City of Benton Harbor, Michigan

Historical and Projected Sewage Disposal System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	2018 (1)	2019 (1)	Budgeted 2020 (2)	Projected 2021 (3)
Operating Revenues								
Sewer RTS/Commodity	$ 1,123,520	$ 1,299,381	$ 1,204,840	$ 1,255,507	$ 1,293,284	$ 1,252,031	$ 1,252,031	$ 1,339,673
Transmission Fees	-	-	-	10,457	7,398	9,524	8,935	8,935
Billing Fees	-	-	-	-	-	-	-	-
Fines	-	-	-	20,198	20,421	21,014	19,477	19,477
Other	17,160	177	-	160,383	175,818	146,825	158,884	158,884
Total Operating Revenues	$ 1,140,680	$ 1,299,558	$ 1,204,840	$ 1,446,545	$ 1,496,921	$ 1,429,394	$ 1,439,327	$ 1,526,969
Operating Expenses (4)								
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 518,532	$ 584,532	$ 547,281	$ 573,478	$ -
Customer Service	178,106	63,627	54,432	50,591	53,131	54,019	52,865	-
Sewer Lift Stations	595,364	728,022	535,147	658,270	635,981	763,049	575,122	-
Storm Drains	22,840	146,957	48,132	233,726	33,284	21,451	26,511	-
Other	8,994	5,138	5,336	-	-	-	-	-
Repair and Replacement	-	-	-	-	-	-	34,982	34,982
Depreciation	306,949	296,727	299,373	163,285	163,285	163,285	-	-
Total Operating Expenses	$ 1,676,612	$ 1,657,305	$ 1,429,883	$ 1,624,403	$ 1,470,213	$ 1,549,085	$ 1,262,958	$ 1,281,378
Operating Income (Loss)	$ (535,932)	$ (357,748)	$ (225,043)	$ (177,859)	$ 26,708	$ (119,691)	$ 176,369	$ 245,592
Non-Operating Revenues (Expenses)								
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/SAW/FDCVT	-	185,108	194,777	88,108	-	-	-	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-
Income From Joint Venture	-	-	-	-	-	-	-	-
Engineering Allocation from Project	-	-	-	-	-	-	(216,666)	(163,431)
Income Tax Transfer/Funds on Hand	-	-	-	-	-	-	325,000	265,000
Depreciation	306,949	296,727	299,373	163,285	163,285	163,285	-	-
Total Non-Operating Revenues (Expenses)	$ 165,591	$ 481,835	$ 496,458	$ 251,393	$ 163,285	$ 163,285	$ 108,334	$ 101,569
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (370,342)	$ 124,087	$ 271,416	$ 73,535	$ 189,993	$ 43,594	$ 284,703	$ 347,161
Debt Service Requirements								
Sewage Disposal System Revenue Bonds, Series 2009	$ 30,553	$ 185,431	$ 182,306	$ 184,118	$ 180,868	$ 182,556	$ 179,181	$ 180,743
Sewage Disposal System Revenue Bonds, Series 2011	84,006	101,137	99,512	102,887	101,137	99,387	102,637	100,762
Sewage Disposal System Revenue Bonds, Series 2020 (5)	-	-	-	-	-	-	-	48,657
Total	$ 114,559	$ 286,568	$ 281,818	$ 287,005	$ 282,005	$ 281,943	$ 281,818	$ 330,162
Debt Service Coverage Ratio	**(3.23x)**	**0.43x**	**0.96x**	**0.26x**	**0.67x**	**0.15x**	**1.01x**	**1.05x**

Utilities Revenue and SRF Bonds	
Annual Excess with 1.05x Coverage.	**$ 16,998**
Cumulative Excess with 1.05x Coverage.	**$ 16,998**
Annual Increase in Revenue Necessary for 1.05x Coverage.	**$0**
Annual Increase Necessary to Produce 1.05x Coverage.	**0.00%**

(1) Actual.
(2) Budgeted information provided by the City on February 14, 2020.
(3) Consumption for the fiscal years ending June 30, 2021 and thereafter is not assumed to change.
Assumes annual rate increases of 7% for the fiscal years ending June 30, 2021 through and including June 30, 2025.
Projected rate increases applied only to Commodity and Ready to Serve Charges. Other revenues are not assumed to change.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2021 through 2023 are assumed to grow 1.5% annually.
(5) Assumes a 30-year SRF loan totaling $3,660,000.

Source: City of Benton Harbor

Projected 2022 (3)	Projected 2023 (3)	Projected 2024 (3)	Projected 2025 (3)	Projected 2026 (3)	Projected 2027 (3)	Projected 2028 (3)	Projected 2029 (3)	Projected 2030 (3)	Projected 2031 (3)	Projected 2032 (3)
$ 1,433,450	$ 1,533,792	$ 1,641,157	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038
8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935
-	-	-	-	-	-	-	-	-	-	-
19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477
158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884
$ 1,620,746	$ 1,721,088	$ 1,828,453	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982
-	-	-	-	-	-	-	-	-	-	-
$ 1,300,074	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050
$ 320,673	$ 402,038	$ 509,403	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
(253,235)	-	-	-	-	-	-	-	-	-	-
335,000	5,000	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
$ 81,765	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 402,438	$ 407,038	$ 509,403	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ 177,243	$ 178,680	$ 175,055	$ 176,368	$ 172,618	$ 173,805	$ 174,868	$ 175,805	$ 176,618	$ 181,970	$ -
98,887	102,012	100,012	98,012	101,012	98,887	101,762	99,512	102,262	98,887	103,002
106,956	106,393	105,831	105,268	104,706	104,143	103,581	103,018	201,331	198,518	200,650
$ 383,086	$ 387,085	$ 380,898	$ 379,648	$ 378,336	$ 376,835	$ 380,211	$ 378,335	$ 480,211	$ 479,375	$ 303,652
1.05x	**1.05x**	**1.34x**	**1.64x**	**1.65x**	**1.66x**	**1.64x**	**1.65x**	**1.30x**	**1.30x**	**2.06x**
$ 19,351	**$ 19,953**	**$ 128,505**	**$ 244,636**	**$ 245,948**	**$ 247,449**	**$ 244,073**	**$ 245,949**	**$ 144,073**	**$ 144,909**	**$ 320,632**
$ 36,350	**$ 56,302**	**$ 184,808**	**$ 429,444**	**$ 675,392**	**$ 922,842**	**$ 1,166,915**	**$ 1,412,864**	**$ 1,556,937**	**$ 1,701,847**	**$ 2,022,479**
$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Projected 2033 (3)	Projected 2034 (3)	Projected 2035 (3)	Projected 2036 (3)	Projected 2037 (3)
$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038
8,935	8,935	8,935	8,935	8,935
-	-	-	-	-
19,477	19,477	19,477	19,477	19,477
158,884	158,884	158,884	158,884	158,884
$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
34,982	34,982	34,982	34,982	34,982
-	-	-	-	-
$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050
$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
$ -	$ -	$ -	$ -	$ -
$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
197,725	199,743	196,706	198,612	200,406
$ 197,725	$ 199,743	$ 196,706	$ 198,612	$ 200,406
3.16x	**3.13x**	**3.17x**	**3.14x**	**3.12x**
$ 426,559	**$ 424,541**	**$ 427,578**	**$ 425,672**	**$ 423,878**
$ 2,449,038	**$ 2,873,580**	**$ 3,301,158**	**$ 3,726,830**	**$ 4,150,709**
$0	**$0**	**$0**	**$0**	**$0**
0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**

City of Benton Harbor, Michigan

Historical and Projected Water System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	2018 (1)	2019 (1)	Budgeted 2020 (2)	Projected 2021 (3)
Operating Revenues								
Water RTS/Commodity	$ 1,854,525	$ 2,028,776	$ 1,970,829	$ 1,622,705	$ 1,599,806	$ 1,507,820	$ 1,507,820	$ 1,657,848
Water Capital Charge		-	-	-	-	-	-	-
Sprinkler, Hydrant, Fire		-	-	38,774	38,522	34,649	32,708	32,708
Other		-	-	160,383	175,818	146,825	158,884	158,884
Fines	17,160	177	-	20,198	20,421	21,015	19,477	19,477
Total Operating Revenues	$ 1,871,685	$ 2,028,953	$ 1,970,829	$ 1,842,060	$ 1,834,567	$ 1,710,309	$ 1,718,889	$ 1,868,917
Operating Expenses (4)								
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 518,532	$ 584,531	$ 547,282	$ 573,478	$ -
Customer Service	178,106	63,627	54,432	50,591	53,132	54,019	52,865	-
Water Treatment	721,683	414,240	457,036	415,496	389,570	470,232	502,693	-
Water Distribution	893,856	554,709	585,567	566,087	630,490	617,840	597,255	-
Repair and Replacement	-	-	-	-	-	-	-	81,421
Other	8,994	5,138	5,336	-	-	-	-	-
Depreciation	306,949	296,727	299,373	462,167	516,765	532,215	557,215	-
Total Operating Expenses	$ 2,673,947	$ 1,751,275	$ 1,889,207	$ 2,012,872	$ 2,174,488	$ 2,221,588	$ 2,283,506	$ 1,782,250
Operating Income (Loss)	$ (802,262)	$ 277,678	$ 81,623	$ (170,813)	$ (339,921)	$ (511,279)	$ (564,617)	$ 86,667
Non-Operating Revenues (Expenses)								
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/FDCVT Proceeds	-	185,108	194,777	438,953	65,243	146,280	75,000	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-
Income From Joint Venture	153,247	172,888	(40,562)	-	-	-	-	-
Engineering Allocation from project	-	-	-	-	-	-	(216,666)	(163,431)
Transfer from Income Tax	-	-	-	-	-	-	575,000	380,000
Transfer from PPI Funds - Tower reimbursement	-	-	-	-	-	-	-	150,000
Budgeted Funds on Hand	-	-	-	-	-	-	-	50,000
Depreciation	306,949	296,727	299,373	462,167	516,765	532,215	557,215	-
Total Non-Operating Revenues (Expenses)	$ 318,838	$ 654,722	$ 455,896	$ 901,120	$ 582,008	$ 678,495	$ 990,549	$ 416,569
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (483,425)	$ 932,400	$ 537,519	$ 730,308	$ 242,087	$ 167,216	$ 425,932	$ 503,236
Debt Service Requirements								
Drinking Water Revolving Fund Revenue Bonds, Series 2009	$ 11,125	$ 8,105	$ 7,980	$ 7,855	$ 7,730	$ 7,605	$ 7,480	$ 7,335
Drinking Water Revolving Fund Revenue Bonds, Series 2010	410,375	410,250	410,000	409,625	414,125	413,375	412,500	411,500
Water Supply System Revenue Bonds, Series 2020 (5)	-	-	-	-	-	-	-	59,817
Total	$ 421,500	$ 418,355	$ 417,980	$ 417,480	$ 421,855	$ 420,980	$ 419,980	$ 478,652
Debt Service Coverage Ratio	**(1.15x)**	**2.23x**	**1.29x**	**1.75x**	**0.57x**	**0.40x**	**1.01x**	**1.05x**

Utilities Revenue and SRF Bonds	
Annual Excess with 1.05x Coverage.	**$ 24,584**
Cumulative Excess with 1.05x Coverage.	**$ 24,584**
Annual Increase in Revenue Necessary for 1.05x Coverage.	**$0**
Annual Increase Necessary to Produce 1.05x Coverage.	**0.00%**

(1) Actual.
(2) As budgeted, received from the City on February 14, 2020.
(3) Consumption for the fiscal years ending June 30, 2021 and thereafter is not assumed to change.
Assumes annual rate increaes of 9.95% for the fiscal years ending June 30, 2021 through and including June 30, 2025.
Projected rate increases applied only to RTS and Commodity Charges.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2021 through 2023 are assumed to grow 3% annually.
(5) Assumes a 30-year DWRF loan totaling $5,065,000.

Source: City of Benton Harbor

Projected 2022 (3)	Projected 2023 (3)	Projected 2024 (3)	Projected 2025 (3)	Projected 2026 (3)	Projected 2027 (3)	Projected 2028 (3)	Projected 2029 (3)	Projected 2030 (3)	Projected 2031 (3)	Projected 2032 (3)	Projected 2033
$ 1,822,804	$ 2,004,173	$ 2,203,588	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845
-	-	-	-	-	-	-	-	-	-	-	-
32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708
158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884
19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477
$ 2,033,873	$ 2,215,242	$ 2,414,657	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
$ 1,833,275	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830
$ 200,598	$ 329,412	$ 528,827	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-
(253,235)	-	-	-	-	-	-	-	-	-	-	-
405,000	27,000	-	-	-	-	-	-	-	-	-	-
150,000	150,000	25,000	-	-	-	-	-	-	-	-	-
50,000	50,000										
-	-	-	-	-	-	-	-	-	-	-	-
$ 351,765	$ 227,000	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 552,363	$ 556,412	$ 553,827	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084
$ 7,230	$ 7,105	$ 6,980	$ 6,855	$ 6,730	$ 6,605	$ 6,480	$ 6,355	$ 6,230	$ 6,105	$ 5,980	$ 5,855
410,375	414,125	412,625	411,000	409,250	412,375	410,250	413,000	410,500	412,875	410,000	412,000
106,050	105,950	105,850	105,750	115,550	115,250	114,950	114,650	208,400	211,150	208,850	211,500
$ 523,655	$ 527,180	$ 525,455	$ 523,605	$ 531,530	$ 534,230	$ 531,680	$ 534,005	$ 625,130	$ 630,130	$ 624,830	$ 629,355
1.05x	**1.06x**	**1.05x**	**1.43x**	**1.41x**	**1.40x**	**1.41x**	**1.40x**	**1.20x**	**1.19x**	**1.20x**	**1.19x**
$ 28,708	**$ 29,232**	**$ 28,372**	**$ 224,479**	**$ 216,554**	**$ 213,854**	**$ 216,404**	**$ 214,079**	**$ 122,954**	**$ 117,954**	**$ 123,254**	**$ 118,729**
$ 53,293	**$ 82,524**	**$ 110,896**	**$ 335,375**	**$ 551,928**	**$ 765,782**	**$ 982,186**	**$ 1,196,265**	**$ 1,319,219**	**$ 1,437,172**	**$ 1,560,426**	**$ 1,679,155**
$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

(3)	Projected 2034	(3)	Projected 2035	(3)	Projected 2036	(3)	Projected 2037	(3)
	$ 2,422,845		$ 2,422,845		$ 2,422,845		$ 2,422,845	
	-		-		-		-	
	32,708		32,708		32,708		32,708	
	158,884		158,884		158,884		158,884	
	19,477		19,477		19,477		19,477	
	$ 2,633,914		$ 2,633,914		$ 2,633,914		$ 2,633,914	
	$ -		$ -		$ -		$ -	
	-		-		-		-	
	-		-		-		-	
	-		-		-		-	
	81,421		81,421		81,421		81,421	
	-		-		-		-	
	-		-		-		-	
	$ 1,885,830		$ 1,885,830		$ 1,885,830		$ 1,885,830	
	$ 748,084		$ 748,084		$ 748,084		$ 748,084	
	$ -		$ -		$ -		$ -	
	-		-		-		-	
	-		-		-		-	
	-		-		-		-	
	-		-		-		-	
	-		-		-		-	
	-		-		-		-	
	-		-		-		-	
	-		-		-		-	
	$ -		$ -		$ -		$ -	
	$ 748,084		$ 748,084		$ 748,084		$ 748,084	
	$ 5,730		$ 5,605		$ 5,480		$ 5,355	
	413,750		410,250		411,625		412,750	
	209,100		211,650		209,150		211,600	
	$ 628,580		$ 627,505		$ 626,255		$ 629,705	
	1.19x		**1.19x**		**1.19x**		**1.19x**	
	$ 119,504		**$ 120,579**		**$ 121,829**		**$ 118,379**	
	$ 1,798,659		**$ 1,919,237**		**$ 2,041,066**		**$ 2,159,445**	
	$0		**$0**		**$0**		**$0**	
	0.00%		**0.00%**		**0.00%**		**0.00%**	

District	County	WSSN	NAME	Stat	Pop	Own	VN?	District Support for VN?	VN Response Due Date	VN Response Received Date	Revision Request Letter Sent Date	Revision Request Response Due Date	Revision Request Response Received Date	Revision Request Comments	Date AMP Rcvd	Submittal Scanned	Needs to be Scanned	Alternate Schedule Due Date	Financial Data Reviewed	Financial comments	Comments to District Staff	Additional information	Date Financial Approved	Date District Approved	Full Approval	Approval Letter Sent Date	Approval Entered in DB	Approved Plan Scanned & Mailed	Comments	Identified Lead Service Lines in Asset Inventory	Has LSL Replacement Projects in CIP	Cost of LSL Projects in CIP	Total 5-yr CIP Needs ($)	Total 20-yr CIP Needs ($)	Avg Annual Funding Gap versus Operating Expenses ($)	Avg Annual Funding Gap versus Operating Expenses + CIP ($)
DISTRICT 11	GENESEE	00540	BEECHER METROPOLITAN DISTRICT	A	9400	L									2/27/2018	2/27/2018			7/6/2018				7/6/2018	3/25/2019	Approved	3/25/2019	7/8/2019		Approved AMP on Lansing server							
DISTRICT 11	GENESEE	01010	BURTON, CITY OF	A	20900	L					4/1/2019	8/1/2019		Partial response received 5/2/2019; Deadline extension approved for remaining items	12/22/2017	1/2/2018			1/31/2018	ays update in 2018		5/3/2019	5/9/2019		-				CIP has not been reviewed and approved by water supply administrators. All else acceptable.							
DISTRICT 11	GENESEE	01490	CLIO, CITY OF	A	2646	L					4/1/2019	6/1/2019			3/21/2018	3/22/2018			7/6/2018	1,2,3					-				Last emailed 6/6/2019. Original extention requested on 2/27/2018 and approved for submittal by 3/22/2018.							
DISTRICT 11	GENESEE	01720	DAVISON, CITY OF	A	5173	L									12/18/2017	1/2/2018			2/28/2018	1		7/8/2019	7/30/2019	3/25/2019	Approved	3/25/2019	4/7/2020		Scan and save approved AMP. AMP letter sent; however, have not received a operating budget. Received 7/8/2019 and approved by Financial.							
DISTRICT 11	GENESEE	02270	FENTON, CITY OF	A	11746	L									2/27/2018	2/27/2018			7/6/2018				7/6/2018	3/25/2019	Approved	3/25/2019	7/8/2019		Scan and save approved AMP.							
DISTRICT 11	GENESEE	02340	FLUSHING, CITY OF	A	8389	L					4/1/2019	6/1/2019	5/13/2019		12/27/2017	1/3/2018			2/5/2018				2/5/2018	4/7/2020	Approved		4/7/2020		Scan and save approved AMP. Send approval to City.							
DISTRICT 11	GENESEE	02617	GENESEE TOWNSHIP	A	10447	L					4/1/2019	6/1/2019	4/18/2019		10/19/2017	1/3/2018			2/5/2018	2,3					-				last emailed 4/17/2020 - CWS had submitted requested information with other attachments on 4/18/2019 (review of submitted documents required)							
DISTRICT 11	GENESEE	02745	GRAND BLANC TOWNSHIP	A	18000	L					4/1/2019	6/1/2019		Partial response received 4/30/2019	12/27/2017	2/13/2018			8/24/2018	1,2,3		5/6/2019	5/10/2019	4/7/2020	Approved		4/7/2020		Scan and save approved AMP. Send approval to Township.							
DISTRICT 11	GENESEE	02740	GRAND BLANC, CITY OF	A	8276	L									2/19/2018	2/22/2018			7/6/2018				7/6/2018	3/25/2019	Approved	3/25/2019	7/8/2019		Scan and save approved AMP.							
DISTRICT 11	GENESEE	03890	LINDEN, CITY OF	A	4004	L					4/1/2019	6/1/2019			1/3/2018	2/15/2018			2/28/2018				2/28/2018		-				last emailed 4/8/2020							
DISTRICT 11	GENESEE	04480	MONTROSE, CITY OF	A	1657	L					4/1/2019	6/1/2019			12/31/2017	2/15/2018			2/28/2018	3					-				last emailed 4/8/2020							
DISTRICT 11	GENESEE	04520	MOUNT MORRIS, CITY OF	A	3086	L					4/1/2019	6/1/2019			12/31/2017	2/15/2018			2/28/2018	2,3					-				approved extension for final submittal of 7/31/2020							
DISTRICT 11	GENESEE	06505	SWARTZ CREEK, CITY OF	A	5768	L					4/1/2019	6/1/2019	4/5/2019	revised LOS goals received; Council approval of CIP via email 3/22/2019	12/21/2017	1/2/2018			8/24/2018				8/24/2018	7/5/2019	Approved		7/5/2019		Scan and save approved AMP.							
DISTRICT 12	EATON	00590	BELLEVUE, VILLAGE OF	A	1282	L					11/18/2019	2/21/2020			1/31/2018	1/31/2018			7/22/2020	2*, 3 -a gap is shown so the calculations they will be choosing aren't spelled out					-				To be submitted 1/16/2018. MTJ							
DISTRICT 12	EATON	01340	CHARLOTTE, CITY OF	A	9074	L									12/27/2017	12/27/2017			2/7/2019				2/7/2019	11/20/2019	Approved	11/20/2019	11/20/2019	11/20/2019								
DISTRICT 12	EATON	01790	DELTA CHARTER TOWNSHIP	A	22000	L					8/15/2019	11/1/2019	8/22/2019	asset inventory, CIP, funding	1/2/2018	1/2/2018			8/23/2019	3 not sure which rates wher		3/5/2020	3/5/2020		-				Awaiting review by WIF staff on financial. Email 2/20/2020.							
DISTRICT 12	INGHAM	01990	EAST LANSING, CITY OF	A	35139	L									12/18/2017	12/18/2017			2/7/2019				2/7/2019	11/20/2019	Approved	11/20/2019		11/20/2019								
DISTRICT 12	EATON	02020	EATON RAPIDS, CITY OF	A	5340	L					11/21/2019	3/20/2020		Extension granted extended from 2/21/2020 to 3/20/2020	12/29/2017	12/29/2017			8/23/2019	1,2,3					-				See email 2/19/2020							
DISTRICT 12	CLINTON	02390	FOWLER, VILLAGE OF	A	1136	L					2/19/2020	5/12/2020			12/12/2017	12/12/2017			8/23/2019	1,2,3					-											
DISTRICT 12	EATON	02770	GRAND LEDGE, CITY OF	A	8500	L									1/3/2018	1/3/2018			8/23/2019	2			2/7/2019	2/19/2020	Approved											
DISTRICT 12	INGHAM	03760	LANSING BOARD OF WATER & LIGHT	A	166000	L									12/6/2017	12/6/2017			2/7/2019				2/7/2019	6/11/2019	Approved	6/11/2019	6/11/2019	6/11/2019								
DISTRICT 12	INGHAM	03770	LANSING TOWNSHIP	A	5500	L					3/5/2020	6/5/2020		Tech/funding info needed.	6/29/2017		X		9/10/2019	3					-				Paper copy to be provided to DWRF. MTJ 1/10/2017							
DISTRICT 12	INGHAM	03840	LESLIE, CITY OF	A	2089	L					7/11/2019	2/21/2020		Asset, CIP, Criticality, Funding	12/29/2017	12/29/2017			2/7/2019	3* have proposed rates but without them implemented there is a gap					-				Email sent 3/4/2020 on status of submitting response.							
DISTRICT 12	INGHAM	04170	MASON, CITY OF	A	8252	L					8/7/2019	10/1/2019		CIP, Funding	1/11/2018	1/11/2018			2/7/2019	3		8/23/2019	8/23/2019	3/5/2020	Approved	3/5/2020	3/5/2020		To be submitted by 1/12/18. MTJ 1/4/2018							
DISTRICT 12	INGHAM	04260	MERIDIAN TOWNSHIP	A	39685	L					3/5/2020	6/5/2020		Funding	12/11/2017	12/11/2017			1/19/2018	2,3		6/11/2020	6/11/2020		-											
DISTRICT 12	INGHAM	04340	MICHIGAN STATE UNIVERSITY	A	13900	L									1/2/2018	1/2/2018			2/7/2019				2/7/2019	3/5/2020	Approved	3/5/2020										
DISTRICT 12	EATON	04990	OLIVET, CITY OF	A	1758	L					11/29/2019	2/27/2020		Tech/funding info needed.	3/26/2018	3/26/2018			2/7/2019	3					-				To be submitted by 1/31/2018. MTJ 1/4/2018							
DISTRICT 12	CLINTON	05100	OVID, VILLAGE OF	A	1612	L								Tech info needed. Financial review requested 2/19/2020.	1/9/2018	1/9/2018									-				Financial review requested 2/19/2020. Letter to go out once received.							
DISTRICT 12	EATON	05550	POTTERVILLE, CITY OF	A	2617	L					8/28/2018	9/14/2018	10/31/2018	Lacks technical info , reviewed revised AMP 3/4/2020. Request for financial review submitted 2/19/2020.	3/6/2018	3/6/2018			8/23/2019	1,2,3					-				Left messages on 1/3/2018, 1/10/2018, 1/16/2018. To be submitted by 1/19/2018 per Wanda Darrow. The city requested an extension until March 5, 2018. MTJ Second letter requesting revised AMP to be issued when financial review completed (3,4,2020)							
DISTRICT 12	CLINTON	06300	ST. JOHNS, CITY OF	A	7900	L					2/19/2020	5/12/2020			1/3/2018	1/3/2018			8/23/2019	1,2,3					-											
DISTRICT 12	INGHAM	06420	STOCKBRIDGE, VILLAGE OF	A	1202	L					7/10/2019	10/1/2019			1/5/2018	1/5/2018			8/23/2019	1,2,3					-											
DISTRICT 12	EATON	06470	SUNFIELD, VILLAGE OF (**< 1k**) (**to be discussed with village**)	A	680	L									1/2/2018	1/2/2018									-											
DISTRICT 12	INGHAM	06970	WEBBERVILLE, VILLAGE OF	A	1503	L					2/19/2020	5/12/2020			12/29/2017	12/29/2017			2/7/2019				2/7/2019		-											
DISTRICT 12	INGHAM	07120	WILLIAMSTON, CITY OF	A	3969	L									12/27/2017	12/27/2017			2/7/2019				2/7/2019	2/18/2020	Approved											
DISTRICT 14	GRATIOT	00140	ALMA CITY OF	A	9275	L									12/8/2017	12/9/2017			8/24/2018	2,3				12/5/2018	Approved											
DISTRICT 14	LAPEER	00150	ALMONT, VILLAGE OF	A	2674	L									12/29/2017	1/2/2018			1/29/2019	2			11/7/2019	12/3/2018	Approved											
DISTRICT 14	GRATIOT	00820	BRECKENRIDGE, VILLAGE OF	A	1339	L									1/2/2018	1/2/2018			1/29/2019			2/14/2019	2/15/2019	12/5/2018	Approved	12/3/2018	12/3/2018									
DISTRICT 14	SHIAWASSEE	01640	CORUNNA, CITY OF	A	3497	L									12/21/2017	12/21/2017			1/29/2019	3				12/3/2018	Approved	12/5/2019	12/5/2019						$ 2,346,750.00	$ 2,700,000.00		
DISTRICT 14	SHIAWASSEE	01900	DURAND, CITY OF	A	3373	L									12/14/2017	12/14/2017			1/29/2019	2,3		2/15/2019	2/22/2019	12/3/2018	Approved	11/30/2018	11/30/2018									
DISTRICT 14	LAPEER	03340	IMLAY CITY, CITY OF	A	3597	L									12/22/2017	12/22/2017			1/29/2019	2,3		11/7/2019	11/7/2019	12/4/2018	Approved	12/3/2018	12/3/2018						$ 750,000.00	$ 2,076,250.00		
DISTRICT 14	GRATIOT	03460	ITHACA, CITY OF	A	3098	L									12/31/2017	1/3/2018			1/29/2019	3			2/21/2019	12/5/2018	Approved	12/5/2019	2/21/2019		Needed financial submittal, which Bob approved on 2/21/2019							
DISTRICT 14	LAPEER	03780	LAPEER, CITY OF	A	8841	L									12/28/2017	12/28/2017			1/29/2019	2				12/4/2018	Approved											
DISTRICT 14	LAPEER	04770	NORTH BRANCH, VILLAGE OF	A	1033	L									12/1/2017	12/9/2017			1/29/2019	3			2/21/2019	12/4/2018	Approved	12/3/2018	12/3/2018									
DISTRICT 14	SHIAWASSEE	05120	OWOSSO, CITY OF	A	15713	L									12/28/2017	1/2/2018			1/29/2019	1,2		3/26/2019	3/26/2019	12/3/2018	Approved	12/3/2018	3/5/2020									
DISTRICT 14	SHIAWASSEE	05280	PERRY, CITY OF	A	2065	L									11/20/2017	12/9/2017			1/29/2019	2,3		2/25/2019	2/26/2019	12/5/2018	Approved	12/5/2018	12/5/2018									
DISTRICT 14	GRATIOT	06320	ST. LOUIS, CITY OF	A	6976	L									1/3/2018	1/3/2018			1/29/2019	1,2,3		3/18/2019	3/26/2019	12/5/2018	Approved	12/5/2018	12/5/2018									
DISTRICT 21	IOSCO	00290	AU SABLE TOWNSHIP	A	2047	L					2/21/2019	6/1/2019			11/22/2017	12/1/2017			1/18/2018	1,2,3		3/26/2019	4/15/2019	12/11/2017	Approved	5/9/2019	5/7/2019									
DISTRICT 21	BAY	00300	AUBURN	A	2087	L					5/1/2019	6/1/2019	6/25/2019		12/18/2017	7/11/2018			2/12/2018	1,2,3	insufficient	6/25/2019	7/10/2019	6/25/2019	Approved											
DISTRICT 21	GLADWIN	00520	BEAVERTON	A	1150	L					3/4/2019	6/1/2019	7/2/2019		10/12/2018	10/12/2018		7/1/2018	2/22/2019	3		7/2/2019	7/11/2019	7/2/2019	Approved				Hired new City Manager in January, granted extension until May 1, 2018							
DISTRICT 21	SAGINAW	00722	BIRCH RUN TOWNSHIP	A	2080	L					2/21/2019	6/1/2019	6/5/2019	rec'd rev 12-03-19	11/30/2017	12/1/2017			8/24/2018	1,3			12/4/2019	11/30/2017	Approved											
DISTRICT 21	SAGINAW	00720	BIRCH RUN, VILLAGE OF	A	1555	L					2/21/2019	6/1/2019			11/30/2017	12/1/2017			1/22/2018	d Saginaw input 2/1			7/8/2019	12/12/2017	Approved											
DISTRICT 21	SAGINAW	00798	BLUMFIELD-REESE WATER AUTH.	A	3202	L					3/4/2019	6/1/2019	3/19/2019		10/16/2017	12/27/2017			2/12/2018	2,3		3/19/2019	3/26/2019	12/27/2017	Approved	5/3/2019	5/7/2019									
DISTRICT 21	SAGINAW	00840	BRIDGEPORT TOWNSHIP	A	10514	L					3/4/2011	6/1/2019	3/11/2019		12/12/2017	12/12/2017			2/12/2018	2,3???		3/11/2019	3/11/2019	12/27/2017	Approved	3/19/2019	5/7/2019									
DISTRICT 21	SAGINAW	00980	BUENA VISTA TOWNSHIP	A	8676	L					2/25/2019	6/1/2019	7/8/2019	Extension until 8-1-19	9/28/2018	9/28/2018		9/30/2018	2/22/2019	3			7/8/2019	7/8/2019	Approved				Extension granted until September 30, 2018							
DISTRICT 21	SAGINAW	01160	CARROLLTON TOWNSHIP	A	6103	L					3/4/2019	6/1/2019	7/8/2019		12/27/2017	12/27/2017			2/12/2018	3			7/8/2019	12/27/2017	Approved											
DISTRICT 21	SAGINAW	01380	CHESANING, VILLAGE OF	A	2394	L					3/4/2019	6/1/2019	3/19/2019		10/11/2017	12/1/2017			1/19/2018	'3	cannot find AM	3/19/2019	3/26/2019	12/1/2017	Approved	5/2/2019	5/7/2019		Chesaning submitted the rate ordinace and the rates on 9/28/18 scanned and placed in draft AMPS folder on 9/28/18							
DISTRICT 21	MIDLAND	01520	COLEMAN, CITY OF	A	1243	L					3/5/2019	6/1/2019	8/23/2019		1/9/2018	1/10/2018			2/13/2018	3		8/23/2019	8/23/2019	1/10/2018	Approved											
DISTRICT 21	IOSCO	02010	EAST TAWAS, CITY OF	A	2808	L									12/28/2017	12/28/2017			3/1/2018				3/1/2018	12/28/2017	Approved	2/20/2019	5/7/2019									
DISTRICT 21	SAGINAW	02420	FRANKENMUTH, CITY OF	A	4944	L					3/5/2019	6/1/2019	7/8/2019	Extension until 8-18-19	12/28/2017	12/28/2017			3/1/2018	1,2,3???			7/8/2019	12/28/2017	Approved											
DISTRICT 21	SAGINAW	02425	FRANKENMUTH, TOWNSHIP	A	1389	L					3/5/2019	6/1/2019	7/8/2019	Extension until 8-18-19	12/28/2017	12/28/2017			3/1/2018	3			7/8/2019	1/3/2018	Approved											
DISTRICT 21	GLADWIN	02650	GLADWIN, CITY OF	A	2933	L					3/5/2019	6/1/2019	6/14/2019		12/4/2017	12/7/2017			1/19/2018	rates don't appear sufficient			7/8/2019	6/14/2019	Approved											
DISTRICT 21	SAGINAW	03110	HEMLOCK/RICHLAND TOWNSHIP	A	1632	L					5/1/2019	6/1/2019	6/11/2019		12/27/2017	12/27/2017			2/28/2018	1,2,3			7/8/2019	12/27/2017	Approved											
DISTRICT 21	MIDLAND	03223	HOMER TOWNSHIP	A	3256	L		Yes	3/31/2019						4/30/2020	4/30/2020			5/5/2020	1,2,3					-											
DISTRICT 21	SAGINAW	03475	JAMES TOWNSHIP	A	2023	L									12/27/2017	12/27/2017			2/28/2018				2/28/2018	12/27/2017	Approved	2/20/2019	5/7/2019									
DISTRICT 21	SAGINAW	03667	KOCHVILLE TOWNSHIP	A	4677	L									12/12/2017	12/12/2017			1/19/2018				1/19/2018	12/27/2017	Approved	2/20/2019	5/7/2019									
DISTRICT 21	MIDLAND	03794	LARKIN TOWNSHIP	A	3184	L		Yes	3/31/2019	2/25/2019	3/4/2019	6/1/2019	4/18/2019		2/25/2019	2/25/2019			2/27/2019	1		4/18/2019	4/18/2019	4/18/2019	Approved	4/29/2019	5/7/2019		Extension requested until March 1, 2018							
DISTRICT 21	MIDLAND	04377	MIDLAND CHARTER TOWNSHIP	A	1451	L					5/1/2019	6/1/2019			6/29/2018	7/10/2018			8/24/2018	2,3	insufficient				-				Received the report on 6/29/18 VN no longer needed							
DISTRICT 21	MIDLAND	04375	MIDLAND CO., WATER DIST. NO. 1 OF	A	10688	L									12/26/2017	12/28/2017			2/28/2018				2/28/2018	12/28/2017	Approved	2/20/2019	5/7/2019									
DISTRICT 21	IOSCO	05040	OSCODA TOWNSHIP	A	6997	L					5/1/2019	6/1/2019			12/29/2017	1/2/2018			2/28/2018	2,3				1/2/2018	-											
DISTRICT 21	SAGINAW	05860	SAGINAW CHARTER TOWNSHIP	A	40840	L									12/1/2017	2/19/17 (revised			2/28/2018	1,2,3		4/29/2019	5/3/2019	12/19/2017	Approved	5/3/2019	5/7/2019									
DISTRICT 21	ISABELLA	06030	SHEPHERD, VILLAGE OF	A	1536	L					5/1/2019	6/1/2019			2/27/2018	7/11/2018			7/6/2018	1,2,3					-				Scanned and uploaded, they are missing practically everything, sending them a list of missing items in the Sanitary Survey. They did not submit any financial information. 5-23-2018							
DISTRICT 21	SAGINAW	06210	SPAULDING TOWNSHIP	A	2153	L									12/27/2017	12/27/2017			2/28/2018				2/28/2018	12/27/2017	Approved	2/20/2019	5/7/2019									
DISTRICT 21	SAGINAW	06260	ST. CHARLES, VILLAGE OF	A	2054	L					5/1/2019	6/1/2019	7/8/2019		12/27/2017	12/27/2017			2/28/2018	2			7/8/2019	12/27/2017	Approved											
DISTRICT 21	SAGINAW	06502	SWAN CREEK TOWNSHIP	A	2342	L									12/27/2017	12/27/2017			2/28/2018				2/28/2018	12/27/2017	Approved	2/20/2019	5/7/2019									
DISTRICT 21	IOSCO	06540	TAWAS CITY, CITY OF	A	1827	L					5/1/2019	6/1/2019	5/9/2019		11/21/2017	12/7/2017			2/28/2018	2,3??		5/9/2019	5/9/2019	12/12/2017	Approved	5/9/2019	5/28/2019	5/9/2019								
DISTRICT 21	SAGINAW	06552	TAYMOUTH TOWNSHIP	A	2033	L					5/1/2019	6/1/2019	7/8/2019		12/20/2017	1/2/2018			2/28/2018	3		5/29/2019	7/8/2019	12/20/2017	Approved											
DISTRICT 21	SAGINAW	06580	THOMAS TOWNSHIP	A	11985	L					5/1/2019	6/1/2019	6/26/2019		10/12/2017	12/1/2017			2/28/2018	2		6/25/2019	7/10/2019	10/16/2017	Approved											
DISTRICT 21	SAGINAW	02470	TITTABAWASSEE TOWNSHIP	A	8672	L					2/25/2019	6/1/2019	3/19/2019		1/16/2019	1/16/2019			2/22/2019	2		3/19/2019	3/26/2019	1/16/2019	Approved	5/2/2019	5/7/2019									
DISTRICT 21	ISABELLA	06725	UNION TOWNSHIP	A	12849	L					5/1/2019	6/1/2019	5/14/2019		12/27/2017	12/27/2017			2/13/2018	2,3???		5/28/2019	6/17/2019	12/27/2017	Approved											
DISTRICT 21	SAGINAW	07280	ZILWAUKEE, CITY OF	A	1658	L					5/1/2019	6/1/2019	6/11/2019		12/27/2017	12/27/2017			2/28/2018	2,3	not sufficient		7/8/2019	1/5/2018	Approved											
DISTRICT 22	ALPENA	00170	ALPENA TOWNSHIP	A	5197	L									12/28/2017	1/5/2018			1/29/2018, 6/19/18				6/19/2018	4/1/2019	Approved	4/1/2019	6/11/2019			Not Evaluated in thi	Not Evaluated in	Not Evaluated in this report	$260,000	$1,425,000	($1,000,000)	($2,425,000)
DISTRICT 22	CLARE	01420	CLARE, CITY OF	A	3071	L									2/19/2018	2/20/2018			8/24/2018				8/24/2018	4/1/2019	Approved	4/1/2019	6/11/2019		Extension requested	Not Evaluated in thi	Not Evaluated in	Not Evaluated in this report	$1,287,000	$2,349,000	$358,634.55	$30,984.32
DISTRICT 22	CRAWFORD	02840	GRAYLING, CITY OF	A	1884	L									12/29/2017	1/5/2018			1/29/2018	1,2,3					-											
DISTRICT 22	CLARE	03030	HARRISON, CITY OF	A	1100	L									1/5/2018	1/5/2018			1/29/2018	2,3??		11/5/2019	11/5/2019	11/25/2019	Approved	11/25/2019	11/25/2019			Not Evaluated in thi	Not Evaluated in	Not Evaluated in this report	$579,000	$1,504,000	$197,227	$66,367
DISTRICT 22	PRESQUE ISLE	05770	ROGERS CITY, CITY OF	A	2827	L									11/14/2017	11/15/2017			1/30/2018	1,2,3??		5/15/2019	5/21/2019	6/17/2019	Approved	6/17/2019	6/26/2019			Not Evaluated in thi	Not Evaluated in	Not Evaluated in this report	$636,000	$1,523,000	$2,060	($1,520,940)
DISTRICT 22	ROSCOMMON	05810	ROSCOMMON, VILLAGE OF	A	1075	L									12/15/2017	12/18/2017			1/30/2018	2,3??		1/10/2020	1/10/2020	1/15/2020	Approved	1/15/2020	1/15/2020			Not Evaluated in thi	Not Evaluated in	Not Evaluated in this report	$697,000	$4,815,000	$114,299	$171,240
DISTRICT 22	OGEMAW	07010	WEST BRANCH, CITY OF	A	2139	L									12/29/2017	1/5/2018			1/29/2018				1/29/2018	4/1/2019	Approved	4/1/2019	6/11/2019			Not Evaluated in thi	Not Evaluated in	Not Evaluated in this report	$2,945,622	$7,823,958	($235,584.66)	($1,057,083.84)
DISTRICT 23	HURON	00340	BAD AXE	A	3129	L					4/17/2019	6/1/2019	4/30/2019		12/21/2017	1/5/2018			2/12/2018			5/8/2019	6/14/2019		Approved											
DISTRICT 23	BAY	00390	BANGOR TOWNSHIP	A	12688	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	BAY	00400	BANGOR-MONITOR METRO DISTRICT	A	2971	L									1/2/2018	1/5/2018			1/18/2018	3				4/25/2019	Approved				Ordinance has been submitted							
DISTRICT 23	BAY	00470	BAY CITY, CITY OF	A	34932	L									12/28/2017	1/5/2018			2/12/2018				2/28/2018	4/25/2019	Approved											
DISTRICT 23	BAY	00485	BAY CO. DEPT OF WATER & SEWER	A	8428	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020				2/12/2018		Approved											
DISTRICT 23	BAY	00518	BEAVER TOWNSHIP	A	1109	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	SANILAC	00930	BROWN CITY	A	1316	L					9/5/2019	1/1/2020	12/18/2019	Update Financial/Other acceptable	12/27/2017	1/5/2018			1/18/2018			3/5/2020	3/5/2020		-				Financial is approved, the remainder is approved, letter will go out soon							
DISTRICT 23	TUSCOLA	01130	CARO, CITY OF	A	4229	L					12/16/2019	6/30/2020			12/20/2017	1/5/2018			1/18/2018	2,3					-				Extension given to have someone qualified finish. 6/30/20							
DISTRICT 23	HURON	01195	CASEVILLE TOWNSHIP	A	2005	L									6/12/2018	6/12/2018			7/6/2018	nt in approved column				8/30/2019	Approved	9/3/2019			Received 6/12/18							
DISTRICT 23	TUSCOLA	01220	CASS CITY, VILLAGE OF	A	2428	L					9/2/2019	6/30/2020			12/29/2017	1/5/2018			2/13/2018	2,3					-				Extension given for completion of a rate study							
DISTRICT 23	SANILAC	01690	CROSWELL, CITY OF	A	2447	L					6/18/2019	12/31/2020		New plant being constructed	1/31/2018	NA		12/31/2020							-				Extension given due to 2019/2020 construction. 2 wells/Iron plant							
DISTRICT 23	BAY	02180	ESSEXVILLE, CITY OF	A	3478	L					5/9/2019	6/1/2019			1/2/2018	1/5/2018			3/1/2018	2,3					-											
DISTRICT 23	BAY	02410	FRANKENLUST TOWNSHIP	A	3422	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	BAY	02465	FRASER TOWNSHIP	A	1140	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	BAY	02960	HAMPTON TOWNSHIP	A	9652	L					5/9/2019	6/1/2019			1/5/2018	1/8/2018			2/28/2018	2,3					-											
DISTRICT 23	BAY	03570	KAWKAWLIN METRO DIST WATER SUP	A	1480	L									12/17/2019	12/19/2019			12/22/2019			12/22/2019	12/22/2019	2/11/2020	Approved	2/12/2020			Late submittal with all of Bay County/ F&V package							
DISTRICT 23	BAY	03565	KAWKAWLIN TOWNSHIP	A	2961	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	SANILAC	04110	MARLETTE, CITY OF	A	1875	L									12/21/2017	1/5/2018			2/28/2018				2/28/2018	5/20/2019	Approved	5/20/2019	6/13/2019									
DISTRICT 23	BAY	04280	MERRITT TOWNSHIP	A	1373	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	TUSCOLA	04400	MILLINGTON, VILLAGE OF	A	1072	L					9/5/2019	12/31/2019	12/16/2019	Financial only	12/21/2017	1/5/2018			2/28/2018	3*		3/5/2020	3/5/2020		-				Financial approved, full approval granted, letter going out soon							
DISTRICT 23	BAY	04440	MONITOR TOWNSHIP	A	4977	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	HURON	05320	PIGEON, VILLAGE OF	A	1208	L			Mar-19	Mar-19					3/26/2019	4/8/2019		Sep-18	5/10/2019	2					-				The rest looks fine, needs finaincial resubmitted							
DISTRICT 23	BAY	05335	PINCONNING TOWNSHIP	A	1376	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	BAY	05330	PINCONNING, CITY OF	A	1220	L		No			9/2/2019	6/30/2020	3/6/2020		3/6/2020	3/6/2020		6/30/2020		Resubmitted		4/6/2020	4/6/2020						Resubmitted on 3/6/20							
DISTRICT 23	HURON	05460	PORT AUSTIN AREA SEWER & WATER	A	1004	L			Mar-19	None					12/3/2019	12/6/2019			12/19/2019	2,3					-				Finished, needs finaincial resubmitted							
DISTRICT 23	HURON	05475	PORT HOPE-GORE-RUBICON U. A.	A	1496	L									12/18/2017	12/18/2017			2/28/2018				2/28/2018	5/20/2019	Approved	5/20/2019	6/13/2019									
DISTRICT 23	SANILAC	05920	SANDUSKY, CITY OF	A	2679	L					9/5/2019	1/1/2020	1/14/2020	Financial only	12/29/2017	1/5/2018			2/28/2018	3		2/26/2020	2/26/2020		-				Financial approved, district approved, letter soon.							
DISTRICT 23	HURON	05990	SEBEWAING LIGHT & WATER	A	1759	L									1/2/2018	1/5/2018			2/28/2018	2,3				4/2/2018	-											
DISTRICT 23	TUSCOLA	06780	VASSAR, CITY OF	A	2697	L									12/29/2017	1/5/2018			1/22/2018				1/22/2018	5/20/2019	Approved	5/20/2019	6/13/2019									
DISTRICT 23	BAY	07125	WILLIAMS TOWNSHIP	A	4949	L					4/15/2019	6/1/2019			1/2/2018	1/5/2018			1/30/2020			1/30/2020	1/30/2020		Approved											
DISTRICT 23	SANILAC	03856	WORTH TOWNSHIP	A	3703	L		Yes	3/31/2019	3/5/2019	3/9/2020	4/30/2020			3/5/2019	4/8/2019			4/8/2019	3	2016 report	still missing #3			-											
DISTRICT 31	JACKSON	00740	BLACKMAN TOWNSHIP	A	9012	L									1/8/2017	1/8/2017			1/30/2018				1/30/2018	6/10/2019	Approved	6/10/2019	6/13/2019			No	No		$330,850	$1,537,350		
DISTRICT 31	JACKSON	00920	BROOKLYN	A	1200	L					6/12/2019	9/30/2019	7/15/2019		12/28/2017	1/8/2017				2,3		7/15/2019	7/30/2019	7/15/2019	Approved	7/31/2019	Done			NA	NA	NA	$95,833	$150,871	$38,061	$30,517
DISTRICT 31	LENAWEE	01470	CLINTON	A	2336	L									12/7/2017	12/7/2017			1/31/2018	3??		6/21/2019	7/10/2019	2/19/2019	Approved	7/11/2019	Done		Emailed 6/7 for rate resolution	Discussed, but not planning to replace			$18,200	$2,200,000		
DISTRICT 31	JACKSON	01580	CONCORD	A	1112	L									12/8/2017	12/15/2017			1/31/2018	3		6/21/2019	7/10/2019	12/15/2017	Approved	7/11/2019	Done		Emailed 6/7 for rate resolution	NA	NA	NA		$181,500		
DISTRICT 31	JACKSON	02830	GRASS LAKE	A	1360	L					6/12/2019	10/31/2019	11/18/2019	requested 1 month extension	1/2/2018	1/8/2018			2/6/2018	2,3		11/19/2019	11/19/2019	12/4/2019	Approved	12/4/2019			Emailed reminder of 9/30 due date on 9/9	NA	NA	NA	$92,500	$690,000	$114,821	$80,321
DISTRICT 31	LENAWEE	03280	HUDSON	A	2307	L					9/19/2019		9/27/2019		12/21/2017	1/8/2017			2/7/2018	1,2,3??		9/27/2019	12/3/2019	9/27/2019	Approved	12/4/2019			Waiting on end of lead pilot grant project for updated submittal, Jae should have status update for EGLE by 9/13				$654,150	$1,492,950	$37,011	-$37,637
DISTRICT 31	JACKSON	03837	LEONI TOWNSHIP	A	2317	L					6/12/2019	9/30/2019	10/31/2019	Comments sent 11/19 granted extension for final product under alternate schedule	12/6/2017	12/7/2017		3/16/2020	2/8/2018	1,2,3		3/13/2020, 7/15/2020		7/15/2020	-				Deadlines established with 2019 survey							
DISTRICT 31	LENAWEE	04006	MADISON TOWNSHIP	A	3480	L									1/2/2018	1/8/2017			2/8/2018	2,3		7/3/2019	7/15/2019	2/8/2018	Approved	7/17/2019	7/30/2019		Funding gap might be closed with new rate increase schedule	NA	NA	NA	$174,000	$6,349,000	$221,193	-$96,807
DISTRICT 31	LENAWEE	04490	MORENCI	A	2220	L					6/27/2018				1/8/2018	1/22/2018			2/8/2018	1,2,3				9/9/2019	-				Needs to redo AMP in light of recent events	No	No					
DISTRICT 31	JACKSON	06227	SPRING ARBOR TOWNSHIP	A	2833	L									1/2/2018	1/8/2018			2/12/2018	2,3???		9/9/2019	9/10/2019	9/10/2019	Approved	9/11/2019				NA	NA	NA	$3,602,000	$6,033,000		
DISTRICT 31	JACKSON	06370	SPSM	A	8187	S					SS, 7/2/2019	12/31/2019			1/16/2018	1/16/2018			2/12/2018	1,2,3					-				Previous AMP prepared without supervisor approval	NA	NA	NA				
DISTRICT 31	JACKSON	06450	SUMMIT TOWNSHIP	A	20012	L									1/2/2018	1/8/2018			2/12/2018	1,2,3		4/3/2019	5/21/2019	6/10/2019	Approved	6/10/2019	Done			NA	NA	NA	$591,000	$5,200,000		
DISTRICT 31	LENAWEE	06560	TECUMSEH	A	8521	L									10/5/2017	12/7/2017			2/12/2018			1/31/2017, 5/2017	2/12/2018	2/8/2018	Approved	6/10/2019	Done			NA	NA	NA	$2,815,000	$3,675,000		
DISTRICT 32	WASHTENAW	00221	ANN ARBOR TOWNSHIP	A	1338	L									12/22/2017	3/9/2018			8/24/2018				8/24/2018	4/23/2018	Approved	7/8/2019										

