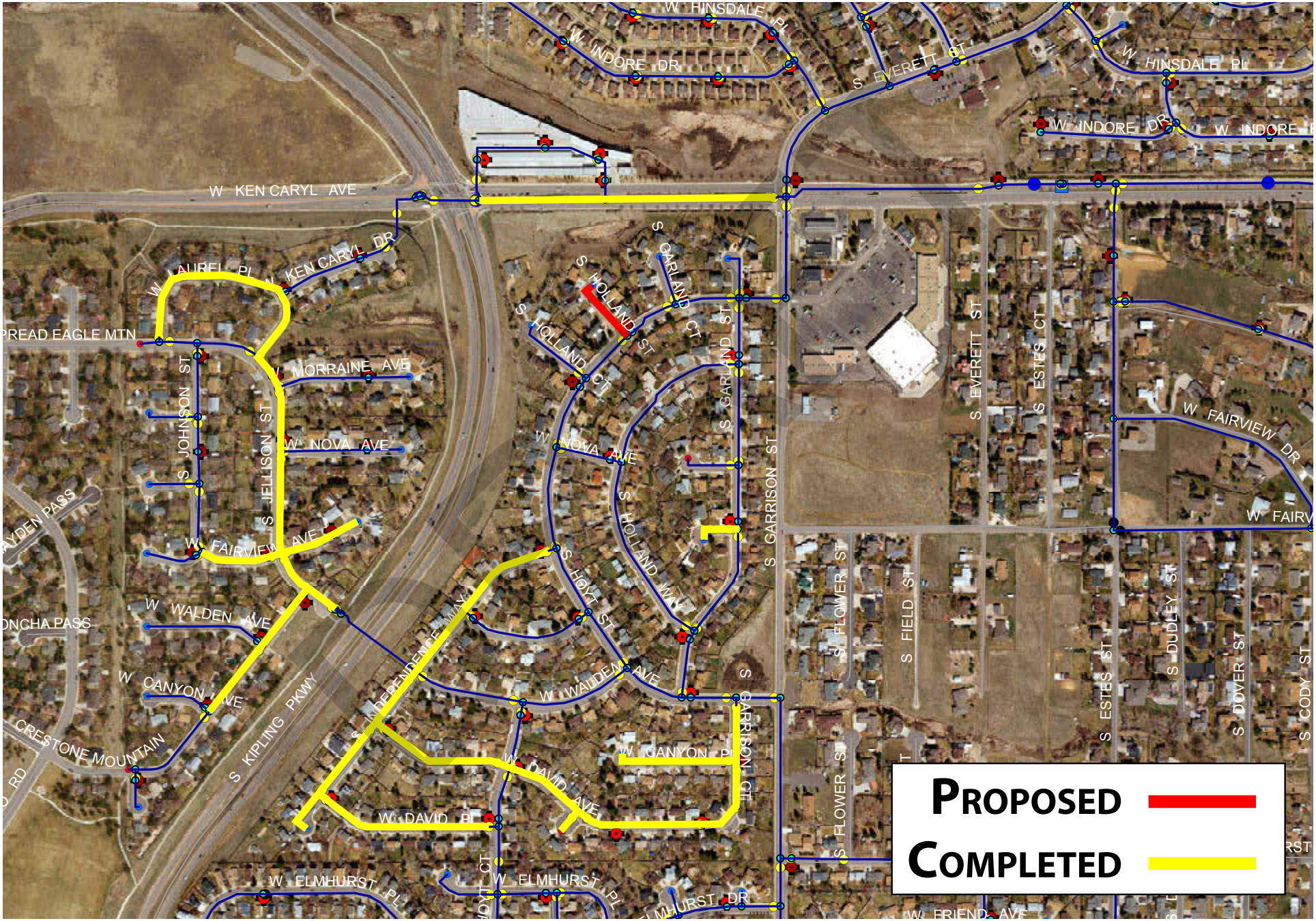
Project:	**CIP 19-2W**		
Location:	S. Holland St. between W. Laurel Pl. to end of cul-de-sac (Meadows Subdivision)		
Description:	Replace 272 feet of 6-inch ductile iron pipe with 6-inch PVC pipe.		
Date Installed:	1978		
Rating:	634 points (three electrolysis breaks)		
Cost:	Construction:	$ 47,600	
	Engineering (10%)	$ 4,760	
		$ 52,360	
	Contingencies (15%)	$ 19,503	
		$ 60,214	

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PROJECT C.I.P. 19-1W
S. GARLAND ST. WATER MAIN REPLACEMENT



PROJECT C.I.P. 19-2W
S. HOLLAND ST. WATER MAIN REPLACEMENT



2019 Capital Improvement Projects
Sewer

No projects scheduled

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2020 Capital Improvement Projects
Water

Project:	**CIP 20-1W**	
Location:	S. Polo Ridge Dr. between Thoroughbred Run and the end of the cul-de-sac (Polo Reserve Subdivision).	
Description:	Replace 788 feet of 12-inch PVC pipe with 6-inch PVC pipe to eliminate constant water quality problems resulting from stagnant water in the existing oversized pipeline.	
Rationale:	This segment of water main is over-sized and must be flushed frequently to maintain water quality. When installed the main was proposed to be connected to an adjacent planned development which never occurred and will not occur. Replacing the 12-inch pipe with a 4-inch or 6-inch pipe will preserve water quality without constant maintenance.	
Date Installed:	1995	
Cost:	Construction:	$ 118,200
	Engineering (10%)	$ 11,820
		$ 130,020
	Contingencies (15%)	$ 19,503
		$ 149,523

Project:	**CIP 20-2W**	
Location:	S. Kipling St. between W. Coal Mine Ave. and W. Fair Ave.	
Description:	Replace 2,223 feet of 16-inch cast iron pipe with 2,223 feet of 16-inch, C-900, class 150 PVC pipe.	
Rationale:	The District experienced an electrolysis failure late 2010. The main is fourteen feet deep due to the reconstruction of S. Kipling St. in early 1990's. The extensive efforts to complete the repair, due to the depth cost the District tens of thousands of dollars. It is recommended to replace the main with 16-inch PVC from valve # L08-3 1 to just south of fire hydrant # K06-F1. Replacing this main to a normal bury depth would make maintenance and repairs much less expensive and safer. Further water outages would be significantly reduced.	

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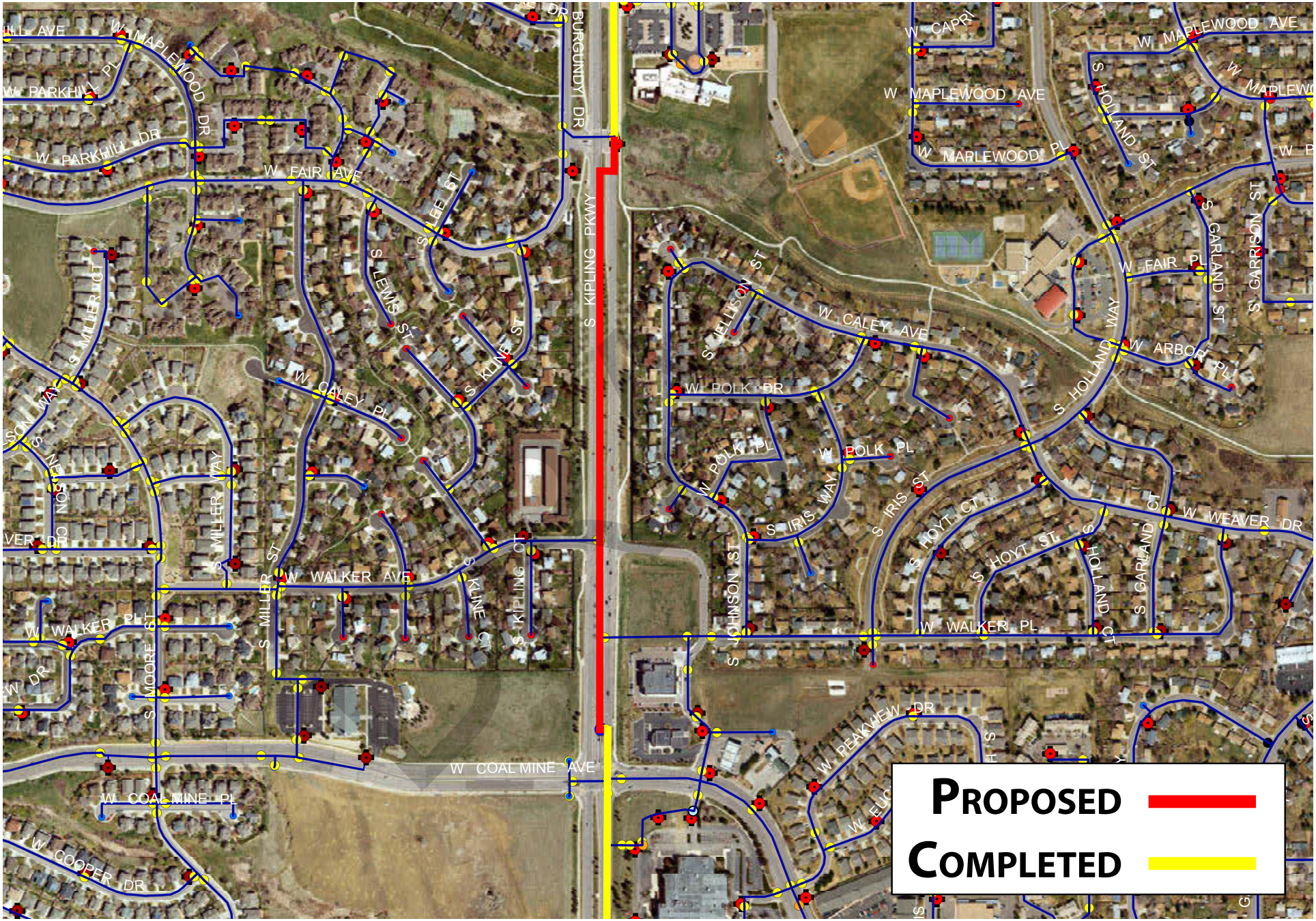
Date Installed:	1974	
Cost:	Construction:	$ 700,210
	Engineering (10%)	$ 70,021
		$ 770,231
	Contingencies (15%)	$ 115,534
		$ 885,765

