



**4th DRAFT**

**2018 Capital Budget  
2018-2030 CIP**

Updated: **May 9, 2017**

2018 Total **20,916,000**

Budget Goal w/ Inflation \$ 17,225,000 \$ 20,730,000 21,560,000 22,420,000 23,320,000 24,250,000

Annual Totals \$ 3,723,000 \$ 17,193,000 \$ 20,919,000 \$ 22,187,000 \$ 22,846,000 \$ 22,985,000 \$ 25,714,000

Line	Project	Description/Purpose	Primary Construction Year	Tasks	2018 Reauthorization	2018	2019	2020	2021	2022	2023
1	<b>BPS #106 Area Hydraulic Improvements</b>		<b>Multiple Years</b>								
2		The upgrade of Booster Pump Station 106 was finished in 2014. Piping improvements to the system have made over several years in the Sunset Hills area. Funds are budgeted for piping improvements to benefit this		Pipeline Improvements				842,000			
3				<b>Total</b>	-	-	-	<b>842,000</b>	-	-	-
5	<b>Well 7 Area Hydraulic Improvements</b>		<b>Multiple Years</b>								
6		Well 7 was totally reconstructed in 2015. To fully benefit from the well upgrade, hydraulic capacity improvements to the distribution system have been budgeted and planned. Piping improvements on Schlimgen Avenue and Mac Pherson Street will improve east west water flow.		Finalize Construction							
7				Pipeline Improvements				866,000			
8				<b>Total</b>	-	-	-	<b>866,000</b>	-	-	-
18	<b>Lake View Reservoir and BPS Reconstruction (Res 113)</b>		<b>2015</b>								
19		Construction of the Lake View Reservoir was completed in 2017. Reconstruction of the Lake View Reservoir and associated pipe upgrades is the first phase of a significant water supply facility upgrade on the north side of Madison. Funds are budgeted in 2020 to upgrade the existing Lake View Booster Pumping station to increase capacity. Hydraulic improvements are being made to the distribution system in 2020 along Lake View Avenue, Esch Lane, and N. Sherman Avenue to improve hydraulics within Pressure Zone 5. This will allow the Zone to be significantly expanded.		Public Engagement				5,000			
20				Engineering Services			161,000				
21				Construct 2-Zone Reservoir							
22				System Hydraulic Imp				1,200,000			
23				Upgrade Pumps @ BPS 213				1,240,000			
24				Water Main Imp. To BPS 213							
25				<b>Total</b>	-	-	<b>161,000</b>	<b>2,445,000</b>	-	-	-
27	<b>Well 31 Design and Construction</b>		<b>2017</b>								
28		In 2015 a 1.5 MG reservoir was constructed on the Well 31 site as Phase 1 of development of the facility. The well house, filter, and booster pump station were bid in early 2017 with construction slated to start in June 2017 and complete by June 2018. Well 31 project will correct a significant system fire protection deficiency identified by the Water Master Plan Pressure Zone 4. Significant expansion of the system over the years to the south and east has resulted in a significant supply restriction in Zone 4. Adding a second source of supply south of the Beltline Highway will improve fire flow capacity. Funds are budgeted for 2019 and 2023 for distribution system improvement along Dutch Mill Road and Voges Rd extended.		Public Engagement							
29				Drill Production Well							
30				Engineering Services	150,000						
31				Construction	2,000,000						
32				Hydraulic Improvement			511,000				575,000
33				<b>Total</b>	<b>2,150,000</b>	-	<b>511,000</b>	-	-	-	<b>575,000</b>
35	<b>Blackhawk Elevated Reservoir (Zone 10)</b>		<b>2017</b>								
36		Due to growth on the far west side, a 1.0 MG elevated reservoir is required to meet fire protection requirements. The tower will combine Pressure Zones 10 and 11 and provide additional gravity fed water storage capacity within Pressure Zone 10. The Blackhawk Reservoir is currently under construction and is scheduled to be in service by September 2018. Piping will be added along Old Sauk to connect the reservoir to the system in early 2018. To further improve north south hydraulic connectivity, piping will be added and improved as the area develops. Funds are budgeted in 2021 for anticipated needed piping improvements.		Public Engagement							
37				Engineering Services	50,000						
38				Construct 1 MG reservoir	1,100,000						
39				Reservoir piping improvements		181,000					
40				Water Main Improvements		599,000			1,240,000		
41				<b>Total</b>	<b>1,150,000</b>	<b>780,000</b>	-	-	<b>1,240,000</b>	-	-
43	<b>Unit Well 12 Conversion to a Two Zone Well</b>		<b>2018</b>								
44		Well 12 will be converted to a two zone well to provide water supply capacity to both Pressure Zone 7 and Pressure Zone 8. This conversion will provide operational flexibility and reliability to the west side supply system. The project will be under construction in 2018 and in service in 2019. Piping improvements along Whitney way are planned for 2023 to bolster hydraulic capacity.		Engineering Services							
45				Well House Construction		3,262,000					
46				Water Main Improvements							1,608,000
47				<b>Total</b>	-	<b>3,262,000</b>	-	-	-	-	<b>1,608,000</b>