DISTRICT 32	MONROE	00245	ASH TOWNSHIP	A	6134	L					7/1/2019	10/31/2019	10/22/2019	New due date: 11/30/2019	1/16/2018	1/22/2018		11/30/2019	1/30/2018	1,2,3					-				updates scanned into "scanned AMP's for Financial Review" folder							
DISTRICT 32	WASHTENAW	00321	AUGUSTA TOWNSHIP	A	3430	L					7/2/2019	10/31/2019			12/26/2017	3/20/2018			6/19/2018	2				4/20/2018	-				financial attachements now scanned and in drafts AMP folder							
DISTRICT 32	MONROE	00635	BERLIN TOWNSHIP	A	9700	L					7/2/2019	10/31/2019	12/20/2019		1/10/2018	1/22/2018			1/30/2018	1,2,3					-											
DISTRICT 32	WASHTENAW	01370	CHELSEA	A	4944	L					7/2/2019	10/31/2019	10/9/2019		1/12/2017	3/9/2018			7/6/2018	3					-				technical comments submitted. Update received 10/9/2019.							
DISTRICT 32	WASHTENAW	01810	DEXTER	A	4160	L									4/11/2018	4/25/2018		3/28/2018	7/6/2018				7/6/2018	4/25/2018	Approved	7/8/2019			requested extension until March 28, postmarked March 28							
DISTRICT 32	MONROE	01880	DUNDEE	A	3957	L					3/5/2020	4/30/2020	3/23/2020		11/9/2017	1/22/2018			1/31/2018	1,2,3		4/7/2020	4/7/2020	4/17/2020	Approved											
DISTRICT 32	HILLSDALE	03170	HILLSDALE	A	8278	L					3/5/2020	4/30/2020			1/3/2018	6/27/2019			6/19/2018	1,2,3		6/27/2019	7/30/2019		-											
DISTRICT 32	HILLSDALE	03490	JONESVILLE	A	2258	L					7/2/2019	10/31/2019			1/2/2018	1/22/2018			2/7/2018	2	not sufficient				-				deadline extended to 5/1/2020							
DISTRICT 32	HILLSDALE	03920	LITCHFIELD	A	1310	L	VN	Yes	3/31/2019	2/28/2019															-											
DISTRICT 32	WASHTENAW	03940	LOCH ALPINE SANITARY AUTHORITY	A	1506	L					3/5/2020	4/30/2020			3/28/2018	3/29/2018		4/30/2018	8/23/2019	2,3		7/7/2020		5/22/2020	-				technical comments submitted. Revision deadline extended to 5/30/2020.							
DISTRICT 32	WASHTENAW	04020	MANCHESTER	A	2250	L									10/26/2017	3/16/2018			7/6/2018				7/6/2018	11/14/2018	Approved	7/8/2019			technical comments submitted							
DISTRICT 32	WASHTENAW	04380	MILAN	A	7363	L	VN	Yes	5/1/2019									6/30/2018							-				Water plant staff contacting city staff to find out if one was completed							
DISTRICT 32	MONROE	04455	MONROE SOUTH COUNTY	A	33816	L					7/2/2019	10/31/2019			1/22/2018	1/23/2018			2/8/2018				2/8/2018		-											
DISTRICT 32	WASHTENAW	40594	NORTHFIELD ESTATES	A	1620	P		Yes	5/1/2019	4/29/2019	3/5/2020	4/30/2020	3/27/2020	New Due Date: 6/1/2020	4/29/2019	4/29/2019		4/30/2018				4/29/2019	7/30/2019		-				requested extension until April 30							
DISTRICT 32	WASHTENAW	40657	NORTHVILLE CROSSING	A	1890	P					7/8/2019	10/31/2019	10/31/2019		12/21/2017	1/19/2018			2/12/2018	1					-				technical comments submitted. Update received 10/31/2019							
DISTRICT 32	MONROE	05290	PETERSBURG	A	1278	L					7/2/2019	10/31/2019			6/15/2018	1/18/2019		6/15/2018	4/4/2019	1,2,3	only provides 2016 rates and potential project costs				-				Deadline extended to 10/31/2020							
DISTRICT 32	WASHTENAW	05360	PITTSFIELD TOWNSHIP	A	23000	L					7/2/2019	10/31/2019	9/11/2019		12/21/2017	3/9/2018			7/6/2018	1,2,3					-				rate study ongoing, funding structure not completed, wait for updated version. Update Received 9/11/2019							
DISTRICT 32	HILLSDALE	05620	READING	A	1078	L					7/2/2019	10/31/2019			12/22/2017	1/22/2018			2/9/2018	2,3					-											
DISTRICT 32	WASHTENAW	05900	SALINE	A	8940	L					7/2/2019	10/31/2019	10/29/2019		12/26/2017	4/23/2018			7/6/2018				7/6/2018	10/29/2019	Approved											
DISTRICT 32	WASHTENAW	05977	SCIO TOWNSHIP	A	8500	L					3/5/2020	4/30/2020			12/28/2017	3/16/2018			6/19/2018	insufficient?		8/22/2019	8/22/2019		-				no funding source in CIP, otherwise good for district - comments submitted							
DISTRICT 32	MONROE	06130	SOUTH ROCKWOOD	A	1543	L					7/2/2019	10/31/2019	10/30/2019		1/10/2018	1/22/2018		11/29/2019	2/12/2018	1,2,3		12/2/2019 need ordinance			-				update submitted 11/25/2019							
DISTRICT 32	WASHTENAW	06490	SUPERIOR TOWNSHIP	A	8500	L					7/8/2019	10/31/2019			1/2/2017	3/20/2018			6/19/2018	2					-				technical comments submitted							
DISTRICT 32	WASHTENAW	07260	YPSILANTI COMMUNITY UTILITY AUTHORITY	A	92400	L		Yes	5/1/2019	4/2/2019	3/5/2020	4/30/2020			4/2/2019	6/19/2019		4/30/2018				6/19/2019	7/15/2019	4/21/2020	Approved				VN rescinded, AMP was received by previous D32 staff prior to VN.							
DISTRICT 33	LIVINGSTON	00860	BRIGHTON, CITY OF	A	7000	L					6/28/2019	12/31/2019	11/20/2019		12/28/2017	1/2/2017			1/30/2018	2,3		1/13/2020		12/16/2019	-				technical comments submitted							
DISTRICT 33	LIVINGSTON	40679	CIDERMILL CROSSINGS	A	1110	P									6/19/2019	7/3/2019																				
DISTRICT 33	LIVINGSTON	02347	FONDA LAKE WATER AUTHORITY	A	1100	L					6/28/2019	10/31/2019	10/31/2019		12/7/2017	12/12/2017			2/5/2018	2,3??		12/22/2019	12/22/2019	12/26/2019	Approved	1/6/2020			technical comments submitted							
DISTRICT 33	LIVINGSTON	02400	FOWLERVILLE, VILLAGE OF	A	2972	L					6/28/2019	2/28/2019			12/21/2017	12/21/2017			2/5/2018	1,2,3					-				technical comments submitted							
DISTRICT 33	LIVINGSTON	40654	HARTLAND MEADOWS	A	1175	P					6/28/2019	12/31/2019			2/5/2018	2/5/2018			6/19/2018				6/19/2018		-				technical comments submitted							
DISTRICT 33	LIVINGSTON	03075	HARTLAND TOWNSHIP	A	1268	L					6/28/2019	10/31/2019	7/9/2019		12/4/2017	12/12/2017			2/28/2018	3		7/16/2019	7/30/2019	7/9/2019	Approved	12/16/2019			Supporting documents saved to folder							
DISTRICT 33	LIVINGSTON	03250	HOWELL, CITY OF	A	9232	L					6/28/2019	10/31/2019	10/18/2019		12/20/2017	12/20/2017			2/7/2018	confusing		6/25/2019	7/10/2019	12/17/2019	Approved	12/18/2019			technical comments submitted							
DISTRICT 33	LIVINGSTON	03929	LIVINGSTON COMMUNITY WATER AUTHORITY	A	1682	P									12/27/2017	12/27/2017			6/27/2019	1,2,3					-				technical comments submitted							
DISTRICT 33	LIVINGSTON	04098	MHOG SEWER & WATER AUTHORITY	A	13944	L					6/28/2019	12/31/2019	12/10/2019		12/27/2017	12/27/2017			2/8/2018	2,3		12/22/2019	12/22/2019	12/26/2019	Approved	1/6/2020			technical comments submitted							
DISTRICT 33	LIVINGSTON	01002	OAK POINTE	A	1900	L					6/28/2019	12/31/2019	12/13/2019		12/27/2017	12/27/2017			1/30/2018	2,3			1/17/2020	1/17/2020	Approved	1/21/2020			technical comments submitted							
DISTRICT 33	LIVINGSTON	05322	PINCKNEY, VILLAGE OF	A	2400	L					6/28/2019	1/31/2020	1/13/2020		12/20/2017	12/20/2017			2/8/2018	3					-				technical comments submitted							
DISTRICT 33	LIVINGSTON	40314	SYLVAN GLEN ESTATES	A	1205	P					6/28/2019	10/31/2019	10/2/2019		11/30/2017	1/4/2018			2/12/2018	1		12/22/2019	12/22/2019	12/26/2019	Approved	12/26/2019			technical comments submitted							
DISTRICT 33	LIVINGSTON	40669	WOODLAND RIDGE	A	1080	P					6/28/2019	10/31/2019	7/23/2019		12/22/2017	12/27/2017			1/18/2018	1,2,3			9/9/2019	7/25/2019	Approved	12/16/2019			technical comments submitted							
DISTRICT 41	WAYNE	00130	ALLEN PARK	A	28210	L					6/25/2019	10/1/2019	7/31/2019	LOS & financial; requested audit on 2/3/2020; rvd audit 2/11/2020; sent to Finance 2/28/2020	12/27/2017	1/2/2018			8/23/2019	2	get audit	3/27/2020	3/27/2020	2/3/2020	Approved	4/2/2020	not yet	yes		Yes (no number)	no	0	$ 3,973,840	$ 14,645,480		
DISTRICT 41	WAYNE	00580	BELLEVILLE	A	3964	L		No, see comment			2/27/2020	5/27/2020		only included spreadsheet; lacked all other elements; prepared by Hennessey	1/16/2018	1/14/2019			2/27/2019	1,2,3,					-				1/14/2019: On 1/17/2018, an assest inventory table and 5-yr & 20-yr CIP was submitted as an appendix to a Reliability Study, but not a full plan. A copy of the RS appendix saved to draft folder. Need to communicate to the supply what additional information is needed.							
DISTRICT 41	WAYNE	00940	BROWNSTOWN TOWNSHIP	A	30627	L					12/5/2019	3/5/2020	2/13/2020		12/26/2017	1/2/2018			1/30/2018	2,3??		2/6/2020	2/6/2020	2/20/2020	Approved	2/20/2020	yes	pdf, no extra copy		no	no, has 1	0	$ 3,754,100	$ 5,205,200		
DISTRICT 41	WAYNE	01100	CANTON TOWNSHIP	A	90173	L									12/26/2017	1/2/2018			1/31/2018				1/31/2018	5/8/2019	Approved	5/8/2109	5/8/2019		5/8/2019 - sent comments by email (need CIP) only the financial section (rate study) scanned	None Known	No	No	$ 3,328,893	$ 1,027,140		
DISTRICT 41	WAYNE	01730	DEARBORN	A	98153	L									5/7/2018	5/7/2018		4/30/2018	7/6/2018				7/6/2018	5/8/2019	Approved	5/9/2019	Y		requested extension to 4/30/2018	N	N	N	$ 33,866,122	$ 25,044,825		
DISTRICT 41	WAYNE	01740	DEARBORN HEIGHTS	A	57774	L					7/11/2019	11/11/2019	11/26/2019		12/20/2017	12/20/2017			8/24/2018	2,3		12/2/2019	12/2/2019	12/4/2019	Approved	12/4/2019	Yes	Yes		No	No	0	$ 3,475,900	$ 3,285,000		
DISTRICT 41	WAYNE	01800	DETROIT CITY OF	A	713777	L					3/5/2020	5/28/2020		(4/14/20) extend due date from 4/30 to 5/28	1/3/2018	1/4/2018			8/24/2018				8/24/2018		-											
DISTRICT 41	WAYNE	01798	DETROIT METROPOLITAN WAYNE CO. AIRPORT	A	6000	L									12/20/2017	12/20/2017			1/31/2018				1/31/2018	1/26/2018	Approved	5/7/2019	5/7/2019			None Known	NA	NA	$ 5,000,000	$ 8,050,000		
DISTRICT 41	WAYNE	02050	ECORSE	A	9512	L		No, see comment			2/27/2020	5/27/2020	7/13/2020	7/13 rcved the revised AMP; need to review	7/5/2018	1/14/2019			2/27/2019	1,2,3		7/13/20 - recvd revised plan; needs finanical review			-				1/14/2019: On 7/5/2018, an assest inventory table and 5-yr & 20-yr CIP was submitted as an appendix to a Reliability Study, but not a full plan. A copy of the RS appendix saved to draft folder. Need to communicate to the supply what additional information is needed.							
DISTRICT 41	WAYNE	02300	FLAT ROCK	A	9878	L					10/3/2019	5/31/2020		Acceptable schedule provided in AMP draft for completion by May 2020- final product should address revision requests	12/27/2017	1/2/2018			2/5/2018, 7/6/2018				7/6/2018		-				Rec'd final copy (email) 5/29/18							
DISTRICT 41	WAYNE	02550	GARDEN CITY	A	27625	L					7/19/2019	3/30/2020		requested ext from 11/19/19 to 3/30/20 due to change in staff	1/4/2018	1/4/2018			2/5/2018	2,3					-											
DISTRICT 41	WAYNE	02630	GIBRALTAR	A	4656	L					6/25/2019	10/1/2019	9/11/2019	submitting annual reports on progress; schedule to complete AMP by Feb 2021	12/27/2017	1/2/2018			2/6/2018	2,3		2/6/2020	2/6/2020		-					no	no, none known	0	$ 10,220,000	$ 7,794,000		
DISTRICT 41	WAYNE	02870	GROSSE ILE TOWNSHIP	A	10371	L									12/27/2017	1/2/2018			2/6/2018	2,3		6/29/2018	5/10/2019	5/14/2018	Approved	8/8/2019	8/8/2019	no extra copy	Township provided add'l rate & ordinance info 5/21/18; saved in draft AMPs for review folder: "02870 Grosse Ile Twp AMP_TB Minutes - Approving rate increase 2018.pdf" and "02870 Grosse Ile Twp AMP_Chapter 197 - Public Works 2018.pdf"							
DISTRICT 41	WAYNE	02900	GROSSE POINTE PARK	A	11555	L	VN	Yes	3/31/2019	3/27/2019									4/3/2020	1,2,3		4/6/2020	4/6/2020		-				3/27/2019 - estimate submittal of AMP Fall 2019 3/4/2020 - An AMP has not been submitted. Contacted the city requesting a date for a submittal of an AMP. They are working on it and investing in AMP, they just need to submit a plan.							
DISTRICT 41	WAYNE	02910	GROSSE POINTE SHORES	A	2929	L					12/9/2019	3/9/2020	3/6/2020	revisions rcvd 3/6/20; requested add'l info by 6/18/2020; need to review 6/5/2020 revisions	12/19/2017	12/19/2017			2/6/2018				2/6/2018		-											
DISTRICT 41	WAYNE	02920	GROSSE POINTE WOODS	A	16135	L					3/5/2020	4/30/2020			1/9/2018	1/9/2018			2/6/2018	3					-											
DISTRICT 41	WAYNE	02880	GROSSE POINTE, CITY OF	A	5421	L					3/5/2020	4/30/2020			2/16/2018	2/22/2018									-				extension to 1/31/2018 requested 12/20/2017							
DISTRICT 41	WAYNE	02970	HAMTRAMCK	A	22413	L					10/16/2019	4/30/2020			1/3/2018	1/4/2018			8/24/2018	1,2,3					-											
DISTRICT 41	WAYNE	03020	HARPER WOODS	A	14236	L					10/22/2019	1/22/2020			2/15/2018	2/15/2018			2/28/2018	1,2,3					-				~~requested extension to 1/31/2018~~							
DISTRICT 41	WAYNE	03140	HIGHLAND PARK	A	11776	L					4/18/2019 (email)		5/10/2019 (email)	Received add'l financial info 5/10/2019; copied to Lansing drive under "completed financial reviews"	1/5/2018	1/5/2018			2/7/2018	2,3	not sufficient	12/3/2019	12/4/2019	12/4/2019	Approved	12/4/2019	Yes	Yes	Draft copy rec'd; another version of the AMP was submitted on 1/4/2019 7/8/2019 - Received add'l financial info 5/10/2019; copied to Lansing drive under "completed financial reviews"	Yes (no number)	Yes	$ 25,000,000.00	$ 52,131,200	$ 125,155,000	may break even in 2019	varies (in millions)
DISTRICT 41	OAKLAND	03200	HOLLY, VILLAGE OF	A	8557	L					4/9/2020	~~7/9/2020~~ 12/31/2020		6/15: requested extension to 12/31/20 due to COVID staff reduction & transition to CityWorks	1/29/2018	2/21/2018			6/19/2018	3					-											
DISTRICT 41	WAYNE	03320	HURON TWP	A	15879	L		No, see comment			2/27/2020	5/27/2020		only included spreadsheet; lacked all other elements; prepared by Hennessey	1/17/2018	1/14/2019			2/27/2019	1,2,3					-				1/14/2019: On 1/17/2018, an assest inventory table and 5-yr & 20-yr CIP was submitted as an appendix to a Reliability Study, but not a full plan. A copy of the RS appendix saved to draft folder. Need to communicate to the supply what additional information is needed.							
DISTRICT 41	WAYNE	03360	INKSTER	A	25369	L					3/5/2020	4/30/2020			12/31/2017	1/2/2018			2/7/2018	2,3					-											
DISTRICT 41	WAYNE	03870	LINCOLN PARK	A	38144	L		No, see comment			10/2/2019	5/30/2020		only included spreadsheet; lacked all other elements; prepared by Hennessey	6/15/2018	1/14/2019			2/27/2019	1,2,3					-				1/14/2019: On 6/15/2018, an assest inventory table and 5-yr & 20-yr CIP was submitted as an appendix to a Reliability Study, but not a full plan. A copy of the RS appendix saved to draft folder. Need to communicate to the supply what additional information is needed.							
DISTRICT 41	WAYNE	03930	LIVONIA	A	96942	L		No, see comment			12/9/2019	~~2/9/2019~~ 3/2/2020	3/3/2020	financial only; extension to 3/2/2020	2/25/2019	2/25/2019		~~9/1/2018~~	12/2/2019	1,2		3/4/2020	3/4/2020	4/2/2019	Approved	3/12/2020	yes	yes	~~requested extension; 1/14/2019: requested second extension submittals delayed to issues with PRVs in calibartion of model and a unusually high number of water main breaks over summer; documents are drafted but CIP needs to go before council for approval which is slated for February. Extension until June 2019, but anticipate submitting before then.~~	No (<3%)	No	No	$ 38,630,000	$ 172,773,000	?	?
DISTRICT 41	WAYNE	04220	MELVINDALE	A	10715	L					3/12/2020	4/30/2020		due date based on completion schedule in draft AMP	12/27/2017	1/2/2018			2/8/2018	2,3					-											
DISTRICT 41	OAKLAND	04390	MILFORD, VILLAGE OF	A	6366	L									12/27/2017	1/2/2018			2/28/2018	1,2,3		11/19/2019	11/19/2019	11/20/2019	Approved	11/20/2019	11/20/2019	Yes	The electronic version of the AMP is incomplete and does not include the attachments (10/29/2019)	No	No	No	$ -	$ 5,585,000	0	0
DISTRICT 41	WAYNE	04830	NORTHVILLE	A	6039	L					12/5/2019	3/9/2020			2016	11/13/2018			2/27/2019	3					-				11/14/18 & 5/8/2019 - email comments 8/20/2018 - Review of file identified that part of the AMP was provided in the 2016 RS; it is missing aspects of the financial documentation requirements; scanned and saved in draft folder.	No	No	No	$ 55,000	$ 20,000		
DISTRICT 41	WAYNE	04845	NORTHVILLE TOWNSHIP	A	26655	L									1/2/2018	1/2/2018			2/8/2018				2/8/2018	5/8/2019	Approved	5/8/2019	5/8/2019	Mailed extra copy		None Known	NA	NA	$ 875,000	$ 3,662,700		
DISTRICT 41	WAYNE	05400	PLYMOUTH	A	9132	L									12/29/2017	1/2/2018			2/8/2018				2/8/2018	8/20/2018	Approved	5/7/2019	5/7/2019			No	No	No	$ 1,952,100	$ 3,081,100		
DISTRICT 41	WAYNE	05420	PLYMOUTH TOWNSHIP	A	27524	L					12/9/2019	3/9/2020	3/4/2020	*need to review revised AMP rcvd 3/4/20	12/20/2017	12/20/2017			2/8/2018				2/8/2018		-											
DISTRICT 41	WAYNE	05640	REDFORD TOWNSHIP	A	48362	L					7/17/2019	12/6/2019	5/26/2020	~~extension to 12/6/2019 (from 11/17/19) granted~~; rcvd revised plan dated Dec 2019 on 5/26/2020	12/18/2017	12/18/2017			2/9/2018				2/9/2018	6/2/2020	Approved	6/8/2020	yes	N/A		Yes	Yes	601,000	$ 2,493,000	$ 9,133,000	0	0
DISTRICT 41	WAYNE	05690	RIVER ROUGE	A	7903	L		No, see comment			2/27/2020	5/27/2020		only included spreadsheet; lacked all other elements; prepared by Hennessey	1/16/2018	1/14/2019			2/27/2019	1,2,3					-				1/14/2019: On 1/17/2018, an assest inventory table and 5-yr & 20-yr CIP was submitted as an appendix to a Reliability Study, but not a full plan. A copy of the RS appendix saved to draft folder. Need to communicate to the supply what additional information is needed.							
DISTRICT 41	WAYNE	05710	RIVERVIEW	A	12486	L					8/8/2019	5/31/2020		city will complete AMP study by May 2020 & has been submitting annual reports on progress.	12/27/2017	1/2/2018			2/9/2018	1,2,3					-				city will complete AMP study by May 2020 & has been submitting annual reports on progress.							
DISTRICT 41	WAYNE	05750	ROCKWOOD	A	3289	L					7/26/2019	8/31/2019	6/12/2020	Reviewed 6/12 revisions	12/27/2017	1/2/2018			2/9/2018	2,3	appears insuffic	8/11/2020	8/11/2020	8/20/2020	Approved	8/20/2020	yes	yes	revised plan submitted 2/4/2020 & 6/12/2020	No LSL	NA	NA	$ 1,708,444	$ 4,755,556	50000	
DISTRICT 41	WAYNE	05785	ROMULUS	A	23989	L									12/28/2017	1/2/2018			2/28/2018, 7/6/2018		(see comments column)		7/6/2018	3/26/2018	Approved	5/7/2019	5/7/2019	Mailed extra copy	To RLS - PDF of Att E to AMP being put on T; contains finanical info you are looking for	No	No	No	$ 2,120,100	$ 580,250		
DISTRICT 41	WAYNE	06170	SOUTHGATE	A	30047	L		No, see comment			9/10/2019	3/31/2020			2/10/2018	1/14/2019			2/27/2019	1,2,3					-				1/14/2019: On 2/20/2018, an assest inventory table and 5-yr & 20-yr CIP was submitted as an appendix to a Reliability Study, but not a full plan. A copy of the RS appendix saved to draft folder. Need to communicate to the supply what additional information is needed.							
DISTRICT 41	WAYNE	06460	SUMPTER TOWNSHIP	A	9576	L					12/9/2019	3/9/2020			4/12/2018	4/12/2018			7/6/2018	2,3					-											
DISTRICT 41	WAYNE	06545	TAYLOR	A	63131	L					9/24/2019	12/24/2019	11/25/2019		12/26/2017	1/2/2018			2/12/2018	2,3	insufficient	11/27/2019	11/27/2019	12/2/2019	Approved	12/2/2019	Yes	Yes		No	No	0	$ 9,520,600	$ 12,921,500		-$2925354 (2016-17)
DISTRICT 41	WAYNE	06650	TRENTON	A	18853	L					6/25/2019	10/1/2019	2/11/2020	complete	12/27/2017	1/2/2018			2/12/2018	2,3		2/6/2020	2/6/2020	2/26/2020	Approved	2/26/2020	Yes	pdf, no extra copy		yes	not in table, but i	0	$ 2,423,285	$ 9,654,025		
DISTRICT 41	WAYNE	06770	VAN BUREN TOWNSHIP	A	27359	L					3/12/2020	10/1/2020		due date based on completion schedule in draft AMP	12/27/2017	1/2/2018			2/12/2018	1,2,3					-											
DISTRICT 41	OAKLAND	06910	WATERFORD TOWNSHIP	A	67652	L					12/5/2019	~~3/5/2020~~ 6/30/2020		Have contract w/DLZ to complete by end of June 2020; negotiated before letter sent	12/21/2017	12/21/2017			2/12/2018	1,2,3					-											
DISTRICT 41	WAYNE	06950	WAYNE	A	17593	L					6/25/2020 ~~3/5/2020~~	7/25/2020 ~~4/30/2020~~	~~4/29/2020~~	6/1/20 - still need 20-yr CIP; ~~need WIFS review~~	7/31/2018	7/31/2018		~~8/31/2018~~	2/27/2019	1,2,3		6/11/2020	6/11/2020		-				~~requested extension to 6/1/2018; requested add'l time 6/29/18~~							
DISTRICT 41	WAYNE	07040	WESTLAND	A	84094	L					12/5/2019	3/5/2020	3/5/2020	3/6/2020 - add'l financial info sent to Bob for review	12/26/2017	1/2/2018			2/28/2018	1,2,3		3/27/2020	3/27/2020	7/1/2018	Approved	4/2/2020	not yet	yes	7/20/2018 - Westland provided add'l document for a cost study	no	no		$ 11,550,000	$ 62,270,000		
DISTRICT 41	OAKLAND	07065	WHITE LAKE TOWNSHIP	A	6000	L									12/27/2017	1/2/2018			2/28/2018	1,2,3		4/30/2019	5/3/2019	2/20/2019	Approved	5/7/2019	5/7/2019			None Known	NA	NA	$ 2,050,320	$ 6,675,000		
DISTRICT 41	WAYNE	07180	WOODHAVEN	A	12875	L		No, see comment			2/27/2020	5/27/2020		only included spreadsheet; lacked all other elements; prepared by Hennessey	1/16/2018	1/14/2019			2/27/2019	1,2,3					-				1/14/2019: On 1/17/2018, an assest inventory table and 5-yr & 20-yr CIP was submitted as an appendix to a Reliability Study, but not a full plan. A copy of the RS appendix saved to draft folder. Need to communicate to the supply what additional information is needed.							
DISTRICT 42	MACOMB	00240	ARMADA, VILLAGE OF	A	1463	L		Yes	3/31/2019	2/12/2019					1/13/2020	1/13/2020		4/10/2018	2/6/2020	1,2,3					-				90 day extension requested 1/10/18, Add'l 90 day extension req'd 4/13/18, Newest Due Date 12/31/19 (awaiting completion of reliability study to contribute)							
DISTRICT 42	ST CLAIR	01008	BURTCHVILLE TOWNSHIP	A	2900	L					9/5/2019	10/31/2019	11/1/2019		12/26/2017	1/2/2018			1/30/2018	3		11/19/2019	11/19/2019	12/4/2019	Approved	12/4/2019	12/4/2019									
DISTRICT 42	ST CLAIR	01110	CAPAC, VILLAGE OF	A	1775	L									12/20/2019	1/13/2020		12/31/2019				5/6/2020	5/7/1950		-				Currently underway (RCAP), majority of work expected by summer 2019							
DISTRICT 42	MACOMB	01290	CENTER LINE, CITY OF	A	8257	L					4/16/2019			*As part of sanitary survey letter. Second set of revisions requested by June 15, 2020.	2/26/2018	2/26/2018			7/6/2018	1		11/27/19 still no budget			-				requested extension to 2/28/2018 (email request 12/21)	no	no	no				
DISTRICT 42	MACOMB	01390	CHESTERFIELD TOWNSHIP	A	41650	L					6/27/2019	8/31/2019	12/2/2019		3/27/2018	3/28/2018			7/6/2018				7/6/2018	12/4/2019	Approved	12/4/2019	12/4/2019									
DISTRICT 42	ST CLAIR	01450	CLAY TOWNSHIP	A	9866	L					6/26/2019	8/31/2019	8/28/2019		12/29/2017	1/3/2018			2/28/2018	2,3		9/3/2019	9/10/2019	12/4/2019	Approved	12/4/2019	12/4/2019									
DISTRICT 42	MACOMB	01480	CLINTON TOWNSHIP	A	97513	L									12/28/2017	1/2/2018			2/28/2018				2/28/2018	4/30/2019	Approved	4/30/2019	4/30/2019			no	no	no	$ 25,630,000.00	$4mil-$5mil/yr	$ -	$ -
DISTRICT 42	ST CLAIR	01493	CLYDE TOWNSHIP	A	2400	L					5/17/2019	7/31/2019	7/31/2019		12/29/2017	1/2/2018			2/12/2018	2,3		9/3/2019	9/10/2019	10/28/2019	Approved	10/31/2019	10/31/2019		Draft copy - DPW Superintendent needs to review still, 2/12 Updated copy rec'd (daved 2/22)	no	no	no				
DISTRICT 42	ST CLAIR	01650	COTTRELLVILLE TOWNSHIP	A	3200	L					6/27/2019	8/31/2019		email sent 5/5/2020 requesting update	12/31/2017	1/2/2018			2/28/2018	3					-											
DISTRICT 42	MACOMB	01950	EASTPOINTE, CITY OF	A	32442	L					4/16/2019			*As part of sanitary survey letter	2/1/2018	2/21/2018			3/1/2018	1,2		5/14/2020	et, question sufficiency		-				extension to 1/31/2018 requested 12/20/2017	no	no	no				
DISTRICT 42	ST CLAIR	02385	FORT GRATIOT TOWNSHIP	A	11153	L					4/30/2019	10/1/2019		granted ext. until 9/1, granted addtl. Ext. to 10/1	12/29/2017	1/2/2018			2/5/2018				2/5/2018	11/14/2019	Approved		11/14/2019		3 separate emails							
DISTRICT 42	MACOMB	02460	FRASER, CITY OF	A	16500	L					4/30/2019	7/31/2020		email sent 5/5/2020 requesting update	1/3/2018	1/3/2018			2/5/2018	3					-					no	no	no				

DISTRICT 42	MACOMB	03040	HARRISON TOWNSHIP	A	24500	L					5/17/2019	7/31/2019		email sent 5/5/2020 requesting update	12/29/2017	1/2/2018			2/7/2018	2,3					-					no	no	no				
DISTRICT 42	ST CLAIR	03628	KIMBALL TOWNSHIP	A	3765	L		Yes	3/31/2019	2/27/2019					5/15/2019	5/16/2019						5/16/2019	7/30/2019	6/19/2019	Approved				Rec'd letter asking for alternate compliance schedule - Hired Tetra Tech, draft to be completed 3/31/19, final 5/15/19							
DISTRICT 42	MACOMB	03836	LENOX TOWNSHIP	A	3000	L									4/2/2018	4/3/2018			8/24/2018				8/24/2018	6/27/2019	Approved	6/27/2019	6/27/2019		90 day extension requested 12/19/17							
DISTRICT 42	MACOMB	03990	MACOMB TOWNSHIP	A	87433	L	VN							Providing annual updates, final plan anticipated 2021. Submitted update in Aug 2019, but it did not satisfy enough requirements to be fully approvable yet				8/30/2019				8/11/2020	8/11/2020		-				Submititng annual progress reports- final program originally expected in 2021 (but system is currently 6-12 months ahead of schedule)							
DISTRICT 42	ST CLAIR	04230	MEMPHIS, CITY OF	A	1180	L					7/26/2019	9/30/2019		*As part of sanitary survey letter, deadline extended via email	4/18/2018	4/18/2018			7/6/2018	2,3		11/27/2019	ed with questions		-											
DISTRICT 42	MACOMB	04690	NEW HAVEN, VILLAGE OF	A	4700	L									4/2/2018	4/3/2018			7/6/2018				7/6/2018	4/30/2019	Approved	4/30/2019	5/20/2019		90 day extension requested due to change in consulting firm	no	no	no	$ -	$ 1,750,000.00	$ -	$ -
DISTRICT 42	ST CLAIR	05490	PORT HURON TOWNSHIP	A	10654	L					6/26/2019	8/31/2019		email sent 5/5/2020 requesting update	12/20/2017	12/20/2017			2/9/2018	3					-											
DISTRICT 42	MACOMB	05670	RICHMOND, CITY OF	A	5733	L					6/27/2019	8/31/2019	8/8/2019	*As part of sanitary survey letter	10/1/2017	12/1/2017			2/9/2018	3			9/13/2019	12/1/2019	Approved		12/1/2019									
DISTRICT 42	MACOMB	05780	ROMEO, VILLAGE OF	A	3750	L					5/17/2019	7/31/2019	7/31/2019		12/18/2017	12/18/2017			2/9/2018	1,2??	appears insuffic	9/3/2019	9/13/2019	11/5/2019	Approved	11/8/2019	11/5/2019			no	no	no				
DISTRICT 42	MACOMB	05820	ROSEVILLE, CITY OF	A	48125	L					3/26/2019	9/30/2019		*As part of sanitary survey letter. Email sent 5/5/2020 to request update	1/16/2018	1/16/2018			2/9/2018				2/9/2018	7/6/2020	Approved		7/6/2020			no	no	no				
DISTRICT 42	MACOMB	06010	SHELBY TOWNSHIP	A	72000	L					6/10/2019	7/31/2019	7/31/2019	*As part of sanitary survey letter	12/26/2017	1/2/2018			2/12/2018	2???, 3		11/18/2018	11/18/2019	12/4/2019	Approved	12/4/2019	12/4/2019									
DISTRICT 42	MACOMB	06280	ST. CLAIR SHORES, CITY OF	A	59715	L					4/30/2019	6/1/2019		email sent 5/5/2020 requesting update	12/18/2017	12/18/2017			2/12/2018	2,3					-					no	no	no				
DISTRICT 42	ST CLAIR	06282	ST. CLAIR TOWNSHIP	A	3270	L					6/26/2019	11/30/2020		email sent 5/5/2020 requesting update	1/12/2018	1/16/2018			2/12/2018	2,3					-											
DISTRICT 42	MACOMB	06385	STERLING HEIGHTS, CITY OF	A	127000	L					6/27/2019	12/13/2019	11/5/2019	extednded to 12/13/19	12/18/2017	12/18/2017			2/12/2018	1,2,3		6/24/2020	6/24/2020		-											
DISTRICT 42	MACOMB	06760	UTICA, CITY OF	A	4577	L					9/5/2019	10/31/2019		email sent 5/5/2020 requesting update	1/2/2018	1/2/2018			2/12/2018	2,3???		6/23/2020	6/23/2020	6/2/2020	Approved	6/8/2020	6/2/2020									
DISTRICT 42	MACOMB	06900	WARREN, CITY OF	A	134056	L					4/30/2019			*As part of sanitary survey letter, supply requested to submit Dec. 2020. Sent follow up email requesting updates sooner	12/27/2017	1/2/2018			2/12/2018	2,3???		5/14/2020	5/14/2020	6/9/2020	Approved		6/9/2020			no	no	no				
DISTRICT 42	MACOMB	06905	WASHINGTON TOWNSHIP	A	15828	L					3/26/2019	9/30/2019		*As part of sanitary survey letter	12/29/2017	1/2/2018			2/28/2018	1,2,3		1/13/2020	1/13/2020	1/13/2020	Approved	1/24/2020			Updated copy rec'd 1/30/18, scanned to folder 2/21/18	no	no	no				
DISTRICT 42	ST CLAIR	07230	YALE, CITY OF	A	1900	L	VN	Yes	3/31/2019					Have reached out to supply to request update on progress/response to VN- have not received satisfactory response											-				4/16/19- No response received							
DISTRICT 43	OAKLAND	05450	AUBURN HILLS	A	21412	L					3/5/2020	4/30/2020	3/25/2020		2/15/2018	2/22/2018			7/6/2018				7/6/2018	4/6/2020	Approved	4/6/2020			requested (via email 12/21) extension to 2/15/18							
DISTRICT 43	OAKLAND	00630	BERKLEY	A	14970	L									12/20/2017	2/28/2018			7/6/2018				7/6/2018	12/6/2019	Approved	12/16/2019			add'l info rec'd 2/16/18							
DISTRICT 43	OAKLAND	00690	BEVERLY HILLS	A	10451	L					3/5/2020	4/30/2020	8/6/2020	Rev Respon Submit date extended to 8/31/20	12/26/2017	1/2/2018			1/30/2018	2, 3??		8/11/2020	8/11/2020	8/11/2020	Approved	8/12/2020			revision rec'd 2/12/18. Revision Response Submit date extended to 8/31/2020.							
DISTRICT 43	OAKLAND	00715	BINGHAM FARMS	A	1136	L									12/21/2017	1/2/2018			2/12/2018				2/12/2018	12/5/2019	Approved	12/16/2019										
DISTRICT 43	OAKLAND	00730	BIRMINGHAM	A	20103	L					3/5/2020	4/30/2020	6/9/2020	Rev Respon Submit date extended to 6/30/20	12/26/2017	1/2/2018			1/30/2018	2, 3??		6/17/2020	6/17/2020	6/17/2020	Approved	6/25/2020			revision rec'd 2/12/18. Revision Response Submit date extended to 6/30/2020.	Revision Response received on 6/9/2020and sent to Bob Scheeider on 6/9/2020						
DISTRICT 43	OAKLAND	00775	BLOOMFIELD HILLS	A	4544	L									12/21/2017	1/2/2018			2/12/2018				2/12/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 43	OAKLAND	00790	BLOOMFIELD TOWNSHIP	A	41070	L					3/5/2020	4/30/2020	4/24/2020	On 4/24/20 Sent to Bob Schneider	12/21/2017	1/2/2018			1/30/2018	2,3??		5/1/2020	5/1/2020	5/4/2020	Approved	5/4/2020			Revision Response received via email on 4/24/20 and forwarded to Robert Schneider on 4/24/20 also.							
DISTRICT 43	OAKLAND	40375	CEDARBROOK ESTATES	A	1728	P									12/20/2017	1/2/2018			2/12/2018				2/12/2018	4/18/2019	Approved	1/22/2020			SHOULD BE D44	No	No	No	$1,000	Avg $13500	$0	$0
DISTRICT 43	OAKLAND	40377	CLARKSTON LAKE ESTATES	A	1245	P					3/5/2020	4/30/2020	4/23/2020	Financial approved 1st submission	12/20/2017	1/2/2018			2/12/2018				2/12/2018	4/30/2020	Approved	5/1/2020	5/1/2020		SHOULD BE D44							
DISTRICT 43	OAKLAND	01440	CLAWSON	A	11825	L					3/5/2020	4/30/2020		Rev Respon Submit date extended to 12/31/20	3/30/2018	3/30/2018		3/30/2018	7/6/2018	1,2					-				requested extension to 3/30/18. Revision Response Submit date extended to 12/31/20							
DISTRICT 43	OAKLAND	01773	DEERWOOD SUBDIVISION	A	1946	L												w/3342							-				Included with Independence Twp AMP							
DISTRICT 43	OAKLAND	02280	FERNDALE	A	22105	L					3/5/2020	4/30/2020	4/23/2020	On 4/23/20 Sent to Bob Schneider	12/26/2017	1/2/2018			2/5/2018	1,2,3		5/1/2020	5/1/2020	5/4/2020	Approved	5/4/2020			add'l info rec'd 1/25/18. Revision Response received via email on 4/23/20 and forwarded to Robert Schneider on 4/23/20 also.							
DISTRICT 43	OAKLAND	03100	HAZEL PARK	A	16400	L									12/28/2017	2/28/2018			7/6/2018				7/6/2018	12/6/2019	Approved	12/16/2019										
DISTRICT 43	OAKLAND	40387	HIGHLAND GREENS ESTATES	A	2268	P		Yes	3/31/2019	4/9/2019					4/9/2019	4/9/2019		10/31/2018	4/9/2019				5/10/2019	1/22/2020	Approved	1/22/2020			SHOULD BE D44 - requested (via email 3/1) extension to 3/31/18; requested another extension (via email 7/11) to 10/31/18; 4/9 - Received AMP via email - sent to district email box for financial review;	No	No	No	$124, 800	Ang $ 28, 700	$0	$0
DISTRICT 43	OAKLAND	03310	HUNTINGTON WOODS	A	6200	L					3/5/2020	4/30/2020	5/22/2020		1/5/2018	1/5/2018			2/7/2018	1,2,3		5/28/2020	5/28/2020	5/28/2020	Approved	6/8/2020			Revision Response received via email on 5/22/20 (sent to Robert Schneider)							
DISTRICT 43	OAKLAND	03342	INDEPENDENCE TOWNSHIP	A	10454	L					3/5/2020	4/30/2020	4/22/2020	On 4/22/20 Sent to Bob Schneider	12/26/2017	1/2/2018			2/7/2018	1,2,3		4/28/2020	4/28/2020	4/30/2020	Approved	4/30/2020			Revision Response received via email on 4/22/20 and forwarded to Robert Schneider on 4/22/20 also.							
DISTRICT 43	OAKLAND	03595	KEEGO HARBOR, CITY OF	A	3286	L									12/21/2017	1/2/2018			2/28/2018				2/28/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 43	OAKLAND	03740	LAKE ORION, VILLAGE OF	A	2973	L					3/5/2020	4/30/2020	4/16/2020		12/26/2017	1/2/2018			2/8/2018				2/8/2018	4/24/2020	Approved	4/24/2020			add'l info rec'd 2/16/18							
DISTRICT 43	OAKLAND	40390	#VALUE!	A	1621	P												Inactive							-				NO LONGER ACTIVE SYSTEM							
DISTRICT 43	OAKLAND	03800	LATHRUP VILLAGE	A	4075	L		Yes	3/31/2019	2/21/2019	3/5/2020	4/30/2020	6/4/2020	On 6/4/20 Sent to Bob Schneider	2/21/2019	2/27/2019		12/31/2018	2/27/2019	2		6/16/2020	6/16/2020	6/16/2020	Approved	6/18/2020			requested (via email 2/27) extension to 12/31/18. Revision Response received on 6/4/2020and sent to Bob Scheeider on 6/4/2020							
DISTRICT 43	OAKLAND	04000	MADISON HEIGHTS	A	29694	L					3/5/2020	4/30/2020		Revision Response Submit date extended to 10/30/20	1/16/2018	1/17/2018			2/8/2018	1,3					-				requested to extend the REVISION RESPONSE deadline to 10/30/20							
DISTRICT 43	OAKLAND	04880	OAK PARK	A	29319	L					3/5/2020	4/30/2020		Revision Respose Submit date extended to 6/30/20	3/1/2018	3/1/2018			7/6/2018				7/6/2018		-				requested (via email 12/22) extension to 2/2/18, requested another extension via email to 3/2/18.Revision Response Submit date extended to 6/30/20							
DISTRICT 43	OAKLAND	05031	ORCHARD LAKE VILLAGE	A	2819	L									12/21/2017	1/2/2018			2/28/2018				2/28/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 43	OAKLAND	05035	ORION TOWNSHIP	A	33000	L					3/5/2020	4/30/2020		Revision Response Submit date extended to 7/31/20	12/22/2017	1/2/2018			2/28/2018	1,2,3					-				requested (email 3/23/20) to extend the REVISION RESPONSE deadline to 7/31/20							
DISTRICT 43	OAKLAND	05138	OXFORD TOWNSHIP	A	9132	L									12/21/2017	1/2/2018			2/28/2018				2/28/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 43	OAKLAND	05130	OXFORD, VILLAGE OF	A	3540	L					3/5/2020	4/30/2020		Rev Respon Submit date extended to 8/31/20	12/28/2017	2/28/2018			7/6/2018				7/6/2018		-				Revision Response Submit date extended to 8/31/20							
DISTRICT 43	OAKLAND	05390	PLEASANT RIDGE	A	2526	L					3/5/2020	4/30/2020	5/11/2020	Revision Response Submit date extended to 12/31/20 - plan to include LSL	7/11/2018	7/11/2018		4/30/2018	8/24/2018	1,2					-				requested (via email 2/27) extension to 4/30/18 - Copy rec'd 7/11 but Assistand City Manager states it was originally sent on 5/10/18. Revision Response Submit date extended to 12/31/20 - plan to include LSL							
DISTRICT 43	OAKLAND	05440	PONTIAC	A	59515	L									12/21/2017	1/2/2018			2/28/2018				2/28/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 43	OAKLAND	05720	ROCHESTER	A	8300	L					3/5/2020	4/30/2020	4/23/2020	Sent directly to Bob Schneider	12/22/2017	1/2/2018			2/28/2018	1,2,3		4/28/2020	4/28/2020	4/30/2020	Approved	4/30/2020			Revision Response sent directly to Robert Schneider on 4/23/20.							
DISTRICT 43	OAKLAND	05723	ROCHESTER EAST	A	4700	L						4/30/2020	4/23/2020	Sent directly to Bob Schneider	12/22/2017	1/2/2018			2/28/2018	1,2,3		4/28/2020	4/28/2020	4/30/2020	Approved	4/30/2020			COMBINED WITH ROCHESTER 5720. Revision Response sent directly to Robert Schneider on 4/23/20.							
DISTRICT 43	OAKLAND	00325	ROCHESTER HILLS	A	70995	L									12/26/2017	1/2/2018			1/30/2018				1/30/2018	12/6/2019	Approved	12/16/2019			revision rec'd 2/12/18							
DISTRICT 43	OAKLAND	05840	ROYAL OAK TOWNSHIP	A	2442	L									12/21/2017	1/2/2018			2/28/2018	2,3			3/5/2020	3/5/2020	Approved	3/5/2020										
DISTRICT 43	OAKLAND	05830	ROYAL OAK, CITY OF	A	57236	L					3/5/2020	4/30/2020		Revision Response Submit date extended to 12/31/20	12/31/2017	1/2/2018			2/28/2018	1,2,3					-				requested (email 3/20/20) to extend the REVISION RESPONSE deadline to 12/31/20							
DISTRICT 43	OAKLAND	04877	SOUTHEAST OAKLAND TOWNSHIP	A	2298	L									12/26/2017	1/2/2018							2/28/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 43	OAKLAND	06160	SOUTHFIELD	A	71739	L					3/5/2020	4/30/2020		Rev Respon Submit date extended to 11/30/20	3/6/2018	3/6/2018			7/6/2018				7/6/2018		-				Rev Respon Submit date extended to 11/30/20							
DISTRICT 43	OAKLAND	04878	SOUTHWEST OAKLAND TOWNSHIP	A	6128	L									12/21/2017	1/2/2018			2/28/2018				2/28/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 43	OAKLAND	06530	SYLVAN LAKE	A	1720	L					3/5/2020	4/30/2020	4/27/2020	On 4/27/20 sent to Bob Schneider	12/21/2017	1/2/2018			2/12/2018	2,3???		5/4/2020	5/4/2020	5/4/2020	Approved	5/4/2020			add'l info rec'd 2/7/18. Revision Response received via email on 4/27/20 and forwarded to Robert Schneider on 4/27/20 also.							
DISTRICT 43	OAKLAND	06690	TROY	A	80980	L					8/16/2019	1/1/2020	12/30/2019		12/26/2017	1/2/2018			2/12/2018	2,3		1/24/2020	1/24/2020	1/29/2020	Approved				SHOULD BE D45 - Revision rec'd and scanned to folder 12/30/19							
DISTRICT 43	OAKLAND	06975	WEST BLOOMFIELD TOWNSHIP	A	49429	L					8/16/2019	1/1/2020	10/23/2019		12/22/2017	1/2/2018			8/24/2018	3		11/7/2019	11/7/2019	8/15/2019	Approved				SHOULD BE D45 - Revision rec'd and scanned to folder 1/17/18 - Second revision rec'd and scanned to folder 10/22/19							
DISTRICT 44	OAKLAND	40376	CHILDS LAKE ESTATES MHC	A	1548	P		Yes	3/31/2019	12/10/2019	3/5/2020	4/30/2020			12/10/2019	12/13/2019			12/22/2019	2 don't need 3					-				4/5/19 - No response received; 10/23/19 - Received an extension to 12/31/19							
DISTRICT 44	OAKLAND	01573	COMMERCE TOWNSHIP	A	17400	L					3/5/2020	4/30/2020		Rev Respon Submit date extended to 8/10/20	12/27/2017	1/2/2018			1/31/2018	1,2		7/21/2020	7/21/2020	7/22/2020	Approved	7/22/2020			SHOULD BE D43. Revision Response Submit date extended to 8/10/2020							
DISTRICT 44	OAKLAND	02240	FARMINGTON HILLS, CITY OF	A	72460	L									12/21/2017	1/2/2018			3/1/2018				3/1/2018	12/5/2019	Approved	12/6/2019										
DISTRICT 44	OAKLAND	02230	FARMINGTON, CITY OF	A	10500	L					12/16/2019	4/1/2020	1/30/2020	extension granted to 10/02/20	12/27/2017	1/2/2018			3/1/2018	1,2,3					-				financial denied - revision due 10/02/2020							
DISTRICT 44	OAKLAND	03312	HIGHLAND TOWNSHIP	A	3472	L									12/21/2017	1/2/2018			2/28/2018				2/28/2018	4/17/2019	Approved					NA	NA	NA	$188,646	$2,084,500	$0	$0
DISTRICT 44	OAKLAND	03968	LYON TOWNSHIP	A	9390	L									12/21/2017	1/2/2018			2/28/2018				2/28/2018	4/17/2019	Approved					No	No	NA	$17,000,000.00	$7,100,000.00	$0	$0
DISTRICT 44	OAKLAND	40612	MEADOW LAKE ESTATES MHC	A	1060	P					3/5/2020	4/30/2020			1/30/2018	2/21/2018			7/6/2018				7/6/2018		-				4/5/19 - Financials approved, no financial data; comments pending							
DISTRICT 44	OAKLAND	04870	NOVI, CITY OF	A	44000	L					3/5/2020	4/30/2020		Rev Respon Submit date extended to 8/31/20	12/27/2017	1/2/2018			1/19/2018	1,2					-				Revision Response Submit date extended to 8/31/20							
DISTRICT 44	OAKLAND	40391	OAK HILL ESTATES MHC	A	1260	P	VN	Yes	3/31/2019																-				4/5/19 - No response received							
DISTRICT 44	OAKLAND	40399	ORION LAKE ESTATES MHC	A	1058	P	VN	Yes	3/31/2019																-				4/5/19 - AMP will not be completed bc WSSN is planning to connect to city water; Current Status - ACO							
DISTRICT 44	OAKLAND	40575	SASHABAW MEADOWS MHP	A	1278	P					4/17/2019				1/2/2018	1/2/2018			2/12/2018				2/12/2018		-				4/5/19 - Financials approved, but no financial data; no other documentation	No	No	No				
DISTRICT 44	OAKLAND	06110	SOUTH LYON, CITY OF	A	11055	L									2/8/2018	2/21/2018			7/6/2018				7/6/2018	4/17/2019	Approved					Yes (1,763)	Yes	$30,000	$327, 500	$1,290,000	$151,824	$741,504
DISTRICT 44	MACOMB	40327	SPRINGBROOK ESTATES MHP	A	1008	P	VN	Yes	3/31/2019																-				4/5/19 - No response received; WSSN intends on connecting to Bruce Twp							
DISTRICT 44	OAKLAND	40397	SPRINGROVE MHC	A	1060	P		Yes	3/31/2019	5/8/2019	3/5/2020	4/30/2020			5/8/2019	12/4/2019			12/19/2019	2 don't need 3					-				3/25/19 - Ext requested via phone by T.Erickson of Process Results to complete the AMP; Ext date 4/30/2019; Email follow-up with request;							
DISTRICT 44	OAKLAND	03749	SPRINGS/PORTSMOUTH APARTMENTS	A	3200	P	VN	Yes	3/31/2019																-				4/5/19 - No response received							
DISTRICT 44	OAKLAND	06875	WALLED LAKE, CITY OF	A	6999	L					3/5/2020	4/30/2020	4/27/2020	On 4/27/20 sent to Bob Schneider	12/26/2017	1/16/2018			2/12/2018	2,3		5/5/2020	5/6/2020	5/7/2020	Approved	5/7/2020			Revision Response received via email on 4/27/20 and 5/5/20, forwarded to Robert Schneider..							
DISTRICT 44	OAKLAND	07135	WIXOM, CITY OF	A	9220	L					3/9/2020	4/30/2020	4/30/2020	On 4/30/20 sent to Bob Schneider	12/29/2017	1/2/2018			2/12/2018	2,3		4/30/2020	5/7/2020	5/13/2020	Approved	5/13/2020			Revision Response received via email on 4/30/20 and forwarded to Robert Schneider.							
DISTRICT 51	ALLEGAN	00120	ALLEGAN	A	5930	L					1/24/2020	3/20/2020	1/31/2020	Requested to have revised AMP submitted in May after council reviews and approves budget	12/22/2017	1/3/2018			2/28/2018				2/28/2018		-											
DISTRICT 51	ALLEGAN	02260	FENNVILLE	A	1459	L					3/5/2020	4/30/2020			12/19/2017 01/17/2018	1/3/2018 1/17/2018			2/28/2018				2/28/2018		-				Part of the plan was updated on 1/17/18							
DISTRICT 51	BARRY	03090	HASTINGS	A	7350	L					3/5/2020	4/30/2020			12/27/2017	12/27/2017			2/7/2018	2,3					-											
DISTRICT 51	ALLEGAN	03525	KALAMAZOO LAKE SEWER & WATER AUTHORITY	A	3892	L					3/5/2020	4/30/2020	3/12/2020		12/17/2017	1/3/2018			2/7/2018	2		6/23/2020	6/23/2020	7/29/2020	Approved											
DISTRICT 51	ALLEGAN	02925	LAKE DOSTER	A	1287	L	VN	Yes	3/31/2019																-				Received as a part of the CIP--need to rescind violation							
DISTRICT 51	BARRY	04360	MIDDLEVILLE	A	3261	L									12/20/2017	12/20/2017			2/8/2018				2/8/2018	3/5/2020	Approved	3/5/2020										
DISTRICT 51	BARRY	04620	NASHVILLE	A	1628	L					10/1/2019	1/1/2020			12/26/2017	12/26/2017			2/8/2018	2, 3???					-											
DISTRICT 51	ALLEGAN	05060	OTSEGO	A	3956	L					9/20/2019	12/20/2019		Have received a response (don't remember exact date since Luke Keyzer came in person) but an exension was requested	12/29/2017	1/3/2018			2/8/2018	1,2,3					-											
DISTRICT 51	ALLEGAN	05065	OTSEGO TOWNSHIP	A	1133	L									12/28/2017	1/3/2018			2/8/2018	1,2,3					-											
DISTRICT 51	ALLEGAN	05380	PLAINWELL	A	3328	L					3/5/2020	5/30/2020	5/29/2020		12/6/2017	12/8/2017			2/8/2018	1,2,3??		4/24/2020	4/24/2020	6/10/2020	Approved											
DISTRICT 51	ALLEGAN	06940	WAYLAND	A	4079	L					9/20/2019	11/25/2019	11/15/2019	Requested an extension	12/19/2017	12/20/2017			2/12/2018	2,3					-											
DISTRICT 52	BERRIEN	00210	ANDREWS UNIVERSITY	A	3000	P		yes	3/31/2019		11/15/2019	3/30/2020			4/5/2019		x		1/30/2018				1/30/2018		-				3/29/2019 received letter from supply indicating they will submit no later than 4/5/2019 HMB; financial portion approved indicates compliance effort - GAW; this was actually submitted as a very small portion of the Berrien Springs AMP; we have not received anything from Andrews.							
DISTRICT 52	VAN BUREN	00380	BANGOR	A	1938	L		yes	3/31/2019	2/14/2019	5/15/2019	8/15/2019			2/14/2019	2/14/2019			4/30/2019				4/30/2019		-											
DISTRICT 52	BERRIEN	00420	BARODA	A	910	L					3/5/2020	4/30/2020		population < 1000, not required AMP	4/4/2018	4/9/2018			6/19/2018	3																
DISTRICT 52	BERRIEN	00650	BERRIEN SPRINGS	A	3530	L					4/26/2019	7/26/2019			12/27/2017	1/3/2018			1/30/2018	3					-											
DISTRICT 52	BRANCH	00910	BRONSON	A	2421	L					4/4/2019	7/4/2019			12/8/2017	12/8/2017			1/30/2018	3					-											
DISTRICT 52	BERRIEN	00960	BUCHANAN	A	4871	L					8/13/2019	11/15/2019	9/26/2019		12/18/2017	12/18/2017			8/23/2018	not sufficient		11/7/2019	11/7/2019	11/21/2019	Approved	11/21/2019	y	y		N	N		1,560,000	2,499,000	66,074	16,074
DISTRICT 52	BERRIEN	01400	CHIKAMING TOWNSHIP	A	2825	L					5/14/2019	8/14/2019; extended to 9/30/2019	requested an additional extension to 12/31/2019; approved pending meeting/phone discussion with supply and engineer.		1/2/2018	1/3/2018			1/31/2018	1,2,3		2/20/2020	2/20/2020	3/4/2020	Approved	3/4/2020	y	y		N	N					
DISTRICT 52	BRANCH	01500	COLDWATER	A	10900	L					4/4/2019	7/4/2019	6/28/2019		12/8/2017	1/3/2018			1/31/2018				1/31/2018		-				submitted by download link on 12/28/2017; however, link did not work. Our office sent response on 1/3/2018.							
DISTRICT 52	BERRIEN	01530	COLOMA	A	2980	L	VN	yes	3/31/2019									6/30/2018							-				consultant in contact; working on report. Report not received by alternate due date							
DISTRICT 52	VAN BUREN	01661	COVERT TOWNSHIP	A	1755	L									1/2/2018	3/26/2018							7/10/2019	3/5/2020	Approved	3/5/2020			Part of City of South Haven AMP - GAW							
DISTRICT 52	VAN BUREN	01750	DECATUR	A	1838	L							6/27/2019		1/1/2018	1/3/2018			1/31/2018				1/31/2018	7/2/2019	Approved	8/13/2019	y	y	Sent updated report (1/5/18) to include the water rate ordinance.	N	N		1,112,000	3,372,000	24,433	79,567
DISTRICT 52	KALAMAZOO	02530	GALESBURG	A	2377	L		no	3/31/2019	2/19/2019	3/5/2020	4/30/2020			7/15/2016	8/20/2019			8/23/2019	2,3					-				MRWA prepared plan in 2016, need to rescind violation							
DISTRICT 52	VAN BUREN	03070	HARTFORD	A	2688	L		yes	3/31/2019						4/25/2019	11/8/2019						11/19/2019	11/19/2019	11/21/2019	Approved	11/21/2019	Y	y		N	N		1,307,000	3,892,000	4044	51,386
DISTRICT 52	KALAMAZOO	03520	KALAMAZOO	A	150000	L					3/9/2020	4/30/2020			12/28/2017	1/3/2018			2/7/2018	1,2,3		8/23/2019	8/23/2019		-				Financial portion of the AMP was not scanned originally. Scanned in 8/21/2019 but was submitted 12/28/2017							
DISTRICT 52	BRANCH	01510	LAKELAND CORRECTIONAL FACILITY	A	1450	S					4/4/2019	7/4/2019	6/30/2019		12/11/2017	12/12/2017			1/31/2018				1/31/2018		-											