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PROJECT C.I.P. 20-1W
S. POLO RIDGE DR. WATER MAIN REPLACEMENT



PROJECT C.I.P. 20-2W
S. KIPLING ST. WATER MAIN REPLACEMENT



2020 Capital Improvement Projects
Sewer

No projects scheduled

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2021 Capital Improvement Projects
Water

No projects scheduled

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2021 Capital Improvement Projects
Sewer

No projects scheduled

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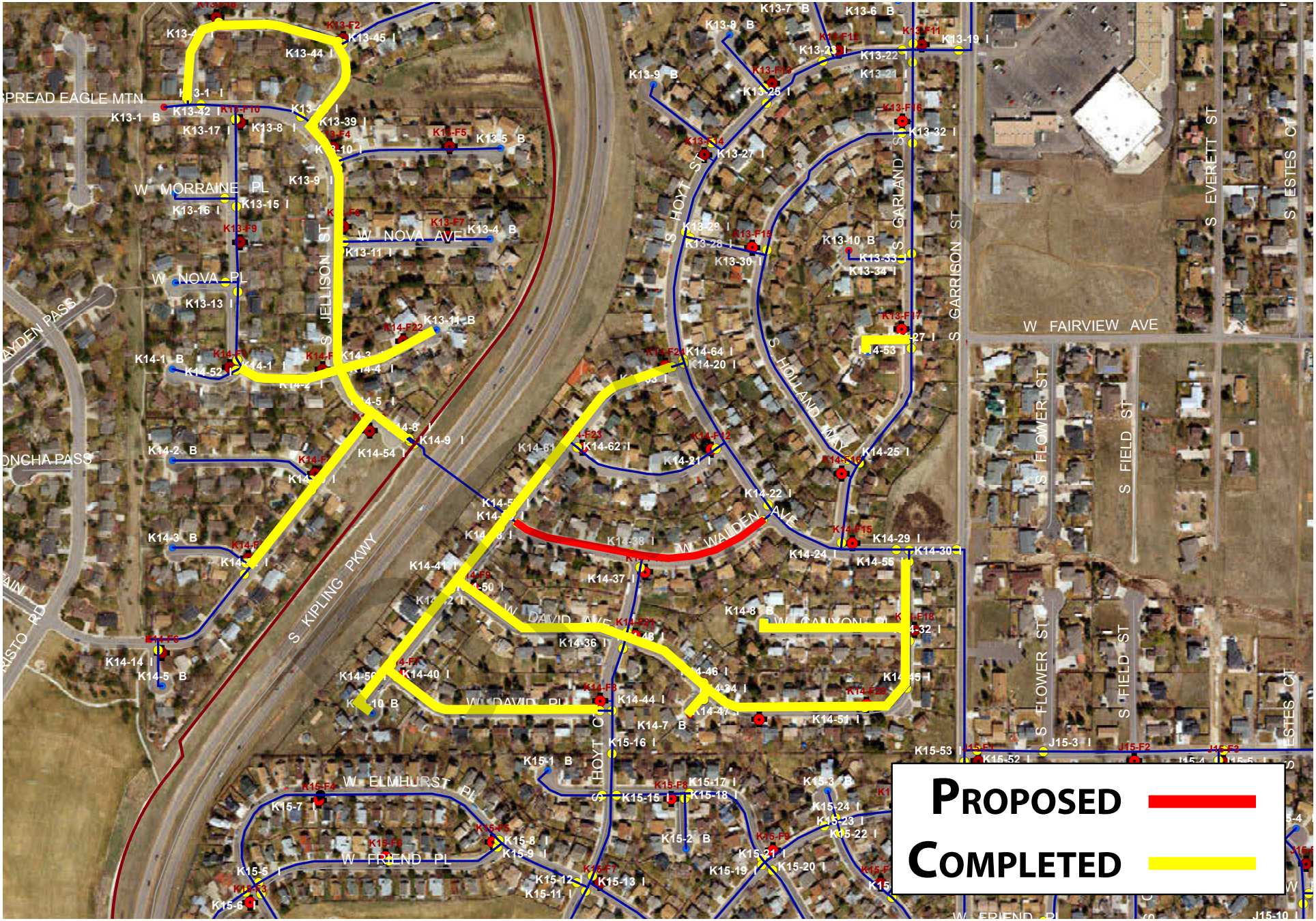
2022 Capital Improvement Projects
Water

Project:	**CIP 22-1W**	
Location:	W. Walden Ave. between S. Independence Wy. And S. Hoyt Ct. (Meadows Subdivision)	
Description:	Replace 448 feet of 12-inch ductile iron pipe with 448 feet of 12-inch, C-900 DR 14 PVC pipe.	
Rating:	609 points (one beam break in 1987 and two electrolysis breaks in 1989 and 2015)	
Date Installed:	1978	
Cost:	Construction:	$ 123,200
	Engineering (10%)	$ 12,320
		$ 135,520
	Contingencies (15%)	$ 20,328
		$ 155,848

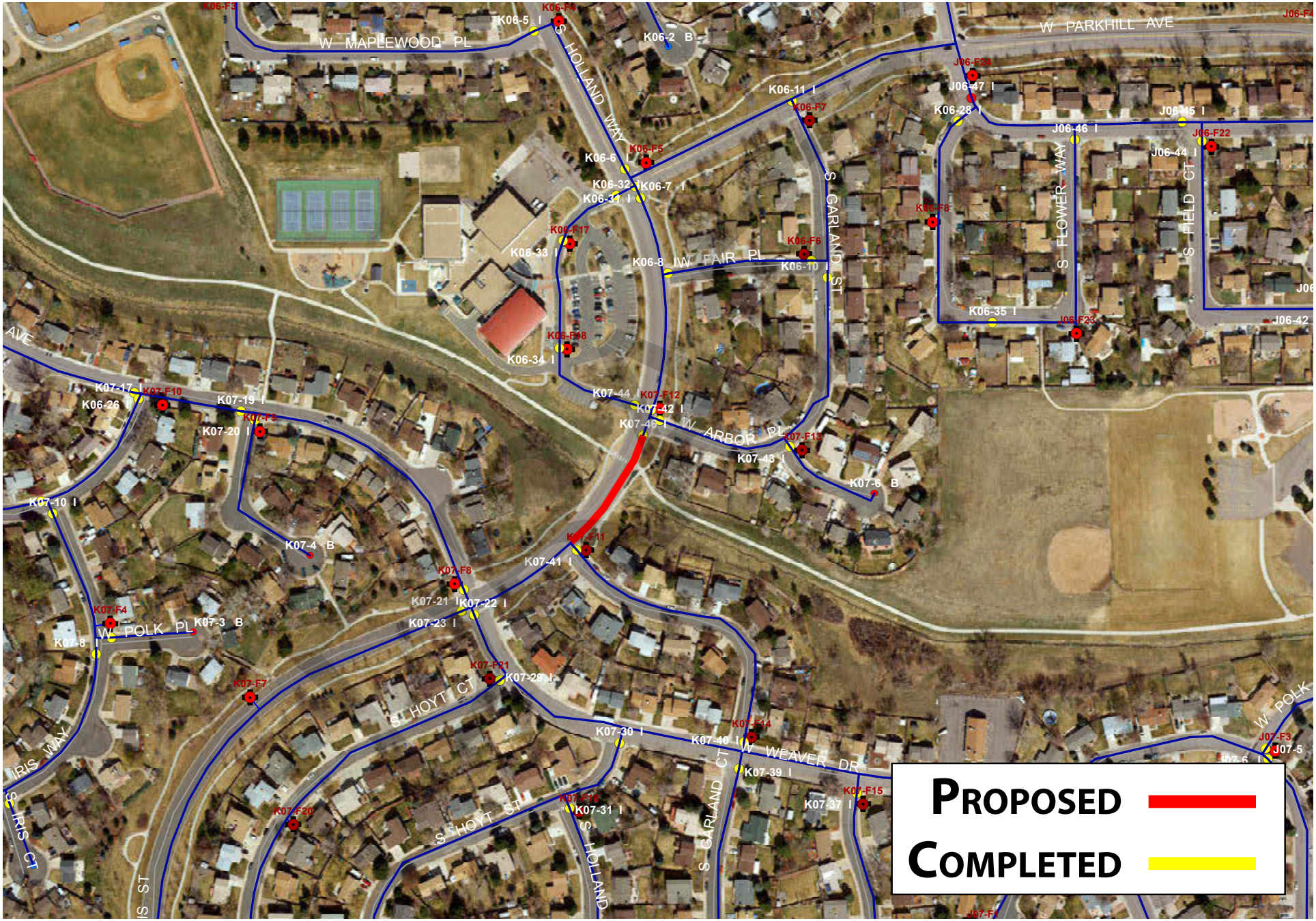
Project:	**CIP 22-2W**	
Location:	S. Holland Wy. Between S. Garland Ct. and S. Garland St. (Kipling Villas Subdivision).	
Description:	Replace 260 feet of 12-inch cast iron pipe with 260 feet of 12-inch ductile iron pipe.	
Rating:	604 points (three electrolysis breaks in 1995, 2006 and 2014)	
Date Installed:	1977	
Cost:	Construction:	$ 96,500
	Engineering (10%)	$ 9,650
		$ 106,150
	Contingencies (15%)	$ 15,922
		$ 122,072

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PROJECT C.I.P. 22-1W
W. WALDEN AVE. WATER MAIN REPLACEMENT



PROJECT C.I.P. 22-2W
S. HOLLAND WAY WATER MAIN REPLACEMENT



2022 Capital Improvement Projects
Sewer

No projects scheduled

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2023 Capital Improvement Projects
Water

No projects scheduled

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2023 Capital Improvement Projects
Sewer

No projects scheduled

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2024 Capital Improvement Projects
Water

No projects scheduled

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2024 Capital Improvement Projects
Sewer

No projects scheduled

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2025 Capital Improvement Projects
Water

No projects scheduled.