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<b>Annual Totals</b>	\$ 3,723,000	\$ 17,193,000	\$ 20,919,000	\$ 22,187,000	\$ 22,846,000	\$ 22,985,000	\$ 25,714,000	

Line	Project	Description/Purpose	Primary Construction Year	Tasks	2018 Reauthorization	2018	2019	2020	2021	2022	2023
48											
49	<b>Water Treatment System at Well 19</b>		<b>2019</b>				<b>Start Const</b>				
50		Iron, manganese and radium at Well 19 require treatment. These three contaminants exceed Madison Water Utility water quality goals. A pressure filter system will remove these contaminants from the water and improve overall water quality bringing the system into compliance with Utility goals.		Public Engagement			10,000				
51			Engineering Services	423,000							
52			Filter Construction				4,071,000				
53			<b>Total</b>	<b>423,000</b>	<b>-</b>	<b>4,081,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
54											
55	<b>BPS 129 Reconstruction</b>		<b>2019</b>				<b>Start Const</b>				
56		Construction of a new and upgraded booster pump station 129 is needed to increase water transfer capacity from Zone 6E to Zone 3. This project will replace the temporary pump station constructed on the Well 29 site in 1990. Pump Station 129 will continue to transfer water from Zone 6E to Zone 3 and back again through a PRV. This operation will provide supply and fire flow capability to the far east side of the system. It will benefit customers through gained reliability and flexibility of operations.		Public Engagement		6,000					
57			Engineering Services		328,000						
58			Water Main Improvements				332,000	866,000	793,000		
59			Construct BPS 129				2,737,000				
60		<b>Total</b>	<b>-</b>	<b>334,000</b>	<b>3,069,000</b>	<b>866,000</b>	<b>793,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	
61											
62	<b>Booster Pump Station 109 (Spanem Ave)</b>		<b>2020</b>				<b>Start Const</b>				
63		With the addition of Well 31 on Tradewinds, water can be moved from Pressure Zone 4 to Pressure Zone 6E to improve overall operational flexibility and reliability. Booster Pump Station 109 is proposed to be constructed at Well 9 to fulfill that function. The pump station will move water from Pressure Zone 4 to Pressure Zone 6E and a pressure reducing valve station will allow water to move from Pressure Zone 6 E to Pressure Zone 4. Piping improvements are budgeted for Buckeye Road and Dean Avenue to improve hydraulic connectivity.		Public Engagement							
64			Engineering Services			284,000					
65			Construct BPS 109					2,364,000			
66			Water Main Improvements						744,000		
67		<b>Total</b>	<b>-</b>	<b>-</b>	<b>284,000</b>	<b>2,364,000</b>	<b>744,000</b>	<b>-</b>	<b>-</b>	<b>-</b>	
68											
69	<b>Well 28 Iron and Manganese Filter</b>		<b>2021</b>				<b>Start Const</b>				
70		Iron and manganese concentrations at Well 28 exceed Utility water quality standards and guidelines. Construction of an Iron and Manganese Filter at Well 28 will address the water quality issues and risk of colored water events and customer complaints on the far west side. A filter will also reduce the need for flushing and will allow Well 28 to become a year around well if necessary due to increasing demands.		Public Engagement			5,000	5,000			
71			Engineering Services			572,000					
72			Filter Construction						4,403,000		
73			<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>577,000</b>	<b>4,408,000</b>	<b>-</b>	<b>-</b>	<b>-</b>
74											
75	<b>Well 30 Iron and Manganese Filter</b>		<b>2022</b>				<b>Start Const</b>				
76		Iron and manganese concentrations at Well 30 exceed Utility water quality standards and guidelines. Construction of an Iron and Manganese Filter at Well 30 will address the water quality issues and risk of colored water events and customer complaints in the Well 30 service area. A filter would improve finished water quality and reduce the need for annual flushing in the Well 30 service area.		Public Engagement			5,000	5,000			
77			Engineering Services			595,000					
78			Filter Construction						4,579,000		
79			<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>600,000</b>	<b>4,584,000</b>	<b>-</b>	<b>-</b>
80											
81	<b>Well 14 Mitigation</b>		<b>2023</b>				<b>Start Const</b>				
82		Well 14 provides an excellent source of water to the west side of Madison and it is in the Utility's best interests to maintain the water supply point in the system. Due to winter road salt operations on University Avenue and the surrounding neighborhoods chloride levels in the water pumped from Well 14 have been rising for several years. A project is proposed for 2018 to investigate alternatives to reduce the Cl concentrations at Well 14.		Public Engagement						10,000	
83			Engineering Services							541,000	
84			Property Purchase							250,000	
85			<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>801,000</b>	<b>4,160,000</b>
86											
87											
88	<b>Well 18 VOC Air Stripper</b>		<b>2024</b>				<b>Start Const</b>				
89		Water Quality monitoring at Well 18 has indicated an upward trend in the VOC levels. Construction of a VOC Air Stripper at Well 18 will address regulatory issues due to these increasing VOC levels at the well. Well 18 provides an excellent source of water to the south side of Madison within Pressure Zone 6W and it is in the Utility's best interests to maintain the well.		Public Engagement							10,000
90			Engineering Services								463,000
91			VOC Treatment Construction								
92			<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
93											