DISTRICT 52	VAN BUREN	03820	LAWRENCE	A	1045	L					8/13/2019	11/15/2019; extented to 1/15/2020; extended to 02/15/2020		Revised AMP received and requested Bob to review the financial part	12/17/2017	1/3/2018			2/8/2018	3		3/5/2020	3/5/2020		-											
DISTRICT 52	VAN BUREN	03830	LAWTON	A	1900	L					6/27/2019	9/30/2019; extended to 12/31/2019		revised AMP recceived and requested to address few items in the AMP	1/10/2018	1/10/2018			2/8/2018				2/8/2018		-											
DISTRICT 52	VAN BUREN	04177	MATTAWAN	A	2037	L					6/27/2019	9/30/2019			6/27/2017	1/3/2018			2/8/2018	3					-											
DISTRICT 52	BERRIEN	04685	NEW BUFFALO TOWNSHIP	A	1380	L					6/27/2019	9/30/2019	9/26/2019		12/5/2017	12/8/2017			2/8/2018	2,3??		11/7/2019	11/7/2019	11/21/2019	Approved	11/21/2019	y	y		N	N		1,723,000	3,002,000	59,506	
DISTRICT 52	BERRIEN	04740	NILES	A	14215	L					6/27/2019	9/30/2019			12/28/2017	1/3/2018			2/8/2018	2,3??					-											
DISTRICT 52	BERRIEN	04750	NILES TOWNSHIP	A	2270	L					6/27/2019	9/30/2019	7/29/2019		12/28/2017	1/3/2018			2/8/2018	1,2,3		8/23/2019	8/23/2019	9/25/2019	Approved	9/26/2019	y	y		N	N		$42,300	$1,511,500	$52,949	$29,949
DISTRICT 52	BERRIEN	05034	ORONOKO TOWNSHIP	A	2310	L									12/27/2017	1/3/2018			2/8/2018	3					-											
DISTRICT 52	KALAMAZOO	05200	PARCHMENT	A	3174	L									12/28/2017	1/3/2018			2/8/2018	1,2,3					-				Water system has been consolidated with Kalamazoo and no longer needs an AMP							
DISTRICT 52	VAN BUREN	05210	PAW PAW	A	3534	L					6/27/2019	9/30/2019	9/25/2019		12/29/2017	1/3/2018			2/8/2018	2,3		11/7/2019	11/7/2019	11/21/2019	Approved	11/21/2019	y	y	Financial information received 9/25/19	N	N		1,321,558	6,233,424	196,752	
DISTRICT 52	KALAMAZOO	05520	PORTAGE	A	46292	L									12/26/2017	12/26/2017			2/9/2018	???, 3		8/22/2019	8/22/2019	8/22/2019	Approved	8/27/2019	10/1/2019									
DISTRICT 52	BRANCH	05580	QUINCY	A	2040	L					4/4/2019	7/7/2019	7/3/2019		12/29/2017	1/3/2017			2/9/2018	2,3		7/5/2019			-											
DISTRICT 52	KALAMAZOO	05970	SCHOOLCRAFT	A	1525	L					3/5/2020	4/30/2020			7/17/2017	8/10/2018						8/22/2019	9/10/2019		-											
DISTRICT 52	VAN BUREN	06103	SOUTH HAVEN/CASCO TWP AUTHORITY	A	3147	L									1/2/2018	3/26/2018			8/23/2018	2,3					-				Part of City of South Haven AMP - GAW							
DISTRICT 52	BERRIEN	03726	SOUTHWEST MICHIGAN REGIONAL SANITARY SEW	A	26780	L					8/13/2019	11/15/2019; extended to 12/31/2019	12/9/2019		12/31/2017	1/3/2018			2/7/2018	2,3		12/19/2019	12/19/2019	1/8/2020	Approved	1/8/2020	y	y		N	N		1,479,000	7,648,000	266,184	
DISTRICT 52	BERRIEN	06600	THREE OAKS	A	1622	L		NO			1/28/2020	6/30/2020			9/30/2019	9/30/2019			10/10/2010	1,2,3					-				Included in survey, and supply sent a response/timeline after the survey							
DISTRICT 52	BRANCH	06720	UNION CITY	A	1630	L					4/4/2019	7/11/2019; extension to 7/25/2019	7/25/2019		1/23/2018	1/25/2018			8/23/2019	1,2,3		still waitng on brian to submit			-				sent email on 12/29/2017 requesting extension because could not get rate study info in time. Our office responded on 1/3/2018 to submit AMP as is and a plan to submit rate study information.							
DISTRICT 52	KALAMAZOO	06800	VICKSBURG	A	2906	L					3/9/2020	4/30/2020			12/28/2017	1/3/2018			2/12/2018	1,2,3		8/23/2019	8/23/2019		-				Financial portion of the AMP was not scanned in at the time it was received. Scanned in 8/21/2019							
DISTRICT 52	BERRIEN	06930	WATERVLIET	A	2735	L					8/13/2019	11/15/2019, extended to 12/15/2019, Extended to 4/08/2020			5/21/2018 7/3/2018	5/23/2018 7/3/2018		5/21/2018	7/23/2018	2,3		9/3/2019			-				consultant in contact; working on report. Updated 7/3/2018; new City Manager							
DISTRICT 54	CALHOUN	00100	ALBION	A	9144	L		Yes	3/31/2019	4/1/2019; revised timeline received May 13, 2019	10/31/2019	12/1/2019	did not include the necessary information on 8/22/2019 submittal. Provided checklist and workbook on 10/31/2019 via email		8/22/2019	10/30/2019		8/30/2019; received 6/28/2019				11/5/2019	11/5/2019		-											
DISTRICT 54	CALHOUN	00260	ATHENS	A	1024	L					4/4/2019	7/4/2019			10/18/2017	12/8/2017			1/30/2018	2,3		7/30/2020	7/30/2020		-											
DISTRICT 54	CALHOUN	00450	BATTLE CREEK - VERONA SYSTEM	A	43975	L					6/28/2019	9/28/2019	9/9/2019		1/22/2018	1/22/2018			1/30/2018	2,3??		9/9/2019	9/13/2019		-				City submitted email that AMP ready to submit but requested method of submittal on 1/2/2018. Our office responded on 1/3/2018.							
DISTRICT 54	CASS	05234	CASS COUNTY WATER SYSTEM	A	1350	L					6/29/2019	10/2/2019; extended to November 30, 2019	1/31/2020		12/31/2017 3/5/18	1/3/2018 update scanned			2/8/2018	1,2,3	Sorry, this is Village of Cass Co Cass?? Cass or Casop				-											
DISTRICT 54	CASS	01250	CASSOPOLIS	A	1815	L					6/28/2019	9/28/2019; date extended TBD due to need for financial re-review	report received 8/30/2019; rate setting resolution receieved 11/16/2019		8/27/2018	8/27/2018			7/6/2018	3		11/19/2019	11/19/2019	4/17/2020	Approved		4/17/2020		Financial Analysis Appendix E updated on 3/5/18							
DISTRICT 54	ST JOSEPH	01310	CENTREVILLE	A	1579	L					4/4/2019	7/4/2019; extended to 8/16/2019	7/19/2019	additional comments included in SS letter write up not yet sent	12/30/2017	1/3/2018			1/31/2018				1/31/2018		-											
DISTRICT 54	ST JOSEPH	01540	COLON	A	1190	L					4/4/2019	7/4/2019	7/3/2019	additional comments included in SS iletter write up not yet sent	12/29/2017	1/3/2018			1/31/2018				2/28/2018		-											
DISTRICT 54	ST JOSEPH	01600	CONSTANTINE	A	2075	L					4/4/2019	7/4/2019	7/3/2019		12/22/2017	1/3/2018			1/31/2018	2,3??		7/5/2019	7/30/2019		-											
DISTRICT 54	CASS	01860	DOWAGIAC	A	6350	L					6/26/2019	9/29/2019; extended to Novemebr 30, 2019	1/31/2020		12/31/2017 3/5/18 update	1/3/2018 update scanned			1/31/2018, 7/6/2	3					-				Financial Analysis Appendix E updated on 3/5/18							
DISTRICT 54	CASS	02077	EDWARDSBURG	A	1160	L					6/26/2019	9/30/2019	10/22/2019		12/27/2017	12/27/2017			2/5/2018	3					-											
DISTRICT 54	CALHOUN	02125	EMMETT TOWNSHIP	A	3475	L	VN	Yes	3/31/2019	AMP received 5/16/2019	6/28/2019	9/28/2019							5/21/2019	1,2,3					-				sent email on 12/29/2017 requesting extension becaise could not get rate study info in time. Our office responded on 1/3/2018 to submit AMP as is and plan to submit rate study information. Received email 1/23/2018 stating the engineer was having trouble retrieving document from server and was working with their IT department.							
DISTRICT 54	ST. JOSEPH	02657	GLEN OAKS COMMUNITY COLLEGE	A		L																4/27/2020	4/27/2020													
DISTRICT 54	CALHOUN	03220	HOMER	A	1668	L					6/28/2019	9/28/2019			12/29/2017	2/20/2018			2/28/2018	1,2,3		5/5/20 1,2,3			-											
DISTRICT 54	ST JOSEPH	03943	LOCKPORT TOWNSHIP	A	1750	L					4/4/2019	7/4/2019; extension granted to 8/2/2019	9/19/2019	setn additional letter on 2/12/2020 requesting additional revisions- due date 3/12/2020	12/27/2017	1/3/2018			2/8/2018	3		9/19/2019			-											
DISTRICT 54	CASS	04070	MARCELLUS	A	1198	L					6/26/2019	extension request approved until	2/3/2020	revision will include LSL information	10/26/2017	12/8/2017			2/8/2018				2/8/2018		-					TBD - Village planning on incorporating						
DISTRICT 54	CALHOUN	04150	MARSHALL	A	7088	L					2/13/2019	7/5/2019	2/28/2019	additional comments sent 3/28/2019; new due date April 28, 2019	12/18/2017	12/18/2017			2/8/2018	3		3/28/2019	4/18/2019	6/20/2019	Approved	6/28/2019	Y	Y		No	No	$ -	$3,325,000	$13,585,000	$58,384	($168,115)
DISTRICT 54	CALHOUN	04760	PENNFIELD TOWNSHIP	A	3619	L					4/4/2019	7/6/2019	7/1/2019		10/18/2017	12/8/2017			2/8/2018	2,3					-											
DISTRICT 54	CALHOUN	06240	SPRINGFIELD	A	3833	L					4/4/2019	7/8/2019	7/3/2019		12/26/2017	12/27/2017			8/23/2018	2		7/5/2019			-											
DISTRICT 54	ST JOSEPH	06440	STURGIS	A	11920	L					4/4/2019	7/9/2019; ext for rate methodology update CIP approval to 8/31/2019	7/3/2019; still need to update rate methodology		12/28/2017	1/5/2018			2/12/2018	3		8/23/2019	8/23/2019	8/12/2020	Approved	8/12/2020	Y	Y	contains alternative lead service line replacement schedule request. Copy available in LC Unit review folder	no	yes	$5,000,000	$3,879,000	$7,616,000		$415, 169
DISTRICT 54	ST JOSEPH	06610	THREE RIVERS	A	7811	L					4/4/2019	7/10/2019	7/3/2019		12/28/2017	1/3/2017			2/12/2018	2,3???		7/5/2019	7/30/2019	2/11/2020	Approved	2/11/2020	2/11/2020	2/12/2020								
DISTRICT 54	ST JOSEPH	07070	WHITE PIGEON	A	1640	L					4/4/2019	7/12/2019			12/27/2017	12/28/2017			8/23/2018	3					-											
DISTRICT 61	OTTAWA	00127	ALLENDALE TOWNSHIP	A	21655	L					3/14/2019	7/13/2019	3/22/2019	Alternate Schedule approved for fixing of financial comments (currently performing a new rate study), and will submit new financials Sep. 2019	12/28/2017	1/3/2017			2/8/2018	2,3		5/31/2019	7/8/2019	4/6/2018	Approved	7/9/2019	7/9/2019			No	No	$ -	$ 2,292,600.00	$ 4,123,270.00	$ 751,340.10	$ 476,455.43
DISTRICT 61	MECOSTA	00710	BIG RAPIDS	A	10894	L					3/14/2019	7/14/2019	5/30/2019		12/28/2017	1/3/2017			2/8/2018	2		5/30/2019	7/8/2019	4/6/2018	Approved	7/9/2019	7/9/2019			No	No	$ -	$ 2,643,300.00	$ 10,933,300.00	$ 613,660.10	$ 58,976.10
DISTRICT 61	OTTAWA	01610	COOPERSVILLE	A	4519	L									12/28/2017	1/9/2018			2/8/2018				2/28/2018	3/14/2018	Approved	3/13/2019	3/13/2019			Goal	No	$ -	$ 6,386,900.00	$ 8,479,500.00	$ 327,434.19	$ (50,447.95)
DISTRICT 61	OTTAWA	01664	CROCKERY TOWNSHIP	A	1012	L					3/14/2019	6/1/2019	3/18/2019		12/28/2017	1/9/2018			2/8/2018	2		3/18/2019	4/3/2019	3/30/2018	Approved	4/18/2019	4/18/2019			None Known	No	$ -	$ 6,900.00	$ 1,507,300.00	$ 134,088.52	$ (3,850.19)
DISTRICT 61	OTTAWA	02285	FERRYSBURG	A	3268	L					3/14/2019	6/1/2019	3/18/2019		12/28/2017	1/9/2018			2/8/2018	2		3/18/2019	3/20/2019	4/2/2018	Approved	4/29/2019	3/20/2019			None Known	No	$ -	$ 261,900.00	$ 1,378,000.00	$ 134,276.00	$ 20,102.86
DISTRICT 61	NEWAYGO	02490	FREMONT	A	4081	L		Yes	3/31/2019	3/28/2019	7/8/2019	8/2/2019	7/16/2019	Request for additional time to work with engineering firm to address the revision request comments. Alternate date (9/3/19) proposed.	3/28/2019	3/28/2019		9/3/2019	4/1/2019	1,2,3		9/18/2019	12/20/2019		-											
DISTRICT 61	MUSKEGON	02507	FRUITPORT TOWNSHIP	A	9355	L					3/14/2019	6/1/2019	3/29/2019		12/28/2017	1/9/2018			2/8/2018	2		4/15/2019	4/24/2019	3/30/2018	Approved	4/25/2019	4/25/2019		Describes plan to store water services information (location, size, material) in GIS system.	None Known	No	$ -	$ 1,060,300.00	$ 5,044,800.00	$ 524,418.90	$ 258,903.11
DISTRICT 61	OTTAWA	02620	GEORGETOWN TOWNSHIP	A	36964	L					3/14/2019	6/1/2019	3/27/2019		11/29/2017	1/9/2018			2/8/2018	1,2		3/29/2019	4/24/2019	12/14/2018	Approved	4/25/2019	4/25/2019			No	No	$ -	$ 1,103,900.00	$ 1,151,900.00	$ (467,009.00)	$ (687,789.00)
DISTRICT 61	OTTAWA	02750	GRAND HAVEN	A	11268	L					3/14/2019	6/1/2019	5/31/2019	Extension to 8/1/2019 Requested	12/22/2017	1/8/2017			2/28/2018	1,2,3		8/1/2019	9/4/2019	4/6/2018	Approved	9/6/2019	9/6/2019		Includes LSLs that are known as part of inventory, plans to identify all unknown SLs over next 2-4 years and add them to inventory.	Yes	No	$ -	$ 3,324,167.00	$ 9,193,818.00	$ 1,095,043.80	$ 175,662.00
DISTRICT 61	OTTAWA	02760	GRAND HAVEN TOWNSHIP	A	13819	L									12/28/2017	1/9/2018			2/28/2018				2/28/2018	3/30/2018	Approved	3/13/2019	3/13/2019			None Known	No	$ -	$ 1,391,200.00	$ 3,546,500.00	$ 708,350.33	$ 153,991.90
DISTRICT 61	OCEANA	03060	HART	A	2126	L									1/2/2018	1/9/2018			2/28/2018				2/28/2018	1/29/2018	Approved	3/13/2019	3/13/2019			Goal	No	$ -	$ 2,218,000.00	$ 8,576,000.00	$ 377,307.24	$ (6,138.71)
DISTRICT 61	OTTAWA	03195	HOLLAND TOWNSHIP CONSOLIDATED	A	34344	L					3/14/2019	6/1/2019	4/26/2019		12/28/2017	1/3/2017			2/28/2018	2		4/26/2019	4/30/2019	3/29/2018	Approved	5/6/2019	5/3/2019			Goal	No	$ -	$ 11,981,563.00	$ 12,247,563.00	$ 235,098.20	$ (1,514,553.66)
DISTRICT 61	OTTAWA	03290	HUDSONVILLE	A	7116	L									12/27/2017	3/9/2018			6/19/2018				6/19/2018	3/9/2018	Approved	3/13/2019	3/13/2019			No	No	$ -	$ 588,700.00	$ 1,121,700.00	$ (55,328.00)	$ (249,328.00)
DISTRICT 61	OTTAWA	03474	JAMESTOWN TOWNSHIP	A	2305	L					5/6/2019	6/1/2019	5/16/2019	Extension to 12/1/19 Requested	12/27/2017	1/3/2017			2/28/2018	1,2,3					-											
DISTRICT 61	ALLEGAN	03747	LAKETOWN TOWNSHIP	A	2628	L									12/26/2017	12/26/2017			2/28/2018				2/28/2018	4/26/2019	Approved	4/29/2019	4/26/2019		Laketown Twp is completely run, operated, and supplied by Holland BPW. Holland BPW completed one AMP which encompasses their entire water system; this includes Laketown Twp and the southern portion of Park Twp.	All services and ancillary info tracked in GIS	Yes	$ 10,815,000.00	$ 20,267,880.00	$ 42,552,880.00	$ 3,367,410.00	$ 1,239,766.00
DISTRICT 61	MUSKEGON	04470	MONTAGUE	A	2479	L									1/2/2017	1/9/2018			2/28/2018				2/28/2018	3/29/2018	Approved	3/13/2019	3/13/2009			Goal	No	$ -	$ 841,000.00	$ 4,891,000.00	$ (57,128.50)	
DISTRICT 61	MUSKEGON	04577	MUSK CO NORTHSIDE WATER SYSTEM	A	3778	L					3/14/2019	6/1/2019	4/19/2019		1/30/2018	1/30/2018			2/28/2018	1,2		4/19/2019	4/30/2019	1/31/2018	Approved	5/6/2019	5/3/2019			No	No	$ -	$ 7,650,000.00	$ 7,787,000.00	$ 1,308,420.88	$ (228,579.12)
DISTRICT 61	MUSKEGON	04590	MUSKEGON CO EASTSIDE WATER SYSTEM	A	6693	L					3/14/2019	6/1/2019	4/19/2019		1/30/2018	1/30/2018			2/28/2018	1,2		4/19/2019	4/30/2019	1/31/2018	Approved	5/6/2019	5/3/2019			No	No	$ -	$ 35,000.00	$ 4,909,000.00	$ 1,308,420.88	$ (228,579.12)
DISTRICT 61	NEWAYGO	04710	NEWAYGO	A	1976	L					8/27/2019	9/27/2019	11/26/2019	Will submit updated plan by 1/1/20	12/27/2017	4/18/2018			6/19/2018	1,2,3		12/23/2019	1/10/2020	1/27/2020	Approved	1/27/2020	1/27/2020			No	No	$ -	$ 261,600.00	$ 1,857,600.00	$ 148,300.00	$ 55,420.00
DISTRICT 61	MUSKEGON	04780	NORTH MUSKEGON	A	3786	L					3/14/2019	6/1/2019			1/2/2017	1/9/2018			8/23/2018	1,2				4/2/2018	-											
DISTRICT 61	MUSKEGON	04850	NORTON SHORES	A	21390	L									12/28/2017	1/3/2017			2/28/2018				2/28/2018	4/6/2018	Approved	3/13/2019	3/13/2019		Describes plan to store water services information (location, size, materials, installation date) in GIS system.	Goal	No	$ -	$ 2,580,000.00	$ 7,435,000.00	$ 763,660.38	$ 46,486.19
DISTRICT 61	OTTAWA	05203	PARK TOWNSHIP (HBPW SERVICE AREA)	A	10946	L					3/14/2019	6/1/2019	3/18/2019		12/29/2017	1/3/2017			2/28/2018	2,3		3/18/2019	4/3/2019	4/2/2018	Approved	4/18/2019	4/18/2019			Goal	No	$ -	$ 153,760.00	$ 3,472,160.00	$ 146,428.10	$ (18,912.10)
DISTRICT 61	MUSKEGON	05610	RAVENNA	A	1219	L					3/14/2019	6/1/2019			12/29/2017	1/3/2017			2/28/2018	2,3				1/24/2018	-											
DISTRICT 61	MUSKEGON	05800	ROOSEVELT PARK	A	3831	L					3/14/2019	6/1/2019	3/18/2019		1/2/2017	1/9/2018			2/28/2018	2		3/18/2019	4/3/2019	3/30/2018	Approved	4/18/2019	4/18/2019			Goal	No	$ -	$ 909,200.00	$ 2,637,800.00	$ 139,410.81	$ 5,505.62
DISTRICT 61	OCEANA	06000	SHELBY	A	1898	L					5/8/2019	6/1/2019		Will submit updated plan by 1/1/20	1/4/2018	3/9/2018			8/23/2018	2,3					-				District Reviewed, missing a lot. Working in getting them into a compliance schedule. 3/27/18							
DISTRICT 61	OTTAWA	06230	SPRING LAKE	A	2512	L									12/28/2017	1/9/2018			8/24/2018	3		3/18/2019	4/3/2019	3/29/2018	Approved	4/18/2019	4/18/2019			Goal	No	$ -	$ 4,777,200.00	$ 6,537,100.00	$ 299,290.10	$ 7,651.10
DISTRICT 61	OTTAWA	06235	SPRING LAKE TOWNSHIP	A	9393	L					3/14/2019	6/1/2019	3/18/2019		12/28/2017	1/9/2018			2/28/2018	2,3		3/18/2019	4/3/2019	3/14/2018	Approved	4/18/2019	4/18/2019			None Known	No	$ -	$ 504,400.00	$ 3,481,200.00	$ 376,299.24	$ 1,056.86
DISTRICT 61	NEWAYGO	07060	WHITE CLOUD	A	1408	L					4/30/2019	6/1/2019			12/26/2017	1/3/2017			2/12/2018	1,2,3		12/23/2019		3/22/2018	-											
DISTRICT 61	MUSKEGON	07100	WHITEHALL	A	2706	L									12/27/2017	1/3/2017			2/28/2018	2		3/18/2019	4/3/2019	4/19/2019	Approved	4/23/2019	4/19/2019		Describes plan to store water services info (location, size, material, installation date) in GIS along side gathering customer side info when water meters are replaced or maintained.	Goal	No	$ -	$ 835,000.00	$ 2,904,000.00	$ 137,925.10	$ (360.62)
DISTRICT 61	OTTAWA	07270	ZEELAND BOARD OF PUBLIC WORKS	A	7921	L									12/29/2017	1/3/2017			2/28/2018				2/28/2018	3/28/2018	Approved	3/13/2019	3/13/2019			No	No	$ -	$ 4,655,000.00	$ 14,727,500.00	$ 613,504.70	$ 487,795.30
DISTRICT 62	KENT	00012	ADA TOWNSHIP	A	6772	L									1/2/2018	1/4/2018			1/22/2018				1/22/2018	9/19/2019	Approved	10/8/2019	9/19/2019									
DISTRICT 62	IONIA	00580	BELDING	A	5877	L									12/27/2017	1/11/2019			1/18/2019				1/18/2019	9/19/2019	Approved	10/8/2019	9/19/2019									
DISTRICT 62	KENT	01023	BYRON-GAINES UTILITY AUTHORITY	A	28846	L					1/28/2020	4/1/2020	4/10/2020		12/27/2017	1/4/2018			1/26/2018	1,2,3		4/10/2020	4/10/2020	4/22/2020	Approved	4/22/2020	4/22/2020									
DISTRICT 62	KENT	01039	CALEDONIA TOWNSHIP	A	3563	L					1/22/2020	4/30/2020	4/16/2020		12/27/2017	1/4/2018			8/24/2018	1,2,3		4/27/2020	4/27/2020	4/28/2020	approved	5/13/2020	4/29/2020									
DISTRICT 62	MONTCALM	01170	CARSON CITY	A	3553	L					1/22/2020	4/1/2020	3/11/2020		10/4/2018	1/11/2019		10/1/2018	1/22/2019	3		3/1/2020	4/15/2020	4/29/2020	Approved	4/29/2020	4/29/2020									
DISTRICT 62	KENT	01260	CEDAR SPRINGS	A	3509	L					1/28//2020	4/1/2020	2/7/2020		5/9/2018	6/29/2018			6/19/2018	3		2/20/2020	2/20/2020	2/21/2020	Approved	2/25/2020	2/25/2020									
DISTRICT 62	KENT	01960	EAST GRAND RAPIDS	A	10694	L									12/29/2017	1/4/2018			1/26/2018				1/26/2018	1/17/2020	Approved	1/22/2020	1/17/2020									
DISTRICT 62	MONTCALM	02070	EDMORE	A	1201	L					1/22/2020	4/1/2020	5/1/2020		12/28/2017	1/4/2018			1/29/2018	1,2,3?		5/13/2020	5/13/2020	5/15/2020	Approved	5/20/2020	5/15/2020									
DISTRICT 62	KENT	02820	GRANDVILLE	A	15378	L									12/29/2017	1/4/2018			1/29/2018				1/29/2018	5/30/2019	Approved	7/1/2019	7/2/2019									
DISTRICT 62	MONTCALM	02850	GREENVILLE	A	8511	L					2/3/2020	4/30/2020			1/4/2018	1/4/2018			1/29/2018	2?, 3					-											
DISTRICT 62	MONTCALM	03240	HOWARD CITY	A	1808	L									12/29/2017	1/4/2018			1/29/2018				1/29/2018	1/17/2020	Approved	1/22/2020	1/17/2020									
DISTRICT 62	IONIA	03370	IONIA	A	12000	L					1/22/2020	4/1/2020			1/4/2018	14/4/2018			1/29/2018	2		3/10/2020	3/10/2020	3/11/2020	Approved	3/12/2020	3/11/2020									
DISTRICT 62	KENT	03620	KENTWOOD	A	30000	L					1/28/2020	4/1/2020			12/28/2017	1/4/2018			1/22/2018	1,2,3					-											
DISTRICT 62	KENT	03695	LAKE BELLA VISTA	A	3584	P					1/28/2020	4/1/2020	3/31/2020		12/28/2017	1/4/2018			1/29/2018	2, 3		3/31/2020	3/31/2020	4/15/2020	Approved	4/22/2020	4/15/2020									
DISTRICT 62	IONIA	03730	LAKE ODESSA	A	2288	L					1/22/2012	4/1/2020	5/5/2020		5/7/2018	6/29/2018			6/19/2018	3		5/6/2020	5/7/2020		-											
DISTRICT 62	MONTCALM	03750	LAKEVIEW	A	1007	L					1/28/2020	4/30/2020	4/28/2020	more detail on technical component	3/22/2018	3/22/2018			6/19/2018				6/19/2018	4/30/2020	Approved	5/13/2020	4/30/2020									
DISTRICT 62	KENT	03950	LOWELL	A	3783	L									12/29/2017	1/4/2018			1/22/2018				2/28/2018	1/24/2020	Approved	1/28/2020.	1/24/2020									
DISTRICT 62	KENT	03955	LOWELL TOWNSHIP	A	1734	L					1/22/2020	4/1/2020			12/21/2017	1/4/2018			1/29/2018	2, 3					-											
DISTRICT 62	IONIA	05530	PORTLAND	A	3872	L					1/27/2020	4/1/2020			12/28/2017	1/4/2018			1/29/2018	2,3					-											
DISTRICT 62	KENT	05730	ROCKFORD	A	6517	L					1/22/2020	4/1/2020	4/3/2020		12/22/2017	1/4/2018			1/26/2018	2,3		2/6/2020	2/6/2020	4/15/2020	Approved	4/22/2020	4/15/2020									
DISTRICT 62	IONIA	05930	SARANAC	A	1296	L					1/28/2020	4/1/2020	3/18/2020		12/22/2017	1/4/2018			1/29/2018	2,3		3/19/2020	4/22/2020	5/13/2020	Approved	5/13/2020	5/13/2020									
DISTRICT 62	KENT	06200	SPARTA	A	4140	L					1/22/2020	4/1/2020	1/27/2020		12/28/2017	1/4/2018			1/26/2018	2			1/27/2020	1/31/2020	Approved	2/3/2020	2/3/2020									
DISTRICT 62	MONTCALM	06360	STANTON	A	1417	L					1/22/2020	4/1/2020	1/27/2020		12/22/2017	1/4/2018			1/26/2018	2			1/27/2020	1/31/2020	Approved	2/11/2020	2/3/2020									
DISTRICT 64	MUSKEGON	40355	APPLE CARR VILLAGE MANUFACTURED HOUSING COMMUNITY	A	1322	P									12/18/2017	1/11/2018			8/24/2018	3	annual audit?			2/14/2019	Approved	4/2/2019	4/2/2019	4/18/2019		na	na	na	0	0	0	0
DISTRICT 64	MUSKEGON	40356	ARLINGTON WOODS MANUFACTURED HOUSING COMMUNITY	A	1650	P									12/11/2017	5/8/2018			6/19/2018	e sort of tot	al revenues	revenues received		2/14/2019	Approved	4/2/2019	4/2/2019	4/18/2019		na	na	na	0	0	0	0
DISTRICT 64	MUSKEGON	40600	EGELCRAFT MANUFACTURED HOUSING COMMUNITY	A	1120	P									12/19/2017	1/11/2018			8/24/2018	3	annual audit?		4/2/2019	2/14/2019	Approved	4/2/2019	4/2/2019	4/18/2019		na	na	na	0	0	0	0
DISTRICT 64	IONIA	40662	SUNSET RIDGE MANUFACTURED HOUSING COMMUNITY	A	470	P									12/27/2017	1/11/2018			8/24/2018	3	annual audit?		4/2/2019	2/14/2019	Approved	4/2/2019	11/25/2019	4/18/2019								
DISTRICT 64	OTTAWA	40614	WEST OLIVE ESTATES MANUFACTURED HOUSING COMMUNITY	A	1850	P	VN	Yes	3/31/2019																-											
DISTRICT 71	LAKE	00350	BALDWIN, VILLAGE OF	A	1060	L									12/29/2017	1/2/2018			2/28/2018	2	5/16/2019	EGLE request 10/7/2019			-											
DISTRICT 71	WEXFORD	01030	CADILLAC, CITY OF	A	10300	L									1/4/2017	1/4/2017			1/30/2018				8/14/2018	8/15/2018	Approved		8/15/2018	8/15/2018		No	No	No	Yes	Yes	None	None
DISTRICT 71	OSCEOLA	02190	EVART, CITY OF	A	1738	L									12/4/2017	12/4/2017			2/13/2018	3	5/1/2019	5/11/2019	9/23/2019	9/23/2019	Approved	9/24/2019	9/23/2019	9/23/2019		Yes	Yes	Yes	Yes	Yes	None	None
DISTRICT 71	BENZIE	02430	FRANKFORT, CITY OF	A	1513	L									3/27/2018	3/27/2018			2/28/2018	3	10/15/2019	12/4/2019	3/10/2020	3/12/2020	Approved	3/13/2020	3/10/2020	3/13/2020								
DISTRICT 71	KALKASKA	03560	KALKASKA, VILLAGE OF	A	2550	L									2/2/2018	2/2/2018			2/28/2018	3	10/5/2018		10/31/2018	10/31/2018	Approved		10/31/18	10/31/2018	Awaiting corrections to plan as of 12/4/2019	No	No	No	Yes	>$1,00,000	None anticipated	None anticipated
DISTRICT 71	MANISTEE	04030	MANISTEE, CITY OF	A	6586	L									11/22/2017	11/22/2017			1/19/2018	3		1/31/2019	2/7/2019	2/15/2019	Approved		2/15/2019	2/15/2019							None	None
DISTRICT 71	WEXFORD	04050	MANTON, CITY OF	A	1221	L									7/1/2015	12/7/2017			2/28/2018	3	10/10/2019	10/10/2019	10/10/2019	10/21/2019	Approved	10/22/2019	10/21/2019	12/5/2019		No lead service lines	NA	NA	None over next five years	$632,224	none through 2029	None
DISTRICT 71	MANISTEE		OAKS CORRECTIONAL FACILITY	I	1030	P		NA							NA	NA	NA	NA	NA	NA	NA		NA	NA	NA		NA	NA	Oaks Correctional Facility declassified from Type I status in 2018	NA	NA	NA	NA	NA	NA	NA
DISTRICT 71	OSCEOLA	05650	REED CITY, CITY OF	A	2430	L									1/10/2017	12/2/2017			2/28/2018	3			1/10/2019	1/28/2019	1/28/2019		1/28/2019	1/28/2019							None	None
DISTRICT 71	MASON	05980	SCOTTVILLE, CITY OF	A	1266	L									12/20/2017	12/20/2017			3/1/2018	2,3???			11/27/2018	12/7/2018	12/16/2018		12/6/2018	12/7/2018		No	No	Just inventory		Yes	None	None

DISTRICT 72	EMMET	00725	BIRCHWOOD FARMS	A	1227	P	VN	Yes	9/16/2019		10/8/2018	12/1/2018		Originally requested extension. Had not shown progress on revisions. Changed operators in Summer 2019 and is redoing AMP.	12/28/2017	12/28/2017			2/28/2018	1,3					-				Revisions to be submitted by 2/1/2019.	
DISTRICT 72	CHARLEVOIX	00800	BOYNE CITY, CITY OF	A	3735	L					10/8/2018	12/1/2018	12/10/2018		12/22/2017	1/2/2018			1/30/2018	3					-				Revisions submitted 12/10/2018. Rending review.	
DISTRICT 72	CHARLEVOIX	01335	CHARLEVOIX TOWNSHIP	A	1700	L					10/8/2018	1/1/2019	5/31/2019	Requested extension for revisions. Performing significant overhaul of AMP.	1/1/2018	1/2/2018			2/28/2018	1,2,3					-				Revisions to be submitted by 1/1/2019.	
DISTRICT 72	CHEBOYGAN	01360	CHEBOYGAN, CITY OF	A	4867	L					10/8/2018	12/1/2018	12/4/2018		12/29/2017	1/2/2018			2/28/2018	3					-				Revisions submitted 11/12/2018. Pending review.	
DISTRICT 72	CHARLEVOIX	01970	EAST JORDAN, CITY OF	A	2215	L					10/8/2018	12/1/2018	12/10/2018		12/21/2017	12/21/2017			2/5/2018	1,2,3					-				Revisions submitted 12/6/2018. Pending review.	
DISTRICT 72	EMMET	03010	HARBOR SPRINGS, CITY OF	A	1194	L					10/8/2018	12/1/2018	3/21/2019		1/9/2018	1/10/2018			2/6/2018	to consultant, very confusing					-				Revisions to be submitted by 2/1/2019.	
DISTRICT 72	EMMET	03927	LITTLE TRAVERSE TOWNSHIP	A	1102	L					10/5/2018	12/1/2018	5/7/2019	Requested extension for resubmittal.	1/9/2018	1/10/2018			2/8/2018	2,3					-				Revisions to be submitted by 2/1/2019.	
DISTRICT 72	EMMET	05300	PETOSKEY, CITY OF	A	9500	L					10/8/2018	12/1/2018	12/4/2018		12/27/2017	12/28/2017			2/8/2018	2,3???		3/10/20 still need 3			-				Revisions submitted 10/22/2018. Pending review.	
DISTRICT 73	ANTRIM	00570	BELLAIRE, VILLAGE OF	A	1164	L					1/31/2020	4/1/2020			12/27/2017	1/3/2018			1/30/2018	3					-						
DISTRICT 73	GRAND TRAVERSE	00743	BLAIR TOWNSHIP	A	2125	L					1/31/2020	5/31/2020	4/20/2020	re-scanned 4/23/2020	3/29/2018	3/29/2018			6/19/2018	1,2,3		4/29/2020	4/29/2020	5/4/2020	Approved				MRWA emailed summary to Twp and Dist Engineer on 3/29/18	
DISTRICT 73	GRAND TRAVERSE	01935	EAST BAY CHARTER TOWNSHIP	A	3293	L					2/4/2020	4/15/2020			3/1/2018	3/6/2018			7/6/2018	1,2					-				Submitted Jointly with East Bay, Garfield and Peninsula by GTCDPW	
DISTRICT 73	ANTRIM	02090	ELK RAPIDS, VILLAGE OF	A	1642	L					2/25/2020	5/15/2020		Requested 5/15/2020 due date	3/19/2018	3/26/2018			6/19/2018				6/19/2018		-						
DISTRICT 73	GRAND TRAVERSE	02565	GARFIELD CHARTER TOWNSHIP	A	12899	L					2/4/2020	4/15/2020	4/27/2020		3/1/2018	3/6/2018			6/19/2018				6/19/2018		-				Submitted Jointly with East Bay, Garfield and Peninsula by GTCDPW	
DISTRICT 73	OTSEGO	02600	GAYLORD, CITY OF	A	3645	L					2/3/2020	5/15/2020			1/19/2018	1/22/2018			2/8/2018	2					-						
DISTRICT 73	LEELANAU	07103	HOMESTEAD/CRYSTAL RIVER WATER CO	A	1365	P					1/31/2020	4/1/2020			6/30/2018	6/30/2018			12/3/2019				12/3/2019		-				received AMP on June 30, 2018. VN proposed a new deadline of June 30, 2018	
DISTRICT 73	GRAND TRAVERSE	40171	KINGS COURT MOBILE HOME PARK	A	1200	P								NA approved as submitted	12/21/2017	12/21/2017			2/12/2018				2/12/2018	2/24/2020	Approved	2/25/2020	2/24/2020	2/25/2020	approved 2/24/2020	
DISTRICT 73	GRAND TRAVERSE	03650	KINGSLEY, VILLAGE OF	A	1469	L					2/3/2020	4/15/2020	2/5/2020	none	6/15/2018	6/15/2018			6/19/2018	1,2,3		2/3/2020	2/3/2020	2/18/2020	Approved	2/20/2020	2/20/2020	2/20/2020	approved 2/18/2020	
DISTRICT 73	ANTRIM	04010	MANCELONA AREA WATER AND SEWER AUTHORITY	A	3380	L					4/20/2020		4/21/2020	Rate resolutions requested and received	12/14/2017	12/14/2017			2/8/2018	3		4/21/2020	4/22/2020	4/8/2020	Approved	4/23/2020	4/22/2020	4/23/2020	Rate Resolutions received by email 4/21/2020 JLW received revision by email 4/1/2020 JLW	yes
DISTRICT 73	GRAND TRAVERSE	05233	PENINSULA TOWNSHIP	A	1790	L					2/4/2020	4/15/2020			3/1/2018	3/6/2018			6/19/2018				6/19/2018		-				Submitted Jointly with East Bay, Garfield and Peninsula by GTCDPW	
DISTRICT 73	GRAND TRAVERSE	~~05578~~	~~PUGSLEY CORRECTIONAL FACILITY~~	I	1347	S								NA CLOSED	CLOSED	CLOSED										-				CLOSED Facility	
DISTRICT 73	ANTRIM	05995	SHANTY CREEK - WATARS ASSOCIATION	A	1150	P					2/25/2020	4/15/2020			3/6/2018	3/6/2019			6/19/2018				6/19/2018		-						
DISTRICT 81	HOUGHTON	00020	ADAMS TOWNSHIP	A	2010	L					5/10/2019	8/8/2019			12/28/2017	1/29/2018			2/12/2018				2/12/2018		-				Received Executive Summary.	
DISTRICT 81	GOGEBIC	00660	BESSEMER	A	2272	L					5/29/2019	8/28/2019			12/14/2017	2/1/2018			2/12/2018	3???		8/28/2019	9/10/2019	9/26/2019	Approved	9/26/2019			Received schedule for completion.	
DISTRICT 81	HOUGHTON	01046	CALUMET TOWNSHIP	A	1789	L					5/31/2019	9/1/2019			12/27/2017	2/1/2018			2/12/2018	1,2,3		2/28/2020			-						
DISTRICT 81	HOUGHTON	02980	HANCOCK	A	4500	L					5/29/2019	7/28/2019			12/28/2017	1/22/2018			2/6/2018				2/6/2018	8/1/2019	Approved	8/1/2019					
DISTRICT 81	HOUGHTON	03230	HOUGHTON	A	7512	L					5/30/2019	9/1/2019			12/22/2017	1/29/2018			2/28/2018	2					-				Received Executive Summary	
DISTRICT 81	GOGEBIC	03420	IRONWOOD	A	6525	L					5/10/2019	7/9/2019			10/25/2017	12/21/2017			2/28/2018	1,2,3		9/10/2019	9/13/2019	12/13/2019	Approved	12/13/2019					
DISTRICT 81	HOUGHTON	03720	LAKE LINDEN	A	1203	L					5/31/2019	9/1/2019			4/19/2018	4/23/2018			7/6/2018	1,2,3					-				Received 4/19/18	
DISTRICT 81	HOUGHTON	03810	LAURIUM	A	2268	L					5/31/2019	9/1/2019			12/27/2018	7/11/2018			112/2/19	1,2					-						
DISTRICT 81	MARQUETTE	04140	MARQUETTE TOWNSHIP	A	2700	L					5/29/2019	8/28/2019			1/2/2018	4/23/2018			7/6/2018	2,3		12/22/2019	12/22/2019	1/8/2020	Approved	1/8/2020					
DISTRICT 81	HOUGHTON	04800	MICHIGAN-AMERICAN WATER CO	A	3717	P					5/31/2019	9/1/2019			1/2/2018	2/1/2018			2/28/2018	1,2		2/28/2020			-						
DISTRICT 81	GOGEBIC	01070	OJIBWAY CORRECTIONAL FACILITY -SHUT DOWN	A	1040	S					xx	xx			5/30/2018	7/11/2018			8/24/2018	1,2					-				Received AMP spreadsheet	
DISTRICT 81	HOUGHTON	03330	PORTAGE TOWNSHIP	A	1214	L					5/10/2019	8/8/2019			12/31/2017	1/29/2018			2/28/2018	2					-				Received Executive Summary	
DISTRICT 81	GOGEBIC	06830	WAKEFIELD	A	2318	L		Yes	3/31/2019	3/25/2019	3/25/2019	5/31/2019			3/25/2019	3/27/2019			10/17/2019			12/3/2019	12/3/2019	12/6/2019	Approved	12/6/2019			Received letter indicating they will not complete an AMP.	
DISTRICT 82	MARQUETTE	02370	FORSYTH TOWNSHIP	A	2370	L					5/9/2019	8/8/2019			1/2/2018	1/29/2018			3/1/2018	3					-				Received Executive Summary	
DISTRICT 82	MARQUETTE	03440	ISHPEMING	A	6470	L					5/30/2019	9/1/2019			1/2/2018	1/29/2018			2/13/2018	2,3???					-						
DISTRICT 82	MARQUETTE	03450	ISHPEMING TWP - WEST	A	2646	L					5/30/2019	9/1/2019			1/2/2018	1/29/2018			7/30/2018	2					-				Received Executive Summary	
DISTRICT 82	MARQUETTE	03510	K I SAWYER	A	3000	L					5/30/2019	9/1/2019			2/28/2018	3/2/2018			7/6/2018	3					-						
DISTRICT 82	CHIPPEWA	03630	KINROSS TOWNSHIP	A	7341	L					5/30/2019	9/1/2019			10/26/2017	12/21/2017			2/28/2018				2/28/2018		-						
DISTRICT 82	ALGER	04560	MUNISING	A	2783	L					5/29/2019	8/28/2019			12/30/2017	1/29/2018			2/28/2018	1,2,3					-						
DISTRICT 82	MARQUETTE	04650	NEGAUNEE	A	4568	L					5/30/2019	9/1/2019			12/28/2017	1/29/2018			2/28/2018	2,3??					-				Received Executive Summary	
DISTRICT 82	LUCE	04730	NEWBERRY CORRECTIONAL FACILITY	A	1001	S					5/30/2019	9/1/2019			4/16/2018	4/23/2018			7/6/2018	1,2,3					-						
DISTRICT 82	LUCE	04720	NEWBERRY WATER & LIGHT	A	2000	L					5/30/2019	9/1/2019			12/28/2017	1/29/2018			2/28/2018	3					-						
DISTRICT 83	DICKINSON	01980	BREITUNG TWP.-EAST KINGSFORD	A	1200	L					5/30/2019	9/1/2019			2/18/2018	2/21/2018			7/6/2018	1,2,3					-						
DISTRICT 83	IRON	01700	CRYSTAL FALLS	A	1922	L					5/29/2019	8/28/2019			1/3/2018	1/22/2018			10/3/2019	2,3		11/18/2019	11/18/2019	12/13/2019	Approved	12/13/2019					
DISTRICT 83	DICKINSON	03400	IRON MOUNTAIN	A	9200	L					5/29/2019	8/28/2019			1/28/2018	2/1/2018			10/14/2019	1,2,3		11/18/2019	11/18/2019	12/16/2019	Approved	12/16/2019					
DISTRICT 83	IRON	03410	IRON RIVER	A	3019	L					5/30/2019	9/1/2019			12/12/2017	12/21/2017			2/28/2018				2/28/2018		-						
DISTRICT 83	DICKINSON	03640	KINGSFORD	A	5480	L					5/29/2019	8/28/2019			4/5/2018	4/23/2018						11/18/2019	11/18/2019		-				Received by email 4/5/18	
DISTRICT 83	DICKINSON	04860	NORWAY	A	3449	L					5/31/2019	9/1/2019			1/4/2018	1/9/2019			9/27/2019	1,2,3		11/18/2019	11/18/2019	12/6/2019	Approved	12/6/2019			Complete AMP received 12/10/18	
DISTRICT 83	DICKINSON	05590	QUINNESEC	A	1200	L					5/30/2019	9/1/2019			2/16/2018	2/21/2018			???						-						
DISTRICT 91	ST CLAIR	00110	ALGONAC, CITY OF	A	4110	L					4/11/2019	6/1/2019			1/30/2018	1/31/2018			4/4/2019	3					-						
DISTRICT 91	WASHTENAW	00220	ANN ARBOR	A	118017	L					4/11/2019	6/1/2019	5/24/2019		12/22/2017	1/2/2018			2/12/2018	1,2,3		1/24/2020	1/24/2020	1/2/2020	Approved		2/7/2020			
DISTRICT 91	MONROE	02500	FRENCHTOWN TOWNSHIP	A	16481	L					4/11/2019	8/1/2019	7/29/2019		12/28/2017	1/2/2018			4/4/2019	1,2		1/17/2020	1/17/2020	1/2/2020	Approved	1/24/2020	1/27/2020			
DISTRICT 91	WAYNE	02890	GROSSE POINTE FARMS	A	9479	L					4/11/2019	6/1/2019	4/26/2019		12/6/2017	1/3/2018			2/6/2018				2/6/2018	5/20/2019	Approved	5/20/2019	1/2/2020			
DISTRICT 91	HURON	03000	HARBOR BEACH, CITY OF	A	1837	L					4/11/2019	6/1/2019	5/15/2019		1/5/2018	1/5/2018			2/6/2018	3		5/15/2019	5/21/2019	1/2/2020	Approved	1/14/2020	1/2/2020			
DISTRICT 91	HURON	03317	HURON REGIONAL WATER AUTHORITY	A	9500	L					4/11/2019	6/1/2019			5/20/2016	4/4/2018			2/12/2018, 7/6/2	1,2,3		4/2/2020	4/2/2020		-						
DISTRICT 91	ST CLAIR	03390	IRA TOWNSHIP	A	7912	L					4/11/2019	6/1/2019	5/15/2019		12/20/2017	1/2/2018			2/12/2018	2,3	2	5/28/2019	7/8/2019	1/2/2020	Approved	1/14/2020	1/2/2020			
DISTRICT 91	ST CLAIR	04090	MARINE CITY	A	4652	L					4/23/2019	9/30/2019	9/30/2019		1/29/2018	4/4/2018			7/6/2018	1,2		1/23/2020	1/23/2020	1/2/2020	Approved					
DISTRICT 91	ST CLAIR	04160	MARYSVILLE, CITY OF	A	9959	L					4/23/2019	6/1/2019	5/17/2019		12/14/2017	12/14/2017			2/12/2018	1,2,3??		7/10/2019	7/15/2019	1/2/2020	Approved	1/14/2020	1/2/2020			
DISTRICT 91	MONROE	04450	MONROE	A	48726	L										12/21/2017	1/2/2018			2/28/2018	1,2,3	missing append	4/18/2019	5/1/2019	5/15/2019	Approved	5/15/2019	12/30/2019			
DISTRICT 91	MACOMB	04510	MOUNT CLEMENS, CITY OF	A	18405	L					4/23/2019	6/1/2019	12/30/2019		12/18/2017	1/3/2018			2/8/2018				2/8/2018	1/3/2020	Approved	1/14/2020	1/3/2020		requested (via email 12/28) extension to 1/12/18	
DISTRICT 91	MACOMB	04670	NEW BALTIMORE, CITY OF	A	12720	L					4/11/2019	6/1/2019	5/15/2019		12/12/2017	1/23/2018			2/8/2018	2,3		5/15/2019	5/21/2019	1/2/2020	Approved	1/14/2020	1/2/2020			
DISTRICT 91	ST CLAIR	05480	PORT HURON, CITY OF	A	33800	L					4/23/2019	6/1/2019	6/4/2019		12/18/2017	1/3/2018			2/9/2018				2/9/2018	1/17/2020	Approved	1/24/2020	1/27/2020			
DISTRICT 91	ST CLAIR	06284	ST. CLAIR WATER AND SEWER AUTHORITY	A	4200	L										12/20/2017	1/2/2018										-						
DISTRICT 91	ST CLAIR	06270	ST. CLAIR, CITY OF	A	5485	L		Yes	3/31/2019	2/25/2019	4/23/2019	6/1/2019			2/25/2019	2/27/2019		4/13/2018	2/27/2019	1,2					-				granted extension to 4/13/18. Draft AMP will be submitted to city week of 7/16/18 for review	
DISTRICT 91	WAYNE	07210	WYANDOTTE	A	25883	L					4/23/2019	6/1/2019			1/26/2018	1/29/2018			7/30/2018	2,3		6/2/2020	6/2/2020	6/2/2020	Approved	6/3/2020				
DISTRICT 92	ALPENA	00160	ALPENA, CITY OF	A	10483	L					4/11/2019	6/1/2019	5/30/2019		12/27/2017	5/14/2018			8/24/2018				8/24/2018	12/30/2019	Approved	12/30/2019	12/30/2019			
DISTRICT 92	BARAGA	00410	BARAGA	A	2240	L							1/20/2020		12/22/2017	5/14/2018			6/19/2018				6/19/2018	1/22/2020	Approved	1/22/2020	1/22/2020			
DISTRICT 92	BAY	00465	Bay Area Water Plant	A	0	L					4/11/2019	6/1/2019	1/29/2020		1/2/2018	1/5/2018			2/12/2018	2,3		2/4/2020	2/4/2020	2/11/2020	Approved	2/19/2020	2/14/2020		Came in with the F&V Bay County Package	
DISTRICT 92	DELTA	02170	ESCANABA	A	13659	L					4/30/2019	6/1/2019	5/31/2019		12/28/2017	5/14/2018			6/19/2018	3 insufficient		2/20/2020	2/20/2020	2/12/2020	Approved	3/3/2020	2/28/2020			
DISTRICT 92	GENESEE	02310	FLINT, CITY OF	A	99763	L										1/31/2018	5/14/2018			6/19/2018	insufficient					-						
DISTRICT 92	GENESEE	02615	GENESEE COUNTY WATER SYSTEM	A	71500	L										12/27/2017	5/14/2018			6/19/2018				6/19/2018	4/12/2019	Approved	4/12/2019				
DISTRICT 92	DELTA	02640	GLADSTONE	A	4396	L					4/30/2019	6/1/2019	1/17/2020		3/29/2018	5/14/2018		4/1/2018	6/19/2018	1,2,3		1/27/2020	1/27/2020	1/22/2020	Approved	2/4/2020				
DISTRICT 92	IOSCO	03319	HURON SHORE REGIONAL UTILITY AUTHORITY	A	1	L					4/30/2019	6/1/2019	5/29/2019		12/30/2017	2/1/2018			6/19/2018	service agreement		5/29/2019	7/8/2019	12/30/2019	Approved	12/30/2019	12/30/2019			
DISTRICT 92	BARAGA	03670	L'ANSE	A	2300	L					4/30/2019	12/31/2019	12/16/2019		12/22/2017	5/14/2017			6/19/2018				6/19/2018	12/30/2019	Approved	12/30/2019	12/30/2019			
DISTRICT 92	SANILAC	03850	LEXINGTON, VILLAGE OF	A	1178	L					4/30/2019	6/1/2019	8/16/2019		1/2/2018	5/14/2018			6/19/2018	3 insufficient		8/23/2019	8/23/2019	12/30/2019	Approved	12/30/2019	12/30/2019			
DISTRICT 92	SCHOOLCRAFT	04040	MANISTIQUE	A	3874	L					6/26/2019	7/31/2019			12/22/2017	5/14/2018			6/19/2018	3					-						
DISTRICT 92	MARQUETTE	04120	MARQUETTE	A	21000	L					4/30/2019	7/1/2019	1/7/2019		12/28/2017	5/14/2018			6/19/2018	1,2,3		1/24/2020	1/24/2020	1/8/2020	Approved	1/30/2020	1/31/2020			
DISTRICT 92	MENOMINEE	04250	MENOMINEE	A	8800	L					4/30/2019	1/1/2020	7/30/2019		12/19/2017	5/14/2018			6/19/2018	2,3 insufficient		1/10/2020	1/10/2020	1/3/2020	Approved	1/14/2020	1/15/2020			
DISTRICT 92	MIDLAND	04370	MIDLAND, CITY OF	A	41706	L					4/11/2019	6/1/2019	5/24/2019		12/28/2017	5/14/2018			8/23/2019	,3 insufficient		9/24/2019	9/24/2019	10/22/2019	Approved	10/22/2019	10/22/2019			
DISTRICT 92	ONTONAGON	05030	ONTONAGON	A	2919	L					4/11/2019	6/1/2019			3/28/2018	5/14/2018		4/1/2018	8/24/2018	3	insufficient				-						
DISTRICT 92	SAGINAW	05850	SAGINAW, CITY OF	A	51508	L										12/26/2017	5/14/2018			6/19/2018				6/19/2018	4/30/2019	Approved	4/30/2019	4/30/2019			
DISTRICT 92	CHIPPEWA	05950	SAULT STE MARIE	A	14689	L										12/31/2017	5/14/2018			6/19/2018				6/19/2018	4/19/2019	Approved	4/19/2019	12/30/2019			
DISTRICT 92	ARENAC	06073	SIMS-WHITNEY UTILITIES AUTH.	A	5627	L										10/1/2015	5/14/2018			6/19/2018				6/19/2018	4/22/2019	Approved	4/22/2019	12/30/2019			
DISTRICT 92	MACKINAC	06290	ST IGNACE	A	2900	L					4/30/2019	6/1/2019			12/14/2017	5/14/2018			6/19/2018	3					-						
DISTRICT 92	ARENAC	06350	STANDISH, CITY OF	A	1509	L										12/28/2017	5/14/2018			6/19/2018				6/19/2018	4/22/2019	Approved	4/22/2019	12/30/2019			
DISTRICT 93	LENAWEE	00040	ADRIAN	A	21133	L					4/11/2019	6/1/2019	5/6/2019		12/20/2017	3/23/2018			6/19/2018	2		5/6/2019	5/9/2019	5/15/2019	Approved	5/15/2019	5/15/2019			
DISTRICT 93	BERRIEN	00605	BENTON CHARTER TOWNSHIP	A	6620	L	VN	Yes	3/31/2019	3/28/2019													2/20/2020	2/20/2020	2/12/2020	Approved		2/28/2020			
DISTRICT 93	BERRIEN	00600	BENTON HARBOR	A	9970	L					4/23/2019	8/1/2019	8/5/2019		1/4/2018	3/23/2018			8/24/2018	3		1/17/2020		1/2/2020	-						
DISTRICT 93	LENAWEE	00750	BLISSFIELD	A	3340	L					4/11/2019	6/1/2019	5/16/2019		6/14/2018	6/14/2018		6/15/2018	7/6/2018	3		5/16/2019	5/22/2019	1/2/2020	Approved	1/2/2020	1/2/2020			
DISTRICT 93	BERRIEN	00850	BRIDGMAN	A	2291	L					4/11/2019	9/30/2019	1/21/2020		12/29/2017	3/23/2018			7/6/2018	gh enough to cover expenses		1/28/2020	1/28/2020	1/21/2020	Approved	2/3/2020	3/30/2020			
DISTRICT 93	CHARLEVOIX	01330	CHARLEVOIX, CITY OF	A	3124	L					4/11/2019	6/1/2019	5/10/2019		12/27/2017	3/23/2018			7/6/2018	gh enough to cover expenses			5/14/2019	5/15/2019	Approved	5/15/2019	5/15/2019			
DISTRICT 93	INGHAM	01995	EAST LANSING MERIDIAN SEWER WATER AUTHORITY	A	1	L										12/8/2017	3/23/2018			4/8/2019			based on DWRF info	4/8/2019	4/18/2019	Approved	4/18/2019	4/19/2019			
DISTRICT 93	KENT	02790	GRAND RAPIDS	A	258416	L					4/11/2019	6/1/2019	4/16/2019		12/27/2017	3/23/2018			6/19/2018				6/19/2018	4/18/2019	Approved	4/18/2019	4/19/2019			
DISTRICT 93	GRATIOT	02836	GRATIOT AREA WATER AUTHORITY	A	1	L					4/11/2019	6/1/2019	4/29/2019		12/19/2017	3/23/2018			7/6/2018	2,3		4/29/2019	4/30/2019	5/15/2019	Approved	5/15/2019	5/15/2019			
DISTRICT 93	OTTAWA	03190	HOLLAND BOARD OF PUBLIC WORKS	A	35048	L					4/11/2019	6/1/2019	5/9/2019		12/18/2017	3/23/2018			7/6/2018				7/6/2018	5/15/2019	Approved	5/15/2019	5/15/2019			
DISTRICT 93	JACKSON	03470	JACKSON	A	33961	L					4/11/2019	10/31/2019	10/7/2019		12/13/2017	3/23/2018			7/6/2018	2		1/10/2020		12/30/2019	-						
DISTRICT 93	BERRIEN	03741	LAKE CHARTER TOWNSHIP	A	6800	L					4/11/2019	9/30/2019	8/21/2019		4/26/2017	4/30/2018			7/6/2018	1,2,3				12/30/2019	-						
DISTRICT 93	MASON	03960	LUDINGTON, CITY OF	A	8357	L					4/11/2019	6/1/2019	5/9/2019		1/2/2018	3/26/2018			7/6/2018	2,3		1/22/2019	1/22/2019	5/15/2019	Approved	5/15/2019	5/15/2019			
DISTRICT 93	ISABELLA	04530	MOUNT PLEASANT, CITY OF	A	26084	L										12/22/2017	3/23/2018			7/6/2018				7/6/2018	4/18/2019	Approved	4/18/2019	4/19/2019			
DISTRICT 93	MUSKEGON	04570	MUSKEGON	A	37213	L										1/11/2018	3/23/2018			7/24/2018				7/24/2018	4/18/2019	Approved	4/18/2019	4/19/2019			
DISTRICT 93	MUSKEGON	04580	MUSKEGON HEIGHTS	A	10856	L					4/11/2019	6/1/2019			2/28/2018	3/23/2018			4/8/2019	1,2,3					-						
DISTRICT 93	BERRIEN	04680	NEW BUFFALO	A	1940	L					4/11/2019	7/1/2019	7/19/2019		1/17/2018	3/23/2018			7/6/2018				7/6/2018	9/9/2019	Approved	9/9/2019	9/9/2019			
DISTRICT 93	OTTAWA	04847	NORTHWEST OTTAWA WATER SYSTEM	A	1	L					4/11/2019	9/1/2019	8/30/2019		12/28/2017	3/23/2018			7/6/2018	ent in approved column			1/24/2020	12/30/2019	Approved	2/4/2020	2/12/2020			
DISTRICT 93	KENT	05370	PLAINFIELD TOWNSHIP	A	40891	L					4/11/2019	6/1/2019	4/15/2019		12/19/2017	3/23/2018			6/19/2018	1,2,3		3/15/2019	4/18/2019	4/23/2019	Approved	4/23/2019	4/29/2019			
DISTRICT 93	VAN BUREN	06100	SOUTH HAVEN	A	4403	L					4/11/2019	6/1/2019	6/19/2019		1/2/2018	3/26/2018			7/6/2018	2		6/19/2019	7/10/2019	1/2/2020	Approved	1/2/2020	1/2/2020			
DISTRICT 93	BERRIEN	06310	ST JOSEPH	A	8789	L										12/29/2017	3/23/2018			6/19/2018				6/19/2018	4/18/2019	Approved	4/18/2019	4/19/2019			
DISTRICT 93	GRAND TRAVERSE	06640	TRAVERSE CITY, CITY OF	A	14532	L										12/22/2017	3/23/2018			7/6/2018				7/6/2018	4/18/2019	Approved	4/18/2019	4/19/2019			
DISTRICT 93	KENT	07220	WYOMING	A	72125	L					4/11/2019	6/1/2019	5/29/2019		12/11/2017	3/23/2018			2/22/2019	2,3		1/17/2020	1/17/2020	1/2/2020	Approved					