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2025 Capital Improvement Projects
Sewer

No projects scheduled

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2026 Capital Improvement Projects
Water

No projects scheduled

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2026 Capital Improvement Projects
Sewer

No projects scheduled.

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2027 Capital Improvement Projects
Water

No projects scheduled

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2027 Capital Improvement Projects
Sewer

No projects scheduled.

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2028 Capital Improvement Projects
Water

Project:	**CIP 28-1W**		
Location:	S. Hoyt Ct. between W. David Ave. and valve # K15-16.1 (Meadows Subdivision).		
Description:	Replace 382 feet of 12-inch ductile iron pipe with 382 feet of 12-inch, C-900 DR 14 PVC pipe.		
Rating:	490 points (two electrolysis breaks in 2009 and 2015)		
Date Installed:	1978		
Cost:	Construction:	$ 105,050	
	Engineering (10%)	$ 10,505	
		$ 115,555	
	Contingencies (15%)	$ 17,333	
		$ 132,888	

Project:	**CIP 28-2W**		
Location:	Old Coal Mine Road between S. Kipling St. and W. Coal Mine Ave.		
Description:	Replace 326 feet of 16-inch cast iron pipe with 326 feet of 16-inch, C-900 DR 14 PVC pipe.		
Date Installed:	1959		
Rating:	488 points (3 breaks in 1995, 1999 and 1999)		
Cost:	Construction:	$ 88,020	
	Engineering (10%)	$ 8,802	
		$ 96,822	
	Contingencies (15%)	$ 14,523	
		$ 111,345	

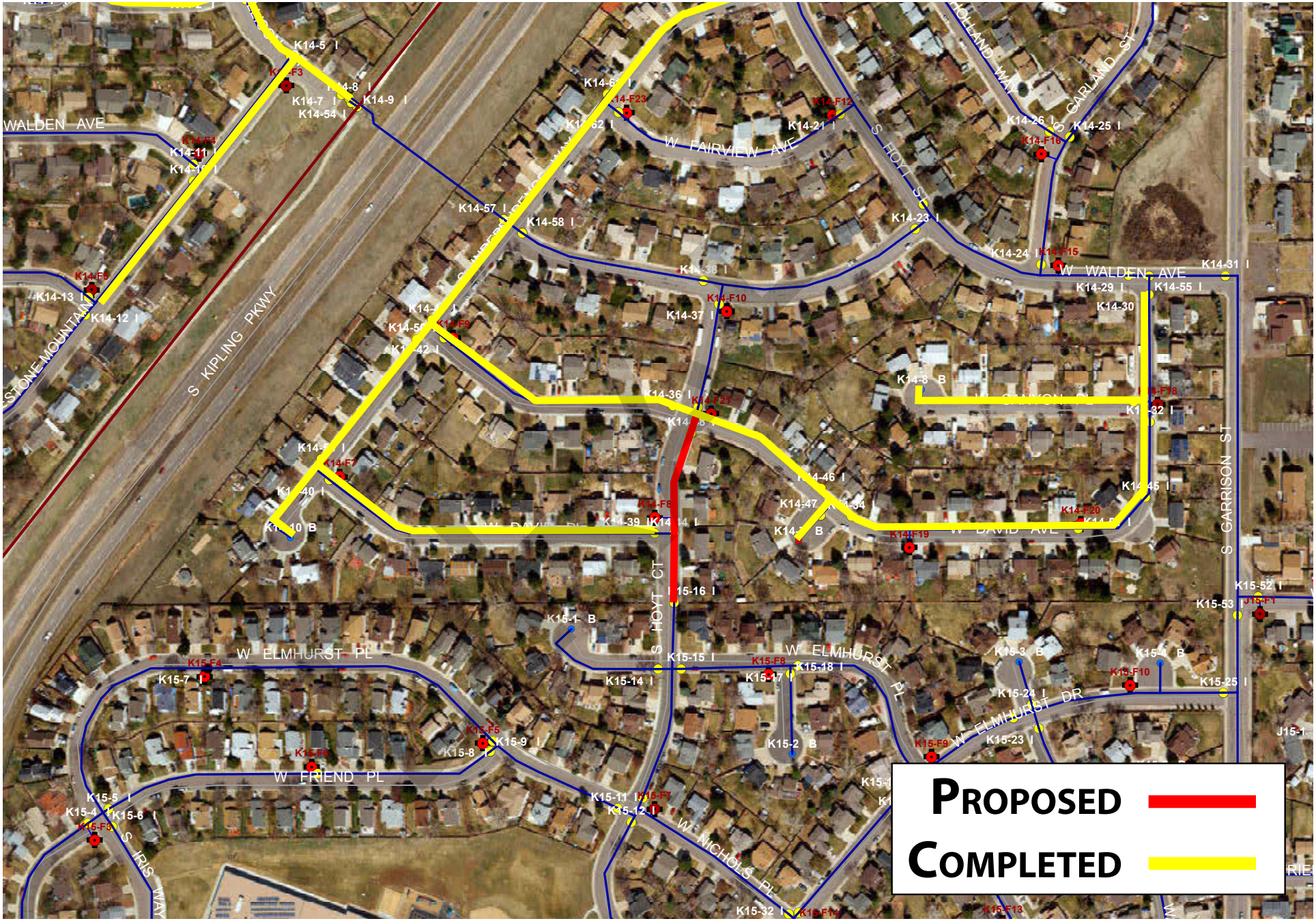
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Project:	**CIP 28-3W**	
Location:	W. Brittany Dr. between S. Pierson St. and Valve M05-10I (Powderhorn Subdivision)	
Description:	Replace 433 feet of 6-inch ductile iron pipe with 433 feet of 6-inch, C-900 DR 14 PVC pipe.	
Rating:	483 points (two electrolysis breaks in 2010 and 2014)	
Date Installed:	1985	
Cost:	Construction:	$ 75,775
	Engineering (10%)	$ 7,577
		$ 83,352
	Contingencies (15%)	$ 12,502
		$ 95,854

Project:	**CIP 28-4W**	
Location:	9525 W. Coal Mine Ave. to Hydrant number K08-F19 (Dutch Ridge Subdivision).	
Description:	Replace 152 feet of 8-inch ductile iron pipe with 152 feet of 8-inch, C-900 DR 14 PVC pipe.	
Rating:	477 points (2 electrolysis breaks in 2010 and 2014)	
Date Installed:	1984	
Cost:	Construction:	$ 53,200
	Engineering (10%)	$ 5,320
		$ 58,520
	Contingencies (15%)	$ 8,778
		$ 67,298

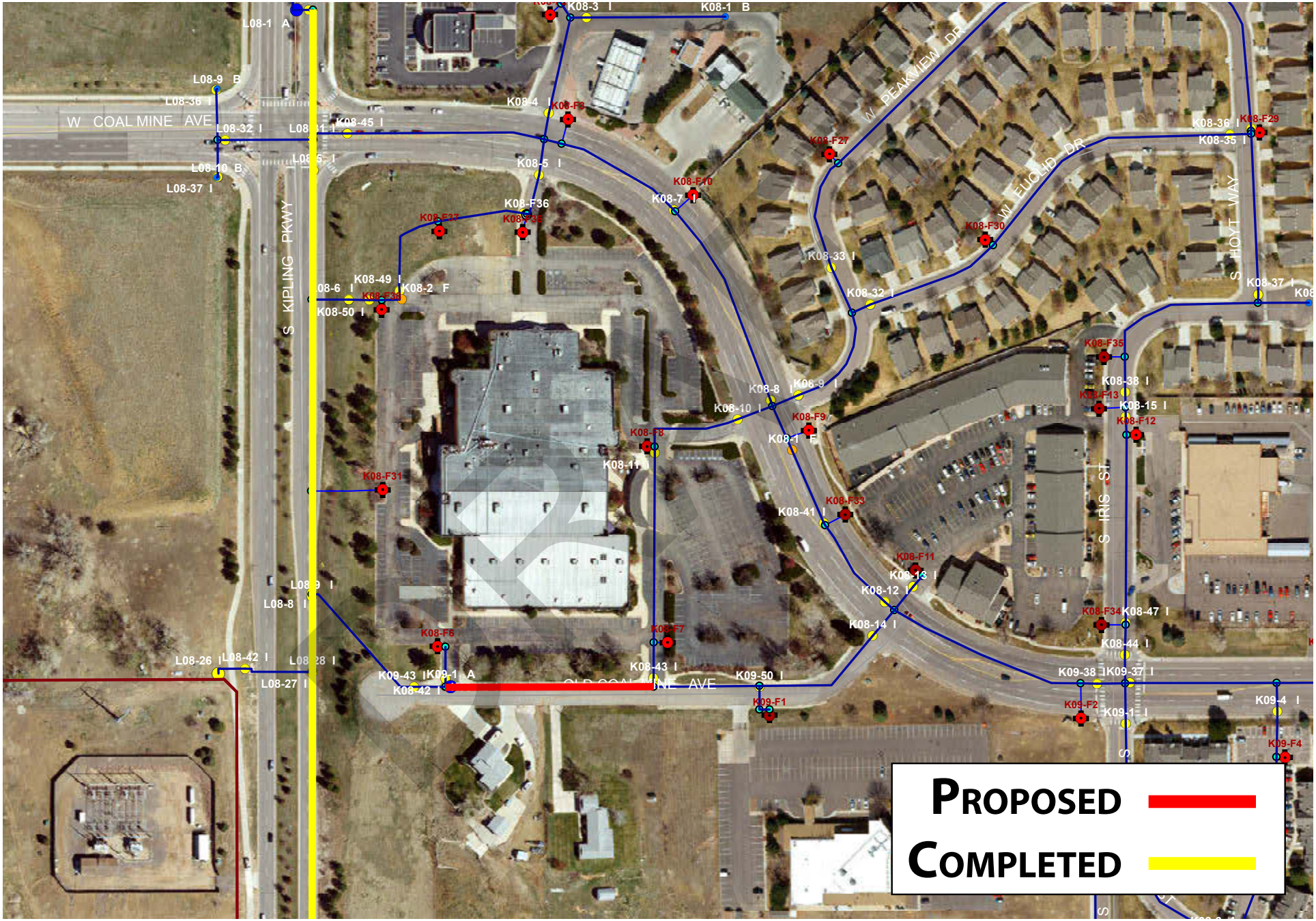
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PROJECT C.I.P. 28-1W
S. HOYT CT. WATER MAIN REPLACEMENT