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Line	Project	Description/Purpose	Primary Construction Year	Tasks	2018 Reauthorization	2018	2019	2020	2021	2022	2023		
94	<b>Well 24 Iron and Manganese Filter</b>		<b>2024</b>										
95	Iron and manganese concentrations at Well 24 exceed Utility water quality standards and guidelines. Construction of an Iron and Manganese filter will address the water quality issues and risk of colored water events and customer complaints in the service area.			Public Engagement							15,000		
96				Engineering Services								557,000	
97				Filter Construction									
98				<b>Total</b>	-	-	-	-	-	-	-	-	<b>572,000</b>
100	<b>New Well - Zone 7 &amp; 8</b>		<b>2025</b>										
101	The 2006 Water Master Plan recommends an additional well to serve both Pressure Zones 7 and 8. The proposed well will improve operational flexibility and system reliability. From Zones 7 and 8 water can be moved to Zones 9 and 10 through existing pumping stations. Water can also be moved to Zone 6W through existing pressure reducing stations. This facility will provide significant operational flexibility to the Utility on the west side of the system and ultimately benefit 5 different pressure zones. Projected development and growth on the west side and the Utility stated policy of limiting average well pumping to 50% of capacity for long term groundwater management make this an important water supply project.			Public Engagement					15,000	10,000			
102				Site Selection and Property Purchase							341,000		
103				Drill test well							144,000		
104				Drill production Well									1,142,000
105				Well Siting Eng Services									
106				Unit Well Engineering Services									
107				Construct Facility									
108				Pipeline Improvements									
109	<b>Total</b>	-	-	-	-	-	-	15,000	495,000	1,142,000			
111	<b>Unit Well No. 8 - Re-Construction</b>		<b>2027</b>										
112	Unit Well No. 8 Re-Construction will totally upgrade and replace the reservoir and pumping station at Well 8. The project will install an iron and manganese filtration system to address current water quality issues. Due to the colored water resulting from the iron and manganese, well operation is currently severely limited to summer only and a total annual production of less than 100 million gallons. The need for this project was verified by the East Side Water Supply project, however, due to concerns about the nearby KIP Corporation VOC contamination, the project has been delayed. The Utility will continue to study the KIP contamination and monitor groundwater quality and flow patterns. Flexibility will be designed into the project to allow the addition of an air stripper if VOC contamination from the KIP site were to reach the well. Funds are included in the budget for a sentinel well in 2018 to allow the water quality to be monitored before it reaches Well 8.			Public Engagement		10,000							
113				Groundwater Study									
114				Sentinel Well			100,000						
115				Engineering Services									
116				Property Acquisition and Permitting									
117	Well 8 Re-Construction												
118	<b>Total</b>	-	110,000	-	-	-	-	-	-	-			
120			Pipe Replacement Reinvestment Budget Goal		13,220,000	13,610,000	14,020,000	14,440,000	14,880,000	15,320,000			
121	<b>Pipeline Replacement/Rehab/Improvements</b>		<b>Ongoing</b>	<b>Total Pipe Rehab Budget</b>	<b>9,650,000</b>	<b>10,036,000</b>	<b>10,438,000</b>	<b>10,855,000</b>	<b>11,289,000</b>	<b>11,741,000</b>			
122	Madison Water Utility has a planned piping system replacement and upgrade program that provides for annual main replacement and rehabilitation to keep the system at an acceptable service level. Assessment of an aging infrastructure indicates the Utility needs to replace or rehabilitate over 400 miles of pipe in the next 40 years to renew and maintain the system. Madison Water Utility will continue to develop and expand the pipe lining program that was started in 2011. Lining pipe instead of replacing it saves money and extends the useful life of existing assets. The Utility's Water Master Plan also recommends hydraulic improvements to the system to correct hydraulic bottlenecks, fire protection limitations, and other identified issues.			Reconstruction Pipe Projects	4,250,000	4,420,000	4,597,000	4,781,000	4,972,000	5,171,000			
123				Pavement Management	4,400,000	4,576,000	4,759,000	4,949,000	5,147,000	5,353,000			
124				Water Main Rehabilitation	1,000,000	1,040,000	1,082,000	1,125,000	1,170,000	1,217,000			
125				Water Mains - New	1,850,000	1,500,000	1,650,000	1,815,000	1,997,000	2,097,000			
126				Master Plan ID' Pipe Projects			736,000	1,137,000	1,561,000	1,769,000			
127	<b>Total</b>	-	<b>11,500,000</b>	<b>11,536,000</b>	<b>12,824,000</b>	<b>13,807,000</b>	<b>14,847,000</b>	<b>15,607,000</b>					