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
GRAND RAPIDS DISTRICT OFFICE

LIESL EICHLER CLARK
DIRECTOR

November 1, 2019

Mr. Ellis Mitchell, City Manager
City of Benton Harbor
200 East Wall Street
Benton Harbor, Michigan 49022

WSSN: **00600**

Dear Mr. Mitchell:

SUBJECT: Administrative Consent Order: Progress Update and Revised Schedule

This letter is in response to discussions with Benton Harbor staff regarding the compliance schedule established in the Administrative Consent Order (ACO) effective March 5, 2019. Extensions for Section II - Compliance Schedule (Compliance Schedule) of the ACO were granted on April 1, 2019, May 16, 2019, and July 2, 2019. On October 17, 2019, the Department of Environment, Great Lakes, and Energy (EGLE) received another request for extensions of additional items in the Compliance Schedule. EGLE staff would like to acknowledge the competing timelines in the Compliance Schedule by granting the requested extension, and also reiterating the terms of the ACO.

Allowing sufficient time to complete tasks in the Compliance Schedule is necessary; however, timely implementation of items that will directly result in greater protection of public health must be prioritized. The table below includes an updated Compliance Schedule that satisfies the recent extension request from the City and sets interim deadlines for items requiring permitting.

Item	Initial Deadline	Extended Deadline	Status/Comment
Submit a rate study	4/1/2019	(completed)	
Submit plan to implement rate increases	4/1/2019	7/1/2020	Needs approval of Commission
Upgrade SCADA system for data access and storage	4/1/2019	(completed)	
Install flow meter on finished water	4/1/2019	12/15/2019	Needs further integration into SCADA
Install continuous chlorine analyzer on WTP tap	4/1/2019	(completed)	
Distribution Operator in charge	4/1/2019	(completed)	
Corrosion Treatment Study	4/1/2019	(completed)	
Submit updated rate collections plan	5/1/2019	12/31/2019	Coordinating with staff
Updated cross connection program including residential accounts	6/1/2019	3/31/2020	
Permit and Construct coagulant feed to existing rapid mix	6/1/2019	(completed)	
Submit maintenance plan for valves and hydrants	6/1/2019	06/30/2020	Allow time for staff to improve rate collections

Conduct professional inspection of water tower, or conduct cleaning and repaint interior	6/30/2019	12/31/2020	Delayed to allow for funding process
Install/repair mussel control system at intake	6/30/2019	4/1/2020	Submit permit application by 3/1/2020
Repair filter to waste valves	1/31/2020	9/1/2020	

Be advised that, per Paragraph 1.3 of the ACO, the City of Benton Harbor remains obligated to pay stipulated penalties of $500 per violation per day for failure to comply with a specific deadline set forth in the Compliance Program, including the extended deadlines set forth above.

It is our intention to work with you on resolving these issues in a timely manner. We anticipate and appreciate your cooperation in working together to resolve these matters. Additionally, if you have any questions regarding this Violation Notice, please contact me below or at sarkipatoe@michigan.gov.

Sincerely,

Ernie Sarkipato, Surface Water Treatment Specialist
Grand Rapids District Office
Drinking Water and Environmental Health Division
616-307-0261

cc/email: Mr. Mike O'Malley, Water Superintendent, Benton Harbor
Mr. Darold Harlan, Distribution Operator
Mr. Mike Bolf, P.E., Engineering Unit Supervisor, EGLE
Ms. Maureen Nelson, Enforcement Specialist, EGLE

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER AND MUNICIPAL ASSISTANCE DIVISION

ASSET MANAGEMENT PROGRAM REVIEW CHECKLIST

Water Supply Name: Benton Harbor WSSN: 00600

Received Date: 1/4/2018

A. Asset Inventory	Answer		
	Yes	No	NA
Includes a description of the assets the system has chosen to track.	☒	☐	☐
Describes the level of detail used for each asset. (pump station / pumping unit / motor)	☒	☐	☐
Includes source, pumping, treatment, and distribution assets.	☐	☒	☐
Describes the parameters tracked for each asset. (Name, Location, Date installed, Exp. useful life, etc.)	☒	☒	☐
Identifies any incomplete or low-confidence data.	☒	☐	☐
Outlines a plan for completing or refining the dataset.	☒	☐	☐

B. Criticality Assessment	Answer		
	Yes	No	NA
Provides a description of the scale used for likelihood of failure.	☒	☐	☐
Provides a description of the scale used for consequence of failure.	☒	☐	☐
Lists factors considered in assessing likelihood of failure.	☒	☐	☐
Lists factors considered in assessing consequence of failure.	☒	☐	☐
Describes the methodology and formula used to calculate the criticality factor.	☒	☐	☐

C. Level of Service Goals	Answer		
	Yes	No	NA
Includes a description of the process used to develop the level of service goals.	☒	☐	☐
Provides a list of water system goals.	☒	☐	☐
Describes how each goal will be tracked and assessed.	☒	☐	☐

D. Capital Improvement Plan	Answer		
	Yes	No	NA
Identifies needs for both 5 and 20 year planning periods.	☒	☐	☐
Plan includes project name, cost, estimated completion date, and funding source.	☒	☐	☐
The CIP has been reviewed and approved by water supply administrators. (owner/board/council/etc)	☒	☐	☐

E. Funding Structure and Rate Methodology	Answer		
	Yes	No	NA
Includes annual operating budget.	☐	☐	☐
Includes current, approved rate structure.	☐	☐	☐
Provides documentation of legal authority for rate setting.	☐	☐	☐
Weighs anticipated costs (operation and capital) against revenue.	☐	☐	☐
Outlines plan to close funding gap, if identified.	☐	☐	☐

Reviewer: _____ Date of Initial Review: _____

☐ Comments Issued, Awaiting Revision Date Revisions Rcvd: _____

☐ Approved Date Approved: _____

Notes:

A. Asset Inventory	Has description of water plant & processes, but does not discuss which assets will be tracked or what parameters
B. Criticality Assessment	
C. Level of Service Goals	
D. Capital Improvement Plan	
E. Funding Structure & Rate Methodology	

WATER ASSET MANAGEMENT PLAN

December 2017

Prepared by:

ABONMARCHE

95 West Main Street, Benton Harbor, MI 49022 • 269.927.2295
abonmarche.com

Contents

Summary of Tables

Summary of Figures

Appendices

1 Executive Summary

1.0 Introduction

The Michigan Department of Environmental Quality (MDEQ), through Michigan's Safe Drinking Water Act, has implemented the requirement that community water supplies servicing more than 1,000 people, prepare and execute an Asset Management Plan (AMP) for their water system. The City of Benton Harbor with a population of 10,038 per the 2010 census, meets the requirements for implementation of an AMP for their water infrastructure.

The goal of the AMP process is to provide the municipality with a comprehensive understanding of the quantity and condition of their existing system to ensure proper measures are being taken to provide a safe and reliable supply of water to consumers. Asset Management Plans analyze life cycle costing to develop a long term plan that associates the needed funding to projects that will be done in the future that include repairing, replacing or rehabilitating particular assets. This ensures that the water system will deliver the desired level of service perpetually.

The AMP consist of five core components as described in the MDEQ document, "Asset Management Guidance for Water Systems" these include:

- Asset Inventory
- Level of Service
- Critical Assets
- Revenue Structure
- Capital Improvement Project Plan

This Water Asset Management Plan was structured to follow the format suggested in the MDEQ "Asset Management Guidance for Water Systems."

1.1 Mission Statement

The Michigan Department of Environmental Quality requires that for an AMP to be approved there must be a mission statement. A Mission Statement is developed to represent the purpose and goals of the water department. The Mission Statement defines the asset management program. The following is a derivation of the standard mission statement recommended by the MDEQ in lieu of a formal statement by the municipality:

We commit to protecting public health, and maintaining and improving performance of our drinking water plant and distribution system assets, while minimizing the long-term cost of operating those assets. We strive to make the most cost-effective renewal and replacement investments and provide the highest-quality customer service possible.

1.2 Asset Management Team

The MDEQ also requires an Asset Management Team be established to oversee the asset management program. The team will also ensure that the mission statement is being fulfilled. When assembling an Asset Management Team, it is important to consider current and past municipal staff (officials, board members, clerks, accountants, and engineers), current and past utility staff (operators and other service workers), and any other stakeholders that can help in assembling the information to develop this Asset Management Plan. Provided below in Table 1 is a summary of the AMP Team. As the AMP is updated, these contacts may be updated and reviewed to determine if additional members are required or other changes are needed to best complete the stated goals of the AMP.

Table 1: City of Benton Harbor Water AMP Team

Member Role	*Current Member*
City Manager	Darwin Watson
Public Services Director	Michael O'Malley
Water Treatment Superintendent	Michael O'Malley
Engineer	Abonmarche

2 Asset Inventory

2.0 Introduction

The first core component of asset management, according to MDEQ, is the asset inventory. The following questions are a guideline for developing an inventory:

- What do I own?
- Where is it?
- What condition is it in?
- What is its remaining useful life?
- What is its value?

Developing the initial inventory on what assets the city owns can be one of the most difficult steps. The majority of the assets for a water system are underground and hidden from view. Therefore, it is difficult to keep track of what is there and what condition it is in. To develop the initial inventory, as-built drawings, invoices, staff knowledge, visual observation, interviews with residents and consultants are all resources that were used. Asset inventory is an ongoing process that should be updated when changes are made to the water system.

2.1 Water System Inventory

The first step in the asset management plan is to determine what assets are owned and maintained by the municipality. These assets for the water utility include not only the

physical pipes that transport water to users but also the water plant, storage facilities, pumps, and fire hydrants. A summary of owned water facilities can be seen in Table 2.

Table 2: Summary of Water Assets

Asset	*Measure*
Water Plant	Renovated 2010-2011
Water Distribution (Pipes)	347,645 Feet (65.8 miles)
Water Meters	2,844
Fire Hydrants	509
Water Tower	1 @ 650,000 Gallon Capacity

Maintenance of these assets is critical to meeting the city's goal of providing safe and reliable drinking water to its users. To complete an accurate and useful asset management plan it is important to gather as much data on the existing age and condition of all assets related to a utility. A more detailed summary of the above listed assets is provided in the following sections.

2.1.1 Water Plant

The Benton Harbor Water Plant is located at 601 Ridgeway, St. Joseph, MI, in the southwest corner of Jean Klock Park near the Lake Michigan shoreline. Built around 1955 by Pearson Construction Co., it is rated by the Michigan Department of Environmental Quality (MDEQ) as an F-1 Complete Treatment Surface Water Treatment Plant and is regulated by the Michigan Safe Drinking Water Act 399 in accordance with the Surface Water Treatment Rules (SWTR). From 2010-2011, the water plant was refurbished and expanded using Michigan's Drinking Water Revolving Loan Funds (DWRLF). Operation was restored to 16 million gallons of water per day (MGD) and technology improvements included: chemical treatment, safer and easier disinfection, particulate matter removal, waste treatment, and other operational equipment.

The current process of the water plant starts with raw Lake Michigan water conveyed via one or more of five low lift pumps at a typical rate of 2-5 MGD from an intake structure located 5,000 feet from the plant in Lake Michigan though a 30-inch diameter pipe to a raw water lift station and wet well. Liquid sodium hypochlorite, in 15% solution, is added as a disinfectant. Liquid aluminum sulfate, in 48% solution, is added to facilitate the chemical binding and settling process of coagulation. Hydrofluorosilicic acid (HFSA) is also added but will soon be switched to a granular sodium fluoride. The pumped raw water that has been chemically treated is discharged into the mixing portion of the two plate settler basins where the flow is mixed in five stages: in the pipeline, in the rapid mixer, and in three successively slower flocculation mixers. During this mixing, the alum destabilizes the particles and then acts as a binding chemical that forms a piece of insoluble floc. The water then enters a plate settler chamber where the floc is settled to the bottom and clear water is drawn off the upper levels. More than 95% of the suspended solids are removed in the flocculation/settling process. The water then flows

to the filters where additional suspended solids are removed before flowing to two underground reservoirs.

2.1.2 Distribution Piping

The existing water distribution system includes over 65 miles of 2" through 20" water main. The mains adjacent to the water treatment plant are 20" and main transmission lines are 8-20" in size. Many residential areas are served by 4"-8" mains. A significant portion of the city (23.7%) is served by mains 2" and 4" in diameter, inadequate for distribution systems with fire protection. Water is pumped from the reservoirs at the water plant via one or two of five high lift (HS) pumps at a rate of either 2 MGD or 4 MGD to the system at 70 to 90 psi. One 2 MGD pump is used during normal consumption to maintain a safe level in the Britain Avenue water tower. A second pump, with a capacity of 4 MGD, is used during emergency situations when the safe level is not maintained. Two 20-inch pipes carry the water from the plant to the city; 12-16-inch pipes distribute the water and 4, 6, & 8-inch pipes deliver water to homes and small businesses.

Improper and lack of looping water mains also causes reduced pressures, stagnant water and increased maintenance. The system is generally well looped, except at the now unused connection with Benton Charter Township on Pipestone and at the City borders. Improper sizing can also be detrimental to the overall pressure in the system, much of the residential areas are fed with 4" main which are too small to generate suitable fire flows.

The system was designed to distribute water to a much larger area than it currently supplies: Benton Charter Township now receives water from the Benton Charter Township Water Plant, St. Joseph Township now receives water from the St. Joseph Water Plant. The City of Benton Harbor distribution system still consists of the large mains that were necessary to distribute water to those further areas, but now only distributes water within the City limits. Therefore, large mains are feeding 4" mains in neighborhoods.

The current 10 State Standards for Water Works recommend water main diameters six (6) inches or greater with most typical applications calling for an eight (8) inch water main as a minimum diameter in order to provide adequate fire protection while maintaining acceptable residual pressures in the system. A breakdown of the City's water distribution system by pipe diameter can be seen in Table 3 and Figure 1. This breakdown shows 83,081 feet of the city's water distribution piping, 23.9% of the system, falls below the 6 inch minimum standard with a further 116,839 feet, or 33.6%, right at the 6 inch minimum diameter.

Table 3: Water Distribution Network Summary

Pipe Diameter (Inches)	Length of Pipe (Feet)	% of System
2	771	0.2%
4	82,310	23.7%
6	116,839	33.6%
8	44,398	12.8%
10	6,964	2.0%
12	57,054	16.4%
16	10,135	2.9%
18	1,181	0.3%
20	27,993	8.1%
Total	347,645	100%

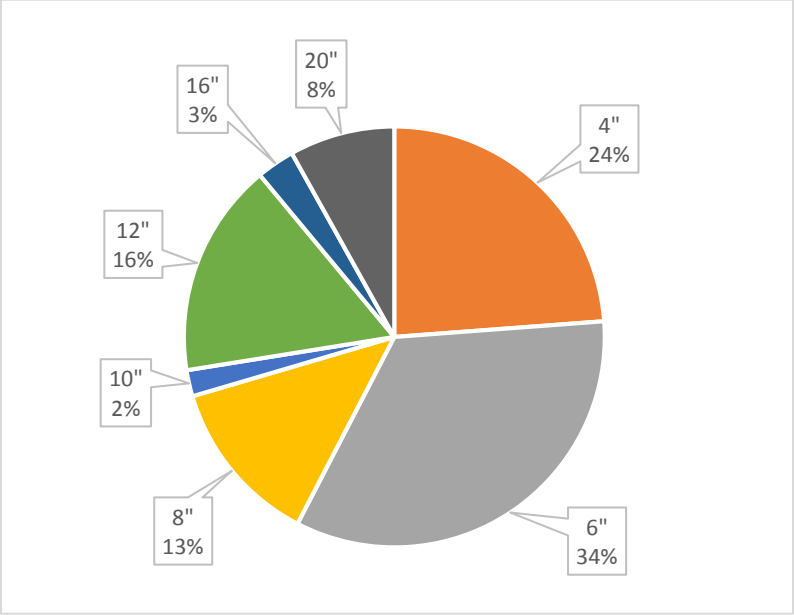

Figure 1: Water Distribution Network Summary (By Size)

A further breakdown of the existing distribution network, showing both piping materials and sizes is presented in Figure 2. An overall listing of all mains owned by the city can be found in Appendix A following this report.

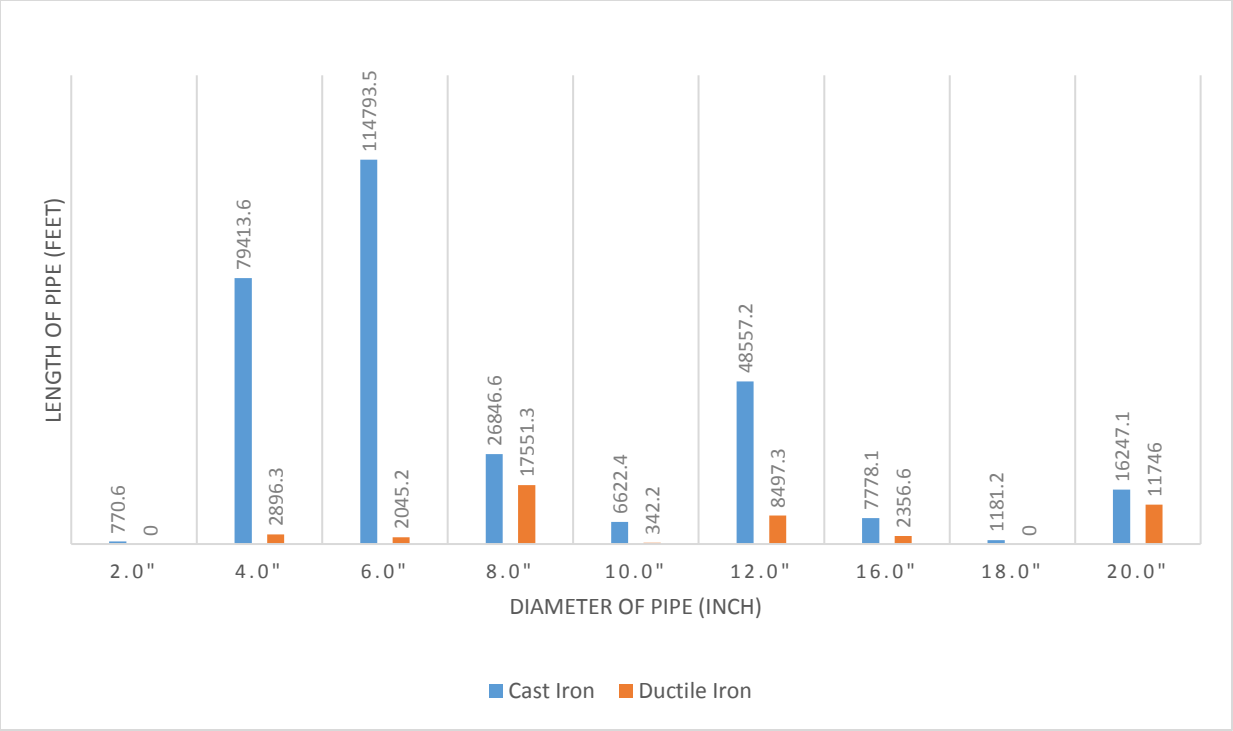

Figure 2: Network Pipe Material and Size Distribution

Table 4 and Figure 3 show the age ranges within the system. 75% of the system is greater than 50 years of age. Underground pipes have an effective life based on the pipe material and installation practices used during their installation. Galvanized pipes generally have an estimated effective life less than 50 years while cast iron pipes can last 75 years, and new ductile iron or plastic pipe materials are capable of lasting 90 years or longer with modern construction practices. The advanced age of the water distribution network is a significant factor in the condition assessment and probability of failure discussed later in the report.

Table 4: Water Distribution Network Summary (By Age)

Age Range	Length of Pipe, feet	%
0 - 25	49,440	14.2%
26 - 50	36,664	10.5%
51 +	261,541	75.2%
Total	347,645	100%

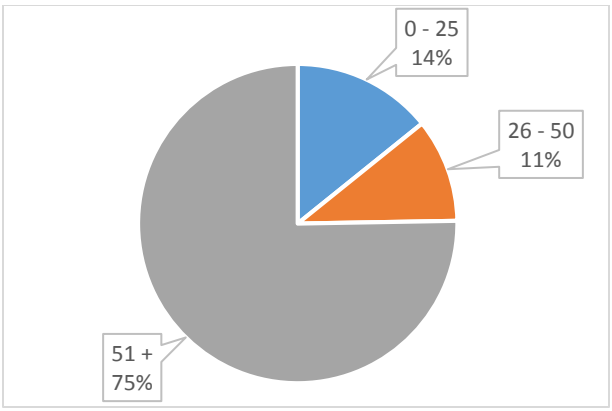

Figure 3: Water Distribution Network Summary (By Age)

2.1.3 Water Meters

The city currently utilizes 3,476 total service connections, 2,844 of these are metered. 2,612 of the meters were recently replaced as part of the SAW grant to provide more accurate readings. Water service connections that are not metered include; City Hall, the police station, the fire station, and several parks, with more being discovered. Water meters measure water usage for residential, commercial, industrial, and governmental customers. The current estimated breakdown of meter usage can be seen below in Table 5.

Table 5: Summary of Existing Water Meters by Use

User Type	*Number of Meters*	*% of System*
Residential	2,474	87%
Commercial	199	7%
Industrial	114	4%
Mixed Use	57	2%
Total	2,844	100%

2.1.4 Fire Hydrants

509 fire hydrants are connected to many strategically placed points on the system. The placement varies based upon the number and types of structures that may catch fire and the availability of water in the water mains around these structures. The ISO Criteria generally requires a flow of 1,000 to 1,500 gpm in residential areas (1- and 2- family dwellings not exceeding two stories in height) and up to 2,500 gpm in commercial areas. The minimum residual pressure at the fire flow is commonly required, by the National Board of Fire Insurance Underwriters, to be 20 psi. A detailed summary of improvements recommended based on increasing fire flows can be found in the reliability study recently completed. A map showing the location and classification of the hydrants as of 2017 can be found in Appendix B. 4" and 2" pipes throughout the City should be generally replaced with 8" to improve fire flows throughout the City. A minimum of 8" Ductile Iron

should be the standard used in any water system replacements or improvements throughout the City. We suggest further investigation via a hydrant flow testing program to best determine where localized hydrant and valve issues are present. A valve turning program is also recommended to better understand the system and improve faults.

2.1.5 Water Tower

A single pedestal elevated storage tank provides the City with water storage for fire protection and to improve system pressure. The water tower is located at Britain and 8th Street. The elevated tank was constructed in 1962 by Pittsburg Steel Company and has a storage capacity of 650,000 gallons. The elevation of the water tower provides 70-75 psi of pressure for the nearby water system. The water tower was last painted in 1990 and the last full inspection was performed by Dixon Engineering in 2008. A copy of this report can be found in Appendix C. In 2013, a partial inspection was performed by Dixon to look for damages relating to an overflow event.

2.1.6 Drinking Water Source

The drinking water source for the City of Benton Harbor is Lake Michigan. 5,000 feet of 36" piping that extends into the lake to an intake structure. In regards to the drinking water source quality, the City of Benton Harbor performs yearly water quality analysis and reporting to inform the public about drinking water quality. Water Quality Reports are created annually and made available to the public via the city's website. Water Quality Reports from 2011, 2012, 2014, 2015, and 2016 can be found in Appendix D.

2.2 Condition Assessment, Remaining Life and Value

Once an inventory of assets to be included in the asset management plan has been collected and reviewed, the next step is determining what the current condition of these assets are, how much remaining life they have, and what their overall value is. Determining the condition of the asset can help estimate what its remaining life will be. Knowing this information will help the city in setting budgeting priorities in the short and long term. Assets are hidden underground so it is difficult to determine their current condition through physical examination. Therefore, record documents are often the easiest way to estimate age.

To determine the anticipated condition of the water system in the City of Benton Harbor, historical mapping and as-built drawings from previous projects were collected and reviewed. As records for the water system have not been consistently updated, we had to make assumptions of the current approximate age of the pipe network. Any pipes installed prior to 1970 were assumed to be cast iron unless otherwise noted and pipes less than thee (3) inches in diameter were assumed to be galvanized unless otherwise noted. Appendix A provides a complete listing of the distribution network in the city which shows the assumed age, size, and length of distribution piping along with other related information.

In regards to anticipated life of the distribution network, Table 6 shows the service life values that were assumed for a given material.

Table 6: Distribution Pipe Service Life Summary

Material	*Service Life (Years)*
Galvanized	40
Cast Iron	75
PVC	90
Ductile Iron	90

It is important to have an order of magnitude understanding of the present value of assets owned so that maintenance and rehabilitation costs can be justified. In plain terms, more overall assets means more money needs to be allocated to their maintenance. Table 7 below summarizes and approximate value of the water distribution asset (water main, hydrants and valves) in the City.

Table 7: Water Distribution Replacement Values

Pipe Diameter (Inches)	*Length of Pipe (Feet)*	*Unit Replacement Cost ($/Foot)*	*Current Replacement Value ($)*
2.0*	771	$320	$246,720
4.0*	82,310	$320	$26,339,200
6.0*	116,839	$320	$37,388,480
8.0	44,398	$335	$14,873,330
10.0	6,964	$395	$2,750,780
12.0	57,054	$405	$23,106,870
16.0	10,135	$450	$4,560,750
18.0	1,181	$485	$572,785
20.0	27,993	$525	$14,696,325
Total	347,645		$124,535,240

*Assumed that mains 6 inches and under would be sized to the new 8 inch standard
** - Unit costs include removal and replacement of water main, installation of control valves, hydrants, and water services as well as replacement of pavement/surface improvements associated with a 10 foot wide trench.

3 Level of Service

3.0 Introduction

As described in the MDEQ Guidance Document, Level of Service (LOS) defines the way in which the utility stakeholders want the utility to perform over the long term. The LOS can include any technical, managerial, or financial components the utility wishes, as long as all regulatory requirements are met. The LOS will become a fundamental part of how the utility is operated.

All utilities must operate within the state and federal regulations and requirements. These regulations are generally specified in the Safe Drinking Water Act for water systems but there are additional rules and regulations at the state and federal level. Although the state and federal regulations set bare minimum standards of operation in the LOS, these standards will not adequately address all areas of operation and should not be the sole factor of the LOS. Utilities should include many other factors to delineate important areas of the utility's operation.

Within the range of the minimum (regulations) and maximum (absolute capabilities of assets), there are numerous items a utility could include within its LOS. Items may be included so the utility can communicate its intentions with its customers, measure its performance, and determine critical assets. Understanding what LOS to choose will help in developing an Asset Management Plan that truly captures the utility's performance and how to accomplish future goals.

Defining the LOS sets the goals for the utility. These goals allow the operations staff to have a better understanding of what is desired from them, and give management a better understanding of how to use staff and other resources more efficiently and effectively. Reviewing how the utility is meeting LOS also allows the management to shift resources if needed from one task to another to meet all the goals most effectively. Understanding the desired LOS will help to prioritize and characterize the system's assets, as well as how to manage finances to reach the LOS goals.

There is a direct link between the LOS provided and the cost to the customer. When a higher LOS is provided, costs to provide that level will likely increase. This direct link demands that the utility have an open dialogue with its customers regarding the LOS desired and the amount the customers are willing to pay for this LOS or increased services.

Typical questions to consider when developing the LOS for the system:

1) What is the LOS goal for health, safety, and security?

2) How often is the system out of compliance with regulations?

3) Are the operators properly certified?

4) How does the utility stay aware of and prepare for new regulations?

5) Do you share your LOS statement with your customers?

6) How do you track and respond to customer needs/complaints?

7) Can the current process be improved?

8) How quickly does the utility respond to customer issues?

9) Is maintenance being deferred to save money?

10) How much will the improvements cost and how will they be funded?

11) Are assets being properly maintained to insure they are in reliable working condition?

12) What areas within the system are most important to insure the best LOS possible?

13) When considering a preferred LOS, are asset age and life cycles, asset conditions, funding availability, etc. being factored in?

14) How often will the LOS statement be reviewed in order to capture changes such as funding availability (growth and decline), regulatory requirements, demand of customers (increases/decreases in customers), and physical deterioration of assets (addressing maintenance)?

15) Are O&M activities being maximized to meet the LOS goals?

3.1 Level of Service Goals

Upon review with the City, the following general LOS goals were selected as a guide to managing their water system.

- Deliver safe drinking water to all users
  - Meet State and Federal requirements for contaminants
- Ensure that taste and appearance are acceptable to all users
  - Meet selected secondary standards for taste, clarity, and color
  - City can track user feedback on water quality issues through City Works
  - Compliance tracked with laboratory testing and Monthly Operating Reports
- Provide adequate fire flows to ensure safety of community
  - "AA" (>1,500 gpm) flows to all commercial, industrial, and educational uses
  - "A" (>1,000 gpm) flows to all residential areas with City limits
  - Track with annual hydrant testing and 5-year computer modeling
- Undertake all necessary preventative maintenance and corrective actions on the system
  - Ensure that assets are meeting or exceeding their lifespans in good condition
  - Minimize cost of ownership
  - Minimize user interruptions due to unscheduled repairs and breaks
  - Record water line breaks so that trends can be identified and priorities can be adjusted

4 Asset Criticality

4.0 Introduction

The criticality of an asset is related to its probability of failure and its consequence of failure. Assets will have different criticality ratings. Criticality ratings are important in determining what assets need attention first. Assets with a higher criticality rating should receive priority first and should be outlined in the city's Asset Management Plan as being

a future project. This allows the city to start budgeting for the work that needs to be done. The two components of assessing criticality, Probability of Failure and Consequence of Failure, are described below.

4.1 Probability of Failure (POF)

Probability of Failure is estimating the likelihood that an asset will fail in the future. A ranking system to compare the probability of failure of multiple assets must be developed first before assigning a rating to each asset. By using the service life values defined in Table 6, and taking the assumed age of the pipes in the distribution network we are able to determine the anticipated probability of failure using equation (1) below. The result of this ratio is multiplied by 10 for use in criticality analysis of the network which is discussed in detail further in the report. In regards to probability of failure, a newly installed pipe will have a POF value of 0 which indicates very low to no probability of failure. A POF value of 10 indicates that the asset has reached or exceeded its intended service life and failure is likely imminent or that the reliability of the asset is severely degraded.

Equation (1): $$Probability\ of\ Failure\ (POF) = \frac{Age\ of\ Asset\ (Years)}{Service\ Life\ (Years)} * 10$$

If Age of Asset > Service Life, POF = 10

Figure 4 below shows a breakdown of the distribution network based on the POF rankings. Much of the system has aged to or beyond its maximum life as indicated by the large amount of the network in the 9-10 rating category. However, recent improvements to the water network have been completed, which is seen by the fair amount of pipes in the 0-2 rating category.

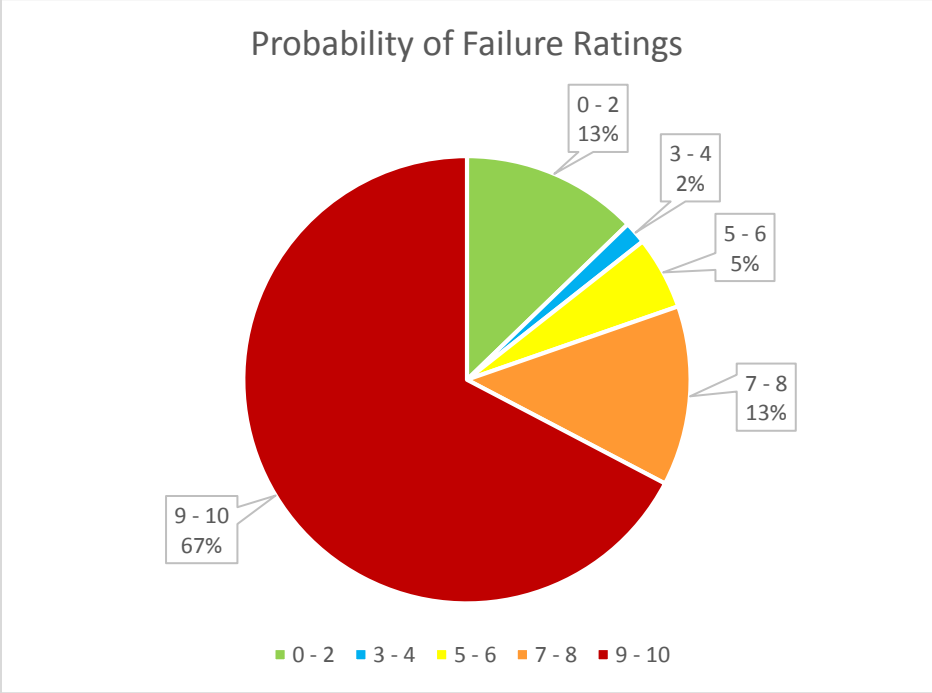

Figure 4: Network Probability of Failure Distribution

4.2 Consequence of Failure (COF)

Consequence of Failure is estimating all of the potential costs that will occur when there is failure to the asset. There are multiple costs to consider and often it tends to be a chain effect and accumulation of multiple different costs. Examples of the potential costs include: cost of repair; social cost associated with the loss of the asset; repair/replacement costs related to collateral damage caused by the failure; legal costs related to additional damage caused by the failure; environmental costs created by the failure; loss of business revenue to the community and any other associated costs or asset losses.

Table 8 below outlines the Consequence of Failure Levels that were developed and applied for this Asset Management Plan. It provides a summary of the selected factors and the ranges that were used to weight a given factor. As certain parameters, such a pipe size, play a larger role in determining consequence these factors were given greater overall weight in the scoring process.

Table 8: Consequence of Failure Levels

Factor & Weight	*Range of Value*	*Multiplier*
Size of Pipe (Inches) W: 5	< 4	0.1
	4 - 6	0.4
	8 - 10	0.7
	≥ 12	1.0
Proximity to Buildings W: 2	X ≥ 10	0
	5 < X < 10	0.5
	≤ 5	0.8
	0	1.0
Proximity to Roadways W: 3	Outside ROW	0
	In ROW Alley/Minor Road (Not Under)	0.2
	IN ROW Major Road (Not Under)	0.5
	Under Alley/Minor Road	0.8
	Under Major Road	1.0

The formula for determining COF has a value range of 0.5 to 10 with a lower score indicating the lowest criticality (small pipe, far away from buildings, outside of the ROW) and a 10 indicating the most critical situation (large pipe, under a building, under a major roadway). Equation 2 presented below was used in the calculation of criticality as previously discussed.

Equation (2): $Consequence\ of\ Failure\ (COF) = S * 5 + Prox_B * 2 + Prox_R * 3$

Where:
S = Size of Pipe
$Prox_B$ = Proximity to Buildings
$Prox_R$ = Proximity to Roadways

Figure 5 below shows a breakdown of the distribution network based on the COF rankings.

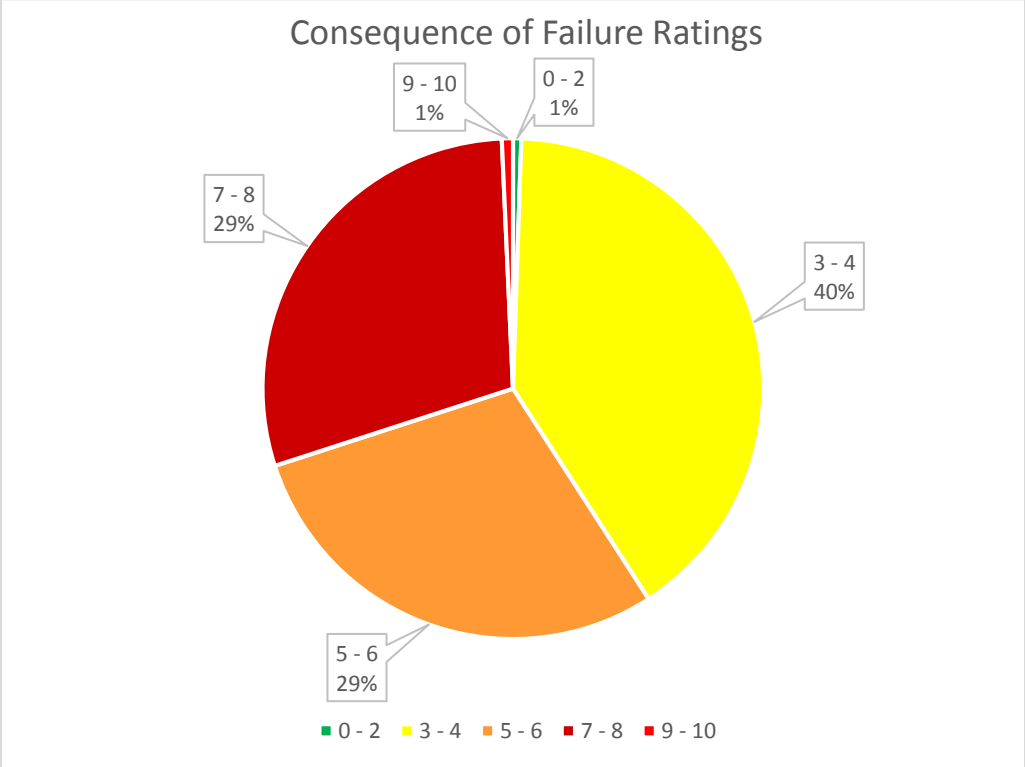

Figure 5: Network Consequence of Failure Distribution

4.3 Criticality & Business Risk Evaluation

Multiplying the Probability of Failure (POF) and the Consequence of Failure (COF) together results in determining the criticality, also referred to as the Business Risk Evaluation (BRE). The assets that have the greatest probability of failure along with the greatest consequence of failure will be the most critical. The equation for calculating the BRE can be seen below.

Equation (3): $BRE = POF * COF$

Where:
BRE = Business Risk Evaluation
POF = Probability of Failure
COF = Consequence of Failure

The product of multiplying the probability of failure with the consequence of failure produces a BRE score of 1 to 100. A BRE score of 1-20 is considered low priority, 21-55 are medium priority, and 56-100 are high priority. Table 9 shows the criticality matrix used for analyzing the assets. Assets with the highest BRE scores should be considered candidates for the 5-year or 20-year Capital Improvement Project list. Appendix A shows all the BRE scores for the Benton Harbor Water System. Appendix E provides mapping based on a variety of factors including remaining useful life, probability of failure, consequence of failure and criticality.

Table 9: Business Risk Evaluation Score Priority Matrix

Consequence of Failure (COF)											
	10	10	20	30	40	50	60	70	80	90	100
	9	9	18	27	36	45	54	63	72	81	90
	8	8	16	24	32	40	48	56	64	72	80
	7	7	14	21	28	35	42	49	56	63	70
	6	6	12	18	24	30	36	42	48	54	60
	5	5	10	15	20	25	30	35	40	45	50
	4	4	8	12	16	20	24	28	32	36	40
	3	3	6	9	12	15	18	21	24	27	30
	2	2	4	6	8	10	12	14	16	18	20
	1	1	2	3	4	5	6	7	8	9	10
		1	2	3	4	5	6	7	8	9	10
	Probability of Failure (POF)										

Figure 6 breaks down the current system by BRE ranking (low, medium, or high). More than 85% of the system is in a medium or high risk category from a BRE perspective. Projects will be selected from the 17% of the network that is currently in the high risk category.

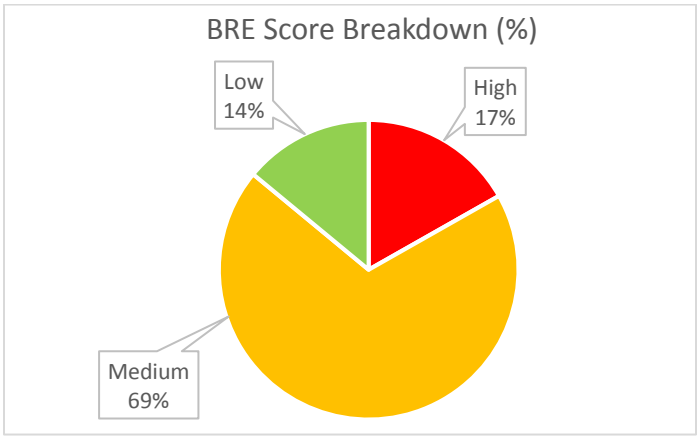

Figure 6: Network BRE Score Distribution

5 Revenue Structure

5.0 Introduction

To help fund rehabilitation or replacement of assets, methodologies are used to determine how revenue is generated. First, the fixed rate methodology can be utilized. Fixed rate methodology is a tool used to determine rates and charges to provide sufficient revenues to cover generally fixed costs that usually occur like the operation, maintenance, and replacement of assets. Next is billable flow methodology which generates revenue through a commodity rate based on consumer usage to address variable costs based upon flow, such as utility consumption. A fixed and variable methodology is typically used. In this method, revenue is generated from two sources, the fixed unit for the source and a commodity rate.

Once total expenses have been determined, the rates and charges for the user can be reviewed to ensure that there is sufficient revenue to cover expenses. If a shortfall exists, then the users are not paying for the cost of service and the difference must be addressed. Occasionally, temporary subsidies are necessary to cover unexpected expenses. However, a continuous use of subsidies will result in rate increases in the future or a deficit in the budget.

The City of Benton Harbor owns and operates the Drinking Water System and has the authority to establish rates to be charged for services as needed.

5.1 Operation & Maintenance Budget and Staff Structure

The annual operation and maintenance (O&M) budget includes typical costs associated with operating and maintaining the system for a year. Excluded from this budget are any major capital improvements that are needed to increase capacity or replace items with a useful life of more than 20 years. Included in the budget are the costs associated with personnel, energy use, supplies, etc. Budgetary projections assume an annual 3% increase in expenses to account for inflation and other factors.

The budget needs to account for the inflation of cost, wages, and utility charges. Efficiency within the City water distribution system is dependent on an adequate and qualified staffing structure. Table 10 is an outline of the existing city staffing that contributes to maintaining the water distribution system. That is, all employees from the department of public services including those who work specifically for the water department. The City will be facing the retirement of several key personnel within the 20 year planning period. Therefore, after the initial 5-year planning horizon, operating expenses are expected to remain flat.

In 2011, the emergency City manager set up a schedule for rates to increase to cover the cost of inflation, operations, maintenance and replacements to the system, and debt service cost on bonds. In 2013, a different emergency City manager approved a 5% reduction in this rate to reduce the financial burden placed on the residents who were facing economic hardships as the City was in a fiscal position to reduce the rates. The city currently operates with a water department budget of $2 million which provides

funding sufficient to address operations but may fall short of the funds needed to cover current debt payments. It appears that a 15% rate increase may be necessary in the next 6 months to close the funding gap for current debt. Annual increases of 2.5% -6.5% will also be needed until 2022. A larger rate increase, grant, or other mechanism of funding will be required to pay off debt necessary to complete all of the projects outlined in this report in 2023. More detail on this is included in Appendix G.

Table 10: City of Benton Harbor Public Services Department Staff Structure

Name	Title	DOB	DOH	License(s)
Michael O'Malley	Superintendent of Water Plant	9/27/1957	7/18/2016	S1 / F1 Certificate
Denny Edwards	Utility Service Operator I	10/20/1967	9/13/1994	F4 / S4 Certificate
Douglas Vanderploeg	Utility Service Operator I	5/20/1956	2/27/1992	F3 / S3 Certificate
Henry Clayton	General Labor	7/24/1978	9/15/2014	N/A
Eddie Davis	Heavy Equipment Operator	6/17/1973	10/20/2003	CDL Certificate
Shawn Echols	General Labor	7/4/1969	3/20/2017	N/A
Steve Forbear	Mechanic	11/17/1965	5/11/2015	CDL Certificate
Micah Goss	General Labor	2/18/1997	1/19/2016	N/A
Dennis Hudson	Heavy Equipment Operator	7/15/1965	11/25/2002	CDL Certificate
Floyd Johnson	Utility Service Technician I	10/1/1981	7/7/2016	CDL Certificate
Dimetrius Meeks	Supervisor Dept. of Public Works	8/15/1972	5/13/1997	N/A
Patrick Patterson	Heavy Equipment Operator	8/30/1963	5/2/2015	CDL Certificate
Richard Woods	Utility Service Technician I	8/20/1960	5/29/2013	CDL Certificate
Thomas Woodson	General Labor	9/19/1954	11/24/2014	CDL Certificate
Eddie Ellis	Utility Service Technician II	9/4/1969	11/30/2001	N/A

5.2 Replacement Fund

The rate methodology should include a replacement schedule for short-lived assets. The breakdown will identify items owned by the utility that have a useful life of 20 years or less

and contain moving parts. The replacement items will appear in the asset inventory, but should have a dedicated funding source due to their limited useful life and importance. On an annual basis, replacement funds are set aside and saved until needed. Once a particular item fails, money is drawn from the replacement fund to replace the failed item without having to disrupt the normal operating budget.

Most of the time, it is not known when any asset will need to be repaired or replaced, but their end of life has been estimated in this plan. The amount should be set aside each year, so that when a repair is needed, the funds are available without having to borrow money for the expense. The replacement schedule can be reviewed and amended annually for budgeting purposes.

6 Capital Improvement Project Plan

6.0 Introduction

A long-term Capital Improvement Plan (CIP) should look at the utility's needs for the future. Ideally, the planning period would be at least 20 years, with a 5 year plan identifying more pressing needs. It should be understood that the specific expenditures and needs of the utility in the latter years, 15 to 20 years, are more speculative than the needs for the first 5 to 10 years, particularly the first 5 years. However, the inclusion of the needs for this longer time period will provide a better opportunity for the water system to plan for its capital needs. Capital improvement projects are projects that the utility has an extended period of time to plan for and are projects that usually cover high cost, non-recurring items.

After the city has determined the projects it will include in its Capital Improvement Project Plan the next step is to associate an estimated cost to these projects. Once an estimated cost is developed, then is it important to think about how the project will be funded in the future. The city should plan on funding the majority of the capital improvement projects from its Water System revenue. Additionally, the city may look for outside sources of funding for projects. Grants and low interest loans should be explored to reduce the impact on rate payers. The city must budget and adjust their rates annually to address operational and capital improvement costs.

6.1 Water System Reliability Study

In 2017, Abonmarche completed another report related to the water distribution system in Benton Harbor. This was a Water System Reliability Study that focused on computer modeling the pressure in the system with reference to the desired fire flows in certain areas. The recommended project upgrade areas can be found in Tables 14 & 18. The full report can be found under the cover, "Water System Reliability Study."