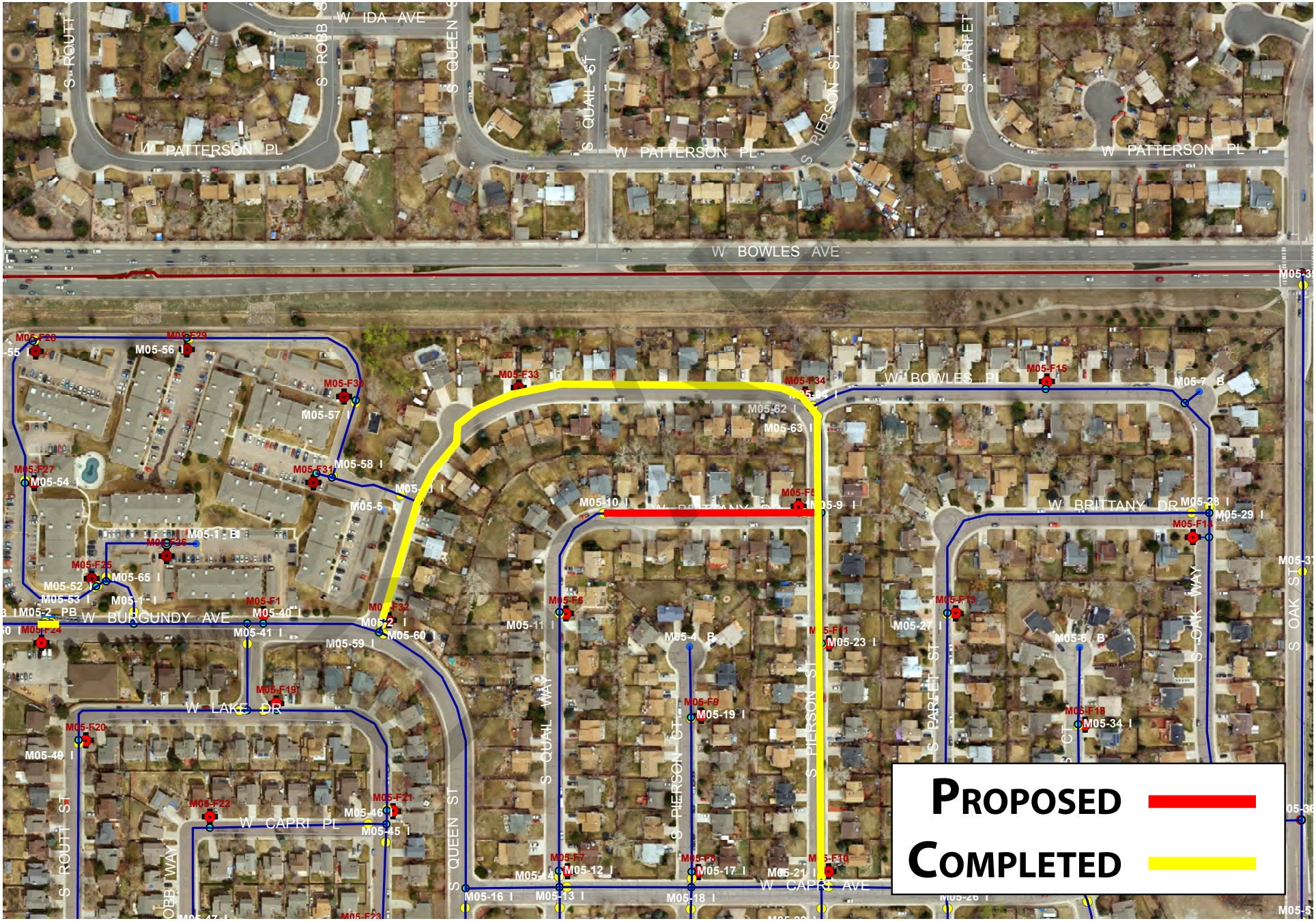


PROJECT C.I.P. 28-2W

W. OLD COAL MINE RD. WATER MAIN REPLACEMENT

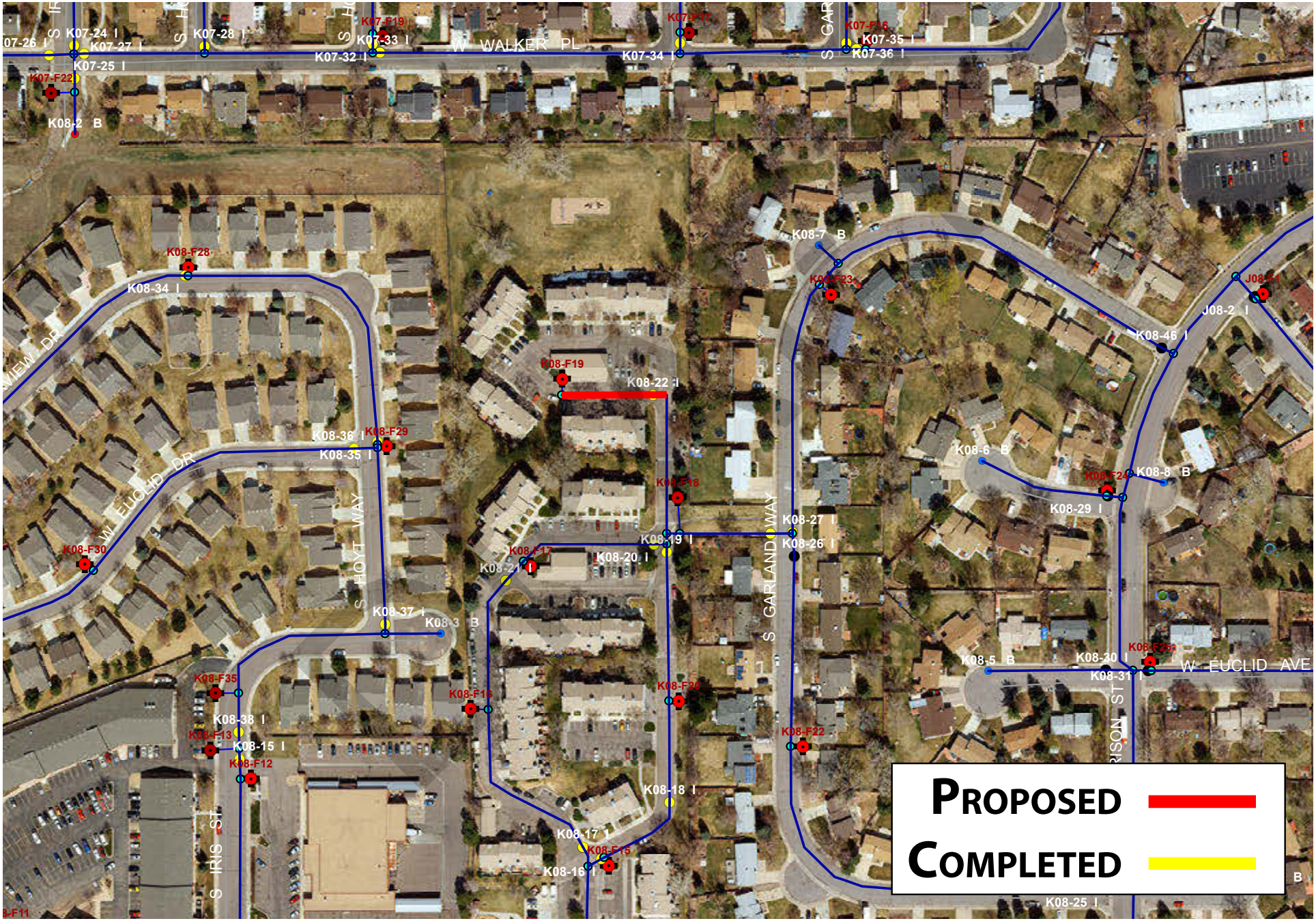


PROJECT C.I.P. 28-3W
W. BRITTANY DR. WATER MAIN REPLACEMENT



PROJECT C.I.P. 28-4W

W. COAL MINE AVE. WATER MAIN REPLACEMENT



2028 Capital Improvement Projects
Sewer

No projects scheduled.