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Line	Project	Description/Purpose	Primary Construction Year	Tasks	2018 Reauthorization	2018	2019	2020	2021	2022	2023	
129	Water Utility Facility Improvements		Annually									
130		SCADA System Upgrade and Expansion				55,000	56,000	57,000	58,000	59,000	60,000	
131		Fiber Optic system installation and upgrade				60,000	61,000	62,000	63,000	64,000	65,000	
132		Flow Meter and VFD Conversion				150,000	155,000	160,000				
133		Addition of separate Chemical Feed Rooms at Well 6, Well 11 and Well 13								678,000		
134		Development of 2 PRV sub zones. One near Pflaum Rd and one in the Nakoma neighborhood						64,000		68,000		
135		Various Facility Upgrade Projects - SCADA Room expansion and Olin VSB expansion				100,000	250,000	263,000	276,000	500,000	525,000	
136		Meter and fixed network Program				364,000	379,000	394,000	410,000	426,000	443,000	
137		Facility Safety Additions, Olin Roof fall protection system				40,000	42,000	44,000	46,000	48,000	50,000	
138		Various Olin and Paterson Upgrades and Improvements				60,000	65,000	70,000	75,000	81,000	87,000	
		Retrofit Chlorine Shutoff Valves at 4 Wells				37,000						
		HMI Install at Well 29				20,000						
		Security Upgrades				71,000						
139		Unit Well and Reservoir Rehab and Maintenance, Well 30, Well 17, Well 11, and Well 18				250,000	269,000	289,000	311,000	334,000	347,000	
140				Total		-	1,207,000	1,277,000	1,403,000	1,239,000	2,258,000	1,577,000
141												
142				Total Estimated Annual Costs		3,723,000	17,193,000	20,919,000	22,187,000	22,846,000	22,985,000	25,714,000
143		Facility Reinvestment and Renewal Goal				3,670,000	3,780,000	3,890,000	4,010,000	4,130,000	4,260,000	
144		Facility Reinvestment and Renewal Actual				3,740,000	3,113,000	403,000	432,000	463,000	484,000	
							Includes Well 12	Includes BPS 129				
				Math Check			17,193,000	20,919,000	22,187,000	22,846,000	22,985,000	25,714,000

The Water Utility has identified various minor improvement and upgrade projects that are necessary to sustain system facilities to meet the established level of service. For budgeting purposes, these projects are itemized under a single heading. Pressure Reducing stations will be constructed throughout the system as needed to reduce areas of excessive pressure and improve operational flexibility.

Several system wide tasks are included in the Capital Budget that cover a variety of repair, rehabilitation, and upgrade projects. The Utility's Infrastructure Management Plan recommends a reinvestment of \$2.5 (2005 dollars) in system facilities to sustain their viability for the long term. This would include Unit Well, pump station, and reservoir improvements and renewal. For budgeting purposes, these projects are itemized under a single heading.

The Utility is in the process of implementing an Asset Management system that will optimize the value of existing assets. This 3 to 5 year process will build on existing systems and evaluate all of the Utility's assets to optimize repair and replacement projects.