6.2 Recommended CIP Projects

6.2.1 Five (5) Year CIP Plan

Presented on the following pages are the five (5) year projects for the water supply, storage, and distribution systems. To complete all the listed projects an estimated $15,798,790 would be required, which works out to approximately $750,000 per year

assuming a 30-year low interest loan is utilized for funding. Appendix F provides a detailed breakdown of the estimated costs for performing the water distribution 5 year CIP Plan.

Table 11: Water Supply 5 Year CIP (2020)

#	Project Description
1	Backwash & Waste Lagoon Improvements
2	High Service Pump #5 Soft Starter
3	New High Service Pump with VFD
4	Repair Roof over Offices
5	Software for Operations Computer
6	Zebra Mussel Pretreatment & Control
7	Alum Treatment
8	Overflow Protection
9	SCADA System Improvements
10	Pump Overhauls
5 Year Water Supply CIP Estimate	$1,000,000

Table 12: Water Storage 5 Year CIP (2018-2019)

#	Project Description	Estimated Cost
1	Exterior High Pressure Water Jet & Acrylic Recoat (Year 1)	$195,000
2	Cathodic Protection System Repair	$3,800
3	Adjust Sway Rods	$3,000
4	Install 30" Diameter Manway in Riser	$7,000
5	Install 30" Roof Hatch	$3,000
6	Install Roof Railing with Painter's Rail	$12,000
7	Paint Pit Piping	$5,000
8	Install Wet Interior Ladder with Fall Prevention	$8,000
9	Replace Sidewall Ladder with Vertical Ladder	$10,000
10	Weld Cathodic Caps and Hole in Roof Vent	$3,000
11	Repair & Replace Roof Beams and Plug Holes	$20,000
12	Repaint Interior	$50,000
5 Year Water Storage CIP Estimate		$319,800

Table 13: Water Distribution 5 Year CIP from Criticality Ratings (2023)

#	Location Description	Estimated Construction Cost
1	Britain Avenue (Riverview to Pipestone)	$3,022,890
2	8th Street (Hinkley to Britain)	$1,770,471
3	Pipestone Rd (Main Street to Washington Street)	$719,352
4	Michigan St. / E. Wall St / Highland Ave (Pipestone St to Jefferson)	$753,810
5	Whitwam-Riverview Dr (Main Street to Whitwam Dr)	$292,512
5 Year Water Distribution CIP from Criticality Estimate		$6,559,035

Table 14: Water Distribution 5 Year CIP from Reliability Study (2023)

#	Location Description	Estimated Construction Cost
1	Stevens (Riverside to Waukonda) Riverside (McCord to Stevens) Buena Vista (Winans to Waukonda) Winans (Buena Vista to Waukonda)	$1,604,025
2	Edwards (Winans to Morton)	$664,950
3	Morton (Green to Territorial) Green (Winans to Morton)	$740,100
4	Washington (Ross to Pipestone) Vineyard (East End to Ross)	$922,650
5	Britain Avenue (Seeley to McCord) Seeley (Britain to Pitkins) Pitkins (Fair to Warwick) Warwick (Fair to Pitkins)	$1,885,845
6	Robbins (Colfax to Windsor) Windsor (Colfax to Robbins) Salem (May to Robbins)	$1,571,685
7	Monroe (Cross to Emery)	$530,700
5 Year Water Distribution CIP from Reliability Study Estimate		$7,919,955

6.2.2 Twenty (20) Year CIP Plan

Presented on the following pages are the twenty (20) year projects for the water supply, storage, and distribution system. To complete all the listed projects an estimated $35,472,668 would be required, which works out to approximately $1.7 million per year if completed all at once with a 30-year low interest loan (assuming today's dollars for construction cost estimates). Appendix F provides a detailed breakdown of the estimated costs for performing the water distribution 20 year CIP Plan.

Table 15: Water Supply 20 Year CIP (2033)

#	Project Description
1	Repair Filters
2	Pump Replacement
3	Other Miscellaneous Needs
4	SCADA System Improvements
5	Pump Overhauls
20 Year Water Supply CIP Estimate	$500,000

Table 16: Water Storage 20 Year CIP (2033)

#	Project Description	Estimated Cost
1	Replacement of Water Tower	$3,000,000
20 Year Water Storage CIP Estimate		$3,000,000

Table 17: Water Distribution 20 Year CIP from Criticality Ratings (2033-2037)

#	Location Description	Estimated Construction Cost
1	Empire Ave (Riverview Dr to Salem Ave)	$736,058
2	Empire Ave (Columbus Ave to Ogden Ave)	$191,026
3	Empire Ave (Jennings Ave to Pipestone St)	$303,267
4	Salem Ave (Empire Ave to May St to Colfax Ave)	$601,043
5	Emery Ave (Union St to Milton and Hurd Ave south)	$519,476
6	Pearl St (Catalpa Ave to Empire Ave)	$641,992
7	Catalpa Ave (Colfax Ave to Columbus Ave)	$674,258
8	Pavone St (Lake Ave to Catalpa Ave)	$582,583
9	Ohio St Alleys (Britain Ave to Pavone St)	$313,131

10	Lake Ave (Market St to Broadway Ave)	$705,184
11	Broadway Ave / Jefferson St (Lake Ave to Highland Ave)	$720,545
12	McCord St (Main St to Britain Ave)	$1,320,774
13	2nd St (Klock Rd to Highland Ave)	$1,596,099
14	Waukonda Ave (Nowlen St to Fair Ave)	$712,673
15	Bond St (Market St to Colfax Ave)	$793,524
16	9th St (Main St to Oak St)	$293,589
17	Territorial Rd (4th St to 2nd St)	$285,734
18	3rd St / East Alley (Territorial to Highland Ave)	$418,060
19	8th St (Klock Rd to Graham Ave)	$955,494
20	Wall St (Riverview Dr to 12th St)	$503,326
21	Hull Ave (Frank St to ~350 ft North of Edwards Ave)	$152,862
22	Klock Rd (Water Plant to East)	$460,755
23	North Shore Dr (Klock Rd to North)	$167,847
24	West of Paw Paw Ave between Waukonda Ave and Frank St	$266,980
25	Building Lot (Water St to 2nd St)	$177,759
26	Maple St (Pipestone St to Cedar St)	$200,361
27	Riverview Dr and River St	$142,862
28	9th St, Britain Ave to South	$227,755
29	Brunson Ave (Hornack Rd to Jefferson St)	$178,681
30	Weld St (Union St to Agard Ave)	$91,555
31	4th St (Territorial Rd to Main St)	$99,025
20 Year Water Distribution CIP from Criticality Estimate		$15,034,278

Table 18: Water Distribution 20 Year CIP from Reliability Study (2033-2037)

#	Location Description	Estimated Construction Cost
1	Jean Klock Blvd (Grand Blvd to Hydrant) Grand Blvd (Hydrant to End)	$2,583,465
2	Waukonda (Loop 12" with 6" far E end)	$18,375
3	Nowlen (Waukonda to Madison) Madison (N McCord to Nowlen) Winans (Madison to LaSalle)	$1,514,235
4	N Fair (Wauceda to LaSalle)	$492,720
5	Hull (1st Hydrant)	$126,525

6	NE Whirlpool Hydrant (Hinkley to Benton Harbor Tech Center)*	$0
7	Hinkley (8th to Bend)	$493,500
8	N Seeley (76' S of Main to hydrant)*	$0
9	N Fair (100' S of Main to hydrant)*	$0
10	Highland (Cass to Winans) Nowlen (Highland to Cass)	$458,070
11	Highland (Seeley to 37' N on Fair)	$582,465
12	Thresher (Hull to McCord) S Winans (Thresher to Buss)	$744,960
13	Fair (Thresher to Vineyard) High (McCord to Fair)	$1,715,355
14	Ohio (Bellview to Hydrant)	$157,500
15	Pleasant (Bellview to Pipestone)	$488,550
16	Thayer Ct (Bellview to Hydrant)	$100,800
17	Colby (Pipestone to Hydrant)	$132,675
18	Ohio (W Britain to Hydrant)*	$0
19	Cedar (Cherry to Britain)	$207,900
20	Apple (Hydrant to McAllister)	$249,540
21	Foster (Superior to Columbus)	$193,200
22	Plummer Ct (Pipestone to Heck)	$167,670
23	Catalpa (Columbus to Pipestone)	$748,335
24	Kline (Colfax to McAllister)	$604,800
25	9th St (2nd Hydrant to Apartment Complex)	$576,450
26	Harrison (Colfax to Broadway)	$561,660
27	Division (Pipestone to Columbus) Columbus (Empire to Division)	$1,842,840
28	Niles (Pipestone to Monroe)	$473,355
29	Clay (Lavette to Broadway)	$654,015
30	Clay (Colfax to End)	$15,750
31	Agard (Loop onto Pipestone)	$84,000
32	Weld (Union to Hurd)*	$0
33	Cross (Colfax to McAllister)	$574,200
34	Colfax (Windsor to Emery)	$375,480
20 Year Water Distribution CIP from Reliability Estimate		$16,938,390

**Cost omitted because already part of Criticality CIP Costs*

6.3 CIP Plan Summary

In summary, as seen below in Tables 19 & 20, for both the five (5) and twenty (20) year CIP plans, an estimated total in excess of $51 million dollars will be needed to address issues with the water system, particularly to replace aging materials that are reaching the end of their useful life.

Table 19: 5 Year Water CIP Plan Summary

Overall 5 Year Water CIP Plan Summary	Estimated Construction Cost
Water Supply	$1,000,000
Water Storage	$319,800
Water Distribution – Criticality Ratings	$6,559,035
Water Distribution - Reliability Study	$7,919,955
Overall 5 Year Water CIP Estimate Summary	$15,798,790

Table 20: 20 Year Water CIP Plan Summary

Overall 20 Year Water CIP Plan Summary	Estimated Construction Cost
Water Supply	$500,000
Water Storage	$3,000,000
Water Distribution – Criticality Ratings	$15,034,278
Water Distribution - Reliability Study	$16,938,390
Overall 20 Year Water CIP Estimate Summary	$35,472,668

7 Conclusions

Overall, the City of Benton Harbor has an aging water infrastructure network, similar to many other communities, which will require continual investment to ensure that it meets both State and Federal requirements as well as the City's specific operating goals. The level of investment for both the five (5) year and twenty (20) year CIP plans should be implemented to ensure that the existing water quality and reliability is maintained and improved within the network. These projects should be coordinated with sewer and roadway projects identified in the SAW funded - Sewer Asset Management Plan and the soon-to-be completed Street Asset Management Plan.

As stated in the MDEQ guidance document, asset management is a systematic process of operating, maintaining, and upgrading assets cost-effectively. It is an active, on-going

process that provides information to managers in order to make sound decisions about their capital assets and allows decision makers to better identify and manage needed investments in their utility's infrastructure. This asset management plan should be updated yearly to reflect changes to the asset inventory, criticality analysis and progress on the capital improvement projects. Thoroughly updating this document regularly is more efficient than trying to figure out what happened years ago and having to make large updates.

Once the most cost effective funding solution has been determined, the city can proceed with adjustments to rates to cover the necessary costs. In the short term it would be beneficial for the city to reinstate the 5% rate increase that was reduced in 2013. A 15% rate increase may be needed in early 2018 to cover current and expected debt service requirements. Due to the large amount of funding necessary to complete the improvements identified, it is expected that the city will complete large projects together and be required to finance them over a long-term with rates adjusted accordingly. Grants should be utilized to the maximum extent possible to minimize impact on users.

Once the improvements outlined in this plan are completed, it should be anticipated that other assets will be reaching the end of their expected effective life, requiring further investment. Benton Harbor is nearing the end of its first generation of water infrastructure with other generations following closely behind.

APPENDIX A

BENTON HARBOR WATER DISTRIBUTION PIPE CONDITION SUMMARY TABLE

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00144	Cast Iron, Assumed	2"	24.0	1909	108	1	0	0.1	75	3.5	10.0	35.0	1.0	0
WMAIN-00146	Cast Iron, Assumed	2"	234.8	1909	108	1	0	0.1	75	3.5	10.0	35.0	1.0	0
WMAIN-00272	Cast Iron, Assumed	2"	293.7	1909	108	0.8	0.8	0.1	75	4.5	10.0	45.0	1.0	0
WMAIN-00512	Cast Iron, Assumed	2"	22.0	1909	108	1	0	0.1	75	3.5	10.0	35.0	1.0	0
WMAIN-00513	Cast Iron, Assumed	2"	31.7	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01088	Cast Iron, Assumed	2"	164.3	1909	108	0.8	0	0.1	75	2.9	10.0	29.0	1.0	0
WMAIN-00003	Cast Iron, Assumed	4"	279.6	1956	61	0.8	0	0.4	75	4.4	8.1	35.8	0.8	14
WMAIN-00005	Cast Iron, Assumed	4"	563.4	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00006	Cast Iron, Assumed	4"	611.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00010	Cast Iron, Assumed	4"	327.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00024	Cast Iron, Assumed	4"	485.4	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00025	Cast Iron, Assumed	4"	344.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00026	Cast Iron, Assumed	4"	404.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00027	Cast Iron, Assumed	4"	4.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00028	Cast Iron, Assumed	4"	326.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00029	Cast Iron, Assumed	4"	327.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00030	Cast Iron, Assumed	4"	979.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00035	Cast Iron, Assumed	4"	6.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00036	Cast Iron, Assumed	4"	71.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00037	Cast Iron, Assumed	4"	311.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00039	Cast Iron, Assumed	4"	452.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00042	Cast Iron, Assumed	4"	249.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00053	Cast Iron, Assumed	4"	546.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00054	Cast Iron, Assumed	4"	314.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00055	Cast Iron, Assumed	4"	657.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00069	Cast Iron, Assumed	4"	299.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00070	Cast Iron, Assumed	4"	543.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00071	Cast Iron, Assumed	4"	918.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00076	Cast Iron, Assumed	4"	39.2	1940	77	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00090	Cast Iron, Assumed	4"	366.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00118	Cast Iron, Assumed	4"	24.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00119	Cast Iron, Assumed	4"	79.7	1909	108	0.2	1	0.4	75	4.6	10.0	46.0	1.0	0
WMAIN-00120	Cast Iron, Assumed	4"	105.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00121	Cast Iron, Assumed	4"	5.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00131	Cast Iron, Assumed	4"	266.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00141	Cast Iron, Assumed	4"	636.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00142	Cast Iron, Assumed	4"	5.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00143	Cast Iron, Assumed	4"	281.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00159	Cast Iron, Assumed	4"	56.4	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00161	Cast Iron, Assumed	4"	33.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00162	Cast Iron, Assumed	4"	445.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00165	Cast Iron, Assumed	4"	495.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00166	Cast Iron, Assumed	4"	332.8	1959	58	0.8	0	0.4	75	4.4	7.7	34.0	0.8	17
WMAIN-00169	Cast Iron, Assumed	4"	328.0	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-00175	Cast Iron, Assumed	4"	162.1	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00176	Cast Iron, Assumed	4"	15.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00179	Cast Iron, Assumed	4"	40.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00180	Cast Iron, Assumed	4"	14.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00188	Cast Iron, Assumed	4"	254.4	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00189	Cast Iron, Assumed	4"	310.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00197	Cast Iron, Assumed	4"	327.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00198	Cast Iron, Assumed	4"	336.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00199	Cast Iron, Assumed	4"	309.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00200	Cast Iron, Assumed	4"	317.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00205	Cast Iron, Assumed	4"	70.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00208	Cast Iron, Assumed	4"	305.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00219	Cast Iron, Assumed	4"	5.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00222	Cast Iron, Assumed	4"	357.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00223	Cast Iron, Assumed	4"	43.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00224	Cast Iron, Assumed	4"	705.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00225	Cast Iron, Assumed	4"	425.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00229	Cast Iron, Assumed	4"	7.0	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00230	Cast Iron, Assumed	4"	46.0	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00231	Cast Iron, Assumed	4"	298.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00232	Cast Iron, Assumed	4"	637.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00235	Cast Iron, Assumed	4"	287.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00239	Cast Iron, Assumed	4"	335.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00240	Cast Iron, Assumed	4"	377.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00241	Cast Iron, Assumed	4"	594.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00249	Cast Iron, Assumed	4"	186.2	1909	108	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00250	Cast Iron, Assumed	4"	3.0	1909	108	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00251	Cast Iron, Assumed	4"	455.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00255	Cast Iron, Assumed	4"	585.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00258	Cast Iron, Assumed	4"	311.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00259	Cast Iron, Assumed	4"	95.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00264	Cast Iron, Assumed	4"	128.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00265	Cast Iron, Assumed	4"	299.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00266	Cast Iron, Assumed	4"	120.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00268	Cast Iron, Assumed	4"	18.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00269	Cast Iron, Assumed	4"	1058.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00270	Cast Iron, Assumed	4"	398.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00271	Cast Iron, Assumed	4"	358.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00273	Cast Iron, Assumed	4"	732.3	1909	108	1	0.5	0.4	75	6	10.0	60.0	1.0	0
WMAIN-00275	Cast Iron, Assumed	4"	452.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00279	Cast Iron, Assumed	4"	42.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00280	Cast Iron, Assumed	4"	640.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00282	Cast Iron, Assumed	4"	196.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00283	Cast Iron, Assumed	4"	1313.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00284	Cast Iron, Assumed	4"	196.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00285	Cast Iron, Assumed	4"	631.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00286	Cast Iron, Assumed	4"	697.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00287	Cast Iron, Assumed	4"	665.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00289	Cast Iron, Assumed	4"	214.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00290	Cast Iron, Assumed	4"	523.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00291	Cast Iron, Assumed	4"	453.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00292	Cast Iron, Assumed	4"	28.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00293	Cast Iron, Assumed	4"	785.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00294	Cast Iron, Assumed	4"	334.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00295	Cast Iron, Assumed	4"	328.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00296	Cast Iron, Assumed	4"	310.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00297	Cast Iron, Assumed	4"	654.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00298	Cast Iron, Assumed	4"	660.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00299	Cast Iron, Assumed	4"	653.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00300	Cast Iron, Assumed	4"	344.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00301	Cast Iron, Assumed	4"	344.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00309	Cast Iron, Assumed	4"	297.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00310	Cast Iron, Assumed	4"	316.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00311	Cast Iron, Assumed	4"	627.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00312	Cast Iron, Assumed	4"	895.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00313	Cast Iron, Assumed	4"	74.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00317	Cast Iron, Assumed	4"	610.7	Pre-1949	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00333	Cast Iron, Assumed	4"	633.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00334	Cast Iron, Assumed	4"	294.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00337	Cast Iron, Assumed	4"	312.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00338	Cast Iron, Assumed	4"	184.4	1940	77	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00339	Cast Iron, Assumed	4"	918.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00347	Cast Iron, Assumed	4"	349.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00354	Cast Iron, Assumed	4"	41.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00356	Cast Iron, Assumed	4"	59.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00361	Cast Iron, Assumed	4"	644.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00362	Cast Iron, Assumed	4"	329.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00363	Cast Iron, Assumed	4"	309.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00364	Cast Iron, Assumed	4"	546.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00367	Cast Iron, Assumed	4"	264.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00368	Cast Iron, Assumed	4"	522.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00375	Cast Iron, Assumed	4"	45.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00376	Cast Iron, Assumed	4"	1293.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00380	Cast Iron, Assumed	4"	102.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00381	Cast Iron, Assumed	4"	659.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00392	Cast Iron, Assumed	4"	60.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00394	Cast Iron, Assumed	4"	300.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00402	Cast Iron, Assumed	4"	200.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00403	Cast Iron, Assumed	4"	411.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00405	Cast Iron, Assumed	4"	9.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00406	Cast Iron, Assumed	4"	540.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00407	Cast Iron, Assumed	4"	28.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00408	Cast Iron, Assumed	4"	330.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00409	Cast Iron, Assumed	4"	607.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00410	Cast Iron, Assumed	4"	240.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00411	Cast Iron, Assumed	4"	909.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00412	Cast Iron, Assumed	4"	3.0	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00413	Cast Iron, Assumed	4"	389.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00414	Cast Iron, Assumed	4"	73.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00422	Cast Iron, Assumed	4"	697.6	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00424	Cast Iron, Assumed	4"	658.1	1950	67	1	0.5	0.4	75	6	8.9	53.6	0.9	8
WMAIN-00430	Cast Iron, Assumed	4"	8.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00452	Cast Iron, Assumed	4"	11.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00486	Cast Iron, Assumed	4"	145.1	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00487	Cast Iron, Assumed	4"	310.7	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00510	Cast Iron, Assumed	4"	546.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00522	Cast Iron, Assumed	4"	108.2	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00526	Cast Iron, Assumed	4"	918.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00527	Cast Iron, Assumed	4"	294.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00530	Cast Iron, Assumed	4"	37.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00531	Cast Iron, Assumed	4"	599.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00533	Cast Iron, Assumed	4"	31.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00540	Cast Iron, Assumed	4"	813.2	1959	58	0.8	0	0.4	75	4.4	7.7	34.0	0.8	17
WMAIN-00546	Cast Iron, Assumed	4"	388.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00548	Cast Iron, Assumed	4"	461.5	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00557	Cast Iron, Assumed	4"	140.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00561	Cast Iron, Assumed	4"	468.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00562	Cast Iron, Assumed	4"	418.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00563	Cast Iron, Assumed	4"	46.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00564	Cast Iron, Assumed	4"	282.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00565	Cast Iron, Assumed	4"	28.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00566	Cast Iron, Assumed	4"	11.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00568	Cast Iron, Assumed	4"	67.7	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00571	Cast Iron, Assumed	4"	1.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00572	Cast Iron, Assumed	4"	357.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00574	Cast Iron, Assumed	4"	44.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00575	Cast Iron, Assumed	4"	546.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00576	Cast Iron, Assumed	4"	217.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00577	Cast Iron, Assumed	4"	465.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00578	Cast Iron, Assumed	4"	29.8	1909	108	0.8	1	0.4	75	6.4	10.0	64.0	1.0	0
WMAIN-00579	Cast Iron, Assumed	4"	288.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00581	Cast Iron, Assumed	4"	155.6	Pre-1952	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00590	Cast Iron, Assumed	4"	495.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00601	Cast Iron, Assumed	4"	90.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00602	Cast Iron, Assumed	4"	575.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00603	Cast Iron, Assumed	4"	583.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00609	Cast Iron, Assumed	4"	576.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00610	Cast Iron, Assumed	4"	16.1	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-00617	Cast Iron, Assumed	4"	36.3	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00620	Cast Iron, Assumed	4"	453.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00630	Cast Iron, Assumed	4"	125.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00631	Cast Iron, Assumed	4"	12.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00636	Cast Iron, Assumed	4"	293.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00638	Cast Iron, Assumed	4"	294.4	1909	108	0.2	1	0.4	75	4.6	10.0	46.0	1.0	0
WMAIN-00641	Cast Iron, Assumed	4"	80.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00642	Cast Iron, Assumed	4"	2.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00643	Cast Iron, Assumed	4"	9.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00644	Cast Iron, Assumed	4"	9.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00647	Cast Iron, Assumed	4"	9.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00650	Cast Iron, Assumed	4"	316.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00661	Cast Iron, Assumed	4"	189.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00662	Cast Iron, Assumed	4"	97.4	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00666	Cast Iron, Assumed	4"	1009.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00669	Cast Iron, Assumed	4"	201.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00672	Cast Iron, Assumed	4"	319.2	Pre-1952	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00682	Cast Iron, Assumed	4"	13.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00685	Cast Iron, Assumed	4"	41.5	1934	83	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00686	Cast Iron, Assumed	4"	68.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00691	Cast Iron, Assumed	4"	258.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00699	Cast Iron, Assumed	4"	5.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00704	Cast Iron, Assumed	4"	47.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00705	Cast Iron, Assumed	4"	9.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00709	Cast Iron, Assumed	4"	43.7	1909	108	0.8	0.5	0.4	75	5.4	10.0	54.0	1.0	0
WMAIN-00717	Cast Iron, Assumed	4"	874.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00727	Cast Iron, Assumed	4"	257.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00728	Cast Iron, Assumed	4"	426.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00730	Cast Iron, Assumed	4"	162.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00739	Cast Iron, Assumed	4"	817.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00764	Cast Iron, Assumed	4"	27.1	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00765	Cast Iron, Assumed	4"	39.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00766	Cast Iron, Assumed	4"	9.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00777	Cast Iron, Assumed	4"	504.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00788	Cast Iron, Assumed	4"	31.6	1909	108	0.8	0.5	0.4	75	5.4	10.0	54.0	1.0	0
WMAIN-00789	Cast Iron, Assumed	4"	164.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00806	Cast Iron, Assumed	4"	300.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00807	Cast Iron, Assumed	4"	194.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00808	Cast Iron, Assumed	4"	189.6	1969	48	1	0	0.4	75	5	6.4	32.0	0.6	27
WMAIN-00836	Cast Iron, Assumed	4"	229.8	1947	70	0.2	0	0.4	75	2.6	9.3	24.3	0.9	5
WMAIN-00845	Cast Iron, Assumed	4"	426.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00850	Cast Iron, Assumed	4"	99.5	Pre-1969	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00851	Cast Iron, Assumed	4"	52.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00852	Cast Iron, Assumed	4"	256.3	1909	108	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00912	Cast Iron, Assumed	4"	242.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00913	Cast Iron, Assumed	4"	61.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00914	Cast Iron, Assumed	4"	444.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00944	Cast Iron, Assumed	4"	257.0	1940	77	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00980	Cast Iron, Assumed	4"	345.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00982	Cast Iron, Assumed	4"	371.0	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00997	Cast Iron, Assumed	4"	225.9	1950	67	0.3	0	0.4	75	2.9	8.9	25.9	0.9	8
WMAIN-01020	Cast Iron, Assumed	4"	298.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01021	Cast Iron, Assumed	4"	389.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01022	Cast Iron, Assumed	4"	92.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01023	Cast Iron, Assumed	4"	85.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01028	Cast Iron, Assumed	4"	156.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01029	Cast Iron, Assumed	4"	461.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01049	Cast Iron, Assumed	4"	161.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01050	Cast Iron, Assumed	4"	46.3	1909	108	0.3	1	0.4	75	4.9	10.0	49.0	1.0	0
WMAIN-01077	Cast Iron, Assumed	4"	278.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01078	Cast Iron, Assumed	4"	130.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01089	Cast Iron, Assumed	4"	689.4	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01090	Cast Iron, Assumed	4"	302.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01100	Cast Iron, Assumed	4"	335.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01108	Cast Iron, Assumed	4"	3.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01110	Cast Iron, Assumed	4"	26.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01111	Cast Iron, Assumed	4"	67.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01171	Cast Iron, Assumed	4"	24.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01247	Cast Iron, Assumed	4"	206.4	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01265	Cast Iron, Assumed	4"	22.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01315	Cast Iron, Assumed	4"	227.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01325	Cast Iron, Assumed	4"	675.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01326	Cast Iron, Assumed	4"	32.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01327	Cast Iron, Assumed	4"	45.8	1937	80	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01328	Cast Iron, Assumed	4"	35.2	1937	80	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01329	Cast Iron, Assumed	4"	250.5	1937	80	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01350	Cast Iron, Assumed	4"	35.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01474	Cast Iron, Assumed	4"	20.9	Pre-1952	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01475	Cast Iron, Assumed	4"	22.5	Pre-1949	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01476	Cast Iron, Assumed	4"	23.2	Pre-1949	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01493	Cast Iron, Assumed	4"	45.7	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-01519	Cast Iron, Assumed	4"	25.7	1909	108	0.8	0.5	0.4	75	5.4	10.0	54.0	1.0	0
WMAIN-01545	Cast Iron, Assumed	4"	5.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01546	Cast Iron, Assumed	4"	3.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01618	Cast Iron, Assumed	4"	11.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01620	Cast Iron, Assumed	4"	7.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01621	Cast Iron, Assumed	4"	10.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01628	Cast Iron, Assumed	4"	32.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01630	Cast Iron, Assumed	4"	41.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01632	Cast Iron, Assumed	4"	39.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01638	Cast Iron, Assumed	4"	17.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01639	Cast Iron, Assumed	4"	38.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01640	Cast Iron, Assumed	4"	3.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01643	Cast Iron, Assumed	4"	2.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01654	Cast Iron, Assumed	4"	131.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01655	Cast Iron, Assumed	4"	4.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01660	Cast Iron, Assumed	4"	46.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01662	Cast Iron, Assumed	4"	428.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01664	Cast Iron, Assumed	4"	46.6	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-01667	Cast Iron, Assumed	4"	306.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01668	Cast Iron, Assumed	4"	54.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01669	Cast Iron, Assumed	4"	11.0	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01672	Cast Iron, Assumed	4"	37.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01673	Cast Iron, Assumed	4"	30.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01677	Cast Iron, Assumed	4"	144.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01682	Cast Iron, Assumed	4"	29.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01684	Cast Iron, Assumed	4"	8.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01685	Cast Iron, Assumed	4"	5.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01686	Cast Iron, Assumed	4"	26.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01687	Cast Iron, Assumed	4"	4.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01688	Cast Iron, Assumed	4"	5.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01693	Cast Iron, Assumed	4"	189.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01701	Cast Iron, Assumed	4"	30.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01721	Cast Iron, Assumed	4"	26.8	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01723	Cast Iron, Assumed	4"	157.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01724	Cast Iron, Assumed	4"	178.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01726	Cast Iron, Assumed	4"	115.0	Pre-1952	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01727	Cast Iron, Assumed	4"	97.9	Pre-1952	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01728	Cast Iron, Assumed	4"	22.6	Pre-1952	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01730	Cast Iron, Assumed	4"	51.6	Pre-1952	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01737	Cast Iron, Assumed	4"	80.7	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01738	Cast Iron, Assumed	4"	7.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00221	Cast Iron, Assumed	4"	35.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01742	Ductile Iron	4"	22.6	2008	9	0.8	0	0.4	90	4.4	1.0	4.4	0.1	81
WMAIN-01743	Ductile Iron	4"	20.3	2008	9	0.8	0	0.4	90	4.4	1.0	4.4	0.1	81
WMAIN-01745	Ductile Iron	4"	15.6	2008	9	0.8	0	0.4	90	4.4	1.0	4.4	0.1	81
<Null>	Ductile Iron	4"	5.9	2015	2	1	0	0.4	90	5	0.2	1.1	0.0	88
WMAIN-00046	Ductile Iron, Assumed	4"	124.2	2008	9	1	0	0.4	90	5	1.0	5.0	0.1	81
WMAIN-00211	Ductile Iron, Assumed	4"	442.5	2006	11	0.8	0	0.4	90	4.4	1.2	5.4	0.1	79
WMAIN-00350	Ductile Iron, Assumed	4"	578.9	1980	37	0.8	0	0.4	90	4.4	4.1	18.1	0.4	53
WMAIN-00586	Ductile Iron, Assumed	4"	448.2	1974	43	0.8	0	0.4	90	4.4	4.8	21.0	0.5	47
WMAIN-00744	Ductile Iron, Assumed	4"	45.6	1974	43	0.8	0	0.4	90	4.4	4.8	21.0	0.5	47
WMAIN-00746	Ductile Iron, Assumed	4"	3.8	1974	43	0.8	0	0.4	90	4.4	4.8	21.0	0.5	47
WMAIN-00748	Ductile Iron, Assumed	4"	807.6	2008	9	0.8	0	0.4	90	4.4	1.0	4.4	0.1	81
WMAIN-00760	Ductile Iron, Assumed	4"	377.9	1971	46	1	0	0.4	90	5	5.1	25.6	0.5	44
WMAIN-01692	Ductile Iron, Assumed	4"	3.1	1974	43	0.8	0	0.4	90	4.4	4.8	21.0	0.5	47
WMAIN-00007	Cast Iron, Assumed	6"	662.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00008	Cast Iron, Assumed	6"	51.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00009	Cast Iron, Assumed	6"	281.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00011	Cast Iron, Assumed	6"	16.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00012	Cast Iron, Assumed	6"	332.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00013	Cast Iron, Assumed	6"	354.4	1956	61	0.8	0	0.4	75	4.4	8.1	35.8	0.8	14
WMAIN-00018	Cast Iron, Assumed	6"	680.7	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00019	Cast Iron, Assumed	6"	44.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00021	Cast Iron, Assumed	6"	9.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00022	Cast Iron, Assumed	6"	69.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00023	Cast Iron, Assumed	6"	489.0	1937	80	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00031	Cast Iron, Assumed	6"	3.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00032	Cast Iron, Assumed	6"	3.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00033	Cast Iron, Assumed	6"	412.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00034	Cast Iron, Assumed	6"	88.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00047	Cast Iron, Assumed	6"	269.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00050	Cast Iron, Assumed	6"	241.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00051	Cast Iron, Assumed	6"	613.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00052	Cast Iron, Assumed	6"	295.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00056	Cast Iron, Assumed	6"	1273.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00057	Cast Iron, Assumed	6"	336.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00058	Cast Iron, Assumed	6"	332.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00059	Cast Iron, Assumed	6"	664.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00060	Cast Iron, Assumed	6"	656.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00061	Cast Iron, Assumed	6"	329.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00067	Cast Iron, Assumed	6"	634.8	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00068	Cast Iron, Assumed	6"	60.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00078	Cast Iron, Assumed	6"	39.5	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-00083	Cast Iron, Assumed	6"	10.7	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-00092	Cast Iron, Assumed	6"	432.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00093	Cast Iron, Assumed	6"	826.6	1959	58	0.8	0	0.4	75	4.4	7.7	34.0	0.8	17
WMAIN-00094	Cast Iron, Assumed	6"	1362.1	1969	48	0.8	0	0.4	75	4.4	6.4	28.2	0.6	27
WMAIN-00108	Cast Iron, Assumed	6"	295.9	1937	80	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00109	Cast Iron, Assumed	6"	14.3	1937	80	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00113	Cast Iron, Assumed	6"	450.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00122	Cast Iron, Assumed	6"	173.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00123	Cast Iron, Assumed	6"	21.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00124	Cast Iron, Assumed	6"	100.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00129	Cast Iron, Assumed	6"	12.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00136	Cast Iron, Assumed	6"	220.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00138	Cast Iron, Assumed	6"	149.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00139	Cast Iron, Assumed	6"	384.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00140	Cast Iron, Assumed	6"	179.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00148	Cast Iron, Assumed	6"	207.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00163	Cast Iron, Assumed	6"	58.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00164	Cast Iron, Assumed	6"	72.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00168	Cast Iron, Assumed	6"	220.1	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-00170	Cast Iron, Assumed	6"	334.8	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00171	Cast Iron, Assumed	6"	494.4	1979	38	1	0	0.4	75	5	5.1	25.3	0.5	37
WMAIN-00182	Cast Iron, Assumed	6"	10.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00183	Cast Iron, Assumed	6"	19.0	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-00184	Cast Iron, Assumed	6"	15.0	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-00185	Cast Iron, Assumed	6"	27.7	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-00186	Cast Iron, Assumed	6"	29.9	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-00187	Cast Iron, Assumed	6"	192.2	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00190	Cast Iron, Assumed	6"	806.7	1978	39	1	0	0.4	75	5	5.2	26.0	0.5	36
WMAIN-00191	Cast Iron, Assumed	6"	296.3	1979	38	1	0	0.4	75	5	5.1	25.3	0.5	37
WMAIN-00192	Cast Iron, Assumed	6"	1313.0	1978	39	1	0	0.4	75	5	5.2	26.0	0.5	36
WMAIN-00193	Cast Iron, Assumed	6"	514.3	1978	39	1	0	0.4	75	5	5.2	26.0	0.5	36
WMAIN-00194	Cast Iron, Assumed	6"	25.1	1978	39	1	0	0.4	75	5	5.2	26.0	0.5	36
WMAIN-00202	Cast Iron, Assumed	6"	1341.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00203	Cast Iron, Assumed	6"	672.4	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00204	Cast Iron, Assumed	6"	80.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00206	Cast Iron, Assumed	6"	308.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00207	Cast Iron, Assumed	6"	181.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00218	Cast Iron, Assumed	6"	253.8	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00233	Cast Iron, Assumed	6"	491.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00234	Cast Iron, Assumed	6"	479.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00247	Cast Iron, Assumed	6"	188.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00252	Cast Iron, Assumed	6"	869.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00253	Cast Iron, Assumed	6"	11.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00256	Cast Iron, Assumed	6"	259.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00263	Cast Iron, Assumed	6"	55.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00267	Cast Iron, Assumed	6"	1240.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00276	Cast Iron, Assumed	6"	20.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00277	Cast Iron, Assumed	6"	589.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00278	Cast Iron, Assumed	6"	168.7	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00288	Cast Iron, Assumed	6"	22.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00302	Cast Iron, Assumed	6"	330.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00303	Cast Iron, Assumed	6"	331.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00304	Cast Iron, Assumed	6"	306.7	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00305	Cast Iron, Assumed	6"	412.9	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00306	Cast Iron, Assumed	6"	211.3	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00307	Cast Iron, Assumed	6"	100.4	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00308	Cast Iron, Assumed	6"	542.7	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00314	Cast Iron, Assumed	6"	8.8	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00315	Cast Iron, Assumed	6"	39.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00316	Cast Iron, Assumed	6"	47.6	Pre-1949	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00318	Cast Iron, Assumed	6"	61.4	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00320	Cast Iron, Assumed	6"	301.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00321	Cast Iron, Assumed	6"	1306.7	Pre-1947	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00322	Cast Iron, Assumed	6"	625.6	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00323	Cast Iron, Assumed	6"	1322.3	Pre-1949	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00332	Cast Iron, Assumed	6"	708.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00335	Cast Iron, Assumed	6"	173.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00336	Cast Iron, Assumed	6"	10.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00340	Cast Iron, Assumed	6"	730.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00341	Cast Iron, Assumed	6"	207.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00342	Cast Iron, Assumed	6"	295.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00343	Cast Iron, Assumed	6"	341.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00346	Cast Iron, Assumed	6"	668.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00348	Cast Iron, Assumed	6"	691.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00349	Cast Iron, Assumed	6"	673.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00351	Cast Iron, Assumed	6"	655.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00352	Cast Iron, Assumed	6"	297.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00353	Cast Iron, Assumed	6"	281.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00355	Cast Iron, Assumed	6"	120.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00365	Cast Iron, Assumed	6"	671.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00366	Cast Iron, Assumed	6"	679.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00370	Cast Iron, Assumed	6"	684.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00371	Cast Iron, Assumed	6"	427.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00372	Cast Iron, Assumed	6"	1285.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00373	Cast Iron, Assumed	6"	627.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00374	Cast Iron, Assumed	6"	657.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00377	Cast Iron, Assumed	6"	832.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00378	Cast Iron, Assumed	6"	650.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00379	Cast Iron, Assumed	6"	669.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00382	Cast Iron, Assumed	6"	664.9	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00387	Cast Iron, Assumed	6"	660.6	Pre-1967	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00393	Cast Iron, Assumed	6"	180.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00395	Cast Iron, Assumed	6"	366.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00396	Cast Iron, Assumed	6"	561.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00397	Cast Iron, Assumed	6"	327.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00398	Cast Iron, Assumed	6"	10.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00399	Cast Iron, Assumed	6"	37.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00400	Cast Iron, Assumed	6"	23.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00401	Cast Iron, Assumed	6"	39.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00404	Cast Iron, Assumed	6"	84.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00425	Cast Iron, Assumed	6"	145.5	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00433	Cast Iron, Assumed	6"	366.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00434	Cast Iron, Assumed	6"	6.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00435	Cast Iron, Assumed	6"	207.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00436	Cast Iron, Assumed	6"	7.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00437	Cast Iron, Assumed	6"	26.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00439	Cast Iron, Assumed	6"	5.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00440	Cast Iron, Assumed	6"	10.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00441	Cast Iron, Assumed	6"	13.3	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00442	Cast Iron, Assumed	6"	59.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00443	Cast Iron, Assumed	6"	3.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00444	Cast Iron, Assumed	6"	9.4	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00445	Cast Iron, Assumed	6"	4.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00446	Cast Iron, Assumed	6"	0.7	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00447	Cast Iron, Assumed	6"	9.4	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00448	Cast Iron, Assumed	6"	56.8	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00450	Cast Iron, Assumed	6"	333.4	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00454	Cast Iron, Assumed	6"	658.8	Pre-1967	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00455	Cast Iron, Assumed	6"	2.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00456	Cast Iron, Assumed	6"	11.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00457	Cast Iron, Assumed	6"	10.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00462	Cast Iron, Assumed	6"	6.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00464	Cast Iron, Assumed	6"	722.7	Pre-1967	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00474	Cast Iron, Assumed	6"	4.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00475	Cast Iron, Assumed	6"	3.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00477	Cast Iron, Assumed	6"	5.2	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00478	Cast Iron, Assumed	6"	9.8	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00482	Cast Iron, Assumed	6"	660.7	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00484	Cast Iron, Assumed	6"	58.6	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00485	Cast Iron, Assumed	6"	8.5	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00490	Cast Iron, Assumed	6"	1294.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00492	Cast Iron, Assumed	6"	1301.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00493	Cast Iron, Assumed	6"	1329.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00494	Cast Iron, Assumed	6"	1347.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00495	Cast Iron, Assumed	6"	670.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00496	Cast Iron, Assumed	6"	1314.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00498	Cast Iron, Assumed	6"	125.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00499	Cast Iron, Assumed	6"	1026.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00500	Cast Iron, Assumed	6"	55.7	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00503	Cast Iron, Assumed	6"	37.7	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00511	Cast Iron, Assumed	6"	588.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00514	Cast Iron, Assumed	6"	36.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0

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WMAIN-00515	Cast Iron, Assumed	6"	29.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00516	Cast Iron, Assumed	6"	7.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00519	Cast Iron, Assumed	6"	237.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00520	Cast Iron, Assumed	6"	69.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00521	Cast Iron, Assumed	6"	6.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00523	Cast Iron, Assumed	6"	70.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00524	Cast Iron, Assumed	6"	179.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00525	Cast Iron, Assumed	6"	323.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00532	Cast Iron, Assumed	6"	478.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00534	Cast Iron, Assumed	6"	981.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00535	Cast Iron, Assumed	6"	303.8	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00536	Cast Iron, Assumed	6"	379.1	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00537	Cast Iron, Assumed	6"	64.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00538	Cast Iron, Assumed	6"	502.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00539	Cast Iron, Assumed	6"	336.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00541	Cast Iron, Assumed	6"	493.0	1959	58	0.8	0	0.4	75	4.4	7.7	34.0	0.8	17
WMAIN-00542	Cast Iron, Assumed	6"	9.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00543	Cast Iron, Assumed	6"	301.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00544	Cast Iron, Assumed	6"	170.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00545	Cast Iron, Assumed	6"	163.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00547	Cast Iron, Assumed	6"	13.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00549	Cast Iron, Assumed	6"	419.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00550	Cast Iron, Assumed	6"	326.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00551	Cast Iron, Assumed	6"	370.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00552	Cast Iron, Assumed	6"	285.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00553	Cast Iron, Assumed	6"	296.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00554	Cast Iron, Assumed	6"	351.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00555	Cast Iron, Assumed	6"	2.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00556	Cast Iron, Assumed	6"	114.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00558	Cast Iron, Assumed	6"	432.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00559	Cast Iron, Assumed	6"	153.9	Pre-1969	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00560	Cast Iron, Assumed	6"	34.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00567	Cast Iron, Assumed	6"	53.8	1909	108	0.2	1	0.4	75	4.6	10.0	46.0	1.0	0
WMAIN-00570	Cast Iron, Assumed	6"	120.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00580	Cast Iron, Assumed	6"	12.4	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00587	Cast Iron, Assumed	6"	105.0	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00588	Cast Iron, Assumed	6"	45.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00589	Cast Iron, Assumed	6"	876.7	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00597	Cast Iron, Assumed	6"	10.0	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00599	Cast Iron, Assumed	6"	36.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00600	Cast Iron, Assumed	6"	279.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00604	Cast Iron, Assumed	6"	12.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00611	Cast Iron, Assumed	6"	451.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00616	Cast Iron, Assumed	6"	1067.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00618	Cast Iron, Assumed	6"	89.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00619	Cast Iron, Assumed	6"	98.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00622	Cast Iron, Assumed	6"	626.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00623	Cast Iron, Assumed	6"	304.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00624	Cast Iron, Assumed	6"	257.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00632	Cast Iron, Assumed	6"	1035.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00633	Cast Iron, Assumed	6"	4.4	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00634	Cast Iron, Assumed	6"	23.6	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00637	Cast Iron, Assumed	6"	649.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00657	Cast Iron, Assumed	6"	11.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00658	Cast Iron, Assumed	6"	9.9	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00659	Cast Iron, Assumed	6"	16.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00660	Cast Iron, Assumed	6"	610.4	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00663	Cast Iron, Assumed	6"	1297.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00664	Cast Iron, Assumed	6"	311.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00665	Cast Iron, Assumed	6"	27.9	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-00667	Cast Iron, Assumed	6"	417.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00668	Cast Iron, Assumed	6"	145.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00674	Cast Iron, Assumed	6"	312.1	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-00675	Cast Iron, Assumed	6"	321.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00678	Cast Iron, Assumed	6"	654.8	Pre-1967	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00680	Cast Iron, Assumed	6"	9.4	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00683	Cast Iron, Assumed	6"	480.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00687	Cast Iron, Assumed	6"	388.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00688	Cast Iron, Assumed	6"	84.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00689	Cast Iron, Assumed	6"	98.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00690	Cast Iron, Assumed	6"	104.7	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00692	Cast Iron, Assumed	6"	144.7	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00693	Cast Iron, Assumed	6"	50.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00696	Cast Iron, Assumed	6"	45.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00697	Cast Iron, Assumed	6"	55.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00707	Cast Iron, Assumed	6"	7.0	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00708	Cast Iron, Assumed	6"	13.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00710	Cast Iron, Assumed	6"	743.6	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00711	Cast Iron, Assumed	6"	409.8	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00715	Cast Iron, Assumed	6"	39.9	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00718	Cast Iron, Assumed	6"	287.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00721	Cast Iron, Assumed	6"	10.0	Pre-1967	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00722	Cast Iron, Assumed	6"	7.7	1967	50	1	0	0.4	75	5	6.7	33.3	0.7	25
WMAIN-00723	Cast Iron, Assumed	6"	10.4	1967	50	1	0	0.4	75	5	6.7	33.3	0.7	25
WMAIN-00724	Cast Iron, Assumed	6"	3.0	1967	50	1	0	0.4	75	5	6.7	33.3	0.7	25
WMAIN-00725	Cast Iron, Assumed	6"	205.1	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00729	Cast Iron, Assumed	6"	50.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00731	Cast Iron, Assumed	6"	501.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00732	Cast Iron, Assumed	6"	593.1	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-00733	Cast Iron, Assumed	6"	319.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00736	Cast Iron, Assumed	6"	8.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00737	Cast Iron, Assumed	6"	8.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00740	Cast Iron, Assumed	6"	615.1	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00741	Cast Iron, Assumed	6"	300.1	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00743	Cast Iron, Assumed	6"	86.4	1959	58	0.2	0	0.4	75	2.6	7.7	20.1	0.8	17
WMAIN-00745	Cast Iron, Assumed	6"	211.4	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00749	Cast Iron, Assumed	6"	10.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00754	Cast Iron, Assumed	6"	9.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00755	Cast Iron, Assumed	6"	11.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00756	Cast Iron, Assumed	6"	391.5	1959	58	0.8	0	0.4	75	4.4	7.7	34.0	0.8	17
WMAIN-00757	Cast Iron, Assumed	6"	148.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00759	Cast Iron, Assumed	6"	13.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00775	Cast Iron, Assumed	6"	1122.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00776	Cast Iron, Assumed	6"	96.8	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00778	Cast Iron, Assumed	6"	57.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00794	Cast Iron, Assumed	6"	84.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00799	Cast Iron, Assumed	6"	24.0	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00800	Cast Iron, Assumed	6"	29.9	1909	108	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00801	Cast Iron, Assumed	6"	16.5	1909	108	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00802	Cast Iron, Assumed	6"	19.4	1909	108	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00803	Cast Iron, Assumed	6"	23.4	1909	108	0	0	0.4	75	2	10.0	20.0	1.0	0
WMAIN-00834	Cast Iron, Assumed	6"	373.3	2005	11	0.8	0	0.4	75	4.4	1.5	6.5	0.1	64
WMAIN-00835	Cast Iron, Assumed	6"	850.0	1947	70	0.2	0	0.4	75	2.6	9.3	24.3	0.9	5
WMAIN-00838	Cast Iron, Assumed	6"	518.7	1947	70	0.2	0	0.4	75	2.6	9.3	24.3	0.9	5
WMAIN-00842	Cast Iron, Assumed	6"	116.2	1947	70	1	0	0.4	75	5	9.3	46.7	0.9	5
WMAIN-00844	Cast Iron, Assumed	6"	246.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00849	Cast Iron, Assumed	6"	87.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00853	Cast Iron, Assumed	6"	118.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00854	Cast Iron, Assumed	6"	25.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00855	Cast Iron, Assumed	6"	352.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00899	Cast Iron, Assumed	6"	10.4	1959	58	0.3	0	0.4	75	2.9	7.7	22.4	0.8	17
WMAIN-00900	Cast Iron, Assumed	6"	375.1	1959	58	0.3	0	0.4	75	2.9	7.7	22.4	0.8	17

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WMAIN-00915	Cast Iron, Assumed	6"	129.8	1959	58	0.3	0	0.4	75	2.9	7.7	22.4	0.8	17
WMAIN-00916	Cast Iron, Assumed	6"	64.8	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-00938	Cast Iron, Assumed	6"	21.4	1950	67	0	0	0.4	75	2	8.9	17.9	0.9	8
WMAIN-00939	Cast Iron, Assumed	6"	21.6	1950	67	0	0	0.4	75	2	8.9	17.9	0.9	8
WMAIN-00950	Cast Iron, Assumed	6"	62.3	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-00956	Cast Iron, Assumed	6"	277.9	1959	58	0.2	0	0.4	75	2.6	7.7	20.1	0.8	17
WMAIN-00957	Cast Iron, Assumed	6"	96.0	1934	83	0.2	0.5	0.4	75	3.6	10.0	36.0	1.0	0
WMAIN-00958	Cast Iron, Assumed	6"	186.4	1934	83	0.2	0.5	0.4	75	3.6	10.0	36.0	1.0	0
WMAIN-00959	Cast Iron, Assumed	6"	79.9	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00960	Cast Iron, Assumed	6"	40.5	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00961	Cast Iron, Assumed	6"	128.6	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00962	Cast Iron, Assumed	6"	20.0	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00963	Cast Iron, Assumed	6"	166.6	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00964	Cast Iron, Assumed	6"	19.7	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00965	Cast Iron, Assumed	6"	61.5	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00966	Cast Iron, Assumed	6"	246.6	1934	83	0.2	0.5	0.4	75	3.6	10.0	36.0	1.0	0
WMAIN-00967	Cast Iron, Assumed	6"	99.3	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00968	Cast Iron, Assumed	6"	6.0	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00969	Cast Iron, Assumed	6"	57.7	1934	83	0.2	0.5	0.4	75	3.6	10.0	36.0	1.0	0
WMAIN-00970	Cast Iron, Assumed	6"	25.4	1934	83	0.2	0.5	0.4	75	3.6	10.0	36.0	1.0	0
WMAIN-00971	Cast Iron, Assumed	6"	71.4	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00972	Cast Iron, Assumed	6"	109.5	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00973	Cast Iron, Assumed	6"	132.8	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00974	Cast Iron, Assumed	6"	4.4	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-00977	Cast Iron, Assumed	6"	367.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00978	Cast Iron, Assumed	6"	355.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00979	Cast Iron, Assumed	6"	343.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-00981	Cast Iron, Assumed	6"	203.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-00984	Cast Iron, Assumed	6"	857.3	1947	70	0.2	0	0.4	75	2.6	9.3	24.3	0.9	5
WMAIN-00988	Cast Iron, Assumed	6"	8.5	1947	70	0.2	0	0.4	75	2.6	9.3	24.3	0.9	5
WMAIN-00989	Cast Iron, Assumed	6"	4.0	1947	70	0.2	0	0.4	75	2.6	9.3	24.3	0.9	5
WMAIN-00992	Cast Iron, Assumed	6"	7.1	2005	11	0.8	0	0.4	75	4.4	1.5	6.5	0.1	64
WMAIN-00994	Cast Iron, Assumed	6"	98.9	1947	70	0	0	0.4	75	2	9.3	18.7	0.9	5
WMAIN-00995	Cast Iron, Assumed	6"	107.5	1950	67	0	0	0.4	75	2	8.9	17.9	0.9	8
WMAIN-00996	Cast Iron, Assumed	6"	23.8	1950	67	0	0	0.4	75	2	8.9	17.9	0.9	8
WMAIN-00998	Cast Iron, Assumed	6"	3.0	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01002	Cast Iron, Assumed	6"	15.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01006	Cast Iron, Assumed	6"	225.6	1998	19	0.2	0	0.4	75	2.6	2.5	6.6	0.3	56
WMAIN-01007	Cast Iron, Assumed	6"	140.7	1998	19	0.2	0	0.4	75	2.6	2.5	6.6	0.3	56
WMAIN-01008	Cast Iron, Assumed	6"	349.2	1998	19	0.2	1	0.4	75	4.6	2.5	11.7	0.3	56
WMAIN-01016	Cast Iron, Assumed	6"	323.3	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01017	Cast Iron, Assumed	6"	141.0	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01018	Cast Iron, Assumed	6"	148.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01019	Cast Iron, Assumed	6"	48.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01035	Cast Iron, Assumed	6"	184.8	1950	67	0.2	0	0.4	75	2.6	8.9	23.2	0.9	8
WMAIN-01037	Cast Iron, Assumed	6"	368.6	1950	67	0.2	0	0.4	75	2.6	8.9	23.2	0.9	8
WMAIN-01038	Cast Iron, Assumed	6"	8.7	1950	67	0.2	0	0.4	75	2.6	8.9	23.2	0.9	8
WMAIN-01039	Cast Iron, Assumed	6"	82.8	1909	108	1	0.8	0.4	75	6.6	10.0	66.0	1.0	0
WMAIN-01044	Cast Iron, Assumed	6"	11.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01047	Cast Iron, Assumed	6"	215.1	1909	108	1	0.5	0.4	75	6	10.0	60.0	1.0	0
WMAIN-01048	Cast Iron, Assumed	6"	21.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01051	Cast Iron, Assumed	6"	13.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01068	Cast Iron, Assumed	6"	131.9	1950	67	0.2	1	0.4	75	4.6	8.9	41.1	0.9	8
WMAIN-01069	Cast Iron, Assumed	6"	738.2	1950	67	0.2	0	0.4	75	2.6	8.9	23.2	0.9	8
WMAIN-01070	Cast Iron, Assumed	6"	290.0	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-01073	Cast Iron, Assumed	6"	174.8	1950	67	0.2	0	0.4	75	2.6	8.9	23.2	0.9	8
WMAIN-01079	Cast Iron, Assumed	6"	805.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01080	Cast Iron, Assumed	6"	11.3	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01081	Cast Iron, Assumed	6"	63.3	1959	58	0.2	0	0.4	75	2.6	7.7	20.1	0.8	17
WMAIN-01083	Cast Iron, Assumed	6"	156.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01086	Cast Iron, Assumed	6"	4.3	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01087	Cast Iron, Assumed	6"	562.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01092	Cast Iron, Assumed	6"	672.1	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01093	Cast Iron, Assumed	6"	50.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01094	Cast Iron, Assumed	6"	84.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01095	Cast Iron, Assumed	6"	413.8	1959	58	1	0.5	0.4	75	6	7.7	46.4	0.8	17
WMAIN-01096	Cast Iron, Assumed	6"	77.4	1959	58	0	0.5	0.4	75	3	7.7	23.2	0.8	17
WMAIN-01103	Cast Iron, Assumed	6"	8.8	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-01112	Cast Iron, Assumed	6"	137.9	1947	70	0.8	0	0.4	75	4.4	9.3	41.1	0.9	5
WMAIN-01113	Cast Iron, Assumed	6"	600.7	1959	58	0.2	0.5	0.4	75	3.6	7.7	27.8	0.8	17
WMAIN-01114	Cast Iron, Assumed	6"	658.2	1950	67	0	0	0.4	75	2	8.9	17.9	0.9	8
WMAIN-01128	Cast Iron, Assumed	6"	10.9	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01147	Cast Iron, Assumed	6"	4.9	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01150	Cast Iron, Assumed	6"	70.7	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01164	Cast Iron, Assumed	6"	3.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01168	Cast Iron, Assumed	6"	15.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01173	Cast Iron, Assumed	6"	21.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01174	Cast Iron, Assumed	6"	34.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01212	Cast Iron, Assumed	6"	34.4	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01214	Cast Iron, Assumed	6"	166.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01249	Cast Iron, Assumed	6"	6.5	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01253	Cast Iron, Assumed	6"	204.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01254	Cast Iron, Assumed	6"	142.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01262	Cast Iron, Assumed	6"	5.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01271	Cast Iron, Assumed	6"	269.2	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01272	Cast Iron, Assumed	6"	643.7	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01273	Cast Iron, Assumed	6"	694.1	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01309	Cast Iron, Assumed	6"	395.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01316	Cast Iron, Assumed	6"	197.0	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01321	Cast Iron, Assumed	6"	19.5	2005	11	0.8	0	0.4	75	4.4	1.5	6.5	0.1	64
WMAIN-01352	Cast Iron, Assumed	6"	85.2	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01353	Cast Iron, Assumed	6"	181.9	1909	108	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01354	Cast Iron, Assumed	6"	212.7	1950	67	0.2	0	0.4	75	2.6	8.9	23.2	0.9	8
WMAIN-01355	Cast Iron, Assumed	6"	24.5	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01358	Cast Iron, Assumed	6"	2007.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01360	Cast Iron, Assumed	6"	661.9	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-01362	Cast Iron, Assumed	6"	30.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01391	Cast Iron, Assumed	6"	52.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01393	Cast Iron, Assumed	6"	7.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01421	Cast Iron, Assumed	6"	3.8	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01422	Cast Iron, Assumed	6"	0.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01442	Cast Iron, Assumed	6"	2.2	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01450	Cast Iron, Assumed	6"	52.6	1937	80	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01452	Cast Iron, Assumed	6"	7.4	1934	83	0.2	0.5	0.4	75	3.6	10.0	36.0	1.0	0
WMAIN-01453	Cast Iron, Assumed	6"	5.2	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01454	Cast Iron, Assumed	6"	45.9	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01458	Cast Iron, Assumed	6"	21.3	1959	58	0.2	0	0.4	75	2.6	7.7	20.1	0.8	17
WMAIN-01470	Cast Iron, Assumed	6"	640.6	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-01471	Cast Iron, Assumed	6"	53.0	Pre-1951	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01477	Cast Iron, Assumed	6"	24.5	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-01478	Cast Iron, Assumed	6"	20.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01479	Cast Iron, Assumed	6"	24.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01480	Cast Iron, Assumed	6"	625.0	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01481	Cast Iron, Assumed	6"	623.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01482	Cast Iron, Assumed	6"	51.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01483	Cast Iron, Assumed	6"	55.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01484	Cast Iron, Assumed	6"	25.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01485	Cast Iron, Assumed	6"	39.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01486	Cast Iron, Assumed	6"	280.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01487	Cast Iron, Assumed	6"	49.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01488	Cast Iron, Assumed	6"	39.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01489	Cast Iron, Assumed	6"	190.6	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0