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SECTION 4

SUMMARY OF COMPLETED WATER AND WASTEWATER SYSTEM EXPANSION AND REHABILITATION/REPLACEMENT PROJECTS

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SECTION 4

SUMMARY OF COMPLETED WATER AND WASTEWATER SYSTEM EXPANSION AND REHABILITATION/REPLACEMENT PROJECTS

October 2018 — **Project CIP 18-2W**
Removed two connections to a 10-inch water main in S. Wadsworth Blvd. and reconnected the two water mains to a 16-inch water main in S. Wadsworth Blvd. ($124,096 est.)

October 2018 — **Project CIP 18-1W**
Replaced 945 feet of 8-inch ductile iron pipe with 945 feet of PVC pipe in S. Pierson St. between W. Brittany Dr. and valve number M05-F11in the Powderhorn Subdivision (231,096 est.)

October 2018 — **Project CIP 18-1S**
Replaced 228 of 8-inch sewer pipe in W. Parkhill Ave. at S. Garland St. (Kipling Villas Subdivision) ($126,284)

October 2018 — **Project CIP 18-1E**
Replaced supervisory control and data acquisition system equipment ($132,421 est.)

November 2017 — **Project CIP 17-1S**
CIPP lined 2,745 feet of 8-inch concrete pipe located in Chatfield Ave. between S. Pierce St. and S. Lamar St. (Herrick Dale Subdivision) (98,214)

October 2017 — **Project CIP 17-2W**
Replaced variable frequency controllers at Hogback Pump Station ($41,525)

October 2017 — **Project CIP 17-1W**
Replaced 1,649 feet of 8-inch asbestos-concrete with 1,649 feet of 8-inch PVC pipe in W. Chatfield Ave. between S. Pierce St. and S. Lamar Ct. ($200,050)

August 2017 — **Project CIP 17-2S**
Installed 111 feet of 8-inch PVC pipe between manholes FV-3 and FV 2-5.4 (Fairway Vistas Subdivision) (59,490)

August 2016 — **Project CIP 16-1S**
CIPP lined 6,998 feet of 15-inch and 980 feet of 18-inch concrete sewer pipe, rehabilitate 31 manholes and replace all manhole frames and covers. ($946,155)

August 2016 — **Project CIP 16-1W**
Replaced 66 feet of 4-inch cast iron pipe including the blow-off assembly (Kipling Villas Subdivision) ($25,555)

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October 2015 **Project CIP 15-1S**
CIPP lined 4,237 feet of 36-inch concrete sewer pipe, lined 21 concrete manholes and replaced 21 manhole frames and covers on the B-line interceptor sewer between Platte Canyon Rd. and the South Platte River. ($1,232,479)

September 2015 **Project CIP 15-2S and 15-3S**
Replaced 836 feet of 8-inch SDR-35 PVC pipe with 836 feet of 8-inch SDR-35 pipe in S. Garrison St. between manholes SC 4-7A and SC 4-7B and W. Geddes Pl. between manholes SC 4-6 and SC 4-8 in the Stony Creek Subdivision and in W. Cooper Pl. between manholes FV 2-5 and FV 2-9 in the Fairway Vista Subdivision ($411,924)

September 2015 **Project CIP 15-1W**
Replaced 553 feet of 6-inch ductile iron pipe in S. Simms Ct. between W. Maplewood Ave. and valve number NO5-5B (Powderhorn Subdivision) ($147,354)

December 2014 **Project CIP 14-1S**
Cured-in-place lined 2,279 feet of 15-inch, 1,612 feet of 21-inch, and 1,842 feet of 36-inch concrete sewer pipe (C-line interceptor) Lined 37 manholes and replaced all manhole frames and covers. ($1,524,912)

October 2014 **Project CIP 14-1W**
Replaced pressure reducing valve and associated piping at W. Burgundy Ave. and S. Simms St., W. Coal Mine Ave. at S. Simms St., and 6618 S. Oak Cir. ($115,660)

September 2014 **Project CIP 14-2W**
Installed 1,100 feet of 12-inch C900, class 150 PVC pipe in W. Blakeland Dr. to establish a looped water system in the Blakeland Subdivision. ($273,704)

December 2013 **Project CIP 13-1S**
Cured-in-place lined 2,816 feet of 42-inch, 7,660 feet of 48-inch, and 1,411 feet of 60-inch concrete sewer pipe (A-line interceptor) Lined 43 manholes. ($3,642,127)

October 2013 **Project CIP 13-1W**
Replaced two pressure reducing valve assemblies at W. Coal Mine Ave. and S. Garrison St. and W. Coal Mine Ave. and S. Owens St. ($66,867)

September 2013 **Project CIP 13-3S**
Replaced 65 feet of 8-inch SDR-25 PVC pipe in S. Simms Wy. between manholes S-2C-1 and S-2C-2 in the Powderhorn Subdivision with 65 feet of 8-inch, C-900, class 200 PVC pipe. ($33,816)

September 2013 **Project CIP 13-2S**
Replaced four Inventron flow meters on the D-line interceptor (2 each), the Columbine interceptor, and the Massey Draw interceptor. ($35,625)

December 2012 **Project CIP 12-1S**

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Rehabilitate with a cured-in-place rehabilitation process 13,296 feet of 33-inch concrete pipe and 3,083 feet of 36-inch concrete pipe. Rehabilitate 51 manholes. ($2,514,591)

October 2012 **Project CIP 12-2S**
C-line and Dutch Creek flow meter rehabilitation. Replaced Inventron flow monitoring equipment with Echo equipment. ($16,438)

August 2012 **Project CIP 11-2W**
Installed a connection to Denver Water Conduit 10 with a pressure reducing valve and vault to provide a second hydraulic connection to the Herrick-Dale Subdivision. ($106,665)

June 2012 **Project CIP 11-1W**
Installed 440 feet of 8-inch, C-900, DR 18, PVC pipe in W. Ken Caryl Ave. between W. Indore Dr. and Falling Water Ranch Subdivision to provide an additional hydraulic connection between Falling Water Ranch and Meadows Sanctuary Subdivisions. ($131,715)

September 2011 **Project CIP 11-1S**
Rehabilitated using cured-in-place lining portions of the C-line interceptor sewer consisting of 5,119 feet of 15-inch, 1,053 feet of 21-inch and 138 feet of 27-inch concrete pipe. Rehabilitated and sealed 23 concrete manholes. ($623,265)

August 2011 A-line flow meter rehabilitation. Replaced Inventron flow monitoring equipment with Pulsar equipment. ($6,855)

September 2010 **Project CIP 10-1S**
Replaced 494 feet of 8-inch PVC pipe in S. Independence Wy. between manholes M3-1G4C and M3-1G4, and in W. David Ave. between manholes M3-1G4 and M3-1G3 and M3-1G2 and M3-1G1 (Meadows Subdivision. ($79,239.)

August 2010 Replaced 85 feet of 12-inch asbestos cement pipe in with 85 feet of 8-inch, C-900, class 150, PVC pipe on S. Yukon Way. (Columbine Knolls South Subdivision). ($25,115.)

October 2009 **Project CIP 09-1W**
Replaced 1,520 feet of 6-inch cast iron pipe in W. Burgundy Dr. and W. Brittany Dr. in Kipling Hills Subdivision with 1,520 feet of 6-inch, C-900, class 150, PVC pipe.

Replaced 205 feet of 6-inch cast iron pipe in S. Dover Ct. in Kipling Villas Subdivision with 205 feet of C900, class 200, PVC pipe.
($214,860)

October 2008 **Project CIP 08-1W**
Replaced 932 feet of 6-inch asbestos cement pipe with 932 feet of 6-inch, C-900, class 150, PVC pipe in S. Dover St. between W. Peakview Dr. and S. Dudley Wy. in the Woodmar Village Subdivision. ($131,769)

August 2008 **Project CIP 08-1S**

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Replaced 53 feet of 8-inch PVC pipe with 53 feet of 8-inch, C-900, class 200, PVC pipe in W. Hinsdale Pl. between manholes SC9-9 and SC9-10 in the Stony Creek Filing No. 9 Subdivision. ($18,648)

August 2008 **Project CIP 08-2S**
Replaced 160 feet of 8-inch PVC pipe with 160 feet of 8-inch, C-900, class 200, PVC pipe in W. Chatfield Ave. between manholes DS 3-5.1 and DS 3-5 in the Dakota Station Subdivision. ($55,945)

November 2007 **Project CIP 07-1W**
Replaced 840 feet of 8-inch ductile iron pipe with 840 feet of 8-inch, C-900, class 150, PVC pipe in W. Chatfield Ave. (easement) in the Dakota Station Subdivision Filing No. 3. ($102,822.)