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WMAIN-01490	Cast Iron, Assumed	6"	38.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01492	Cast Iron, Assumed	6"	38.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01494	Cast Iron, Assumed	6"	99.8	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01495	Cast Iron, Assumed	6"	52.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01496	Cast Iron, Assumed	6"	48.3	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01497	Cast Iron, Assumed	6"	3.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01498	Cast Iron, Assumed	6"	51.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01501	Cast Iron, Assumed	6"	103.3	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01502	Cast Iron, Assumed	6"	266.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01504	Cast Iron, Assumed	6"	5.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01505	Cast Iron, Assumed	6"	4.2	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01506	Cast Iron, Assumed	6"	8.7	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01507	Cast Iron, Assumed	6"	27.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01508	Cast Iron, Assumed	6"	141.5	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-01509	Cast Iron, Assumed	6"	26.4	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-01510	Cast Iron, Assumed	6"	56.0	1959	58	0.3	0	0.4	75	2.9	7.7	22.4	0.8	17
WMAIN-01511	Cast Iron, Assumed	6"	56.0	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01512	Cast Iron, Assumed	6"	83.8	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01527	Cast Iron, Assumed	6"	113.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01540	Cast Iron, Assumed	6"	4.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01541	Cast Iron, Assumed	6"	4.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01548	Cast Iron, Assumed	6"	113.9	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01562	Cast Iron, Assumed	6"	49.6	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01624	Cast Iron, Assumed	6"	141.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01625	Cast Iron, Assumed	6"	117.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01627	Cast Iron, Assumed	6"	2.7	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01631	Cast Iron, Assumed	6"	0.2	1909	108	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01633	Cast Iron, Assumed	6"	2.2	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-01634	Cast Iron, Assumed	6"	7.3	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-01635	Cast Iron, Assumed	6"	11.9	1909	108	0.3	0	0.4	75	2.9	10.0	29.0	1.0	0
WMAIN-01636	Cast Iron, Assumed	6"	11.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01641	Cast Iron, Assumed	6"	4.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01642	Cast Iron, Assumed	6"	55.6	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01644	Cast Iron, Assumed	6"	31.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01645	Cast Iron, Assumed	6"	20.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01647	Cast Iron, Assumed	6"	3.4	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01648	Cast Iron, Assumed	6"	36.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01649	Cast Iron, Assumed	6"	4.6	1950	67	1	0	0.4	75	5	8.9	44.7	0.9	8
WMAIN-01650	Cast Iron, Assumed	6"	173.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01651	Cast Iron, Assumed	6"	77.4	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01652	Cast Iron, Assumed	6"	15.0	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01653	Cast Iron, Assumed	6"	36.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01659	Cast Iron, Assumed	6"	3.9	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01663	Cast Iron, Assumed	6"	37.0	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01666	Cast Iron, Assumed	6"	97.3	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01674	Cast Iron, Assumed	6"	7.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01675	Cast Iron, Assumed	6"	2.8	1950	67	0.8	0	0.4	75	4.4	8.9	39.3	0.9	8
WMAIN-01676	Cast Iron, Assumed	6"	20.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01678	Cast Iron, Assumed	6"	37.1	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01681	Cast Iron, Assumed	6"	36.5	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01683	Cast Iron, Assumed	6"	18.7	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01689	Cast Iron, Assumed	6"	572.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01690	Cast Iron, Assumed	6"	61.2	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01695	Cast Iron, Assumed	6"	20.0	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01698	Cast Iron, Assumed	6"	33.5	1909	108	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01704	Cast Iron, Assumed	6"	3.1	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01705	Cast Iron, Assumed	6"	4.5	2005	11	0.8	0	0.4	75	4.4	1.5	6.5	0.1	64
WMAIN-01706	Cast Iron, Assumed	6"	3.9	1950	67	0.2	0	0.4	75	2.6	8.9	23.2	0.9	8
WMAIN-01714	Cast Iron, Assumed	6"	5.6	1934	83	0.2	0	0.4	75	2.6	10.0	26.0	1.0	0
WMAIN-01715	Cast Iron, Assumed	6"	45.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01716	Cast Iron, Assumed	6"	56.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01717	Cast Iron, Assumed	6"	29.2	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01718	Cast Iron, Assumed	6"	315.9	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01719	Cast Iron, Assumed	6"	55.0	Pre-1947	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01720	Cast Iron, Assumed	6"	9.4	1934	83	0.8	0	0.4	75	4.4	10.0	44.0	1.0	0
WMAIN-01722	Cast Iron, Assumed	6"	18.5	1934	83	1	0	0.4	75	5	10.0	50.0	1.0	0
WMAIN-01732	Cast Iron, Assumed	6"	23.5	1959	58	1	0	0.4	75	5	7.7	38.7	0.8	17
WMAIN-01733	Cast Iron, Assumed	6"	11.9	1959	58	0.8	0	0.4	75	4.4	7.7	34.0	0.8	17
WMAIN-01736	Cast Iron, Assumed	6"	97.4	1951	66	0.8	0	0.4	75	4.4	8.8	38.7	0.9	9
<Null>	Ductile Iron	6"	7.1	2015	2	1	0	0.4	90	5	0.2	1.1	0.0	88
WMAIN-00629	Ductile Iron, Assumed	6"	9.0	2006	11	0.2	0	0.4	90	2.6	1.2	3.2	0.1	79
WMAIN-00652	Ductile Iron, Assumed	6"	37.7	1974	43	1	0	0.4	90	5	4.8	23.9	0.5	47
WMAIN-00653	Ductile Iron, Assumed	6"	32.2	1974	43	1	0	0.4	90	5	4.8	23.9	0.5	47
WMAIN-00655	Ductile Iron, Assumed	6"	10.0	1974	43	1	0	0.4	90	5	4.8	23.9	0.5	47
WMAIN-00656	Ductile Iron, Assumed	6"	8.0	1974	43	1	0	0.4	90	5	4.8	23.9	0.5	47
WMAIN-00742	Ductile Iron, Assumed	6"	51.1	2008	9	1	0	0.4	90	5	1.0	5.0	0.1	81
WMAIN-00761	Ductile Iron, Assumed	6"	47.0	1971	46	0	0	0.4	90	2	5.1	10.2	0.5	44
WMAIN-00762	Ductile Iron, Assumed	6"	45.0	1971	46	0.8	0	0.4	90	4.4	5.1	22.5	0.5	44
WMAIN-00779	Ductile Iron, Assumed	6"	116.1	1974	43	0.8	0	0.4	90	4.4	4.8	21.0	0.5	47
WMAIN-00793	Ductile Iron, Assumed	6"	6.6	1974	43	0	0	0.4	90	2	4.8	9.6	0.5	47
WMAIN-01003	Ductile Iron, Assumed	6"	102.5	1974	43	1	0	0.4	90	5	4.8	23.9	0.5	47
WMAIN-01004	Ductile Iron, Assumed	6"	253.5	1974	43	0	0	0.4	90	2	4.8	9.6	0.5	47
WMAIN-01040	Ductile Iron, Assumed	6"	102.6	1974	43	0.2	0.8	0.4	90	4.2	4.8	20.1	0.5	47
WMAIN-01041	Ductile Iron, Assumed	6"	306.1	1974	43	0.2	0.8	0.4	90	4.2	4.8	20.1	0.5	47
WMAIN-01042	Ductile Iron, Assumed	6"	47.3	1974	43	0.2	0	0.4	90	2.6	4.8	12.4	0.5	47
WMAIN-01043	Ductile Iron, Assumed	6"	214.0	2007	10	1	0.8	0.4	90	6.6	1.1	7.3	0.1	80
WMAIN-01162	Ductile Iron, Assumed	6"	235.5	2008	8	1	0	0.4	90	5	0.9	4.4	0.1	82
WMAIN-01213	Ductile Iron, Assumed	6"	7.6	2007	10	0.3	0	0.4	90	2.9	1.1	3.2	0.1	80
WMAIN-01252	Ductile Iron, Assumed	6"	120.0	2008	8	1	0	0.4	90	5	0.9	4.4	0.1	82
WMAIN-01525	Ductile Iron, Assumed	6"	248.0	2007	10	1	0	0.4	90	5	1.1	5.6	0.1	80
WMAIN-01542	Ductile Iron, Assumed	6"	14.0	2008	9	1	0	0.4	90	5	1.0	5.0	0.1	81
WMAIN-01543	Ductile Iron, Assumed	6"	11.2	2008	8	1	0	0.4	90	5	0.9	4.4	0.1	82
WMAIN-01670	Ductile Iron, Assumed	6"	9.7	1974	43	1	0	0.4	90	5	4.8	23.9	0.5	47
WMAIN-01697	Ductile Iron, Assumed	6"	3.3	1974	43	0	0	0.4	90	2	4.8	9.6	0.5	47
WMAIN-00004	Cast Iron, Assumed	8"	330.1	1934	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00017	Cast Iron, Assumed	8"	662.5	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00048	Cast Iron, Assumed	8"	22.6	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00049	Cast Iron, Assumed	8"	3.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00072	Cast Iron, Assumed	8"	357.9	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00073	Cast Iron, Assumed	8"	436.4	1940	77	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00074	Cast Iron, Assumed	8"	349.1	1940	77	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00079	Cast Iron, Assumed	8"	261.3	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00081	Cast Iron, Assumed	8"	69.4	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00082	Cast Iron, Assumed	8"	13.3	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00086	Cast Iron, Assumed	8"	279.8	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00087	Cast Iron, Assumed	8"	353.8	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00149	Cast Iron, Assumed	8"	187.5	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00156	Cast Iron, Assumed	8"	713.1	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00160	Cast Iron, Assumed	8"	7.9	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00172	Cast Iron, Assumed	8"	281.7	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00210	Cast Iron, Assumed	8"	3.3	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00236	Cast Iron, Assumed	8"	291.6	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00237	Cast Iron, Assumed	8"	301.6	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00238	Cast Iron, Assumed	8"	7.1	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00242	Cast Iron, Assumed	8"	36.6	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00243	Cast Iron, Assumed	8"	8.2	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00244	Cast Iron, Assumed	8"	36.7	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00245	Cast Iron, Assumed	8"	22.0	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00257	Cast Iron, Assumed	8"	925.8	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00281	Cast Iron, Assumed	8"	551.1	1909	108	1	0.8	0.7	75	8.1	10.0	81.0	1.0	0
WMAIN-00319	Cast Iron, Assumed	8"	305.4	Pre-1947	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00324	Cast Iron, Assumed	8"	674.2	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00326	Cast Iron, Assumed	8"	197.2	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00357	Cast Iron, Assumed	8"	664.2	2000	17	1	0	0.7	75	6.5	2.3	14.7	0.2	58
WMAIN-00358	Cast Iron, Assumed	8"	305.2	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00359	Cast Iron, Assumed	8"	289.7	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00383	Cast Iron, Assumed	8"	688.1	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00384	Cast Iron, Assumed	8"	12.8	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00419	Cast Iron, Assumed	8"	333.2	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00453	Cast Iron, Assumed	8"	56.0	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00463	Cast Iron, Assumed	8"	363.3	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00479	Cast Iron, Assumed	8"	9.4	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00488	Cast Iron, Assumed	8"	325.5	Pre-1956	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00489	Cast Iron, Assumed	8"	6.0	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00497	Cast Iron, Assumed	8"	567.8	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00504	Cast Iron, Assumed	8"	27.7	1967	50	1	0	0.7	75	6.5	6.7	43.3	0.7	25
WMAIN-00506	Cast Iron, Assumed	8"	27.0	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00507	Cast Iron, Assumed	8"	3.6	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00517	Cast Iron, Assumed	8"	88.7	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00518	Cast Iron, Assumed	8"	4.2	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00569	Cast Iron, Assumed	8"	214.0	1934	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00585	Cast Iron, Assumed	8"	334.3	Pre-1956	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00592	Cast Iron, Assumed	8"	35.0	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00593	Cast Iron, Assumed	8"	352.9	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00596	Cast Iron, Assumed	8"	18.4	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00605	Cast Iron, Assumed	8"	22.2	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00607	Cast Iron, Assumed	8"	262.1	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00608	Cast Iron, Assumed	8"	5.6	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00670	Cast Iron, Assumed	8"	292.6	Pre-1947	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-00671	Cast Iron, Assumed	8"	640.2	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00695	Cast Iron, Assumed	8"	627.5	1934	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00702	Cast Iron, Assumed	8"	578.2	1909	108	1	0.5	0.7	75	7.5	10.0	75.0	1.0	0
WMAIN-00769	Cast Iron, Assumed	8"	649.8	1959	58	1	0.8	0.7	75	8.1	7.7	62.6	0.8	17
WMAIN-00771	Cast Iron, Assumed	8"	355.0	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00772	Cast Iron, Assumed	8"	33.1	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00773	Cast Iron, Assumed	8"	38.3	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00774	Cast Iron, Assumed	8"	193.0	1959	58	1	0.8	0.7	75	8.1	7.7	62.6	0.8	17
WMAIN-00804	Cast Iron, Assumed	8"	47.7	1937	80	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00805	Cast Iron, Assumed	8"	298.6	1937	80	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00829	Cast Iron, Assumed	8"	743.6	1940	77	0.2	0.8	0.7	75	5.7	10.0	57.0	1.0	0
WMAIN-00846	Cast Iron, Assumed	8"	201.2	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01001	Cast Iron, Assumed	8"	541.3	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-01010	Cast Iron, Assumed	8"	159.5	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01025	Cast Iron, Assumed	8"	207.0	1934	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01026	Cast Iron, Assumed	8"	128.7	1934	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01027	Cast Iron, Assumed	8"	96.7	1950	67	0.8	0	0.7	75	5.9	8.9	52.7	0.9	8
WMAIN-01036	Cast Iron, Assumed	8"	1051.4	1950	67	0.2	0	0.7	75	4.1	8.9	36.6	0.9	8
WMAIN-01074	Cast Iron, Assumed	8"	7.4	1959	58	0.2	0	0.7	75	4.1	7.7	31.7	0.8	17
WMAIN-01075	Cast Iron, Assumed	8"	80.4	1959	58	0.2	0	0.7	75	4.1	7.7	31.7	0.8	17
WMAIN-01076	Cast Iron, Assumed	8"	260.2	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01115	Cast Iron, Assumed	8"	238.7	1947	70	1	0.5	0.7	75	7.5	9.3	70.0	0.9	5
WMAIN-01132	Cast Iron, Assumed	8"	63.4	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01136	Cast Iron, Assumed	8"	60.8	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01137	Cast Iron, Assumed	8"	92.3	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01138	Cast Iron, Assumed	8"	81.1	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01139	Cast Iron, Assumed	8"	108.6	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01140	Cast Iron, Assumed	8"	59.6	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01141	Cast Iron, Assumed	8"	143.9	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01145	Cast Iron, Assumed	8"	5.5	1937	80	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01146	Cast Iron, Assumed	8"	6.9	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01160	Cast Iron, Assumed	8"	83.1	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01170	Cast Iron, Assumed	8"	97.1	2008	9	1	0	0.7	75	6.5	1.2	7.8	0.1	66
WMAIN-01257	Cast Iron, Assumed	8"	10.1	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17

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WMAIN-01258	Cast Iron, Assumed	8"	4.3	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01259	Cast Iron, Assumed	8"	61.6	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01266	Cast Iron, Assumed	8"	7.5	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01267	Cast Iron, Assumed	8"	2.9	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01268	Cast Iron, Assumed	8"	6.0	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01269	Cast Iron, Assumed	8"	19.1	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01310	Cast Iron, Assumed	8"	214.5	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01311	Cast Iron, Assumed	8"	14.4	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01317	Cast Iron, Assumed	8"	312.7	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01319	Cast Iron, Assumed	8"	148.5	1947	70	0.8	0.5	0.7	75	6.9	9.3	64.4	0.9	5
WMAIN-01320	Cast Iron, Assumed	8"	88.0	1947	70	0.8	1	0.7	75	7.9	9.3	73.7	0.9	5
WMAIN-01322	Cast Iron, Assumed	8"	793.2	2005	11	0.8	0	0.7	75	5.9	1.5	8.7	0.1	64
WMAIN-01323	Cast Iron, Assumed	8"	1179.3	2005	11	0.8	0	0.7	75	5.9	1.5	8.7	0.1	64
WMAIN-01330	Cast Iron, Assumed	8"	7.5	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01339	Cast Iron, Assumed	8"	296.4	Pre-2006	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01340	Cast Iron, Assumed	8"	360.9	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01367	Cast Iron, Assumed	8"	0.0	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01377	Cast Iron, Assumed	8"	18.9	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-01378	Cast Iron, Assumed	8"	24.8	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01389	Cast Iron, Assumed	8"	16.3	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01427	Cast Iron, Assumed	8"	0.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01440	Cast Iron, Assumed	8"	111.8	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01441	Cast Iron, Assumed	8"	10.0	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01443	Cast Iron, Assumed	8"	9.1	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01444	Cast Iron, Assumed	8"	58.1	1940	77	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01445	Cast Iron, Assumed	8"	70.1	1940	77	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01446	Cast Iron, Assumed	8"	661.3	1940	77	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01468	Cast Iron, Assumed	8"	72.1	Pre-1956	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01469	Cast Iron, Assumed	8"	293.8	Pre-1956	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01472	Cast Iron, Assumed	8"	43.2	Pre-1947	83	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01473	Cast Iron, Assumed	8"	25.0	Pre-1947	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01499	Cast Iron, Assumed	8"	25.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01500	Cast Iron, Assumed	8"	7.7	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01518	Cast Iron, Assumed	8"	55.4	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01520	Cast Iron, Assumed	8"	90.1	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01547	Cast Iron, Assumed	8"	23.5	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-01617	Cast Iron, Assumed	8"	18.7	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01619	Cast Iron, Assumed	8"	3.3	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01661	Cast Iron, Assumed	8"	5.4	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01671	Cast Iron, Assumed	8"	43.5	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01725	Cast Iron, Assumed	8"	284.8	Pre-1947	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01729	Cast Iron, Assumed	8"	5.6	Pre-1947	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01731	Cast Iron, Assumed	8"	30.9	Pre-1947	83	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00357	Cast Iron, Assumed	8"	332.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01356	Ductile Iron	8"	13.0	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
WMAIN-01357	Ductile Iron	8"	636.1	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
WMAIN-01739	Ductile Iron	8"	20.8	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
WMAIN-01740	Ductile Iron	8"	12.4	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
WMAIN-01741	Ductile Iron	8"	805.1	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
WMAIN-01744	Ductile Iron	8"	732.5	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
WMAIN-01746	Ductile Iron	8"	689.9	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
WMAIN-01747	Ductile Iron	8"	629.4	2008	9	0.8	0	0.7	90	5.9	1.0	5.9	0.1	81
<Null>	Ductile Iron	8"	8.8	2015	2	0.8	0	0.7	90	5.9	0.2	1.3	0.0	88
<Null>	Ductile Iron	8"	29.9	2015	2	0.8	0	0.7	90	5.9	0.2	1.3	0.0	88
<Null>	Ductile Iron	8"	289.6	2015	2	0.8	0	0.7	90	5.9	0.2	1.3	0.0	88
<Null>	Ductile Iron	8"	116.5	2015	2	1	0	0.7	90	6.5	0.2	1.4	0.0	88
<Null>	Ductile Iron	8"	75.5	2015	2	0.8	0	0.7	90	5.9	0.2	1.3	0.0	88
<Null>	Ductile Iron	8"	399.5	2015	2	0.8	0	0.7	90	5.9	0.2	1.3	0.0	88
<Null>	Ductile Iron	8"	487.0	2015	2	1	0	0.7	90	6.5	0.2	1.4	0.0	88
WMAIN-00167	Ductile Iron, Assumed	8"	212.0	1974	43	1	0	0.7	90	6.5	4.8	31.1	0.5	47
WMAIN-00212	Ductile Iron, Assumed	8"	15.5	2006	11	1	0	0.7	90	6.5	1.2	7.9	0.1	79

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00651	Ductile Iron, Assumed	8"	196.3	1974	43	1	0	0.7	90	6.5	4.8	31.1	0.5	47
WMAIN-00785	Ductile Iron, Assumed	8"	16.0	1993	24	1	0	0.7	90	6.5	2.7	17.3	0.3	66
WMAIN-00787	Ductile Iron, Assumed	8"	24.0	1993	24	1	0	0.7	90	6.5	2.7	17.3	0.3	66
WMAIN-00813	Ductile Iron, Assumed	8"	265.7	2007	10	0.8	0	0.7	90	5.9	1.1	6.6	0.1	80
WMAIN-00814	Ductile Iron, Assumed	8"	427.6	2007	10	0.8	0	0.7	90	5.9	1.1	6.6	0.1	80
WMAIN-00815	Ductile Iron, Assumed	8"	216.8	2007	10	0.8	0	0.7	90	5.9	1.1	6.6	0.1	80
WMAIN-00816	Ductile Iron, Assumed	8"	12.5	2007	10	0.8	0	0.7	90	5.9	1.1	6.6	0.1	80
WMAIN-00817	Ductile Iron, Assumed	8"	94.3	2007	10	0.2	0	0.7	90	4.1	1.1	4.6	0.1	80
WMAIN-00833	Ductile Iron, Assumed	8"	1176.9	1974	43	1	0	0.7	90	6.5	4.8	31.1	0.5	47
WMAIN-00860	Ductile Iron, Assumed	8"	5.0	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-00887	Ductile Iron, Assumed	8"	6.5	2002	15	0.3	0	0.7	90	4.4	1.7	7.3	0.2	75
WMAIN-00891	Ductile Iron, Assumed	8"	70.3	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01091	Ductile Iron, Assumed	8"	481.1	1974	43	1	0	0.7	90	6.5	4.8	31.1	0.5	47
WMAIN-01107	Ductile Iron, Assumed	8"	17.7	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01215	Ductile Iron, Assumed	8"	324.8	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01216	Ductile Iron, Assumed	8"	38.9	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01217	Ductile Iron, Assumed	8"	18.0	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01218	Ductile Iron, Assumed	8"	19.0	2007	10	1	0.5	0.7	90	7.5	1.1	8.3	0.1	80
WMAIN-01219	Ductile Iron, Assumed	8"	3.4	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01220	Ductile Iron, Assumed	8"	32.2	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01221	Ductile Iron, Assumed	8"	32.3	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01222	Ductile Iron, Assumed	8"	338.3	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01223	Ductile Iron, Assumed	8"	141.5	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01224	Ductile Iron, Assumed	8"	284.6	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01225	Ductile Iron, Assumed	8"	231.6	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01226	Ductile Iron, Assumed	8"	76.8	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01227	Ductile Iron, Assumed	8"	34.3	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01228	Ductile Iron, Assumed	8"	17.9	2007	10	1	0.5	0.7	90	7.5	1.1	8.3	0.1	80
WMAIN-01229	Ductile Iron, Assumed	8"	7.0	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01230	Ductile Iron, Assumed	8"	9.6	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01231	Ductile Iron, Assumed	8"	119.2	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01232	Ductile Iron, Assumed	8"	89.0	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01233	Ductile Iron, Assumed	8"	89.0	2007	10	1	0.5	0.7	90	7.5	1.1	8.3	0.1	80
WMAIN-01234	Ductile Iron, Assumed	8"	15.7	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01235	Ductile Iron, Assumed	8"	59.7	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01236	Ductile Iron, Assumed	8"	93.1	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01237	Ductile Iron, Assumed	8"	131.9	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01238	Ductile Iron, Assumed	8"	10.6	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01239	Ductile Iron, Assumed	8"	30.0	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01240	Ductile Iron, Assumed	8"	16.9	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01241	Ductile Iron, Assumed	8"	15.0	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01242	Ductile Iron, Assumed	8"	22.4	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01243	Ductile Iron, Assumed	8"	249.9	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01244	Ductile Iron, Assumed	8"	52.6	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01245	Ductile Iron, Assumed	8"	11.6	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01246	Ductile Iron, Assumed	8"	50.5	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01270	Ductile Iron, Assumed	8"	107.3	2007	10	0.2	0	0.7	90	4.1	1.1	4.6	0.1	80
WMAIN-01274	Ductile Iron, Assumed	8"	9.7	2007	10	0.8	0	0.7	90	5.9	1.1	6.6	0.1	80
WMAIN-01275	Ductile Iron, Assumed	8"	75.1	2009	8	0.2	0.8	0.7	90	5.7	0.9	5.1	0.1	82
WMAIN-01276	Ductile Iron, Assumed	8"	244.5	2009	8	0.8	0.5	0.7	90	6.9	0.9	6.1	0.1	82
WMAIN-01277	Ductile Iron, Assumed	8"	60.5	2009	8	0.8	0	0.7	90	5.9	0.9	5.2	0.1	82
WMAIN-01278	Ductile Iron, Assumed	8"	191.3	2009	8	0.8	0	0.7	90	5.9	0.9	5.2	0.1	82
WMAIN-01279	Ductile Iron, Assumed	8"	257.6	2009	8	0.8	0	0.7	90	5.9	0.9	5.2	0.1	82
WMAIN-01280	Ductile Iron, Assumed	8"	54.2	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01281	Ductile Iron, Assumed	8"	100.7	2009	8	0.2	0.5	0.7	90	5.1	0.9	4.5	0.1	82
WMAIN-01282	Ductile Iron, Assumed	8"	28.8	2009	8	0.2	0.8	0.7	90	5.7	0.9	5.1	0.1	82
WMAIN-01283	Ductile Iron, Assumed	8"	23.8	2009	8	0.2	0.8	0.7	90	5.7	0.9	5.1	0.1	82
WMAIN-01284	Ductile Iron, Assumed	8"	90.0	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01285	Ductile Iron, Assumed	8"	75.8	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01286	Ductile Iron, Assumed	8"	56.0	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01287	Ductile Iron, Assumed	8"	36.5	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01288	Ductile Iron, Assumed	8"	539.5	2009	8	0.8	0	0.7	90	5.9	0.9	5.2	0.1	82
WMAIN-01289	Ductile Iron, Assumed	8"	21.6	2009	8	0.8	0	0.7	90	5.9	0.9	5.2	0.1	82
WMAIN-01290	Ductile Iron, Assumed	8"	29.9	2009	8	0.2	0.5	0.7	90	5.1	0.9	4.5	0.1	82
WMAIN-01291	Ductile Iron, Assumed	8"	32.7	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01292	Ductile Iron, Assumed	8"	14.6	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01293	Ductile Iron, Assumed	8"	18.0	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01294	Ductile Iron, Assumed	8"	8.0	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01295	Ductile Iron, Assumed	8"	8.4	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01296	Ductile Iron, Assumed	8"	22.5	2009	8	0.2	0.5	0.7	90	5.1	0.9	4.5	0.1	82
WMAIN-01297	Ductile Iron, Assumed	8"	16.5	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01298	Ductile Iron, Assumed	8"	0.4	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01299	Ductile Iron, Assumed	8"	104.4	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01308	Ductile Iron, Assumed	8"	1273.1	2007	10	0.2	0	0.7	90	4.1	1.1	4.6	0.1	80
WMAIN-01312	Ductile Iron, Assumed	8"	19.4	2008	8	1	0	0.7	90	6.5	0.9	5.8	0.1	82
WMAIN-01331	Ductile Iron, Assumed	8"	697.2	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01332	Ductile Iron, Assumed	8"	650.1	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01333	Ductile Iron, Assumed	8"	195.8	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01334	Ductile Iron, Assumed	8"	236.9	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01335	Ductile Iron, Assumed	8"	30.3	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01336	Ductile Iron, Assumed	8"	28.9	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01337	Ductile Iron, Assumed	8"	14.0	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01338	Ductile Iron, Assumed	8"	228.8	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01341	Ductile Iron, Assumed	8"	362.5	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01342	Ductile Iron, Assumed	8"	134.9	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01343	Ductile Iron, Assumed	8"	14.9	2006	11	1	0	0.7	90	6.5	1.2	7.9	0.1	79
WMAIN-01344	Ductile Iron, Assumed	8"	12.0	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01345	Ductile Iron, Assumed	8"	5.6	2006	11	0.8	0	0.7	90	5.9	1.2	7.2	0.1	79
WMAIN-01346	Ductile Iron, Assumed	8"	9.3	2006	11	1	0	0.7	90	6.5	1.2	7.9	0.1	79
WMAIN-01347	Ductile Iron, Assumed	8"	32.8	2015	2	0.8	0	0.7	90	5.9	0.2	1.3	0.0	88
WMAIN-01359	Ductile Iron, Assumed	8"	96.1	1974	43	0.2	0	0.7	90	4.1	4.8	19.6	0.5	47
WMAIN-01375	Ductile Iron, Assumed	8"	78.6	2007	10	0.2	0	0.7	90	4.1	1.1	4.6	0.1	80
WMAIN-01376	Ductile Iron, Assumed	8"	0.1	2007	10	0.2	0	0.7	90	4.1	1.1	4.6	0.1	80
WMAIN-01522	Ductile Iron, Assumed	8"	55.5	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01523	Ductile Iron, Assumed	8"	78.1	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01524	Ductile Iron, Assumed	8"	9.9	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01528	Ductile Iron, Assumed	8"	98.4	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01529	Ductile Iron, Assumed	8"	27.0	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01530	Ductile Iron, Assumed	8"	11.0	2007	10	0.3	0	0.7	90	4.4	1.1	4.9	0.1	80
WMAIN-01626	Ductile Iron, Assumed	8"	4.3	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01707	Ductile Iron, Assumed	8"	3.3	2007	10	1	0	0.7	90	6.5	1.1	7.2	0.1	80
WMAIN-01708	Ductile Iron, Assumed	8"	31.6	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01709	Ductile Iron, Assumed	8"	6.3	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01710	Ductile Iron, Assumed	8"	0.8	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01711	Ductile Iron, Assumed	8"	0.8	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
WMAIN-01712	Ductile Iron, Assumed	8"	9.8	2009	8	0.2	0	0.7	90	4.1	0.9	3.6	0.1	82
<Null>	Ductile Iron, Assumed	8"	13.6	2015	2	0.8	0	0.7	90	5.9	0.2	1.3	0.0	88
WMAIN-00084	Cast Iron, Assumed	10"	574.8	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-00096	Cast Iron, Assumed	10"	291.3	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00097	Cast Iron, Assumed	10"	308.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00098	Cast Iron, Assumed	10"	325.3	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00099	Cast Iron, Assumed	10"	369.8	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00100	Cast Iron, Assumed	10"	291.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00606	Cast Iron, Assumed	10"	598.1	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00615	Cast Iron, Assumed	10"	90.7	1969	48	1	0	0.7	75	6.5	6.4	41.6	0.6	27
WMAIN-00758	Cast Iron, Assumed	10"	71.5	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00795	Cast Iron, Assumed	10"	144.6	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00796	Cast Iron, Assumed	10"	129.5	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00797	Cast Iron, Assumed	10"	116.7	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00798	Cast Iron, Assumed	10"	121.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-00811	Cast Iron, Assumed	10"	10.5	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-00830	Cast Iron, Assumed	10"	381.5	1959	58	0.2	0	0.7	75	4.1	7.7	31.7	0.8	17

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00831	Cast Iron, Assumed	10"	313.9	1959	58	0.2	0.5	0.7	75	5.1	7.7	39.4	0.8	17
WMAIN-00923	Cast Iron, Assumed	10"	434.4	1959	58	0.2	1	0.7	75	6.1	7.7	47.2	0.8	17
WMAIN-00954	Cast Iron, Assumed	10"	260.1	1959	58	0.8	0	0.7	75	5.9	7.7	45.6	0.8	17
WMAIN-00955	Cast Iron, Assumed	10"	419.4	1959	58	0.8	0	0.7	75	5.9	7.7	45.6	0.8	17
WMAIN-01082	Cast Iron, Assumed	10"	52.2	1959	58	0.2	0	0.7	75	4.1	7.7	31.7	0.8	17
WMAIN-01129	Cast Iron, Assumed	10"	96.1	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-01166	Cast Iron, Assumed	10"	17.0	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01256	Cast Iron, Assumed	10"	429.9	1950	67	1	0	0.7	75	6.5	8.9	58.1	0.9	8
WMAIN-01314	Cast Iron, Assumed	10"	638.6	1909	108	0.8	0	0.7	75	5.9	10.0	59.0	1.0	0
WMAIN-01451	Cast Iron, Assumed	10"	38.4	1959	58	1	0	0.7	75	6.5	7.7	50.3	0.8	17
WMAIN-01699	Cast Iron, Assumed	10"	20.2	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01700	Cast Iron, Assumed	10"	74.9	1909	108	1	0	0.7	75	6.5	10.0	65.0	1.0	0
WMAIN-01713	Cast Iron, Assumed	10"	3.3	1959	58	0.8	0	0.7	75	5.9	7.7	45.6	0.8	17
WMAIN-00825	Ductile Iron, Assumed	10"	11.1	2008	8	1	0	0.7	90	6.5	0.9	5.8	0.1	82
WMAIN-01104	Ductile Iron, Assumed	10"	8.0	1974	43	0.2	0	0.7	90	4.1	4.8	19.6	0.5	47
WMAIN-01133	Ductile Iron, Assumed	10"	64.6	2008	8	1	0	0.7	90	6.5	0.9	5.8	0.1	82
WMAIN-01428	Ductile Iron, Assumed	10"	1.5	2008	8	1	0	0.7	90	6.5	0.9	5.8	0.1	82
WMAIN-01503	Ductile Iron, Assumed	10"	257.0	1974	43	0.2	0	0.7	90	4.1	4.8	19.6	0.5	47
WMAIN-00014	Cast Iron, Assumed	12"	8.0	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00015	Cast Iron, Assumed	12"	15.0	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00043	Cast Iron, Assumed	12"	172.7	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00044	Cast Iron, Assumed	12"	185.4	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00062	Cast Iron, Assumed	12"	8.0	1934	83	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00063	Cast Iron, Assumed	12"	317.9	1967	50	0.8	0	1	75	7.4	6.7	49.3	0.7	25
WMAIN-00064	Cast Iron, Assumed	12"	7.0	1934	83	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00065	Cast Iron, Assumed	12"	300.3	1967	50	0.8	0	1	75	7.4	6.7	49.3	0.7	25
WMAIN-00066	Cast Iron, Assumed	12"	9.4	1967	50	0.8	0	1	75	7.4	6.7	49.3	0.7	25
WMAIN-00077	Cast Iron, Assumed	12"	636.8	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-00080	Cast Iron, Assumed	12"	9.4	1940	77	0	0	1	75	5	10.0	50.0	1.0	0
WMAIN-00088	Cast Iron, Assumed	12"	295.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00089	Cast Iron, Assumed	12"	286.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00091	Cast Iron, Assumed	12"	9.4	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00095	Cast Iron, Assumed	12"	44.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00116	Cast Iron, Assumed	12"	22.6	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00117	Cast Iron, Assumed	12"	16.1	1937	80	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00125	Cast Iron, Assumed	12"	397.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00126	Cast Iron, Assumed	12"	363.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00127	Cast Iron, Assumed	12"	316.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00128	Cast Iron, Assumed	12"	272.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00130	Cast Iron, Assumed	12"	9.4	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00132	Cast Iron, Assumed	12"	275.9	1937	80	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00133	Cast Iron, Assumed	12"	231.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00134	Cast Iron, Assumed	12"	315.1	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00173	Cast Iron, Assumed	12"	502.1	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00174	Cast Iron, Assumed	12"	324.9	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00177	Cast Iron, Assumed	12"	22.8	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00178	Cast Iron, Assumed	12"	73.5	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00181	Cast Iron, Assumed	12"	12.3	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00195	Cast Iron, Assumed	12"	312.4	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00196	Cast Iron, Assumed	12"	325.6	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00201	Cast Iron, Assumed	12"	342.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00214	Cast Iron, Assumed	12"	58.3	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00215	Cast Iron, Assumed	12"	225.4	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00216	Cast Iron, Assumed	12"	6.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00217	Cast Iron, Assumed	12"	5.8	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00220	Cast Iron, Assumed	12"	300.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00226	Cast Iron, Assumed	12"	360.8	1934	83	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00227	Cast Iron, Assumed	12"	25.3	1934	83	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00260	Cast Iron, Assumed	12"	74.5	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00261	Cast Iron, Assumed	12"	792.6	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00262	Cast Iron, Assumed	12"	1028.2	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0

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WMAIN-00325	Cast Iron, Assumed	12"	8.9	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00327	Cast Iron, Assumed	12"	630.5	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00328	Cast Iron, Assumed	12"	290.2	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00329	Cast Iron, Assumed	12"	631.4	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00330	Cast Iron, Assumed	12"	29.7	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00331	Cast Iron, Assumed	12"	14.7	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00360	Cast Iron, Assumed	12"	670.2	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00385	Cast Iron, Assumed	12"	1223.5	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00386	Cast Iron, Assumed	12"	9.5	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00388	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00391	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00415	Cast Iron, Assumed	12"	277.1	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00416	Cast Iron, Assumed	12"	116.4	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00418	Cast Iron, Assumed	12"	348.0	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00420	Cast Iron, Assumed	12"	22.1	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00421	Cast Iron, Assumed	12"	25.5	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00423	Cast Iron, Assumed	12"	9.4	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00426	Cast Iron, Assumed	12"	9.4	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00428	Cast Iron, Assumed	12"	291.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00429	Cast Iron, Assumed	12"	296.7	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00431	Cast Iron, Assumed	12"	333.8	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00432	Cast Iron, Assumed	12"	725.6	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00438	Cast Iron, Assumed	12"	17.3	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00449	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00451	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00458	Cast Iron, Assumed	12"	15.6	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00459	Cast Iron, Assumed	12"	36.2	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00460	Cast Iron, Assumed	12"	15.1	1967	50	0.8	0	1	75	7.4	6.7	49.3	0.7	25
WMAIN-00461	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00465	Cast Iron, Assumed	12"	10.3	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00466	Cast Iron, Assumed	12"	0.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00467	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00468	Cast Iron, Assumed	12"	3.9	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00469	Cast Iron, Assumed	12"	676.3	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00470	Cast Iron, Assumed	12"	61.9	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00471	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00472	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00473	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00476	Cast Iron, Assumed	12"	9.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00481	Cast Iron, Assumed	12"	657.9	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00483	Cast Iron, Assumed	12"	222.7	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00491	Cast Iron, Assumed	12"	674.3	1967	50	0.2	0	1	75	5.6	6.7	37.3	0.7	25
WMAIN-00528	Cast Iron, Assumed	12"	40.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00529	Cast Iron, Assumed	12"	18.7	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00612	Cast Iron, Assumed	12"	80.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00613	Cast Iron, Assumed	12"	181.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00614	Cast Iron, Assumed	12"	126.7	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00625	Cast Iron, Assumed	12"	22.1	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00628	Cast Iron, Assumed	12"	13.7	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00639	Cast Iron, Assumed	12"	243.1	1937	80	0.2	1	1	75	7.6	10.0	76.0	1.0	0
WMAIN-00640	Cast Iron, Assumed	12"	300.8	1937	80	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00646	Cast Iron, Assumed	12"	58.4	1937	80	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00649	Cast Iron, Assumed	12"	505.8	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00679	Cast Iron, Assumed	12"	5.5	1967	50	0.8	0	1	75	7.4	6.7	49.3	0.7	25
WMAIN-00700	Cast Iron, Assumed	12"	473.9	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-00701	Cast Iron, Assumed	12"	180.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00726	Cast Iron, Assumed	12"	270.1	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00750	Cast Iron, Assumed	12"	31.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00751	Cast Iron, Assumed	12"	47.2	1909	108	0	0	1	75	5	10.0	50.0	1.0	0
WMAIN-00809	Cast Iron, Assumed	12"	60.9	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00819	Cast Iron, Assumed	12"	177.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0

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WMAIN-00820	Cast Iron, Assumed	12"	35.4	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00821	Cast Iron, Assumed	12"	64.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00822	Cast Iron, Assumed	12"	41.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00823	Cast Iron, Assumed	12"	292.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00824	Cast Iron, Assumed	12"	91.4	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00826	Cast Iron, Assumed	12"	16.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00827	Cast Iron, Assumed	12"	90.9	1998	19	1	0	1	75	8	2.5	20.3	0.3	56
WMAIN-00837	Cast Iron, Assumed	12"	24.0	1947	70	0.2	0	1	75	5.6	9.3	52.3	0.9	5
WMAIN-00841	Cast Iron, Assumed	12"	305.2	2005	11	0.8	0	1	75	7.4	1.5	10.9	0.1	64
WMAIN-00843	Cast Iron, Assumed	12"	112.8	1947	70	1	0	1	75	8	9.3	74.7	0.9	5
WMAIN-00847	Cast Iron, Assumed	12"	347.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00848	Cast Iron, Assumed	12"	63.4	1969	48	1	0	1	75	8	6.4	51.2	0.6	27
WMAIN-00886	Cast Iron, Assumed	12"	71.4	2002	15	1	0	1	75	8	2.0	16.0	0.2	60
WMAIN-00896	Cast Iron, Assumed	12"	200.3	2002	15	1	0	1	75	8	2.0	16.0	0.2	60
WMAIN-00897	Cast Iron, Assumed	12"	111.6	2002	15	1	0	1	75	8	2.0	16.0	0.2	60
WMAIN-00901	Cast Iron, Assumed	12"	697.7	1959	58	0.2	0	1	75	5.6	7.7	43.3	0.8	17
WMAIN-00902	Cast Iron, Assumed	12"	150.6	1969	48	0.2	0	1	75	5.6	6.4	35.8	0.6	27
WMAIN-00903	Cast Iron, Assumed	12"	79.6	1969	48	0.2	0	1	75	5.6	6.4	35.8	0.6	27
WMAIN-00907	Cast Iron, Assumed	12"	838.5	1969	48	1	0	1	75	8	6.4	51.2	0.6	27
WMAIN-00908	Cast Iron, Assumed	12"	23.3	1909	108	0.3	0	1	75	5.9	10.0	59.0	1.0	0
WMAIN-00909	Cast Iron, Assumed	12"	47.8	1909	108	0.3	0	1	75	5.9	10.0	59.0	1.0	0
WMAIN-00910	Cast Iron, Assumed	12"	33.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00919	Cast Iron, Assumed	12"	645.4	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-00920	Cast Iron, Assumed	12"	642.4	1940	77	0	0	1	75	5	10.0	50.0	1.0	0
WMAIN-00922	Cast Iron, Assumed	12"	358.9	1940	77	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00945	Cast Iron, Assumed	12"	204.3	1909	108	0.3	0	1	75	5.9	10.0	59.0	1.0	0
WMAIN-00946	Cast Iron, Assumed	12"	203.9	1979	38	1	0	1	75	8	5.1	40.5	0.5	37
WMAIN-00951	Cast Iron, Assumed	12"	488.0	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00952	Cast Iron, Assumed	12"	23.6	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00975	Cast Iron, Assumed	12"	1099.0	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-00985	Cast Iron, Assumed	12"	13.2	1947	70	0.2	0	1	75	5.6	9.3	52.3	0.9	5
WMAIN-00986	Cast Iron, Assumed	12"	93.6	1947	70	0.2	0	1	75	5.6	9.3	52.3	0.9	5
WMAIN-00993	Cast Iron, Assumed	12"	248.7	1947	70	0.8	1	1	75	9.4	9.3	87.7	0.9	5
WMAIN-00999	Cast Iron, Assumed	12"	269.6	1950	67	0.3	0	1	75	5.9	8.9	52.7	0.9	8
WMAIN-01000	Cast Iron, Assumed	12"	132.1	1950	67	0.3	0	1	75	5.9	8.9	52.7	0.9	8
WMAIN-01005	Cast Iron, Assumed	12"	132.2	1998	19	1	0	1	75	8	2.5	20.3	0.3	56
WMAIN-01009	Cast Iron, Assumed	12"	487.7	1909	108	0.2	0	1	75	5.6	10.0	56.0	1.0	0
WMAIN-01030	Cast Iron, Assumed	12"	24.0	1934	83	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-01031	Cast Iron, Assumed	12"	1009.0	1934	83	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-01045	Cast Iron, Assumed	12"	156.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01046	Cast Iron, Assumed	12"	20.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01062	Cast Iron, Assumed	12"	105.6	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01063	Cast Iron, Assumed	12"	11.7	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01064	Cast Iron, Assumed	12"	70.0	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01065	Cast Iron, Assumed	12"	14.5	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01066	Cast Iron, Assumed	12"	57.8	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01067	Cast Iron, Assumed	12"	162.0	1950	67	0.3	0	1	75	5.9	8.9	52.7	0.9	8
WMAIN-01085	Cast Iron, Assumed	12"	525.5	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-01097	Cast Iron, Assumed	12"	649.0	1967	50	0.2	0	1	75	5.6	6.7	37.3	0.7	25
WMAIN-01101	Cast Iron, Assumed	12"	246.6	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-01102	Cast Iron, Assumed	12"	1326.6	1967	50	0.2	0	1	75	5.6	6.7	37.3	0.7	25
WMAIN-01105	Cast Iron, Assumed	12"	13.0	1998	19	0.3	0	1	75	5.9	2.5	14.9	0.3	56
WMAIN-01106	Cast Iron, Assumed	12"	697.0	1998	19	1	0	1	75	8	2.5	20.3	0.3	56
WMAIN-01130	Cast Iron, Assumed	12"	5.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01143	Cast Iron, Assumed	12"	54.0	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01144	Cast Iron, Assumed	12"	69.8	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01161	Cast Iron, Assumed	12"	24.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01163	Cast Iron, Assumed	12"	52.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01165	Cast Iron, Assumed	12"	10.0	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01167	Cast Iron, Assumed	12"	22.7	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01172	Cast Iron, Assumed	12"	59.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01175	Cast Iron, Assumed	12"	11.9	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01176	Cast Iron, Assumed	12"	20.3	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01177	Cast Iron, Assumed	12"	88.3	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01178	Cast Iron, Assumed	12"	11.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01179	Cast Iron, Assumed	12"	9.9	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01180	Cast Iron, Assumed	12"	21.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01181	Cast Iron, Assumed	12"	144.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01182	Cast Iron, Assumed	12"	159.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01183	Cast Iron, Assumed	12"	404.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01184	Cast Iron, Assumed	12"	531.9	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01185	Cast Iron, Assumed	12"	25.8	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01187	Cast Iron, Assumed	12"	171.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01188	Cast Iron, Assumed	12"	19.3	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01189	Cast Iron, Assumed	12"	31.6	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01190	Cast Iron, Assumed	12"	221.9	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01191	Cast Iron, Assumed	12"	3.5	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01192	Cast Iron, Assumed	12"	88.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01193	Cast Iron, Assumed	12"	375.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01194	Cast Iron, Assumed	12"	204.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01195	Cast Iron, Assumed	12"	74.9	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01196	Cast Iron, Assumed	12"	55.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01197	Cast Iron, Assumed	12"	31.9	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01198	Cast Iron, Assumed	12"	36.3	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01199	Cast Iron, Assumed	12"	194.6	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01205	Cast Iron, Assumed	12"	292.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01206	Cast Iron, Assumed	12"	366.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01207	Cast Iron, Assumed	12"	544.1	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01208	Cast Iron, Assumed	12"	73.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01209	Cast Iron, Assumed	12"	73.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01210	Cast Iron, Assumed	12"	61.1	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01211	Cast Iron, Assumed	12"	2.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01250	Cast Iron, Assumed	12"	20.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01251	Cast Iron, Assumed	12"	106.2	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01260	Cast Iron, Assumed	12"	3.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01261	Cast Iron, Assumed	12"	18.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01307	Cast Iron, Assumed	12"	235.8	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01324	Cast Iron, Assumed	12"	100.2	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01348	Cast Iron, Assumed	12"	532.3	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01364	Cast Iron, Assumed	12"	33.2	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01365	Cast Iron, Assumed	12"	7.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01366	Cast Iron, Assumed	12"	6.3	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01368	Cast Iron, Assumed	12"	0.0	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01369	Cast Iron, Assumed	12"	0.0	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01370	Cast Iron, Assumed	12"	90.7	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01371	Cast Iron, Assumed	12"	25.7	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01372	Cast Iron, Assumed	12"	105.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01373	Cast Iron, Assumed	12"	31.2	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01374	Cast Iron, Assumed	12"	135.1	1969	48	0.8	0	1	75	7.4	6.4	47.4	0.6	27
WMAIN-01379	Cast Iron, Assumed	12"	57.9	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01380	Cast Iron, Assumed	12"	297.6	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01381	Cast Iron, Assumed	12"	24.3	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01382	Cast Iron, Assumed	12"	145.9	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01383	Cast Iron, Assumed	12"	45.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01384	Cast Iron, Assumed	12"	59.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01385	Cast Iron, Assumed	12"	52.9	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01386	Cast Iron, Assumed	12"	63.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01387	Cast Iron, Assumed	12"	55.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01388	Cast Iron, Assumed	12"	35.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01390	Cast Iron, Assumed	12"	5.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01392	Cast Iron, Assumed	12"	5.9	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01394	Cast Iron, Assumed	12"	62.8	2008	8	1	0	1	75	8	1.1	8.5	0.1	67

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01395	Cast Iron, Assumed	12"	28.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01396	Cast Iron, Assumed	12"	40.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01397	Cast Iron, Assumed	12"	2.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01398	Cast Iron, Assumed	12"	63.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01399	Cast Iron, Assumed	12"	36.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01400	Cast Iron, Assumed	12"	21.8	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01401	Cast Iron, Assumed	12"	29.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01402	Cast Iron, Assumed	12"	15.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01403	Cast Iron, Assumed	12"	0.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01404	Cast Iron, Assumed	12"	146.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01405	Cast Iron, Assumed	12"	31.9	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01406	Cast Iron, Assumed	12"	11.0	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01407	Cast Iron, Assumed	12"	29.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01408	Cast Iron, Assumed	12"	13.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01409	Cast Iron, Assumed	12"	14.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01410	Cast Iron, Assumed	12"	9.6	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01411	Cast Iron, Assumed	12"	9.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01412	Cast Iron, Assumed	12"	2.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01413	Cast Iron, Assumed	12"	7.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01414	Cast Iron, Assumed	12"	2.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01415	Cast Iron, Assumed	12"	6.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01417	Cast Iron, Assumed	12"	21.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01418	Cast Iron, Assumed	12"	0.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01429	Cast Iron, Assumed	12"	10.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01430	Cast Iron, Assumed	12"	5.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01435	Cast Iron, Assumed	12"	53.2	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01436	Cast Iron, Assumed	12"	1.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01437	Cast Iron, Assumed	12"	6.6	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01438	Cast Iron, Assumed	12"	319.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01439	Cast Iron, Assumed	12"	154.1	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01456	Cast Iron, Assumed	12"	8.1	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01457	Cast Iron, Assumed	12"	37.7	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-01459	Cast Iron, Assumed	12"	93.1	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-01460	Cast Iron, Assumed	12"	82.6	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-01461	Cast Iron, Assumed	12"	21.0	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-01462	Cast Iron, Assumed	12"	186.7	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-01463	Cast Iron, Assumed	12"	641.9	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01464	Cast Iron, Assumed	12"	450.7	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-01465	Cast Iron, Assumed	12"	360.6	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01466	Cast Iron, Assumed	12"	261.9	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01467	Cast Iron, Assumed	12"	16.7	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-01513	Cast Iron, Assumed	12"	3.6	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01514	Cast Iron, Assumed	12"	185.4	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01515	Cast Iron, Assumed	12"	122.9	1950	67	0.3	0	1	75	5.9	8.9	52.7	0.9	8
WMAIN-01516	Cast Iron, Assumed	12"	29.5	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01517	Cast Iron, Assumed	12"	25.8	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01521	Cast Iron, Assumed	12"	101.8	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01532	Cast Iron, Assumed	12"	61.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01533	Cast Iron, Assumed	12"	6.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01534	Cast Iron, Assumed	12"	20.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01535	Cast Iron, Assumed	12"	6.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01536	Cast Iron, Assumed	12"	102.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01537	Cast Iron, Assumed	12"	10.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01544	Cast Iron, Assumed	12"	29.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01549	Cast Iron, Assumed	12"	382.5	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-01550	Cast Iron, Assumed	12"	8.3	1909	108	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-01551	Cast Iron, Assumed	12"	10.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01552	Cast Iron, Assumed	12"	30.7	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01553	Cast Iron, Assumed	12"	10.4	2008	8	1	0	1	75	8	1.1	8.5	0.1	67
WMAIN-01563	Cast Iron, Assumed	12"	55.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01564	Cast Iron, Assumed	12"	23.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01565	Cast Iron, Assumed	12"	63.5	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01566	Cast Iron, Assumed	12"	18.8	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01567	Cast Iron, Assumed	12"	35.4	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01568	Cast Iron, Assumed	12"	3.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01569	Cast Iron, Assumed	12"	51.4	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01570	Cast Iron, Assumed	12"	17.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01571	Cast Iron, Assumed	12"	22.6	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01572	Cast Iron, Assumed	12"	0.4	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01573	Cast Iron, Assumed	12"	10.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01574	Cast Iron, Assumed	12"	35.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01575	Cast Iron, Assumed	12"	27.0	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01576	Cast Iron, Assumed	12"	44.0	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01577	Cast Iron, Assumed	12"	52.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01578	Cast Iron, Assumed	12"	22.0	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01579	Cast Iron, Assumed	12"	56.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01580	Cast Iron, Assumed	12"	11.8	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01581	Cast Iron, Assumed	12"	10.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01582	Cast Iron, Assumed	12"	109.6	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01583	Cast Iron, Assumed	12"	60.1	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01584	Cast Iron, Assumed	12"	9.4	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01585	Cast Iron, Assumed	12"	54.3	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01586	Cast Iron, Assumed	12"	4.4	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01587	Cast Iron, Assumed	12"	22.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01588	Cast Iron, Assumed	12"	19.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01589	Cast Iron, Assumed	12"	0.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01590	Cast Iron, Assumed	12"	86.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01591	Cast Iron, Assumed	12"	7.4	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01592	Cast Iron, Assumed	12"	28.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01593	Cast Iron, Assumed	12"	26.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01594	Cast Iron, Assumed	12"	8.3	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01595	Cast Iron, Assumed	12"	4.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01596	Cast Iron, Assumed	12"	72.6	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01597	Cast Iron, Assumed	12"	39.5	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01598	Cast Iron, Assumed	12"	48.1	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01599	Cast Iron, Assumed	12"	2.6	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01600	Cast Iron, Assumed	12"	51.6	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01601	Cast Iron, Assumed	12"	33.4	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01602	Cast Iron, Assumed	12"	41.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01603	Cast Iron, Assumed	12"	1.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01604	Cast Iron, Assumed	12"	17.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01605	Cast Iron, Assumed	12"	53.1	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01606	Cast Iron, Assumed	12"	56.8	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01607	Cast Iron, Assumed	12"	2.7	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01608	Cast Iron, Assumed	12"	16.4	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01609	Cast Iron, Assumed	12"	46.9	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01610	Cast Iron, Assumed	12"	63.5	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01611	Cast Iron, Assumed	12"	57.5	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01612	Cast Iron, Assumed	12"	24.7	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01613	Cast Iron, Assumed	12"	32.3	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01614	Cast Iron, Assumed	12"	12.6	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01615	Cast Iron, Assumed	12"	43.8	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01616	Cast Iron, Assumed	12"	7.3	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01622	Cast Iron, Assumed	12"	8.2	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01623	Cast Iron, Assumed	12"	20.5	2008	9	1	0	1	75	8	1.2	9.6	0.1	66
WMAIN-01646	Cast Iron, Assumed	12"	52.6	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01691	Cast Iron, Assumed	12"	78.7	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-01702	Cast Iron, Assumed	12"	2.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01703	Cast Iron, Assumed	12"	166.1	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01734	Cast Iron, Assumed	12"	604.1	1934	83	0.8	0	1	75	7.4	10.0	74.0	1.0	0
WMAIN-01735	Cast Iron, Assumed	12"	5.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00001	Ductile Iron	12"	55.6	1959	58	1	0	1	90	8	6.4	51.6	0.6	32

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00002	Ductile Iron	12"	13.5	1959	58	1	0	1	90	8	6.4	51.6	0.6	32
<Null>	Ductile Iron	12"	559.0	2012	5	0.2	0	1	90	5.6	0.6	3.1	0.1	85
<Null>	Ductile Iron	12"	601.2	2012	5	0.2	0	1	90	5.6	0.6	3.1	0.1	85
WMAIN-00228	Ductile Iron, Assumed	12"	1037.4	1971	46	0.8	0	1	90	7.4	5.1	37.8	0.5	44
WMAIN-00856	Ductile Iron, Assumed	12"	441.1	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00857	Ductile Iron, Assumed	12"	478.2	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00858	Ductile Iron, Assumed	12"	383.6	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00861	Ductile Iron, Assumed	12"	179.9	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00862	Ductile Iron, Assumed	12"	86.2	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00863	Ductile Iron, Assumed	12"	26.2	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-00864	Ductile Iron, Assumed	12"	51.8	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00865	Ductile Iron, Assumed	12"	17.8	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00866	Ductile Iron, Assumed	12"	62.5	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00867	Ductile Iron, Assumed	12"	44.4	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00869	Ductile Iron, Assumed	12"	188.4	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00870	Ductile Iron, Assumed	12"	3.1	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-00871	Ductile Iron, Assumed	12"	1.8	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-00872	Ductile Iron, Assumed	12"	3.0	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00873	Ductile Iron, Assumed	12"	1.6	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00874	Ductile Iron, Assumed	12"	2.0	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-00875	Ductile Iron, Assumed	12"	4.0	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-00876	Ductile Iron, Assumed	12"	404.4	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00877	Ductile Iron, Assumed	12"	72.0	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00878	Ductile Iron, Assumed	12"	72.0	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00879	Ductile Iron, Assumed	12"	2.0	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00880	Ductile Iron, Assumed	12"	2.0	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00881	Ductile Iron, Assumed	12"	16.4	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00882	Ductile Iron, Assumed	12"	18.6	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00883	Ductile Iron, Assumed	12"	160.3	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00884	Ductile Iron, Assumed	12"	5.9	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00885	Ductile Iron, Assumed	12"	4.2	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-00889	Ductile Iron, Assumed	12"	237.9	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00890	Ductile Iron, Assumed	12"	108.6	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-00892	Ductile Iron, Assumed	12"	30.6	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-00893	Ductile Iron, Assumed	12"	23.0	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00894	Ductile Iron, Assumed	12"	265.6	2002	15	1	0	1	90	8	1.7	13.3	0.2	75
WMAIN-00895	Ductile Iron, Assumed	12"	3.4	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-01134	Ductile Iron, Assumed	12"	24.7	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01135	Ductile Iron, Assumed	12"	6.5	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01142	Ductile Iron, Assumed	12"	38.0	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-01169	Ductile Iron, Assumed	12"	15.0	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01200	Ductile Iron, Assumed	12"	116.3	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01201	Ductile Iron, Assumed	12"	32.5	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01202	Ductile Iron, Assumed	12"	17.2	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01203	Ductile Iron, Assumed	12"	238.8	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01204	Ductile Iron, Assumed	12"	432.1	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01263	Ductile Iron, Assumed	12"	3.3	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01264	Ductile Iron, Assumed	12"	3.4	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01300	Ductile Iron, Assumed	12"	67.0	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01301	Ductile Iron, Assumed	12"	649.9	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01302	Ductile Iron, Assumed	12"	75.9	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01303	Ductile Iron, Assumed	12"	47.5	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01304	Ductile Iron, Assumed	12"	86.5	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01305	Ductile Iron, Assumed	12"	54.5	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01306	Ductile Iron, Assumed	12"	329.9	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01313	Ductile Iron, Assumed	12"	11.8	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01349	Ductile Iron, Assumed	12"	3.6	2006	11	1	0	1	90	8	1.2	9.8	0.1	79
WMAIN-01416	Ductile Iron, Assumed	12"	52.7	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01419	Ductile Iron, Assumed	12"	60.0	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01420	Ductile Iron, Assumed	12"	48.7	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01423	Ductile Iron, Assumed	12"	60.9	2008	8	1	0	1	90	8	0.9	7.1	0.1	82

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WMAIN-01424	Ductile Iron, Assumed	12"	35.1	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01425	Ductile Iron, Assumed	12"	72.2	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01426	Ductile Iron, Assumed	12"	50.2	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01431	Ductile Iron, Assumed	12"	13.2	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01432	Ductile Iron, Assumed	12"	8.8	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01433	Ductile Iron, Assumed	12"	6.4	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01434	Ductile Iron, Assumed	12"	19.3	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01526	Ductile Iron, Assumed	12"	24.1	2007	10	0.3	0	1	90	5.9	1.1	6.6	0.1	80
WMAIN-01531	Ductile Iron, Assumed	12"	31.3	2007	10	1	0	1	90	8	1.1	8.9	0.1	80
WMAIN-01554	Ductile Iron, Assumed	12"	9.2	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01555	Ductile Iron, Assumed	12"	10.2	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01556	Ductile Iron, Assumed	12"	16.7	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01557	Ductile Iron, Assumed	12"	35.4	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01558	Ductile Iron, Assumed	12"	14.9	2008	8	1	0	1	90	8	0.9	7.1	0.1	82
WMAIN-01560	Ductile Iron, Assumed	12"	3.2	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-01561	Ductile Iron, Assumed	12"	1.1	2012	5	1	0	1	90	8	0.6	4.4	0.1	85
WMAIN-00101	Cast Iron, Assumed	16"	31.3	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00102	Cast Iron, Assumed	16"	334.1	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00103	Cast Iron, Assumed	16"	363.8	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00104	Cast Iron, Assumed	16"	319.2	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00105	Cast Iron, Assumed	16"	7.0	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00106	Cast Iron, Assumed	16"	9.4	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00107	Cast Iron, Assumed	16"	311.3	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00115	Cast Iron, Assumed	16"	9.4	1937	80	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00417	Cast Iron, Assumed	16"	9.4	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00501	Cast Iron, Assumed	16"	69.3	1934	83	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00502	Cast Iron, Assumed	16"	30.7	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00505	Cast Iron, Assumed	16"	9.4	1934	83	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00719	Cast Iron, Assumed	16"	15.5	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00720	Cast Iron, Assumed	16"	62.4	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00763	Cast Iron, Assumed	16"	250.2	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-00810	Cast Iron, Assumed	16"	151.1	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00840	Cast Iron, Assumed	16"	304.0	1947	70	1	0	1	75	8	9.3	74.7	0.9	5
WMAIN-00917	Cast Iron, Assumed	16"	266.5	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00918	Cast Iron, Assumed	16"	569.8	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-00921	Cast Iron, Assumed	16"	956.2	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00924	Cast Iron, Assumed	16"	731.2	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00940	Cast Iron, Assumed	16"	61.4	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00990	Cast Iron, Assumed	16"	84.3	1947	70	1	0	1	75	8	9.3	74.7	0.9	5
WMAIN-01012	Cast Iron, Assumed	16"	477.6	1950	67	0	0	1	75	5	8.9	44.7	0.9	8
WMAIN-01013	Cast Iron, Assumed	16"	149.8	1934	83	0.2	0	1	75	5.6	10.0	56.0	1.0	0
WMAIN-01014	Cast Iron, Assumed	16"	98.5	1934	83	0.2	0	1	75	5.6	10.0	56.0	1.0	0
WMAIN-01015	Cast Iron, Assumed	16"	281.6	1934	83	0.2	1	1	75	7.6	10.0	76.0	1.0	0
WMAIN-01052	Cast Iron, Assumed	16"	110.6	1959	58	0.2	0	1	75	5.6	7.7	43.3	0.8	17
WMAIN-01053	Cast Iron, Assumed	16"	164.5	1959	58	0.2	0	1	75	5.6	7.7	43.3	0.8	17
WMAIN-01058	Cast Iron, Assumed	16"	84.2	1959	58	0.2	0	1	75	5.6	7.7	43.3	0.8	17
WMAIN-01059	Cast Iron, Assumed	16"	53.1	1959	58	0.2	0	1	75	5.6	7.7	43.3	0.8	17
WMAIN-01060	Cast Iron, Assumed	16"	130.4	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-01084	Cast Iron, Assumed	16"	64.4	1937	80	0.3	0	1	75	5.9	10.0	59.0	1.0	0
WMAIN-01098	Cast Iron, Assumed	16"	623.2	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-01131	Cast Iron, Assumed	16"	5.4	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01159	Cast Iron, Assumed	16"	23.5	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01255	Cast Iron, Assumed	16"	404.0	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-01449	Cast Iron, Assumed	16"	40.3	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01455	Cast Iron, Assumed	16"	0.3	1959	58	0.3	0	1	75	5.9	7.7	45.6	0.8	17
WMAIN-01491	Cast Iron, Assumed	16"	59.8	1967	50	1	0	1	75	8	6.7	53.3	0.7	25
WMAIN-01559	Cast Iron, Assumed	16"	49.9	1959	58	1	0	1	75	8	7.7	61.9	0.8	17
WMAIN-00941	Ductile Iron, Assumed	16"	110.2	1950	67	1	0	1	90	8	7.4	59.6	0.7	23
WMAIN-00942	Ductile Iron, Assumed	16"	421.1	1950	67	0.2	0.5	1	90	6.6	7.4	49.1	0.7	23
WMAIN-01054	Ductile Iron, Assumed	16"	155.2	2012	5	0.2	0	1	90	5.6	0.6	3.1	0.1	85
WMAIN-01055	Ductile Iron, Assumed	16"	92.5	2012	5	0.2	0	1	90	5.6	0.6	3.1	0.1	85

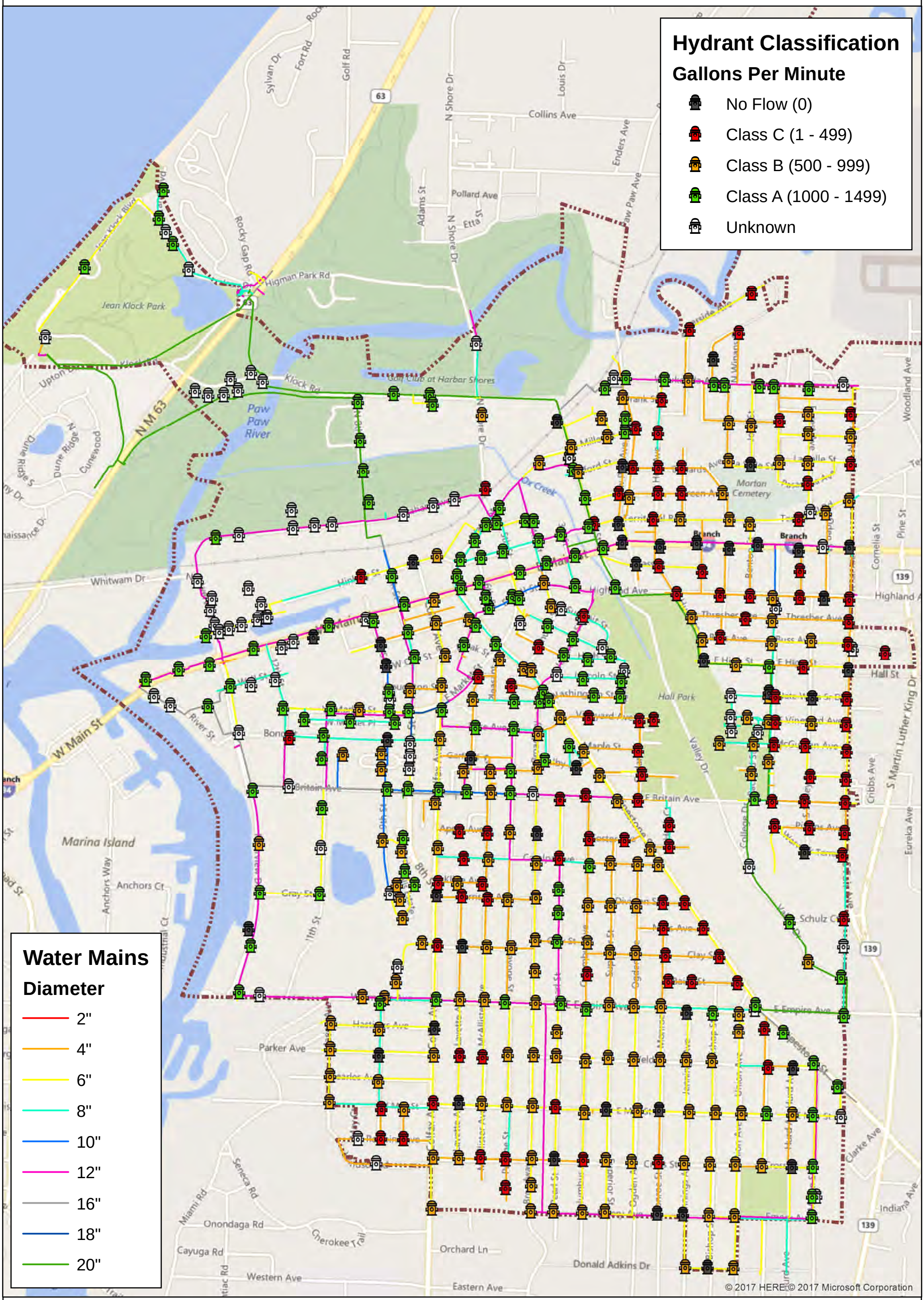
GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-01056	Ductile Iron, Assumed	16"	93.3	2012	5	0.2	0	1	90	5.6	0.6	3.1	0.1	85
WMAIN-01057	Ductile Iron, Assumed	16"	397.8	2012	5	0.2	0	1	90	5.6	0.6	3.1	0.1	85
WMAIN-01061	Ductile Iron, Assumed	16"	420.8	2012	5	0.2	0	1	90	5.6	0.6	3.1	0.1	85
WMAIN-01318	Ductile Iron, Assumed	16"	665.8	Pre-1999	43	1	0	1	90	8	4.8	38.2	0.5	47
WMAIN-00085	Cast Iron, Assumed	18"	181.8	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00427	Cast Iron, Assumed	18"	6.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00828	Cast Iron, Assumed	18"	111.3	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00904	Cast Iron, Assumed	18"	98.2	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00905	Cast Iron, Assumed	18"	196.9	1969	48	1	0	1	75	8	6.4	51.2	0.6	27
WMAIN-00906	Cast Iron, Assumed	18"	303.4	1969	48	1	0	1	75	8	6.4	51.2	0.6	27
WMAIN-00943	Cast Iron, Assumed	18"	123.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01447	Cast Iron, Assumed	18"	89.7	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01448	Cast Iron, Assumed	18"	70.7	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00112	Cast Iron, Assumed	20"	65.5	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00150	Cast Iron, Assumed	20"	174.5	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00151	Cast Iron, Assumed	20"	44.1	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00153	Cast Iron, Assumed	20"	15.2	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00154	Cast Iron, Assumed	20"	52.8	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00157	Cast Iron, Assumed	20"	703.3	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00508	Cast Iron, Assumed	20"	32.1	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00509	Cast Iron, Assumed	20"	97.8	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00591	Cast Iron, Assumed	20"	909.8	1968	49	0.2	0	1	75	5.6	6.5	36.6	0.7	26
WMAIN-00594	Cast Iron, Assumed	20"	354.1	1968	49	0.2	0	1	75	5.6	6.5	36.6	0.7	26
WMAIN-00595	Cast Iron, Assumed	20"	645.2	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00598	Cast Iron, Assumed	20"	93.9	1968	49	0.2	0	1	75	5.6	6.5	36.6	0.7	26
WMAIN-00694	Cast Iron, Assumed	20"	9.4	1934	83	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00712	Cast Iron, Assumed	20"	87.0	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00713	Cast Iron, Assumed	20"	647.0	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00716	Cast Iron, Assumed	20"	9.4	1950	67	1	0	1	75	8	8.9	71.5	0.9	8
WMAIN-00734	Cast Iron, Assumed	20"	589.4	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00735	Cast Iron, Assumed	20"	318.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00738	Cast Iron, Assumed	20"	9.4	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00752	Cast Iron, Assumed	20"	1548.1	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00753	Cast Iron, Assumed	20"	56.6	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00786	Cast Iron, Assumed	20"	22.9	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00790	Cast Iron, Assumed	20"	352.6	1909	108	0	0.8	1	75	6.6	10.0	66.0	1.0	0
WMAIN-00832	Cast Iron, Assumed	20"	1003.0	1968	49	1	0	1	75	8	6.5	52.3	0.7	26
WMAIN-00926	Cast Iron, Assumed	20"	990.2	2000	17	0	0	1	75	5	2.3	11.3	0.2	58
WMAIN-00931	Cast Iron, Assumed	20"	88.7	1947	70	1	0	1	75	8	9.3	74.7	0.9	5
WMAIN-00932	Cast Iron, Assumed	20"	195.5	1947	70	1	0	1	75	8	9.3	74.7	0.9	5
WMAIN-00933	Cast Iron, Assumed	20"	173.2	1947	70	0.2	0	1	75	5.6	9.3	52.3	0.9	5
WMAIN-00936	Cast Iron, Assumed	20"	921.5	1950	67	0.2	0	1	75	5.6	8.9	50.0	0.9	8
WMAIN-00937	Cast Iron, Assumed	20"	30.6	1950	67	0.2	0	1	75	5.6	8.9	50.0	0.9	8
WMAIN-00991	Cast Iron, Assumed	20"	67.7	1947	70	1	0	1	75	8	9.3	74.7	0.9	5
WMAIN-01117	Cast Iron, Assumed	20"	1616.9	2000	17	1	0	1	75	8	2.3	18.1	0.2	58
WMAIN-01119	Cast Iron, Assumed	20"	2237.2	2000	17	1	0.5	1	75	9	2.3	20.4	0.2	58
WMAIN-01120	Cast Iron, Assumed	20"	881.0	1947	70	1	0	1	75	8	9.3	74.7	0.9	5
WMAIN-01361	Cast Iron, Assumed	20"	51.6	1947	70	0.8	0	1	75	7.4	9.3	69.1	0.9	5
WMAIN-01538	Cast Iron, Assumed	20"	25.1	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-01539	Cast Iron, Assumed	20"	111.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
<Null>	Cast Iron, Assumed	20"	225.4	1947	70	0.2	0	1	75	5.6	9.3	52.3	0.9	5
WMAIN-00752	Cast Iron, Assumed	20"	790.0	1909	108	1	0	1	75	8	10.0	80.0	1.0	0
WMAIN-00654	Ductile Iron, Assumed	20"	108.4	1974	43	1	0	1	90	8	4.8	38.2	0.5	47
WMAIN-00780	Ductile Iron, Assumed	20"	396.9	1993	24	1	0	1	90	8	2.7	21.3	0.3	66
WMAIN-00781	Ductile Iron, Assumed	20"	52.0	1993	24	0.3	0	1	90	5.9	2.7	15.7	0.3	66
WMAIN-00782	Ductile Iron, Assumed	20"	4.5	1993	24	0.3	0	1	90	5.9	2.7	15.7	0.3	66
WMAIN-00783	Ductile Iron, Assumed	20"	10.3	1993	24	0.3	0	1	90	5.9	2.7	15.7	0.3	66
WMAIN-00784	Ductile Iron, Assumed	20"	29.8	1993	24	0.3	0	1	90	5.9	2.7	15.7	0.3	66
WMAIN-00791	Ductile Iron, Assumed	20"	1575.5	1950	67	1	0	1	90	8	7.4	59.6	0.7	23
WMAIN-00925	Ductile Iron, Assumed	20"	157.0	1974	43	1	0	1	90	8	4.8	38.2	0.5	47
WMAIN-00927	Ductile Iron, Assumed	20"	1624.5	1974	43	1	0	1	90	8	4.8	38.2	0.5	47

GIS Object ID	Material	Diameter (Inch)	Length of Pipe (Feet)	Assumed Install Date	Age in 2017	Proximity to Road Value (0 - 1)	Proximity to Buildings Value (0 - 1)	Size Value (0 - 1)	Effective Excepted Life (EEL)	Consequence of Failure (COF) (0 = Low, 10 = High)	Probability of Failure (POF) (0 = Low, 10 = High)	Criticality (COF x POF) (0 = Low, 100 = Critical)	Consumed Pipe (0 = New, 1 = Consumed)	Remaining Useful Life (Years)
WMAIN-00928	Ductile Iron, Assumed	20"	690.1	1974	43	1	0	1	90	8	4.8	38.2	0.5	47
WMAIN-00929	Ductile Iron, Assumed	20"	506.3	Pre-2012	43	0	0	1	90	5	4.8	23.9	0.5	47
WMAIN-00930	Ductile Iron, Assumed	20"	112.2	1974	43	0	0	1	90	5	4.8	23.9	0.5	47
WMAIN-00934	Ductile Iron, Assumed	20"	259.2	1974	43	1	0	1	90	8	4.8	38.2	0.5	47
WMAIN-00935	Ductile Iron, Assumed	20"	300.2	1974	43	1	0	1	90	8	4.8	38.2	0.5	47
WMAIN-00953	Ductile Iron, Assumed	20"	761.6	1993	24	0.8	0	1	90	7.4	2.7	19.7	0.3	66
WMAIN-01033	Ductile Iron, Assumed	20"	211.7	1950	67	1	0	1	90	8	7.4	59.6	0.7	23
WMAIN-01034	Ductile Iron, Assumed	20"	176.0	1950	67	0	0	1	90	5	7.4	37.2	0.7	23
WMAIN-01109	Ductile Iron, Assumed	20"	2055.7	1993	24	0.8	0	1	90	7.4	2.7	19.7	0.3	66
WMAIN-01118	Ductile Iron, Assumed	20"	87.4	2000	17	1	0	1	90	8	1.9	15.1	0.2	73
WMAIN-01121	Ductile Iron, Assumed	20"	303.0	1974	43	0	0	1	90	5	4.8	23.9	0.5	47
WMAIN-01122	Ductile Iron, Assumed	20"	17.8	2000	17	0.3	0	1	90	5.9	1.9	11.1	0.2	73
WMAIN-01123	Ductile Iron, Assumed	20"	19.9	2000	17	0.3	0	1	90	5.9	1.9	11.1	0.2	73
WMAIN-01124	Ductile Iron, Assumed	20"	228.6	1974	43	0.2	0	1	90	5.6	4.8	26.8	0.5	47
WMAIN-01125	Ductile Iron, Assumed	20"	572.0	2000	17	0.3	0	1	90	5.9	1.9	11.1	0.2	73
WMAIN-01126	Ductile Iron, Assumed	20"	544.6	2000	17	0	0	1	90	5	1.9	9.4	0.2	73
WMAIN-01127	Ductile Iron, Assumed	20"	826.7	1974	43	0	0	1	90	5	4.8	23.9	0.5	47
WMAIN-01363	Ductile Iron, Assumed	20"	60.5	1950	67	1	0	1	90	8	7.4	59.6	0.7	23
WMAIN-01696	Ductile Iron, Assumed	20"	53.6	1993	24	1	0	1	90	8	2.7	21.3	0.3	66

APPENDIX B

2017 HYDRANT CLASSIFICATION MAP

Hydrants by Classification

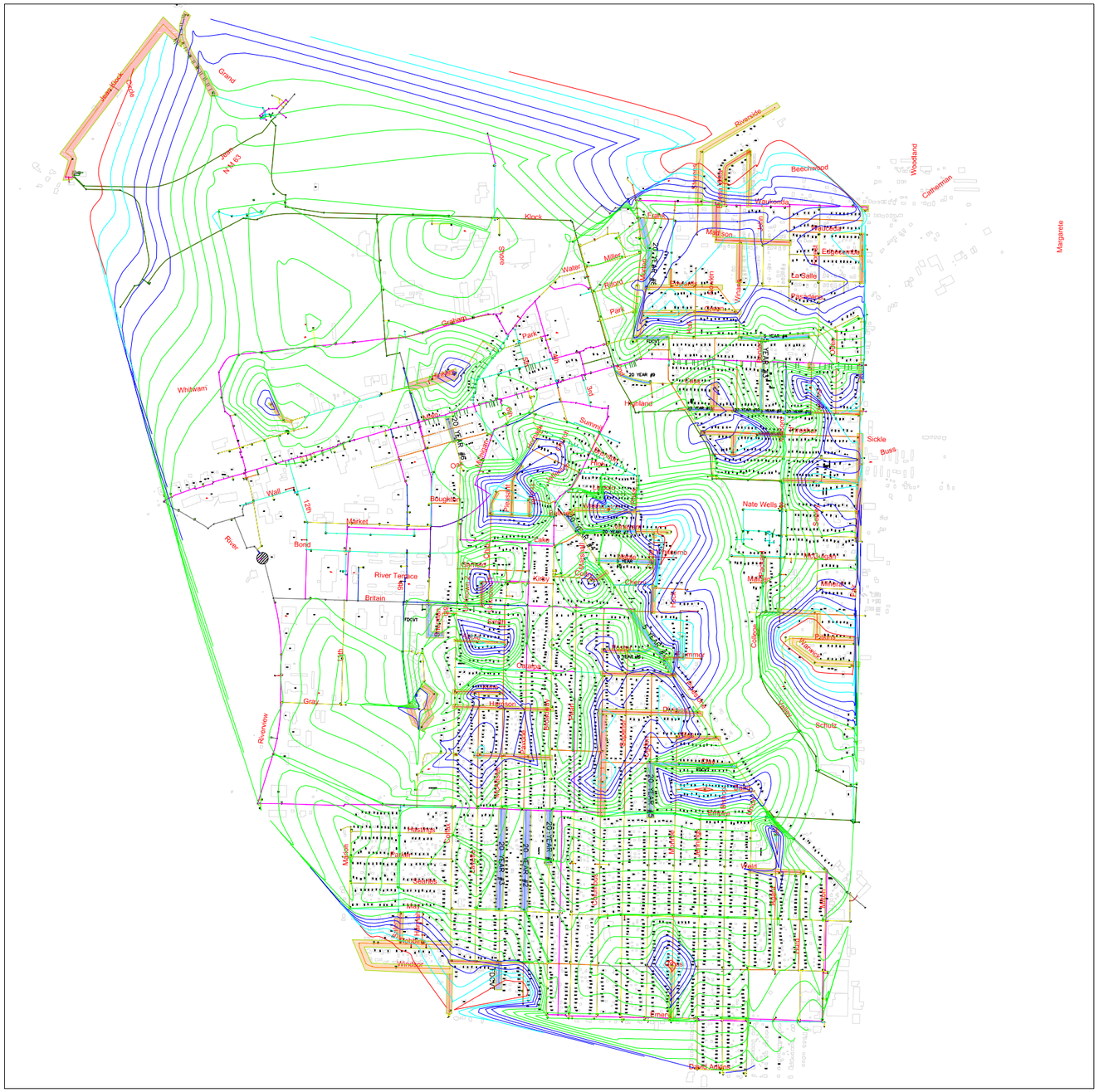


City of Benton Harbor, Michigan

0 0.125 0.25 0.5 Mi

ABONMARCHE
Confidence By Design

Prepared: September 2017



HYDRANT FLOW
Legend: Fire Flow (Available) (gpm)

<= 500
<= 750
<= 1,000
<= 1,500

Color Coding Legend
Pipe: Diameter (in)

<= 2.0
<= 4.0
<= 6.0
<= 8.0
<= 10.0
<= 12.0
<= 16.0
<= 18.0
<= 20.0

NO.	REVISION DESCRIPTION:	BY:	DATE:

ABONMARCHE
Battle Creek
Benton Harbor
Kalamazoo
South Haven
Goshen
Hobart
Lafayette
South Bend
Valparaiso
Engineering · Architecture · Land Surveying
17 N. Washington St.
Valparaiso, IN 46383
T 219.464.4464
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PROJECT:
BENTON HARBOR
WATER RELIABILITY STUDY

SHEET TITLE:
TOTAL AVAILABLE
FIRE FLOW
CURRENT CONDITIONS

DRAWN BY: SRF
DESIGNED BY:
PM REVIEW:
QA/QC REVIEW:
DATE:
SEAL:
SIGNATURE:
DATE:

HARD COPY IS INTENDED TO BE 24" X 36" WHEN PLOTTED. SCALE(S) INDICATED AND GRAPHIC QUALITY MAY NOT BE ACCURATE FOR ANY OTHER SIZES

SCALE:
HORZ: 1"=750'
VERT:

ACI JOB #
16-1099

SHEET NO.
1 of 1

APPENDIX C

WATER TOWER

INSPECTION REPORT

Dixon Engineering, Inc.

Maintenance Inspection

650,000 Gallon Double Ellipse

Britain Tank
Benton Harbor, Michigan

Inspection Performed: May 7, 2008
Report Prepared: May 21, 2008
Reviewed by Ira M. Gabin, P.E.: June 4, 2008

Phone (616) 374-3221
Fax (616) 374-7116
http://www.dixonengineering.net
dixon@dixonengineering.net

Dixon Engineering Inc.
1104 Third Ave. Lake Odessa, MI 48849

CONCLUSIONS:

1. The exterior coating is a urethane system that is in fair condition, has poor adhesion, and is slightly faded. Primary modes of failure are delamination, primer bleed-through, and spot coating breaks to the substrate. There are numerous areas of spot coating failure on the sidewalls and roof. Coating deterioration is moderate. The logo and lettering are extensively faded.

2. The wet interior coating is a three coat epoxy system that is in good condition. There are areas of minor spot failure on the floor and sidewalls. Above the high water line the coating is in good condition. The roof coating is deteriorating at open lap seams and on the roof beam edges. The roof beams and lap joints have minor edge corrosion.

3. Lower sections of some of the radial roof stiffeners have fallen into the tank's bowl.

RECOMMENDATIONS:

1. Schedule regular cleanings and inspections of the tank by an independent, third party as recommended by AWWA, or once every five years.

2. In three years budget to high pressure water jet (10,000 – 20,000 psi) spot power tool clean, and recoat the exterior with an acrylic system. The estimated cost is $195,000.

3. Or, abrasive blast clean the tank's exterior to a commercial grade (SSPC-SP6) condition inside a dust-tight, flexible-frame containment system, and recoat with a four coat polyurethane system. The estimated cost is $300,000, plus $75,000 for containment.

4. Repair and continue cathodic protection for wet interior surfaces. Use a qualified cathodic protection contractor for maintenance.

5. Repair foundation cracks and seal the surface with an epoxy coating. Cost would be incidental if completed with a major recoating project.

6. Recaulk areas of missing caulk between the tank's column baseplates and foundations. This could be done by in-house personnel.

7. Adjust the sway rods. The estimated cost is $3,000.

8. Install a 30 in. manway in the bottom of the riser. The estimated cost is $7,000.

9. Enlarge the roof hatch to 30 in. diameter. The estimated cost is $3,000.

10. Install a 25 ft. diameter, 42 in. high railing and a painter's rail on the roof. The estimated cost is $12,000.

11. Abrasive blast clean to a near white grade (SSPC-SP10), and paint the rusted pit piping. The estimated cost is $5,000.

12. Install a new wet interior ladder from the roof hatch to the bowl. Equip with a fall prevention device. Remove the damaged 4 ft. of ladder at the sidewall manway and replace with new. The estimated cost is $8,000.

13. Remove the roof ladder, and replace with hand rails from the step-off platform to the roof hand rail. The estimated cost is $10,000.

14. Weld plates over the cathodic protection lift holes in the roof and the hole in the roof vent. The estimated cost is $3,000.

15. Reinstall the fallen sections of the roof beams and inspect the remaining beams for repair. Budget $20,000.

A DISCUSSION on RESCUE/RETRIEVAL OPERATIONS from ELEVATED LEGGED STORAGE TANKS

A series of accidents involving falls from or in water tanks has highlighted inadequacies in tank design and a potentially greater problem. The rescue may be more dangerous than the original accident, with the potential for more loss of life or injury. Contractors and engineers are responsible for their own employees. Even with safety training and proper equipment, accidents will occur. Most rescue squads are local or neighboring fire departments, some with more practice than other departments. Elevated tanks were designed to store water, not for rescue or retrieval convenience. The following items would make working on and retrieval from water tanks safer. This discussion is offered as a starting point. We recommend that you meet with your rescue personnel and draft a rescue plan. A copy of the plan should be kept at the tank and with the rescue crew.

OSHA now requires 30 in. manways and hatches, and roof ladders are to be replaced with platforms, steps, and railings. We have always objected to replacement of ladders every other year as regulations change, especially on retrofit of existing tanks. We recommend the changes be made during the next major tank painting project.

Retrieval from Interior:

Current Access:

Access to the roof is from the leg, sidewall, and roof ladders. The ladders do not meet MiOSHA size standards. All exterior ladders contain a rail-type fall prevention device. There is a ladder in the wet interior from the sidewall manway to the bowl area. The wet interior ladder is in poor condition and does not have a fall prevention device. There is a 12 in. x 18 in. manway in the bottom of the riser, and a 24 in. diameter roof hatch to the wet interior. The top of the bowl riser does have a grate, but has a safety railing.

Modified Access:

Providing safe access to rescue personnel is essential. Replace the sidewall ladder so it extends straight up to a work platform with railings that surrounds the roof edge hatch. Replace the existing roof hatch with a 30 in. hatch with a lockable, rainproof lid. The existing hatch is too small for a rescue basket and rescue personnel with equipment. Replace the roof ladder with a series of steps and railings to permit access to the center of the roof standing upright. Install a movable fall prevention device on the railing. Install a 42 in. high railing on the roof. The railing would allow tie-off locations and increased safety during routine maintenance. The ladder and railing could be used your personnel when checking lights, vents, and security annually; or by antenna personnel. The railing could also be used for antenna mounting. Install a new wet interior ladder from the roof hatch to the floor, and repair the damaged section of the sidewall/bowl ladder. Once in the tank there is a 6 ft. diameter riser. A 42 in. high railing has been installed around the top of the riser. This provides a safe, although slippery, work environment for the rescue crew for retrieval down the riser.

Retrieval down Riser:

1. *Retrieval down through the riser is usually the safest method. Remove the new vent from the top center of the tank, and attach a winch or pulley system to a tripod set-up over the vent.*

2. *Raise and lower the basket through the riser and out the new 30 in. diameter manway at the bottom of the riser. Rescue personnel would also raise and lower all their equipment through the riser, and then leave the wet interior using the wet interior ladder with fall prevention. On the roof, personnel would be working from inside the security of a roof railing around the center attachment area and roof hatch.*

Modifications Necessary:

1. *Install a 30 in. manway in the bottom of the riser ($7,000).*

2. *Install a new sidewall ladder with a step-off platform and roof hand rails ($10,000).*

3. *Install a new 30 in. roof hatch ($3,000).*

4. *Install a roof railing ($12,000).*

5. *Install a new wet interior ladder ($8,000).*

Equipment:

Winch or pulley system and tripod.
Basket.
Fall prevention sliders.

COST SUMMARY:

Exterior high pressure water jet and recoat with acrylic system:	$195,000
Adjust sway rods:	3,000
Install 30 in. diameter manway in riser:	7,000
Install 30 in. roof hatch:	3,000
Install roof railing with painter's rail:	12,000
Paint pit piping:	5,000
Install new wet interior ladder with fall prevention:	8,000
Replace sidewall ladder with vertical ladder and step-off platform:	10,000
Weld cathodic caps and hole in roof vent:	3,000
Repair and replace roof beams and seal weld remaining beams and plug holes:	20,000
	$266,000
Engineering and contingencies:	53,000
Total:	**$319,000**

Because of the delaminating topcoat, a long-term strategy includes removal of the total coating system and abrasive blast cleaning and repainting with a dust-tight, flexible-frame containment system – add $180,000 to exterior repainting costs.

Note: The age and design of this tank with its lattice legs, struts, sway rods, and riveted construction make it very expensive to maintain compared to modern tanks. By comparison, the cost to overcoat the exterior of a modern 650,000 gallon pedestal-style tank is estimated at $85,000. The City is encouraged to discuss with its consulting engineers long-term planning for a new tank that would be much cheaper to maintain.

INSPECTION:

On May 7, 2008, Dixon Engineering, Inc. (DIXON) performed a maintenance inspection on the 650,000 gallon double ellipse water storage tank owned by the City of Benton Harbor, MI. Purposes of the inspection were to evaluate the interior and exterior coatings' performance and life expectancy; assess the condition of metal surfaces and appurtenances; review safety and health aspects; and make budgetary recommendations for continued maintenance of the tank. All recommendations are incorporated into this report, with budgeting estimates for repairs. Inspectors for DIXON were Roy Wise, Larry Houck, and Eric Binkowski. Scheduling and arrangements for the inspection were completed through Greg Alimenti.

CONDITIONS and RECOMMENDATIONS:

Exterior Coating Conditions:

The exterior coating is a multiple coat urethane system applied in 1990. It is beginning to chalk and fade, and there is a loss of gloss. Surfaces have faded due to exposure to ultraviolet rays, which is a normal occurrence for an exposed coating system. The coating is adequately protecting the metal and aesthetics are fair. While the coating may appear to have an acceptable aesthetic quality, the actual condition is poor. Adhesion is poor and many, minor coating breaks and exposed prime coat will soon appear, allowing rust to form on the surface.

The riser coating is in fair condition, with minor breaks, with small amounts of surface rust and rust staining. Primary methods of deterioration are spot coating breaks and topcoat delamination.

The bowl coating is in fair condition, with minor coating breaks, with small amounts of surface rust and rust staining. Primary method of deterioration is spot coating breaks to the primer.

The balcony coating is in fair condition.

The exterior sidewall coating is in fair condition. Primary methods of deterioration are delamination and spot coating breaks to the primer, with small amounts of surface rust and rust staining. The sidewalls and lower bowl areas are covered with light algae growth.

The exterior roof coating is in fair condition. Primary methods of deterioration are spot coating breaks and undercoat bleed-through. There are minor areas of primer bleed-through on the roof.

Lettering on the tank consists of "BENTON HARBOR" in two locations. Lettering is block-style. There is a sidewall logo (City logo with gulls).

Exterior Coating Recommendations:

Budget for exterior overcoating by 2011, or when aesthetics dictate. The estimated cost to recoat is $195,000.

High pressure water jet (10,000 – 20,000 psi) the existing coating to remove loose and poorly adhering topcoats. The coating system would consist of a spot prime coat on the bare metal, followed by two full coats of acrylic. The acrylic system had good gloss and sheen retention. The additional recoat would supply an added barrier thickness for continued service. This alternative was selected because the existing primer has good adhesion. The purpose of this procedure is to remove all the poorly adhering topcoat, leaving the primer in-place. This procedure greatly reduces the cost of the project and prolongs the life of the coating system. The system can be repainted every eight-to-ten years without disturbing the primer. With regular recoating, the life of the existing system could be extended twenty years or more before the coating would have to be completely removed. The tank would be removed from service during the project to reduce moisture condensation on the surface.

Wet Interior Coating Conditions:

The wet interior coating is an epoxy system applied by G & M Painting in 1990. The roof coating is in good condition, 99% intact, with the primary areas of deterioration along the lap seams, beam edges, and in crevices. The tank's roof contains open lap seams that have started to rust and stain, typical for a tank of this construction where the lap seams are open and not seal welded or caulked. Staining in the lap seams is not a concern, but should be monitored during future inspections for corrosion growth. Roof beam edge corrosion is typical, but should be corrected before structural loss of steel occurs. Coating deterioration is occurring along edges of some of the roof support beams. Rust is also occurring at the roof-to-beam junction.

The sidewall coating is in good condition, 99% intact. There is no significant damage at the high water line, which would be the area most affected by ice pressures and ice movement. Causes of deterioration are spot coating breaks, delamination from age, and abrasion. The coating is still protecting the metal, with the exception of several spot coating breaks. The sidewalls are covered with light mineral staining, which does not affect the integrity of the coating system.

Coating on the bottom of the tank is in good condition, 99% intact. Causes of deterioration are blisters, spot coating breaks from age, and abrasion. The coating is still protecting the metal, with the exception of some spot coating breaks. The bottom is covered with light mineral staining, which does not affect the integrity of the coating system. The bottom of the tank was covered with approximately ¼ in. of mud sediment that was flushed from the interior.

The riser coating is in fair condition, 95% intact. Causes of deterioration are pinholes, and spot coating breaks at lap seams and stitch welds. The coating is still protecting the metal, with the exception of several spot coating breaks. The riser coating is covered with light mineral staining, which does not affect the integrity of the coating system.

Wet Interior Coating Recommendations:

The existing coating system has not deteriorated to the point where replacement is warranted. The cathodic protection system did not appear to be functioning based on the severed lines at the top of the riser. Long-term budget for repainting in ten years. The estimated cost is $95,000.

Cathodic Protection Conditions:

The floating ring cathodic protection system appeared to be non-functional. The wiring has been sheared in the bowl. Coating breaks are present on the floor, sidewalls, and riser. Pitting has started at the coating breaks, as the cathodic system is not working.

Cathodic Protection Recommendations:

Repair and continue operation of the submerged cathodic protection system. Have a qualified cathodic protection contractor maintain the system. Repairs to the system should be completed as soon as possible to minimize corrosion growth at areas of coating breaks.

Site Conditions:

The tank site is small in size and is fenced with a single locking gate. There is an average size staging area for contractors' equipment. The site is maintained. There is residential development to the east and north, and commercial development to the west. Neighbors are close to the tank and extra precaution will need to be taken to keep paint and/or debris from neighbors' properties. The site is accessible from a municipal street, and the tank is located approximately 20 ft. from the main access road. Drainage for the site is towards the foundation.

Foundation Conditions:

The exposed column and riser foundations are in good condition and showed minor amounts of deterioration. Deterioration includes chipping and spalling. The concrete is spalled without rebar exposure. Differential settlement of the foundations has not occurred from freeze/thaw cycles. The top 6 in. of the foundations are exposed. Corrosion is occurring on some of the anchor bolt chairs.

Grout Conditions:

The grout is in poor condition around the column baseplates. 20 ft. of grout is missing between the bottom plates and column foundations.

Grout Recommendations:

Remove all loose and deteriorated column caulk and repair. This could be done by in-house personnel.

Leg Conditions:

The tank is supported by ten single lattice columns that attach to the sidewalls and bowl at balcony level. The columns are in good condition and appeared in alignment.

Balcony Conditions:

Disclaimer: Unless we feel that ladders and balconies are unsafe, it is our opinion that if they were built to code at the time of construction, they do not require replacement. The code changed three times in the late 1980's and early 1990's and it seems ridiculous to replace each time. However, it is our responsibility to inform you of this possible deficiency.

The exterior balcony is in fair condition. It is located on the exterior sidewalls, is 30 in. wide, with a 42 in. high hand rail. The hand rail has a kick plate at the balcony floor. The diagonal balcony posts and top rail are angle iron. The balcony acts as a sidewall stiffener. There was no evidence of bird droppings or ponding water. There is minor corrosion at the balcony-to-tank connection.

Rod Conditions:

The tank's sway rods are in good condition. Coating on the sway rods is in fair condition, with minor spots of coating failure and surface rust on the rods and turnbuckles, and on the struts between the leg columns. Because of the inaccessibility of the sway rods, exact tension could not be determined. However, based on the amount of coating loss on the rods where the rub against each other, it was evident the rods are loose.

The riser tie rods are in good condition. The tank has ten riser tie rods that extend from the leg columns to the riser with bolted ring connections. Crevice corrosion is active behind the ring.

Rod Recommendations:

Adjust the sway rods. Loose sway rods will allow the tank to move excessively, placing undue stress on the connections. The estimated cost is $3,000.

Overflow Pipe Conditions:

The tank has an 8 in. diameter overflow pipe that exits the roof knuckle, extends down along the sidewall, through the balcony, and down along a leg column to ground level. The pipe discharges to a storm drain below grade.

Hatch/Manway Conditions:

The tank has a 24 in. diameter, flip-top, round roof access hatch to the wet interior that is in good condition. The hatch has a rainproof cover consisting of a 4 in. curb, and a 2 in. lip on the cover. It was locked. The hatch was not operable, as the roof ladder prevents opening the hatch.

The tank has a 24 in. diameter access manway in the sidewall shell, and a 24 in. diameter access manway in the riser that are in good condition. The sidewall manway is not hinged, and the gasket showed no signs of leaking. The bolts have no coating.

Hatch/Manway Recommendations:

Install a 30 in. manway in the riser. Average size rescue baskets will not pass through the existing manway. The estimated cost is $7,000.

Replace the roof access hatch with a new 30 in. curbed hatch that has a 2 in. lip, 4 in. curb, and a lockable hasp. Average size rescue baskets and rescue personnel wearing equipment will not pass through the existing 24 in. hatch. The estimated cost is $3,000.

Vent Conditions:

The roof vent is a 16 in. flow-through design. The vent has a 3 in. diameter hole cut through the top plate for antenna cable. The hole is open and would allow birds to enter the wet interior. The vent is properly screened. No evidence of entry was found.

Vent Recommendations:

Weld shut the hole that was cut in the top plate of the vent. This could be done in conjunction with roof repairs.

Roof Hand Rail/Painter's Rail Conditions:

The roof has neither a roof hand rail nor a painter's rail.

Roof Hand Rail/Painter's Rail Recommendations:

Install a 25 ft. diameter, 42 in. high railing on the roof. The railing would allow tie-off locations and safety during routine vent screen and obstruction light inspections, and would also provide a work area for retrieval personnel using roof extraction. The railing should provide sufficient area to rest a basket for helicopter lift, or for stabilizing before lowering down through the riser. Install a painter's rail outside the railing so contractor rigging does not interfere with the railing's interior clear area. The estimated cost is $12,000.

Install safety grabs and rigging couplings on the exterior roof near the painter's rail for fall prevention of workers in the wet interior. The grabs would allow workers in the wet interior to be completely tied off to fall prevention at all times. Cost would be incidental to coating costs.

Antenna Conditions:

The roof area contains one antenna that is attached to the roof vent.

The balcony has three antennas attached to mounting brackets on the hand rail. The antenna cables attached to the roof vent present a potential safety and health problem.

Antenna Recommendations:

Lock the access hatch to the wet interior. Because of the antennas there will be people working on the tank on a routine basis who may not be familiar with the sanitary requirements of a potable water supply. In addition, with more people accessing the tank, the door may be inadvertently left open.

Require the antenna contractor to return and correct the cable and hygiene problems. The simple solution is to have a mounting pole welded to the roof and a plate welded over the open hole.

Pit/Pit Piping Conditions:

The tank is operated by valves located in the pit below the tank. The pit does not have an altitude valve. The owner noted there have been no problems with the valve. The rusted piping is in poor condition. Coating on the piping is also in poor condition. The pipes and valves have extensive coating failure. Some of the valves are new and do not require painting. Said valves should be protected from damage during any maintenance painting. No coating remains on the piping. Steel loss is occurring on the flanges and bolts in the pit. The pit was dry during the inspection.

Pit/Pit Piping Recommendations:

Abrasive blast clean the piping to a near white condition (SSPC-SP10), and apply two coats of epoxy. The corroded bolts should be replaced after abrasive blast cleaning. The estimated cost is $5,000.

Fill Pipe Conditions:

The 10 in. diameter fill pipe extends 1 ft. into the bottom of the riser. The top of the pipe does not have a deflector plate.

Mud Valve Conditions:

A single mud valve is located in the bottom of the riser. The valve operated properly during the inspection.

Ladder Conditions:

The tank has an exterior leg ladder that starts approximately 12 ft. above ground level, and extends up to the balcony. The ladder is in good condition, and contains a rail-type fall prevention device.

The tank has a fixed sidewall shell and revolving roof ladder. The ladder has a rail-type fall prevention device, preventing movement. The roof ladder cannot move past the roof manway and overflow weir box. The revolving roof ladder attaches around the vent pipe at the center of the roof.

The wet interior has a ladder from the sidewall manway to the bottom of the bowl. The ladder is in poor condition, and does not meet current MiOSHA size requirements. The top section has been damaged by ice. The ladder does not have a rail-type fall prevention device. There is no ladder from the roof manway to the bowl.

Ladder Recommendations:

The revolving roof sidewall shell ladder should be replaced with a vertical sidewall ladder that runs up to a step-off platform that is surrounded with hand rails at the roof hatch. The step-off platform would provide a safe working area around the roof hatch. The estimated cost is $10,000. A hand rail from the step-off platform to the roof hand rail would replace the roof ladder. Steps or cleats would be installed to increase traction. This would remove all loading from the roof vent pipe.

Install a ladder in the wet interior from the roof to the bowl. Equip with a fall prevention device. Repair the damaged section of the sidewall/bowl ladder. The estimated cost is $8,000.

Wet Interior Metal Conditions:

The steel structure is in poor condition above the high water line, and in good condition below the high water line.

The interior roof is supported by twelve radial beams that are in poor condition, with minor corrosion at the edges. Several of the roof beams are bent and broken. There are gaps in the riveted seam where the roof meets the sidewalls. There are several old bolt holes in the roof.

There is a hand rail around the riser opening.