November 2007 **Project CIP 07-2W**
Replaced 489 feet of 6-inch asbestos-cement pipe in W. Weaver Pl. east of W. Walker Dr. (Woodmar Square Subdivision) with 489 feet of 6-inch, C-900, class 150, PVC pipe. ($65,417)

August 2007 **Project CIP 07-1S**
Replaced 906 feet of 8-inch PVC sewer pipe in W. Cooper Dr. between manholes P6-11 and P6-9 and P6-8 and P6-7 (Powderhorn Subdivision Filing No. 6) with 906 feet of 8-inch, C-900, class 200 PVC pipe. ($205,206)

September 2006 **Project CIP 06-1W**
Replaced 245 feet of 4-inch ductile iron pipe in S. Moore St. north of W. Glasgow Ave. with 245 feet of 4-inch, C900, class 150, PVC pipe (Meadows Subdivision) ($59,098)

August 2006 **Project CIP 06-1S**
Rehabilitated (epoxy lined) 1,120 feet of 8-inch vitrified clay pipe in W. Kingsley Ave. between manholes MD-3 and HD-7 in the Herrick Dale Subdivision. ($34,861)

November 2005 **Project CIP 05-4W**
Replaced 1,252 feet of 12-inch cast iron pipe and 105 feet of 8-inch cast iron pipe with 1,357 feet of 12-inch, C900, class 150, PVC pipe in W. Ken Caryl Ave. between S. Garrison St. and S. Kipling St. ($316,867)

October 2005 **Project CIP 05-3W**
Replaced 1,300 feet of 8-inch ductile iron pipe with 1,300 feet of 8-inch C900, class 150, PVC pipe in W. Bowles Cir. between W. Lake Ave. and valve number N05-29I (Powderhorn subdivision. ($120,807)

October 2005 **Project CIP 05-2W**
Replaced 1,200 feet of 6-inch ductile iron pipe with 1,200 feet of 6-inch C900, class 150, PVC pipe in S. Taft St. between W. Lake Ave. and S. Swadley Wy. (Powderhorn subdivision). ($120,807)

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October 2005 **Project CIP 05-1W**
Replaced 1,020 feet of 6-inch asbestos-cement pipe with 1,020 feet of 6-inch C900, class 150, PVC pipe in W. Laurel Pl. between Spread Eagle Mountain and S. Jellison St. (Williamsburg Subdivision Filing No. 1). ($120,807)

November 2004 **Project CIP 04-1W**
Replaced 800 feet of 6-inch ductile iron pipe with 800 feet of 6-inch C900, class 150, PVC pipe in S. Parfet St. between W. Walker Dr. and W. Polk Dr., and replaced 1,127 feet of 8-inch ductile iron pipe with 1,127 feet of 8-inch C900, class 150, PVC pipe in W. Bowles Ave. between W. Burgundy Ave. and S. Pierson St. ($100,857)

November 2004 **Project CIP 04-2W**
Replaced 1,127 feet of 8-inch ductile iron pipe with 1,127 feet of 8-inch C900, class 150, PVC pipe in W. Bowles Ave. between W. Burgundy Ave. and S. Pierson St. ($139,278.)

November 2004 **Project CIP 04-1S**
Replaced 574 feet of 8-inch SDR-25, PVC pipe with 574 feet of 8-inch C900, class 200, PVC pipe. ($117,982)

October 2004 **Project CIP 04-2S**
Rehabilitated using a cured-in-place method of rehabilitation 1,300 feet of 12-inch clay tile pipe in W. Maplewood Pl., S. Holland Way, and W. Parkhill Ave. in the Kipling Villas Subdivision. ($53,896)

June 2004 **Project CIP 03-1S**
Constructed sewer flow metering vault on the B-Line Sewer Interceptor. ($275,043)

October 2003 **Project CIP 03-1W**
Replaced 1,600 feet of 6-inch ductile iron water pipe in S. Independence Way between S. Hoyt St. and the end of the Independence Way cul-de-sac (Meadows Subdivision Filing No. 3) ($146,784)

September 2003 **Project CIP 03-2S**
Replaced 938 feet of 8-inch SDR-35 PVC sewer pipe with 938 feet of C900, class 200, PVC pipe in S. Parfet St. from manhole P2-6A to P2-6, S. Owens Ct. from manhole P2-4B to P2-4A, and W. Coal Mine Ave. from manhole FV-2 to FV-1. ($163,383)

September 2002 Constructed sewer flow metering vaults on the Massey Draw and C-Line Interceptors. ($245,420)

December 2002 **Project CIP 02-2S**
Replaced 876 feet of 8-inch SDR-35 PVC pipe with 876 feet of C900, class 200, PVC pipe in S. Oak Ct. between S. Parfet St. and S. Owens St. (manholes P2-2E to P2-2). ($39,236)

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December 2002 **Project CIP 02-1W**
Replaced 455 feet of 6-inch ductile iron pipe in W. Canyon Pl. (Meadows Subdivision Filing No. 2) with 455 feet of 6-inch C900, class 150, PVC pipe. ($128,375)

December 2001 **Project CIP 01-1W**
Replaced 405 feet of 12-inch, 430 feet of 8-inch, and 810 feet of 6-inch asbestos cement pipe in Vista View Dr. between W. Ottawa Ave. and W. Meadows Dr. and in S. Lewis Ct. between S. Miller Ct. and S. Miller St. with C-900, class 150, PVC pipe. ($261,421)

December 2001 **Project CIP 01-4W**
Replaced 186 feet of 6-inch ductile iron pipe in W. Nova Pl. west of S. Garland St. with 186 feet of 6-inch, C-900, class 150, PVC pipe. ($15,798)

December 2001 Replaced 360 feet of 8-inch, SDR-35, PVC sewer pipe between manholes M.31 and M.32 in W. Ontario Ave. with 360 feet of 8-inch, C-900, class 200, PVC pipe. Replaced 8-inch SDR-35, PVC pipe in W. Cooper Ave. between manholes S-2F-1 and S-2F with 127 feet of 8-inch, C-900, class 200, PVC pipe. Replaced 231 feet of 8-inch, SDR-35, PVC pipe in S. Parfet St. between manholes P2 and 6A and P2 and 6B with 231 feet of C-900, class 200, PVC pipe. ($168,828)

November 2000 **Project CIP 99-1W-RR**
Replaced 1,300 feet of 8-inch ductile iron pipe in W. Bowles Cir. From a point 150' west of S. Simms St. to valve number N05-29I with 1,300' of 8-inch C-900, class 150 PVC pipe. ($99,819)

September 2000 **Project CIP 00-1W**
Replaced 1,100 feet of ductile iron pipe in Bowles Avenue Marketplace with 1,100 feet of C-900, class 150, PVC pipe. ($104,325)

September 2000 **Project CIP 00-1S**
Replaced 282 feet of 8-inch, SDR-35, PVC pipe between manholes PH 3A-1 and PH 3 on S. Owens Ct. and 260 feet of 8-inch, SDR-35, PVC pipe between manholes PH 3 and PH 2 on W. Fair Ave. with C-900, class 200, PVC pipe (Powderhorn Subdivision Filing No. 5). ($117,987).

August 2000 **Project CIP 00-2W**
Replaced 26 Pacific States fire hydrants located at the following locations:

1.	On W. Walker Dr. and S. Yukon St.	H07-F12
2.	On S. Teller Ct. and W. Polk Ave.	H07-F3
3.	On S. Webster St. and S. Yukon St.	H08-F1
4.	On W. Walker Dr. and S. Peakview Ave.	H08-F6
5.	On W. Calhoun Pl. and W. Calhoun Dr.	I08-F4
6.	On S. Upham St. at W. Euclid Pl.	H08-F4
7.	On S. Brentwood St. at W. Polk Pl.	I07-F4
8.	On W. Caley Pl. 500' west of Yarrow St.	I07-F5
9.	On W. Caley Pl. 550' west of Yarrow St.	I07-F6
10.	On S. Yarrow St. at W. Caley Dr.	I07-F7
11.	On W. Calhoun Pl. at W. Calhoun Dr.	I08-F4
12.	On S. Allison Ct. at W. Hoover Pl.	I08-F5

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13.	On W. Arbor Dr. at S. Everett Ct.	J06-F21
14.	On S. Field Ct. at W. Arbor Ave.	J06-F22
15.	On S. Everett Wy. At S. Estes St.	J07-F6
16.	On W. Weaver Ave. at S. Dudley Wy.	J07-F7
17.	On S. Santa Fe Dr. 2, 750' south of Mineral	C15-F1
18.	On S. Santa Fe Dr. 6,800' south of Mineral	C17-F1
19.	On S. Holland Wy. At W. Maplewood Pl.	K06-F4
20.	On S. Independence St. at W. Maplewood Pl.	K06-F3
21.	On S. Holland St. 50' west of Maplewood	K06-F11
22.	On W. Burgundy Ave. at S. Holland Wy.	K05-F9
23.	On S. Holland St. at W. Capri Ave.	K05-F21
24.	On W. Capri Ave. at S. Independence St.	K05-F13
25.	On W. Lake Ave. at S. Independence St.	K05-F12
26.	On W. Lake Ave. at S. Holland Wy.	K05-F11

($55,694)

August 2000

Project CIP 00-3W, CIP 01-3W, and CIP 02-2W
Installed By-Pass Assemblies at zone valves located at the following sites:

1.	On W. Fairview Dr. at S. Saulsbury Ct.	H13-19I
2.	On W. Nova Dr. at W. Morraine Dr.	H13-21I
3.	On S. Pierce Wy. at W. Morraine Dr.	H13-28I
4.	On W. Ken Caryl Ave. at S. Pierce St.	H13-31I
5.	On W. Walden Dr. at S. Upham St.	H14-1I
6.	On W. David Dr. at S. Vance Ct.	H14-23I
7.	On S. Vance Ct. at W. Nichols Pl.	H15-24I
8.	On S. Quay Ct. at W. Clifton Pl.	H16-19I
9.	On S. Vance Ct. at W. Nichols Pl.	H16-4I
10.	On W. Clifton Ave. at S. Upham St.	H16-5I
11.	On S. Upham St. at W. Clifton Ave. (north)	H16-6I
12.	On S. Cody Wy. at W. Capri Pl.	J05-37I
13.	On S. Wadsworth Blvd. At W. Bowles Ave.	J05-43I
14.	On W/ Arbor Ave. at S. Garrison St.	J06-47I
15.	On S. Flower St. 120' west of Capri Ave.	J06-50I
16.	On W. Glasgow Ave. at S. Nelson St.	L12-1I
17.	On S. Oak St. at W. Capri Ave.	M05-36I
18.	On S. Oak Cir. At Cooper Dr.	M08-25I
19.	On S. Newcombe St. at W. Rowland Ave.	M10-8I
20.	On W. Roxbury Ave. at W. Meadows Dr.	L11-42I
21.	On W. Polk Dr. at W. Weaver Dr.	J07-3I
22.	On S. Everett Wy. at W. Peakview Dr.	J08-34I
23.	On S. Field Wy. at W. Peakview Dr.	J08-36I
24.	On W. Peakview Dr. at W. Weaver Dr.	J08-38I
25.	On W. Euclid Ave. at S. Estes St.	J08-9I
26.	On W. Freemont Pl. at S. Carr St.	J11-22I
27.	On W. Glasgow Pl. at S. Carr St.	J12-36I
28.	On W. Maplewood Ave. at S. Garland Wy.	K06-18I
29.	On W. Maplewood Dr. at S. Garrison St.	K06-27I
30.	On. W. Meadows Dr. at W. Roxbury Ave.	L11-41I

($63,976)

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June 2000 **Project CIP 00-4W**
Installed a connection between a Southwest Metropolitan owned 8-inch water main in W. Chatfield Ave. and Denver Water Department's Conduit 10 at W. Chatfield Ave. and S. Lamar St. Installed a pressure reducing valve at the connection. ($63,836).

December 2000 **Project CIP 99-2S**
Installed flumes and flow metering stations on the Dutch Creek Interceptor and Columbine Interceptor. ($245,250)

May 2000 **Project CIP 97-1B-SE**
Expanded and Remodeled District Office building at 8739 W. Coal Mine Ave. ($1,747,788)

April 2000 **Project CIP 97-1W-SE**
Installed 700' of 16-inch ductile iron water pipe in Continental Divide Rd. between Chatfield Pump Station and northern section line of Section 4. ($14,348)

April 2000 **Project CIP 97-2W-SE**
Constructed 15.0 million gallon per day pump station with associated piping and controls. Project included installation of a pressure reducing valve station on Denver Water Department Conduit 115 at S. Kipling St. and W. Coal Mine Ave. ($397,252)

April 2000 **Project CIP 97-3W-SE**
Constructed 5.0-million-gallon reservoir at W. Chatfield Ave. and S. Kipling St. ($485,131)

December 1999 **Project CIP-2W-RR**
Replaced Pacific States fire hydrants at the following locations:

1.	S. Yarrow at W. Euclid Pl.	I08-F11
2.	S. Allison St. at W. Peakview Dr.	I07-F3
3.	S. Dover St. at S. Cody Way	J07-F8
4.	W. Arbor Ave. at W. Parkhill Ave.	J06-F24
5.	S. Holland Way at W. Bowles Ave.	K05-F8
6.	W. Maplewood Pl. at S. Garland Ct.	K06-F10
7.	W. Lake Dr. at S. Garland Way	K05-F14
8.	W. Lake Dr. at S. Garland Way	K05-F15
9.	W. Burgundy Ave. at S. Garland Way	K05-F10

($17,823)

December 1999 **Project CIP 99-1S-RR**
Installed two sewer flow metering stations on the D-Line Interceptor. ($311,816)

November 1998 **Projects CIP 98-1W-RR and CIP 98-3W-RR**
Replaced 70 feet of 12-inch, 1,676 feet of 6-inch, and 100 feet of 4-inch ductile iron pipe in W. David Avenue between S. Garrison Court and S. Independence Way and 562 feet of cast iron pipe in W. Brittany Place between S. Estes Street and W. Brittany Drive. **(**$225,010**)**

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July 1998 **Project CIP 98-2W-RR**
Replaced five Pacific States Fire Hydrants at the following locations:

1. W. Euclid Avenue at S. Everett Way
2. S. Field Street at S. Everett Way
3. S. Field Street at W. Peakview Drive
4. S. Everett Way at W. Peakview Drive
5. S. Estes Street at W. Peakview Drive

($9,533)

October 1997 **Project CIP 97-1S-RR**
Replaced 800 feet of 8-inch SDR-35 sewer pipe with 800 feet of C-900, Class 200 PVC pipe in Crestone Mountain and W. Fairview Avenue. **($71,133)**

July 1997 **Project CIP 97-2W-RR**
Replaced five Pacific States fire hydrants at:

1. W. Euclid Avenue at S. Garrison Street (K08-F25)
2. S. Field Ct. At W. Euclid Avenue (J08-F2)
3. S. Dover Way at W. Euclid Place (J08-F9)
4. S. Upham Street at W. Euclid Place (H08-F4)
5. S. Dover Way at S. Dover Street (J08-F10)

($12,049)

May 1997 **Project CIP 97-1W-RR**
Replaced 200 feet of 6-inch cast iron pipe in W. Capri Place and 1,000 feet of 8-inch cast iron pipe in W. Cody Way with C-900, Class 150 PVC pipe. ($105,522)

September 1996 **Project CIP 96-2W-RR**
Relocated 1,000 feet of 16-inch pipe in W. Coal Mine Ave. between S. Wadsworth Blvd. and 8739 W. Coal Mine Ave. ($86,948)

August 1996 **Project 94-1W-RR**
Replaced 1,300 feet of 8-inch asbestos-cement pipe and 1,900 feet of 16-inch ductile iron pipe in W. Ken Caryl Ave. between S. Carr St. and S. Estes St. with a 16-inch ductile iron pipe. ($152,724)

August 1996 **Project CIP 94-3W-SE**
Constructed 5.74 million gallons per day pumping station at 13398 W. Coal Mine Ave. ($540,518)

July 1996 **Project CIP 94-2W-SE**
Constructed 3.55 million gallon treated water reservoir on the east side of the Dakota Hogback south of W. Bowles Ave. ($2,309,961)

July 1996 **Project 96-3W-RR**
Replaced five Pacific States fire hydrants at:

1. W. Burgundy Ave., 620 feet SE of S. Cody St. (J05-F17)
2. W. Capri Pl., 175 feet east of S. Cody St. (J05-F18)
3. S. Ammons Ct. at W. Peakview Dr. (I08-F2)

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4. S. Brentwood Way at W. Peakview Dr. (I07-F11)
5. W. Brittany Pl. at W. Brittany Dr. (J05-F16)

September 1995 **Project CIP 95-2W-RR**
replaced Pacific States fire hydrants at:

1. S. Santa Fe Dr. 200 feet S of entrance to Wolhurst Subdivision (C16-F1)
2. S. Cody Way at W. Peakview Dr. (J08-F12)
3. 7808 W. Peakview Dr. (I07-F8)
4. S. Wadsworth Blvd., 200 feet N of W. Parkhill Ave. (J06-F12)
6. W. Arbor Ave., at S. Dudley Ct. (J06-F18)

($14,100)

September 1995 Replaced 765 feet of 6-inch cast iron pipe with 765 feet of 6-inch PVC pipe in W. David Place between S. Independence Way and S. Hoyt Street. ($56,461.25)

August 1995 **Unscheduled Project**
Relocated 2,625 feet of 16-inch, 2,104 feet of 12-inch, 312 feet of 8-inch, and 105 feet of 6-inch cast iron and asbestos-cement water main in S. Kipling St. between W. Geddes Ave. and W. Bowles Ave. **(**$353,560.67 total cost; $133,230.66 Southwest Metropolitan and $220,330.02 Jefferson County)

July 1995 **Project CIP 95-1W-RR**
Relocated 484 feet of 12-inch cast iron pipe with 12-inch ductile iron pipe in W. Coal Mine Avenue east of S. Wadsworth Blvd. ($25,591.96)

May 1995 **Project 94-1W-SE**
Installed 6,300 feet of 36-inch water main in W. Coal Mine Ave. from S. Ward St. to Hogback Reservoir (Denver Water Department Conduit 137 Phase II). ($841,273.35)

May 1995 **Project CIP 94-1S-SE**
Installed 2,900 feet of 15-inch, 1,510 feet of 18-inch, and 5,585 feet of 21-inch PVC sewer pipe along the western boundary of South Platte Park (Platte River Interceptor Sewer). ($931,924.47)

September 1994 Replaced Pacific States fire hydrants at:

1. S. Garland Way at S. Garrison (south intersection)
2. S. Dudley Way at W. Peakview Dr.
3. W. Polk Ave., 500' east of S. Yukon Ct.
4. W. Caley Dr. 375' east of S. Yukon Ct. and W. Weaver Pl. at W. Walker Dr.

($12,407)

July 1994 A-Line Interceptor Sewer Flow Metering Station. ($85,994)

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August 1993 Acquired the 20-inch water main in Mineral Avenue between Platte Canyon Rd. and Santa Fe Drive from the Denver Water Department. ($182,927)

May 1993 Replaced 1,180 feet of 12-inch asbestos-cement water pipe in S. Jellison St. between W. Laurel Pl. and Crestone Mountain (Williamsburg Subdivision Filing No. 1). ($101,900)

September 1990 Installed 30 feet of 12-inch ductile iron pipe in S. Pierce St. at W. Polk Ave. ($8,093)

September 1990 Installed fire hydrant assembly on S. Wadsworth Blvd. at W. Bowles Ave. ($3,350)

August 1990 Replaced 285 feet of 8-inch PVC. sewer main (collapsed) in W. Peakview Dr. north of Coal Mine Ave. (MH FV-3 to MH FV-4) (Fairway Vista). ($29,900)

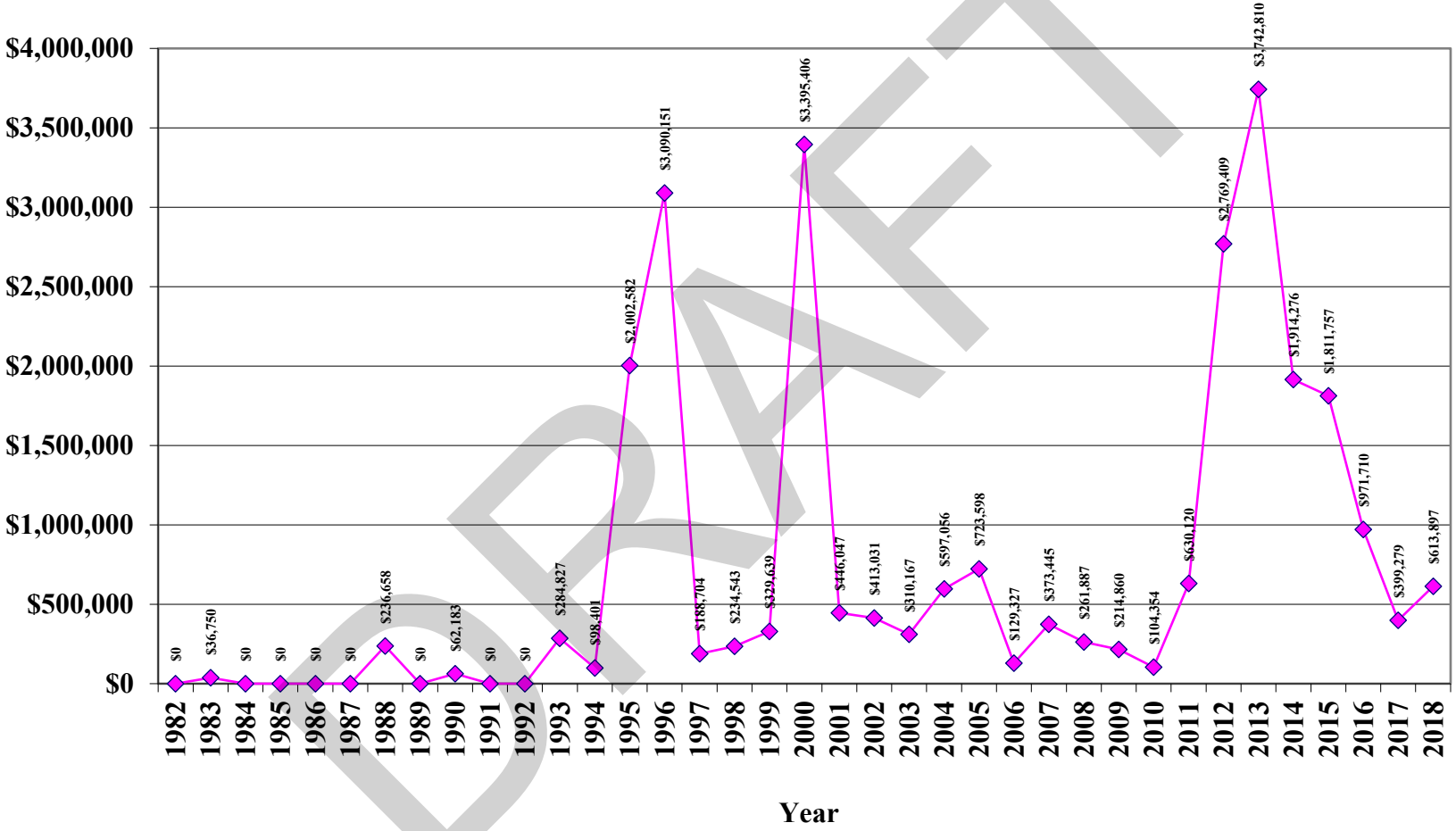
May 1990 Replaced 180 feet of 8-inch PVC. sewer main (collapsed) in S. Iris Way between S. Johnson Ct. and W. Friend Pl. (MH DS-9 to MH DS-10) (Dakota Station Subdivision Filing No. 2). ($20,840)

November 1988 Installed 5,253 feet of 15 inch, 99 feet of 18 inch and 57 feet of 8 inch PVC sanitary sewer pipe for the Lilley Gulch Parallel between Wadsworth Blvd. and Kipling St. ($236,658)

February 1983 Replaced 625 feet of 12 inch asbestos-cement water main in Crestone Mountain between S. Jellison St. and W. Canyon Ave. and 475 feet of 6 inch asbestos-cement water main in W. Walden Ave. west of Crestone Mountain (Williamsburg #1). ($36,750)

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Capital Improvement Expenditures

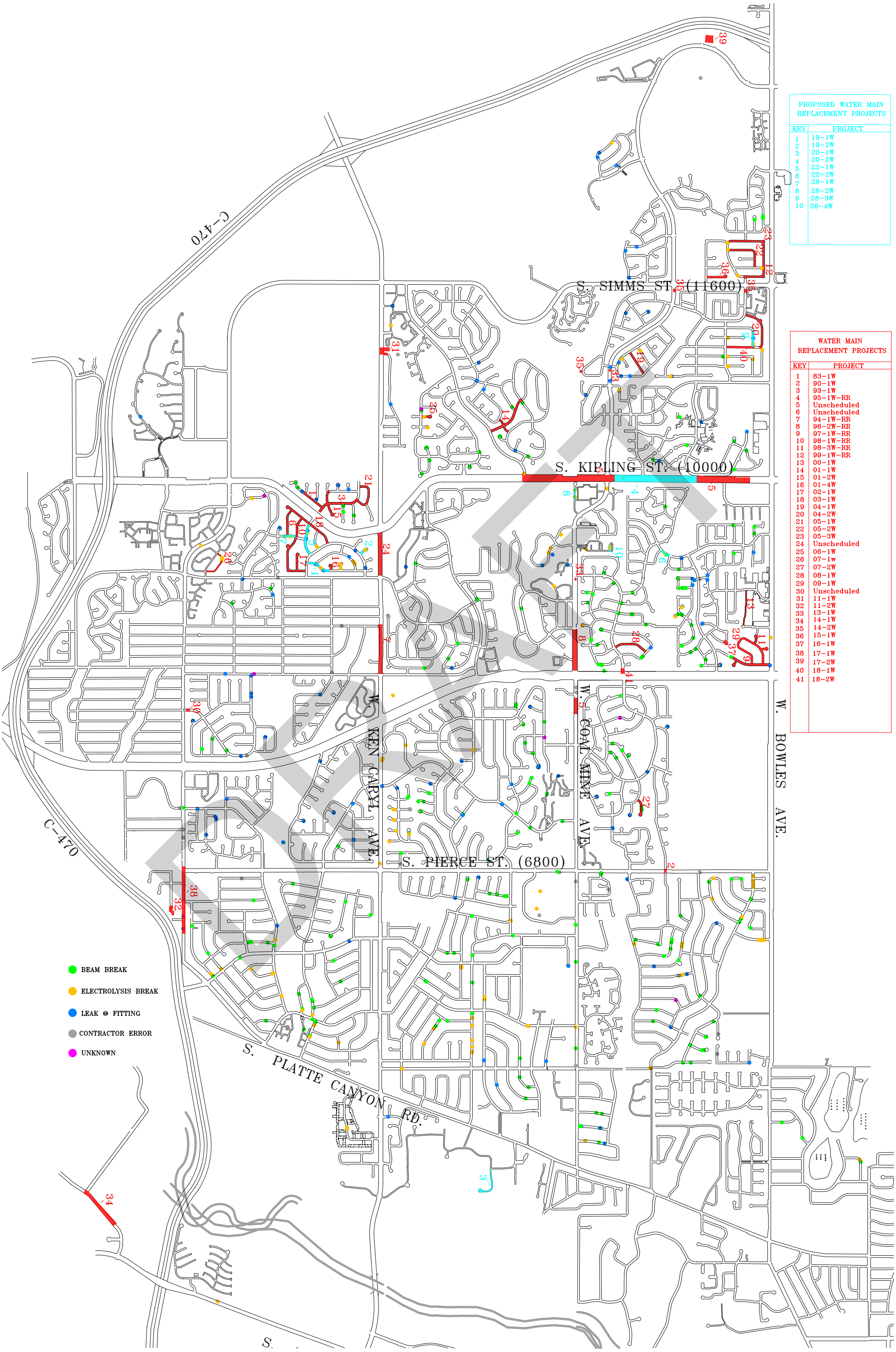


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SECTION 5

CAPITAL IMPROVEMENT PROJECT MAP

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PROPOSED WATER MAIN REPLACEMENT PROJECTS

KEY	PROJECT
1	19-1W
2	19-2W
3	20-1W
4	20-2W
5	22-1W
6	22-2W
7	28-1W
8	28-2W
9	28-3W
10	28-4W

WATER MAIN REPLACEMENT PROJECTS

KEY	PROJECT
1	83-1W
2	90-1W
3	93-1W
4	95-1W-RR
5	Unscheduled
6	Unscheduled
7	94-1W-RR
8	96-2W-RR
9	97-1W-RR
10	98-1W-RR
11	98-3W-RR
12	99-1W-RR
13	00-1W
14	01-1W
15	01-2W
16	01-4W
17	02-1W
18	03-1W
19	04-1W
20	04-2W
21	05-1W
22	05-2W
23	05-3W
24	Unscheduled
25	06-1W
26	07-1w
27	07-2W
28	08-1W
29	09-1W
30	Unscheduled
31	11-1W
32	11-2W
33	13-1W
34	14-1W
35	14-2W
36	15-1W
37	16-1W
38	17-1W
39	17-2W
40	18-1W
41	18-2W