Metal in the riser is severely pitted. The pitting occurred prior to the current coating application. The metal is being protected by the current coating. There is minor, active corrosion in the riser.

Wet Interior Metal Recommendations:

Monitor corrosion on edges of the roof beams. Recoat the roof before metal loss becomes significant.

Reweld or replace the five bent and broken roof beams. The estimated cost is $20,000. This is budgeted separately and does not include any other paint touch-ups. Plug the old bolts holes in the roof and seal the gaps in the riveted seam where the roof meets the sidewall, and where the cathodic caps on the roof have shifted. Seal weld the remaining or undamaged roof beams.

STEEL TANK FIELD INSPECTION REPORT
LEG TANK

DATE: **May 7, 2008**

I. TANK DATA

OWNER: **City of Benton Harbor**
CLIENT CODE: **22-11-05-01**
TANK NAME: **650,000 Gallon Double Ellipse (Britain Tank)**
LOCATION: City: **Benton Harbor**
State: **MI**
TANK SIZE: Capacity: **650,000 gallons**
Height to bottom (LWL): **126 feet**
CONSTRUCTION: **Welded - Riveted**
Type of Structure: **Double Ellipse**
Type of Roof: **Ellipsoid**
Type of Bowl: **Ellipsoid**
DATE CONSTRUCTED: **1962**
MANUFACTURER: **PDM**

COATING HISTORY:	EXTERIOR	WET INTERIOR	DRY INTERIOR **N/A**
DATE LAST COATED	**1990**	**1990**	
CONTRACTOR	**G&M**	**G&M**	
PAINT SYSTEM	**Polyurethane**	**3 coat epoxy polyamide**	
SURFACE PREPARATION	**SP6**	**SP10**	
PAINT MANUFACTURER	**Tnemec**	**Tnemec**	
PAINT SAMPLES	**No**	**No**	
LEAD COATING	**No**	**No**	

INSPECTED BY: **Dixon Engineering, Inc.**
INSPECTORS: **Roy Wise; Larry Houck; Eric Binkowski**
TYPE OF INSPECTION: Maintenance
DATE LAST INSPECTED: **10/16/97**

II. INSPECTION DATA

SITE CONDITIONS:

Fenced: **Yes**
Control building: **No**
Antenna control sites: **Yes**
Number: **1**
Location: **Adjacent to riser; underneath bow; city antenna**
Site condition: **Not maintained**
Neighborhood: **Residential - Retail**
Describe surroundings: **Residential north and east; body shop west**
Power lines within 50 feet: **Yes**
Other concerns: **Building (8 ft. x 8 ft.) located 6 ft. from riser; trees and limbs touching tank southeast side; fencing 6 ft. – 8 ft. from tank legs**

PIPING:

Pit: **Yes**
Location: **Adjacent to tank**
Condition of pit structure: **Fair**
SCADA controls: **No**
Controls heated: **Yes**
Altitude valve: **Yes**
Condition of coating: **Poor**
Describe coating: **Erosion - No coating remaining**
Condition of metal: **Good**
Piping comments: **Some valves are new with intact coating; older valves/pipes have scale rust on bolts and flanges**

FOUNDATION:

Riser:

Foundation exposed: **Yes**
Amount exposed: **6 inches**
Exposed foundation condition: **Good**
Chipped or cracked: **Yes**
Severity: **Minor**
Type of grout: **None**
Indications of foundation settlement: **No**
Riser comments: **Riser moved during inspection**

Legs:

Foundation exposed: **Yes**

FOUNDATION:

Amount exposed: **6 inches**
Exposed foundation condition: **Good**
Concrete chipped or cracked: **Yes**
Severity: **Minor**
Type of grout: **Caulk**
Condition: **Fair**
Grout missing: **Yes**
Amount missing: **20 ft.**
Indications of foundation settlement: **No**
Leg comments: **Delaminated coating to substrate**

Site:

Site drainage: **Towards foundation**
Indications of underground leakage: **No**
Undermining of foundation: **No**
Shrubs, trees, etc. encroachment: **No**

EXTERIOR:

Legs:

Number: **10**
Type: **Lattice**
Exterior connection to tank: **Good**
Explain: **Minimal rusting/rust staining**
Topcoat condition: **Good**
Primer/Previous coating condition: **Good**
Describe coating: **Delamination - Spot coating breaks to substrate**
Dry film thickness (DFT) of coatings: **8 - 14 mils**
Metal condition: **Good**
Leg comments: **Delaminated topcoat to prime**

Riser:

Diameter: **72 inches**
Topcoat condition: **Fair**
Primer/Previous coating condition: **Good**
Describe coating: **Delamination - Rust bleed through**
Mildew growth: **Yes**
Amount: **Light**
Dry film thickness (DFT) of coatings: **6 - 10 mils**
Metal condition: **Good**

EXTERIOR:

Riser comments: **Delaminated topcoat-to-prime; exposed steel rusting**

Tank Bowl:

Topcoat condition: **Good**
Primer/Previous coating condition: **Good**
Mildew growth: **Yes**
Amount: **Light**
Metal condition: **Good**
Riser to bowl connection: **Good**
Bowl comments: **Light algae growth**

Tank Sidewall:

Lettering: **Yes** Number: **2**
Describe the lettering: **BENTON HARBOR**
Logo: **Yes** Number: **1**
Describe the logo: **City logo with gulls**
Topcoat condition: **Fair**
Primer/Previous coating condition: **Good**
Describe coating: **Fading - Delamination - Spot coating breaks to primer**
Dry film thickness (DFT) of coatings: **8 - 13 mils**
Metal condition: **Good**
Sidewall comments: **Topcoat cracks and delamination; areas of pinhole rusting at low film build**

Tank Roof:

Topcoat condition: **Good**
Primer/Previous coating condition: **Fair**
Describe coating: **Fading - Delamination - Spot coating breaks to substrate - Rust bleed-through**
Dry film thickness (DFT) of coatings: **7 - 14 mils**
Metal condition: **Good**
Roof comments: **Rusting at spot coating breaks; coating undercoat bleed-through from coating erosion**

EXTERIOR ACCESSORIES:

Anchor Bolts:

Number bolts per leg: **2**
Diameter: **1½ inches**

EXTERIOR ACCESSORIES:

Number of riser anchor bolts: **None**
Coating condition: **Good**
Metal condition: **Good**
Anchor bolt comments: **Some rust bleed-through and corrosion with minor steel loss**

Exterior Overflow Pipe:

Coating condition: **Good**
Metal condition: **Good**
Inside diameter: **8 inches**
Condition of screen: **None in-place**
Flap gate: **No**
Air gap: **No**
Splash pad: **No**
Overflow comments: **Overflow connects to storm sewer below grade**

Riser Manway:

Coating condition: **Fair**
Metal condition: **Good**
Size: **24 in. diameter**
Gasket leaking: **No**
Hinged: **Yes**

Struts and Rods:

Number of bays: **4**
Sway rods:
- Coating condition: **Fair**
- Metal condition: **Good**

Struts:
- Coating condition: **Fair**
- Metal condition: **Good**

Riser rods:
- Coating condition: **Fair**
- Metal condition: **Good**

Sway rods, struts, rod comments: **Loose sway rods in upper bay; coating delaminated from prime coat**

Leg Ladder:

Coating condition: **Good**

EXTERIOR ACCESSORIES:

Metal condition: **Good**
Toe clearance: **7 inches**
Width of rungs: **15 inches**
Thickness of rungs: **5/8 inch**
Shape of rungs: **Round**
Fall prevention device: **Yes**
Type: **Rail**
Condition: **Good**
Cage: **No**
Step-off Platform: **No**
Leg ladder comments: **Delaminated topcoat-to-prime; surface rusting at exposed prime**

Balcony:

Balcony width: **30 inches**
Railing height: **42 inches**
Midrail: **Diagonals**
Toe plate height: **3 inches**
Coating condition: **Fair**
Describe coating: **Delamination - Spot coating breaks to substrate**
Balcony supports and connections: **Good**
Missing bolts or rivets: **No**
Number of penetrations: **11**
Penetrations reinforced: **No**
Penetration uses: **Overflow pipe - columns**
Accumulation of bird droppings: **No**
Water pooling: **No**
Metal condition: **Good**
Balcony comments: **Antenna cables/conduit; rusting along balcony toe kick**

Sidewall Ladder:

Style: **Vertical**
Coating condition: **Good**
Metal condition: **Good**
Toe clearance: **6 inches**
Width of rungs: **15 inches**
Thickness of rungs: **5/8 inch**
Shape of rungs: **Round**

EXTERIOR ACCESSORIES:

Style: **Fixed**
Fall prevention device: **Yes**
Type: **Rail**
Cage: **No**

Sidewall Hatch:

Coating condition: **Good**
Metal condition: **Good**
Size: **24 in. diameter**
Bolted: **Yes**
Hinged: **No**
Gasket leaking: **No**

Platform: N/A

Roof Ladder:

Design: **Revolving**
Coating condition: **Good**
Metal condition: **Good**
Width of rungs: **15 inches**
Shape of rungs: **Round**
Fall prevention device: **Yes**
Type: **Rail**
Condition: **Good**
Cage: **No**
Roof ladder comments: **Roof ladder over top of the wet interior roof manway restricting manway operation; ladder offset to sidewall ladder**

Roof Handrail: N/A [Proposed Diameter: 25 feet]

Roof Access Hatches:

Wet interior:
Coating condition: **Good**
Metal condition: **Good**
Opening size: **24 inches**
Shape: **Round**
Hatch security: **Unknown**
Hatch comments: **Unable to open because of roof ladder**

EXTERIOR ACCESSORIES:

Roof Vents:

Number of vents: **1**
Type: **Standard**
Neck diameter: **16 inches**
Coating condition: **Good**
Metal condition: **Good**
Screen condition: **Good**
% of screen open: **100**
Vent Comments: **3 in. diameter hole cut in top of vent for antenna cable**

Aviation Lights: N/A

Cathodic Caps:

Number: **10 - 12**
Coating condition: **Good**
Metal condition: **Good**
Aligned: **No**
Cathodic cap comments: **Caps require adjustment to close open gaps in roof**

Rigging Couplings: N/A

Antennas:

Number: **3 + 1**
Location: **Balcony (3); Roof vent (1)**
Cable runs: **Up 2 legs**
Cables interfere with climbing: **No**
Antenna comments: **Antenna on roof runs through open hole in top of vent restricting closing of hole**

WET INTERIOR:

Tank Roof:

Topcoat condition: **Good**
Primer condition: **Good**
Metal condition: **Good**
Roof to sidewall connection: **Fair**
Condition of laps: **Good**
Laps: **Open**

EXTERIOR ACCESSORIES:

Tank roof comments: **5 approximately 6 in. gaps at roof-to-sidewall connection; several old bolt holes in roof**

Tank Sidewall:

Topcoat condition: **Good**
Primer condition: **Good**
Describe coating: **Rust undercutting - no coating where steel beams removed**
Mineral deposits: **Light**
Metal condition: **Good**
Active pitting: **No**
Previous pitting: **No**
Previous pit filling: **Unknown**
Tank Sidewall comments: **Spot rusting at rivets/lap seams**

Access Tube: N/A

Tank Bottom:

Topcoat condition: **Good**
Primer condition: **Good**
Describe coating: **Spot coating breaks to substrate**
Mineral deposits: **Light**
Metal condition: **Good**
Active pitting: **No**
Previous pitting: **No**
Previous pit filling: **Unknown**
Sediment on floor: **Yes**
Depth of sediment: **¼ inch**
Tank bottom comments: **Some burn marks from cut steel; multiple pinholes and rusting throughout bowl**

Riser:

Topcoat condition: **Good**
Primer condition: **Good**
Describe coating: **Spot coating breaks to substrate**
Metal condition: **Good**
Active pitting: **Yes**
Deepest pit depth: **⅛ inch**
Number of pits: **11-25**

EXTERIOR ACCESSORIES:

Previous pitting: **Yes**

Number of pits: **More than 75**

Previous pit filling: **Unknown**

Riser comments: **Rusting at all rivet seams**

WET INTERIOR ACCESSORIES:

Tank Ladder:

Coating condition: **Good**

Metal condition: **Fair**

Toe clearance: **8 inches**

Width of rungs: **16 inches**

Thickness of rungs: **$^{5}/_{8}$ inch**

Shape of rungs: **Round**

Shape of side rails: **Flat plate**

Fall prevention device: **No**

Tank ladder comments: **Previous steel loss on rungs**

Cathodic Protection:

Clips and pressure fitting present: **Yes**

Type: **Floating ring**

Condition: **Poor**

Explain: **Wires sheared off at top of riser**

Cathodic protection comments: **Cathodic requires repair**

Fill Pipe:

Diameter: **10 inches**

Coating condition: **Good**

Metal condition: **Good**

Height above floor: **18 inches**

Deflector plate/grate/bar: **No**

Recirculation line: **No**

Fill pipe comments: **No deflector plate**

Draw Pipe: N/A - (Same as fill pipe)

Overflow:

Type: **Weir box**

Coating condition: **Fair**

Metal condition: **Good**

WET INTERIOR ACCESSORIES:

Roof Beams: Radial
Number: **12**
Shape: **Angle**
Dimensions: **3 x 4 inches**
Coating condition: **Good**
Metal condition: **Good**
Roof beam comments: **Bottom sections have been removed approximately 5 ft. and fallen into the tank; 5 beams require repair**

Sidewall Beams: N/A

Riser Safety:
Riser grate: **No**
Riser railing: **Yes**
Railing height: **42 inches**
Midrail height: **24 inches**
Toe plate height: **4 inches**
Coating condition: **Good**
Metal condition: **Good**

Siphon: N/A

Interior Balcony: N/A

Spider: N/A

Recommendations:

Coating: **Budget to abrasive blast clean the exterior or high pressure water clean and acrylic overcoat system; abrasive blast clean pit piping and paint**

Health: **Weld cathodic caps and holes in roof; relocate antennas on roof vent; weld plate over open hole**

Safety: **Install exterior sidewall ladder with platform; adjust sway rods; install 30 in. manway in riser and 30 in. roof hatch; install railing and painter's rail on roof; new ladder in wet interior and on sidewall; install antenna post to roof and relocate antenna from roof vent**

Metal: **Fix and replace roof beams; repair cathodic protection; install deflector plate on fill pipe**

Field Inspection Report is prepared from the contractor's viewpoint. It contains most of the information the contractor needs to prepare his bid for any repairs or repainting. The Engineer uses it to prepare the engineering report. Cost estimates are more accurate if contractor problems can be anticipated. While prepared from the contractor's viewpoint, the only intended beneficiary is the owner. These reports are completed with diligence, but the accuracy is not guaranteed. The contractor is still advised to visit the site.

(1) Benton Harbor 650,000 gallon water storage tank.

(2) Delaminated coating on leg foundation, and missing grout beneath baseplate.

(3) Missing grouting on riser baseplate, and delaminated coating on foundation.

(4) Building with antenna control equipment next to riser.

(5) Delaminated topcoat on lattice leg.

(6) Delaminated topcoat on leg.

(7) Delaminated topcoat on leg and leg strut.

(8) Rust at buckles, and delaminated topcoat on strut.

(9) Delaminated topcoat on strut and leg.

(10) Delaminated coating on riser, and rust staining.

(11) Delaminated coating on riser, and rust staining.

(12) Delaminated coating on riser, and algae on bowl.

(13) Bottom of bowl, and areas of topcoat delamination.

(14) Lower bowl algae stain and accumulation.

(15) Coating intact on upper bowl.

(16) Delaminated coating/rust at balcony.

(17) Delaminated topcoat on sidewall.

(18) Sidewall ladder and pinhole rusting.

(19) Faded lettering, and overflow bracket.

(20) Pinhole rusting on sidewall.

(21) Roof coating is intact - areas of bleed-through.

(22) Exterior roof coating is intact.

(23) Roof cathodic cap.

(24) Roof ladder over top of the roof manway.

(25) Roof ladder over top of the roof manway.

(26) Overflow weir box and antenna cable showing rusting.

(27) Roof vent with antenna mount and open hole.

(28) Roof vent screen and antenna cable.

(29) Bottom of sidewall/bowl ladder.

(30) Sidewall/bowl ladder, and cathodic protection float.

(31) Damaged 4 ft. of sidewall/bowl ladder, and torn gasket.

(32) Coating breaks on lower sidewall rivets.

(33) Coating break and rusting on upper bowl.

(34) Coating intact on lower sidewall.

(35) Coating intact on sidewall.

(36) Coating intact on previous pitting.

(37) Light coming through roof cathodic lift plates.

(38) Bottom of bowl, and riser railing.

(39) Cut or sheared cathodic wires.

(40) Riser-to-bowl junction - coating protecting steel.

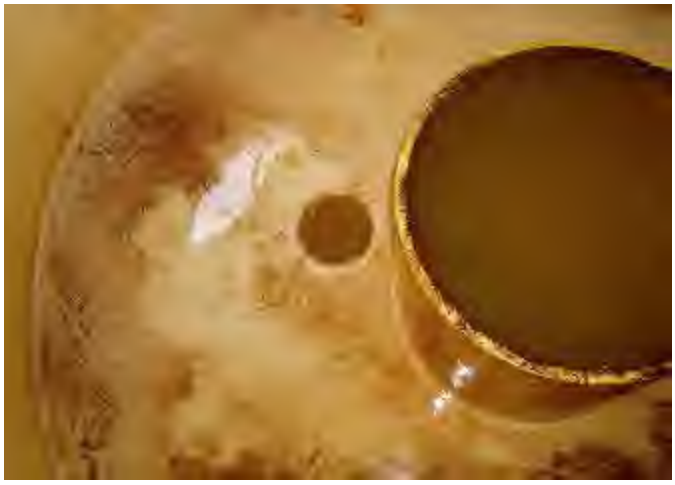
(41) Rust staining at riser can stitch welds.

(42) Rust staining at riser can stitch welds.

(43) Rust staining at riser can stitch welds.

(44) Rusting in area of previous pitting.

(45) Coating intact in areas of previous pitting.



(46) Fill pipe and mud valve.

(47) Riser hatch manway cover hinge.

(48) Rusted pit piping and flanges.

(49) Leg ladder fall prevention rail and vandal guard.

(50) Deformed riser ladder rung.

(51) Pit door opening and stairway.

APPENDIX D

2010, 2011, 2015, 2016 ANNUAL WATER QUALITY REPORTS

City of Benton Harbor Utility Services Department's 2010 Consumers Confidence Report

Contact Us: Michael O'Malley, Benton Harbor Water Plant (269) 927-8471
Darwin Watson, Benton Harbor Public Works/Utility Services Director (269) 927-8445
Utility Billing Payment Center (269) 934-7638
Benton Charter Township Water (269) 925-0616

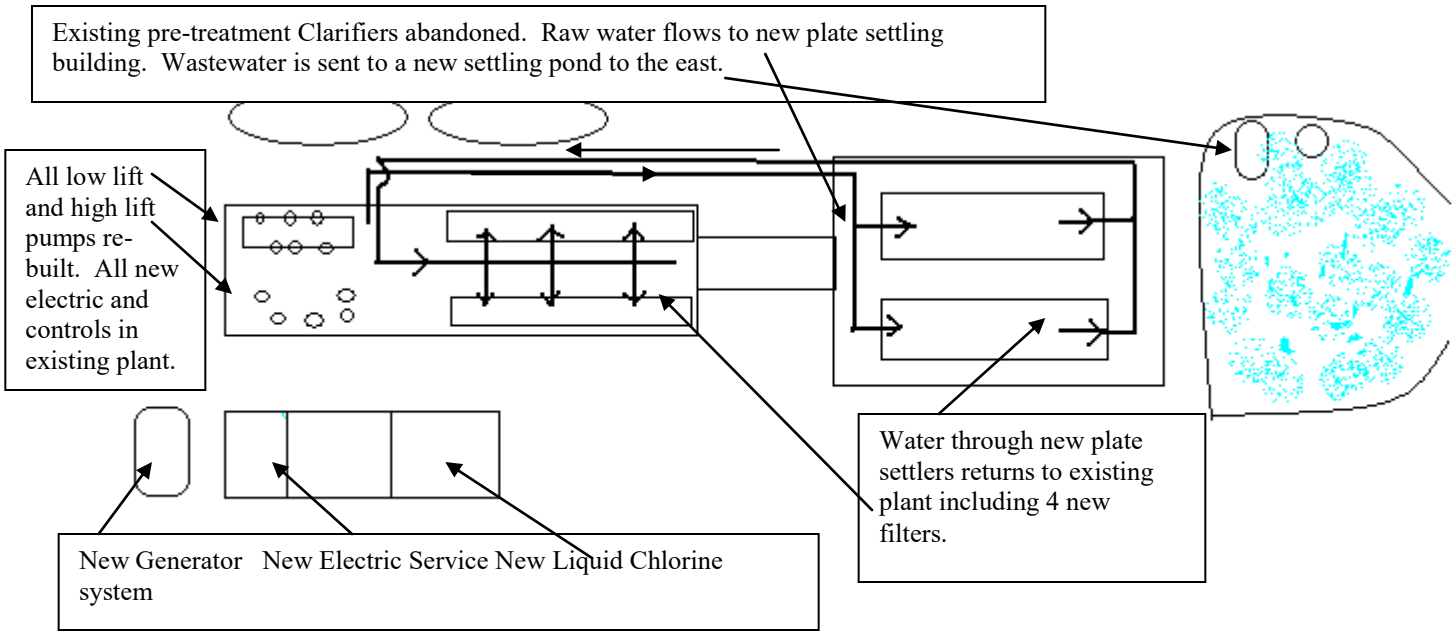
Water Plant Renovations are Nearly Complete

The Benton Harbor Water Plant is located in the southwest corner of Benton Harbor's beautiful Jean Klock Park. The Water Plant was constructed in the 1950's as a complete treatment plant that includes chemical addition for disinfection and particulate removal; mixing and settling chambers; filters; a storage reservoir; and high lift pumps to distribute the water to the City and the Townships of Benton Charter, St. Joe Charter, Hagar and Sodus. The water plant was aging and had experienced some failures. For the past 15 months the Contractor Davis Construction with several sub-contractors have been busy remodeling the existing plant and equipment and building the new treatment addition shown in the photograph. The project is nearly complete and will probably finish slightly over the $12 million budget. Funding for the project is through the State of Michigan's Drinking Water Revolving Loan Funds, which feature low interest loans to Michigan water projects. Additional funding was obtained from the Federal Government through the American Resources and Recovery Act, which will reduce the loan amount by 40%. The project is expected to be complete by October of 2011. Upon completion of the filtration plant project, the existing plant will have an anticipated life span in excess of 50 years and will offer 14 million gallons of water per day to our area users.

2010 Benton Harbor Water Quality Report

The Benton Harbor Water Plant uses Lake Michigan as its source. There are presently 5 water plants in Berrien County that use Lake Michigan as its source, including: New Buffalo, Bridgman, Lake Township and St. Joseph and the soon to be completed Benton Charter Township Water Plant. Lake Michigan is a surface water supply and is venerable to a wide range of contaminates. Because of this the EPA and MDEQ have very strict guidelines for the proper operation and testing of the water processed in these types of plants. Our Lake Michigan water is collected through a 36" pipeline that extends 4800 feet west of the water plant's shoreline. The Benton Harbor Utility Service Department's number one priority is to provide safe, high quality water to all of its customers. In pursuit of that mission, we consistently meet, and often exceed, federal and state standards for safe water.

The State MDEQ performed an assessment of our source water in 2003 to determine the susceptibility or the relative potential of contamination. The susceptibility rating is on a six-tiered scale from "very-low" to "high" based primarily on geologic sensitivity, water chemistry and contaminant sources. The susceptibility of our source is moderately high. This is due to the fact that the source water area for the Benton Harbor intake includes 1,236 potential contaminant sources, 121 listed potential contaminant sources within the susceptible area, plus urban and agricultural runoff from the St. Joseph River watershed in the St. Joseph River. A copy of the full report can be obtained by calling the water plant at (269) 927-8471.



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To ensure that tap water is safe to drink, EPA prescribes limits on the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water.
Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

A. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
B. Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
C. Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm-water runoff, and residential uses.
D. Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also, come from gas stations, urban storm-water runoff and septic systems.
E. Radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (800-426-4791).

National Primary Drinking Water Regulation Compliance
For more information about our water quality, or to receive an additional copy of this report, please contact the Water Superintendent, Michael O'Malley (269) 927-8471 or e-mail to momalley@bhcity.org.
Tours of the Water Plant are easily arranged for school or community groups by contacting the plant. For more information about safe drinking water, visit the U.S. Environmental Protection Agency (EPA) at www.epa.gov/safewater

Water Quality Detect Tables
Benton Harbor water personnel routinely monitor over 80 potential contaminants in our drinking water according to Federal and State laws. The following table lists detects of regulated contaminants found in our water for the year beginning January 1, 2010 and ending December 31, 2010, unless otherwise noted. The test results show that these contaminants were found, but are well below the drinking water guidelines.

Regulated Monitoring at the Plant

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected (RAA)	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
Arsenic*	10*	0*	Less than 2 ppb	NA	No	9/6/10	Erosion of natural deposits; Runoff from Orchards; Runoff from glass and electronics production waste.
Nitrate (ppm)	10	N/A	ND	NA	No	9/6/10	Naturally present in the environment.
Fluoride (ppm)	4	4	1.1	1.1	No	9/6/10	Water additive, which promotes strong teeth.
Chlorine Residual	4	MRDL=4	1.51	1.23 to 1.97	No	2010	Disinfectant
TOC**	TT	N/A	1.8	1.5 to 2.0	No	2010	Naturally present in the environment
Bromodichloromethane (ppb)	80	N/A	7.5	7.5	No	9/6/10	Formed when chlorine is added to water containing naturally occurring organic material.

Chlorodibromomethane (ppb)	80	N/A	2.8	2.8	No	9/6/10	Formed when chlorine is added to water containing naturally occurring organic material.
Chloroform (ppb)	80	N/A	13	13	No	9/6/10	Formed when chlorine is added to water containing naturally occurring organic material.
Total Tri-halomethanes (ppb)	80	N/A	23.6	23.6	No	9/6/10	Formed when chlorine is added to water containing naturally occurring organic material.

**The Total Organic Carbon (TOC) was measured each quarter and the system met all TOC removal requirements set by the State of Michigan.

Regulated Monitoring Distribution System (Stage 1 Disinfection Byproduct Rule)

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected/ (RAA)	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
TTHM (ppb)	80	N/A	54	28 to 54	NO	2010	Formed when chlorine is added to water containing naturally occurring organic material
HAA5 (ppb)	60	N/A	33	17 to 33	NO	2010	Formed when chlorine is added to water containing naturally occurring organic material

Unregulated Monitoring Distribution System (Stage 2 Disinfection Byproduct Rule) Testing in 2008-2009

Detected Substance	Benton Harbor city Samples Avg/High	Benton Twp Samples Ave/High	Range Across System	Likely Source of Contaminants. This testing is being conducted over a 12 month period to determine the vulnerability of various points in the 2 largest distribution systems served by the Benton Harbor Water Plant. Results listed are for tests run October to December 2008 only.
TTHM (ppb)	57/78	39/71	21 to 79	Formed when chlorine is added to water containing naturally occurring organic material
HAA5 (ppb)	19/21	26/35	3 to 56	Formed when chlorine is added to water containing naturally occurring organic material

TTHM's are Total Trihalomethanes and HAA5's are Haleoacetic Acids. We have completed a 1- year study of these Chlorine by-products in the City and Township distribution systems. The results will dictate what sites we will sample from in the coming years to better assure the community that the waters are properly disinfected and do not pose a threat from these by-products.

Long Term 2 (Enhanced Surface Water Treatment Rule) Testing in 2008-2009

Detected Substance	Largest Number Detected	Range of organisms detected	Likely Source of Contaminants is Lake Michigan. Lake Michigan testing is was conducted over a 24 month period that began April 2008. Testing is complete in 2009
Cryptosporidium (# of organisms)	3	0 to 3	Open Lake Michigan. Cryptosporidium are microbes found in open water sources.
E. *coli* (# of organisms)	7	1 to 82	Open Lake Michigan. E. *coli* are bacteria found in open water sources.
Giardia	3	0 to 3	Open Lake Michigan. Giardia are microbes found in open water sources.

Turbidity Monitoring at the Plant

Water Clarity	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
Filter Effulent NTU	0.3* or no sample above 1.00	N/A	0.48 & 0.38	0.07 to 0.48	No	2010	Soil runoff.

* Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indication of the effectiveness of our filtration system. The turbidity level of the filtered water shall be less than or equal to 0.30 NTU in 95% of the samples taken each month and shall not exceed 1.0 NTU at any time.

Distribution System Monitoring Lead and Copper. Last required test date 2008.

Detected Substance	Highest Level Allowed (AL)	EPA Goal Level (AL)	90 th Percentile Detected	Range	Sites Found Above AL	Violation	Likely Source of Contaminants
Lead (ppb)	15.0	0	5	2.2 to 17	0	No	Corrosion of Household plumbing
Copper (ppb)	1300	1300	76	660 to 1.9	0	No	Corrosion of Household plumbing

The testing for lead and copper was conducted at 41 homes and completed in September of 2008. Lead and copper monitoring began in the early 1990's. Testing has been done with success every three years since 1996. The results of the 2008 test are excellent with all samples tested found to be below the action level (AL) of 15 ppb for Lead and 1300 ppb for Copper. The tri-annual testing will be done as required by September 30, 2011.

Unregulated and Special Monitoring

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Level Detected	Likely Source
Sodium	N/A	N/A	7	Naturally present in the environment
Sulfate	N/A	N/A	28	Naturally present in the environment

Definitions

MCL Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG Maximum Contaminant Level Goal: The level of a contaminant in drinking water below, which there is no known or expected risk to health. MCLG's allow for a margin of safety.

MRDL Maximum Residual Disinfectant Level or MRDL means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG Maximum residual disinfectant level goal, or MRDLG, means the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

AL Action Level: The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.

PPM parts per million or milligrams per liter (mg/l)

PPB parts per billion, or micrograms per liter (ug/l)

NTU Nephelometric Turbidity Units, a measure of the cloudiness of water

N/A Not applicable

RAA Running Annual Average.

TT Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Other Water Quality Parameters of Interest

At the plant we routinely perform other water quality tests. These tests are not for official reporting, but are useful when describing the quality of our drinking water.

Parameter	2010 Average	2010 Range	Units
Chlorine, distribution	0.82	.06 to 1.45	Mg/L as free Cl-
PH	7.1	6.6to 7.7	pH units
Total Alkalinity	97.4	80 to 122	Mg/L as CaCO3
Total Hardness	145	127 to 184	Mg/L as CaCO3
Calcium Hardness	45	37 to 74	Mg/L as Ca
Magnesium Hardness	8.5	2 to 13	Mg/L as Mg
Chloride	10.5	3.1 to 17.3	Mg/L as Cl-

- For Customers owning a new dishwasher the Benton Harbor average water hardness is *8-10 grains per gallon.*

Other water testing in 2010 included full testing for synthetic and additional organic chemicals. There were no detectable levels found among any of the un-regulated contaminates tested. And no detects found among the list of the contaminates including: 2 types of Carbamates; 5 types of Chlorinated Acid Herbicides; and 20 types of Pesticides.

Other Water and Sewer Projects in and around Benton Harbor

- The MDOT Business Loop I-94 project was completed in 2010. Two years of construction to replace all water, sewer a sewer lift station and storm water infrastructure; new road and sidewalks and attractive landscaping and lighting.
- Benton Charter Township began construction of its treatment plant and distribution piping in 2010 and should be complete near September of 2011. The raw water intake and pump station is on Rocky Gap Road. The treatment plant is on North Shore Drive. Water main for distribution and separation from the City lines is complete or underway on North Shore, Paw Paw Ave, Waukonda Ave, Fair Ave, Emery St, and Donald Atkins. Projects that will begin soon include M-139, Pipestone, and Colfax Ave. The City and Benton Township water departments have worked closely together to minimize interruptions in service and the project is proceeding according to plan.
- The City of Benton Harbor Sewer Department will begin an important sewer and sewer lift station project after the summer. Some badly needed sewer lines, 3 new lift stations and quality control upgrades to the other lift stations will improve overall sewer service for the residents of Benton Harbor. Funding for this project is through the State Revolving Fund (SRF) and will be approved in early to mid October 2011.

Benton Harbor Water Plant
200 E. Wall Street
Benton Harbor, MI. 49022

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ECRWSS
U.S.POSTAGE PAID
EDDM Retail

**********ECRWSS**********

Local
Postal Customer
Benton Harbor, MI. 49022

City of Benton Harbor Utility Services Department's 2011 Consumers Confidence Report

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Kaye Jenkins, Utility Billing Payment Center (269) 934-7638
Tom Spitzner, Water/Sewer Superintendent, (269) 927-8471

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National Primary Drinking Water Regulation Compliance

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Public Notices Required in 2011

There were 3 events in the Benton Harbor Water System that required Public Notice to be made by the MDEQ.

1. A Filtered water turbidity sample that exceeded the 1 NTU rule on June 21, 2011.
2. A Coliform bacteria positive was found in the distribution system of St. Joseph Charter Township very near the border of the City of Benton Harbor on September 14, 2011.
3. The Water Department failed to sample all of the 30 lead and copper sites that have been collected over the past couple of years.

A Public notice for the turbidity event was distributed in 1 mass mailing by the end of July, 2011.

A Public notice for both the positive Coliform sample and the failure to complete all Lead & Copper sampling were combined into 1 notice and was distributed by mass mailing by mid-October, 2011.

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Nitrate (ppm)	10	N/A	ND	NA	No	9/27/11	Naturally present in the environment.
Fluoride (ppm)	4	4	0.78	0.78	No	9/27/11	Water additive, which promotes strong teeth.
Chlorine Residual	4	MRDL=4	2.48	0.88 to 2.48	No	2011	Disinfectant
TOC**	TT	N/A	1.94	1.78 to 1.94	No	2011	Naturally present in the environment
Bromodichloromethane (ppb)	80	N/A	7.2	7.2	No	9/27/11	Formed when chlorine is added to water containing naturally occurring organic material.
Chlorodibromomethane (ppb)	80	N/A	3.7	3.7	No	9/27/11	Formed when chlorine is added to water containing naturally occurring organic material.
Chloroform (ppb)	80	N/A	9.3	9.3	No	9/27/11	Formed when chlorine is added to water containing naturally occurring organic material.
Total Tri-halomethanes (ppb)	80	N/A	20	20	No	9/27/11	Formed when chlorine is added to water containing naturally occurring organic material.

Regulated Monitoring Distribution System (Stage 1 Disinfection Byproduct Rule)

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected/ (RAA)	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
TTHM (ppb)	80	N/A	45	40 to 50	NO	2011	Formed when chlorine is added to water containing naturally occurring organic material
HAA5 (ppb)	60	N/A	33	22 to 39	NO	2011	Formed when chlorine is added to water containing naturally occurring organic material

Unregulated Monitoring Distribution System (Stage 2 Disinfection Byproduct Rule) Testing in 2008-2009

Detected Substance	Benton Harbor city Samples Avg/High	Benton Twp Samples Ave/High	Range Across System	Likely Source of Contaminants. This testing is being conducted over a 12 month period to determine the vulnerability of various points in the 2 largest distribution systems served by the Benton Harbor Water Plant. Results listed are for tests run October to December 2008 only.
TTHM (ppb)	57/78	39/71	21 to 79	Formed when chlorine is added to water containing naturally occurring organic material
HAA5 (ppb)	19/21	26/35	3 to 56	Formed when chlorine is added to water containing naturally occurring organic material

TTHM's are Total Trihalomethanes and HAA5's are Haleoacetic Acids. We have completed a 1- year study of these Chlorine by-products in the City and Township distribution systems. The results will dictate what sites we will sample from in the coming years to better assure the community that the waters are properly disinfected and do not pose a threat from these by-products.

Long Term 2 (Enhanced Surface Water Treatment Rule) Testing in 2008-2009

Detected Substance	Largest Number Detected	Range of organisms detected	Likely Source of Contaminants is Lake Michigan. Lake Michigan testing is was conducted over a 24 month period that began April 2008. Testing is complete in 2009
Cryptosporidium (# of organisms)	3	0 to 3	Open Lake Michigan. Cryptosporidium are microbes found in open water sources.
E. *coli* (# of organisms)	7	1 to 82	Open Lake Michigan. E. *coli* are bacteria found in open water sources.
Giardia	3	0 to 3	Open Lake Michigan. Giardia are microbes found in open water sources.

Turbidity Monitoring at the Plant

Water Clarity	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
Filter Effulent NTU	0.3* or no sample above 1.00	N/A	1.8 & 0.33	0.07 to 1.8	Yes, 1.8 NTU	2011 Violation 6/18/11	Soil runoff.

* Turbidity is a measure of the cloudiness of the water.

On June 18, 2011, our operators measured and recorded turbidity values in excess of the MDEQ standard of no sample greater than 1 NTU. This was an unusual and isolated event and has been attributed to contamination of the sample because of construction interference. Regardless of the reason for the improper result, the Water Department issued a public notice under the guidelines of the MDEQ and has to be reported in this 2011 Consumers Confidence Report (CCR).

Distribution System Monitoring Lead and Copper. Last Official Test Date 2008. And, Tests Not complete in 2011.

Detected Substance	Highest Level Allowed (AL)	EPA Goal Level (AL)	90 th Percentile Detected	Range	Sites Found Above AL	Violation	Likely Source of Contaminants
Lead (ppb) 2008	15.0	0	5	2.2 to 17	0	No	Corrosion of Household plumbing
Copper (ppb) 2008	1300	1300	76	660 to 1.9	0	No	Corrosion of Household plumbing
Lead (ppb) 2011	15.0	0	11	0 to 22	1	No	Corrosion of Household plumbing
Copper (ppb) 2011	1300	1300	70	0 to 100	0	No	Corrosion of Household plumbing

Lead and copper monitoring began in the early 1990's. Testing was conducted in September 2011. There were not enough homes participating in the testing and the Water Department received a violation for failing to monitor at 30 sites. Notice was sent in October, 2011 and testing is required by September 30, 2012. The results of the 2011 tests are not official but are included above.

Unregulated and Special Monitoring

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Level Detected	Likely Source
Sodium	N/A	N/A	10	Naturally present in the environment
Sulfate	N/A	N/A	33	Naturally present in the environment

Definitions

MCL Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG Maximum Contaminant Level Goal: The level of a contaminant in drinking water below, which there is no known or expected risk to health. MCLG's allow for a margin of safety.

MRDL Maximum Residual Disinfectant Level or MRDL means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG Maximum residual disinfectant level goal, or MRDLG, means the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

AL Action Level: The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.

PPM parts per million or milligrams per liter (mg/l)

PPB parts per billion, or micrograms per liter (ug/l)

NTU Nephelometric Turbidity Units, a measure of the cloudiness of water

N/A Not applicable

RAA Running Annual Average.

TT Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Other Water Quality Parameters of Interest

At the plant we routinely perform other water quality tests. These tests are not for official reporting, but are useful when describing the quality of our drinking water.

Parameter	**2011Average**	**2011 Range**	**Units**
Chlorine	1.49	.88 to 2.48	Mg/L as free Cl-
PH	7.2	6.6to 7.7	pH units
Total Alkalinity	105	90 to 135	Mg/L as CaCO3
Total Hardness	150	130 to 197	Mg/L as CaCO3
Calcium Hardness	46	18 to 61	Mg/L as Ca
Magnesium Hardness	9	3 to 16	Mg/L as Mg
Chloride	11.5	1.4 to 19.5	Mg/L as Cl-

- For Customers owning a new dishwasher the Benton Harbor average water hardness is *8-10 grains per gallon.*

2014 Benton Harbor Water Quality Report

The Benton Harbor Water Plant uses Lake Michigan as its source. There are presently 5 other water plants in Berrien County that use Lake Michigan as its source, including: New Buffalo, Bridgman, Lake Township, St. Joseph, and Benton Charter Township. Lake Michigan is a surface water supply and is vulnerable to a wide range of contaminants. Because of this the EPA and MDEQ have very strict guidelines for the proper operation and testing of the water processed in these types of plants. Our Lake Michigan water is collected through a 36" pipeline that extends 4800 feet west of the water plant's shoreline. The Benton Harbor Utility Service Department's number one priority is to provide safe, high quality water to all of its customers. In pursuit of that mission, we consistently meet, and often exceed, federal and state standards for safe water.

The State MDEQ performed an assessment of our source water in 2003 to determine the susceptibility or the relative potential of contamination. The susceptibility rating is on a six-tiered scale from "very-low" to "high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The susceptibility of our source is moderately high. This is due to the fact that the source water area for the Benton Harbor intake includes 1,236 potential contaminant sources, 121 listed potential contaminant sources within the susceptible area, plus urban and agricultural runoff from the St. Joseph River watershed in the St. Joseph River.

General Health Information Provided by EPA

To ensure that tap water is safe to drink, EPA prescribes limits on the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

A. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
B. Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
C. Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm-water runoff, and residential uses.
D. Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also, come from gas stations, urban storm-water runoff and septic systems.
E. Radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (800-426-4791).

National Primary Drinking Water Regulation Compliance
For more information about our water quality, or to receive an additional copy of this report, please contact Director of Utility Services, Stewart A. Beach (269) 927-8471 or e-mail to sbeach@cityofbentonharbormi.gov (mailto:sbeach@cityofbentonharbormi.gov) .

Tours of the Water Plant are easily arranged for school or community groups by contacting the plant. For more information about safe drinking water, visit the U.S. Environmental Protection Agency (EPA) at www.epa.gov/safewater (http://www.epa.gov/safewater/)

Water Quality Detect Tables

Benton Harbor water personnel routinely monitor over 80 potential contaminants in our drinking water according to Federal and State laws. The following table lists detects of regulated contaminants found in our water for the year beginning January 1, 2014 and ending December 31, 2014, unless otherwise noted.

Regulated Monitoring at the Plant

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected (RAA)	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants

Arsenic	10*	0*	Less than 2 ppb	NA	No	9/6/10	Erosion of natural deposits; Runoff from Orchards; Runoff from glass and electronics production waste.
Nitrate (ppm)	10	N/A	1.5	ND to1.5	No	2/27/14	Naturally present in the environment.
Fluoride (ppm)	4	4	0.67	0.67	No	2/27/14	Water additive, which promotes strong teeth.
Chlorine Residual	4	MRDL=4	1.73	0.9 to 3.8	No	2014	Disinfectant
TOC	TT	N/A	1.785	1.31 to 3.83	No	2014	Naturally present in the environment

Regulated Monitoring Distribution System (Stage 1 Disinfection Byproduct Rule)

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected/ (RAA)	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
TTHM (ppb)	80	N/A	31	25.2 to 35	NO	2014	Formed when chlorine is added to water containing naturally occurring organic material
HAA5 (ppb)	60	N/A	64	13 to 139	YES*	2014	Formed when chlorine is added to water containing naturally occurring organic material

*See "**Public Notices Required for 2014**"

TTHM's are Total Trihalomethanes and HAA5's are Haleoacetic Acids. We have completed a 1- year study of these Chlorine by-products in the City distribution system. The results will dictate what sites we will sample from in the coming years to better assure the community that the waters are properly disinfected and do not pose a threat from these by-products.

Turbidity Monitoring at the Plant

Water Clarity	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
Filter Effluent NTU	0.3* or no sample above 1.00	N/A	.21	0.03 to 0.21	No	2014	Soil runoff.

* Turbidity is a measure of the cloudiness of the water.

Distribution System Monitoring Lead and Copper. Last Official Test Date 2012

Detected Substance	Highest Level Allowed (AL)	EPA Goal Level (AL)	90 th Percentile Detected	Range	Sites Found Above AL	Violation	Likely Source of Contaminants
Lead (ppb) 2012	15.0	0	5	0 to 38	1	No	Corrosion of Household plumbing
Copper (ppb) 2012	1300	1300	200	0 to 670	0	No	Corrosion of Household plumbing

Lead and copper monitoring began in the early 1990's. Testing was conducted in September 2012.

If present, elevated levels of lead cab cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Benton Harbor is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at http://water.epa.gov/drink/info/lead/index.cfm (http://water.epa.gov/drink/info/lead/index.cfm)

Unregulated and Special Monitoring 2/26/2014

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Level Detected	Likely Source
Sodium	N/A	N/A	16	Naturally present in the environment
Sulfate	N/A	N/A	39	Naturally present in the environment
Chloride	N/A	N/A	34	Naturally present in the environment, storm water

Definitions

MCL	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using th
MCLG	Maximum Contaminant Level Goal: The level of a contaminant in drinking water below, which there is no known or expected risk to health. MCLG's allow
MRDL	Maximum Residual Disinfectant Level or MRDL means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that additi microbial contaminants.
MRDLG	Maximum residual disinfectant level goal, or MRDLG, means the level of a drinking water disinfectant below which there is no known or expected risk to hea disinfectants to control microbial contaminants.
AL	Action Level: The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.
PPM	parts per million or milligrams per liter (mg/l)
PPB	parts per billion, or micrograms per liter (ug/l)
NTU	Nephelometric Turbidity Units, a measure of the cloudiness of water
N/A	Not applicable
RAA	Running Annual Average.
TOC	Total Organic Carbon
TT	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Public Notices Required for 2014

MONITORING VIOLATION

During the monitoring period July 1, 2014 to September 30, 2014, Benton Harbor did not collect the required number of routine samples for disinfection byproducts (TTHM and HAA5). We are required to collect these samples during the month of August. Additional samples were collected in the next monitoring period (October 1, 2014 to December 31, 2014), in the required sampling month of November, and our sampling returned to compliance. We are reviewing our monitoring schedule to ensure this does not happen again.

MCL VIOLATION

The City of Benton Harbor is required to sample for disinfection byproducts, which includes HAA5s, on a quarterly basis. The MCL for HAA5s is based on the Locational Running Annual Average (LRAA) which is the average of the past four quarter results. During May 2014, the City of Benton Harbor had a high irregular result but results since this sample have been below the MCL. Due to this irregular result, and the missed samples from the third quarter, we our running annual average for the fourth quarter 2014 was 64 ppb, which exceeds the MCL of 60 ppb. Some people who drink water containing haloacetic acids in excess of EPA's standard over many years may have an increased risk of getting cancer. The City of Benton Harbor collected additional samples, as required, on February 19, 2015, and the results have put the City of Benton Harbor back into compliance.

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Monitoring Requirements Not Met for City of Benton Harbor

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During August 2014, we did not complete all monitoring for Total Trihalomethanes (TTHMs), and Haloacetic Acids (HAA5s); therefore, cannot be sure of the quality of our drinking water during that time.

What should I do? There is nothing you need to do at this time. This is not an emergency. You do not need to boil water or use an alternative source of water at this time.

The table below lists the contaminant we did not properly test for during August 2014, how often we are supposed to sample for this contaminant and how many samples we are supposed to take, how many samples we took, when samples should have been taken, and the date we collected follow-up samples.

Contaminant	Required sampling frequency	Number of samples taken	When all samples should have been taken	Date additional samples were (or will be) taken
TTHMs	2	0	8/1/2014 to 8/30/02014	11/1/2014 to 11/30/2014
HAA5s	2	0	8/1/2014 to 8/30/02014	11/1/2014 to 11/30/2014

What happened? What is being done? We failed to collect the necessary TTHMs and HAA5s samples for the monitoring period August 2014. Follow-up samples during the next compliance periods of November 2014 and February 2015 brought the City back into compliance. For more information, please contact: Stewart A. Beach at 269-927-8471

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by the City of Benton Harbor.

<!--p>Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (800-426-4791).

National Primary Drinking Water Regulation Compliance

For more information about our water quality, or to receive an additional copy of this report, please contact the Water Superintendent, Stewart A. Beach (269) 927-8471 or e-mail to sbeach@cityofbentonharbormi.gov (mailto:sbeach@cityofbentonharbormi.gov) .

2015 Benton Harbor Water Quality Report

This report covers the drinking water quality for Benton Harbor for the calendar year 2015. This information is a snapshot of the quality of the water that we provided to you in 2015. Included are details about where your water comes from, what it contains, and how it compares to Environmental Protection Agency (EPA) and state standards. To receive a paper copy in the mail, contact Jay Ouzts at F&V Operations (616) 588-2900 or Darwin Watson, Benton Harbor City Manager (269) 927-8400.

We invite public participation in decisions that affect drinking water quality. Meetings are held on the 1st and 3rd Monday of each month in the Lula Lee Commission Chambers, 200 E. Wall Street, Benton Harbor. For more information about your water, or the contents of this report, contact Jay Ouzts at F&V Operations (616) 588-2900 or Darwin Watson, Benton Harbor City Manager (269) 927-8400.

The Benton Harbor Water Plant uses Lake Michigan as its source. There are presently 5 other water plants in Berrien County that use Lake Michigan as its source, including: New Buffalo, Bridgman, Lake Township, St. Joseph, and Benton Charter Township. Lake Michigan is a surface water supply and is vulnerable to a wide range of contaminants. Because of this the EPA and MDEQ have very strict guidelines for the proper operation and testing of the water processed in these types of plants. Our Lake Michigan water is collected through a 36" pipeline that extends 4800 feet west of the water plant's shoreline. The Benton Harbor Utility Service Department's number one priority is to provide safe, high quality water to all of its customers. In pursuit of that mission, we consistently meet, and often exceed, federal and state standards for safe water.

The State DEQ performed an assessment of our source water in 2003 to determine the susceptibility or the relative potential of contamination. The susceptibility rating is on a six-tiered scale from "very-low" to "high" based primarily on geologic sensitivity, water chemistry, and contaminant sources. The susceptibility of our source is moderately high. This is due to the fact that the source water area for the Benton Harbor intake includes 1,236 potential contaminant sources, 121 listed potential contaminant sources within the susceptible area, plus urban and agricultural runoff from the St. Joseph River watershed in the St. Joseph River. For additional information, or to obtain a copy of the source water study, please contact Jay Ouzts at F&V Operations (616) 588-2900 or Darwin Watson, Benton Harbor City Manager (269) 927-8400.

General Health Information Provided by EPA

To ensure that tap water is safe to drink, EPA prescribes limits on the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

A. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
B. Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
C. Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm-water runoff, and residential uses.
D. Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also, come from gas stations, urban storm-water runoff and septic systems.
E. Radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (800-426-4791).

National Primary Drinking Water Regulation Compliance
For more information about our water quality, or to receive an additional copy of this report, please contact Jay Ouzts at F&V Operations (616) 588-2900 or Darwin Watson, Benton Harbor City Manager (269) 927-8400.
Tours of the Water Plant are easily arranged for school or community groups by contacting the plant. For more information about safe drinking water, visit the U.S. Environmental Protection Agency (EPA) at www.epa.gov/safewater

Public Notices Required for 2015
Testing data from 2015 resulted in no public notices.

Water Quality Data Tables
Benton Harbor water personnel routinely monitor over 80 potential contaminants in our drinking water according to Federal and State laws. The following table lists regulated contaminants detected in our water for the year beginning January 1, 2015 and ending December 31, 2015, unless otherwise noted.

Definitions

MCL	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG	Maximum Contaminant Level Goal: The level of a contaminant in drinking water below, which there is no known or expected risk to health. MCLG's allow for a margin of safety.
MRDL	Maximum Residual Disinfectant Level or MRDL means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MRDLG	Maximum residual disinfectant level goal, or MRDLG, means the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
AL	Action Level: The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.
PPM	parts per million or milligrams per liter (mg/l)
PPB	parts per billion, or micrograms per liter (ug/l)
NTU	Nephelometric Turbidity Units, a measure of the cloudiness of water
N/A	Not applicable
RAA	Running Annual Average.
TOC	Total Organic Carbon
TT	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Regulated Monitoring at the Plant

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected (RAA)	Range	Violation Yes, or No	Date of Sample	Likely Source of Contaminants
Fluoride (ppm)	4	4	0.15	N/A	No	2015	Water additive, which promotes strong teeth.
Chlorine Residual (ppm)	4	MRDL=4	1.38	0.64 to 2.16	No	2015	Disinfectant
TOC (ppm)	TT	N/A	2.11	0.79 to 2.11	No	2015	Naturally present in the environment
Bromodichloromethane (ppb)	80	N/A	7.2	ND to 7.2	No	2015	Formed when chlorine is added to water containing naturally occurring organic material.
Chlorodibromomethane (ppb)	80	N/A	2.9	ND to 2.9	No	2015	Formed when chlorine is added to water containing naturally occurring organic material.
Chloroform (ppb)	80	N/A	11.0	ND to 11.0	No	2015	Formed when chlorine is added to water containing naturally occurring organic material.

Total Trihalomethanes (ppb)	80	N/A	21.0	ND to 21.0	No	2015	Formed when chlorine is added to water containing naturally occurring organic material.

Regulated Monitoring Distribution System (Disinfection Byproduct)

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level (RAA)	Lowest-Highest Level Detected/	Violation Yes or No	Date of Sample	Likely Source of Contaminants
TTHM (ppb)	80	N/A	37	22.7 to 60.0	NO	2015	Formed when chlorine is added to water containing naturally occurring organic material
HAA5 (ppb)	60	N/A	56	10 to 17	NO	2015	Formed when chlorine is added to water containing naturally occurring organic material

Turbidity Monitoring at the Plant

Water Clarity	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
Filter Effluent NTU	0.3* or no sample above 1.00	N/A	0.25	0.03 to 0.25	No	2015	Soil runoff.

* Turbidity is a measure of the cloudiness of the water.

Distribution System Monitoring Lead and Copper. Last Official Test Date 2015.

Detected Substance	Highest Level Allowed (AL)	EPA Goal Level (AL)	90th Percentile Detected	Range	Sites Found Above AL	Violation	Likely Source of Contaminants
Lead (ppb) 2015	15.0	0	12	0 to 38	2	No	Corrosion of Household plumbing
Copper (ppb) 2015	1300	1300	0	0 to 670	0	No	Corrosion of Household plumbing

Lead and copper monitoring began in the early 1990's. Testing was conducted in September 2015.

** Additional Information for Lead If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Andrews University is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Unregulated and Special Monitoring 2/26/2015

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Level Detected	Likely Source
Sodium	N/A	N/A	8	Naturally present in the environment
Sulfate	N/A	N/A	23	Naturally present in the environment
Chloride	N/A	N/A	12	Naturally present in the environment, storm water

A Notice to our Benton Harbor Drinking Water Community.

Please note that the following required lead language was missing from our 2016 Consumer Confidence Report:

Information about lead: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Benton Harbor is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

We apologize for this omission. A copy of the full report is available on our website at www.BentonHarborCity.com Follow the links on the opening page to the Water Page and the Updated Consumers Confidence Report. If you would like a copy you can request a paper copy by contacting The Benton Harbor Water Plant (269) 927-8471-2 or the Water Payment Center at (269) 927-8400-2. We are open weekdays 8:30 am to 5:00 pm.

The limits have not changed from 15ppb for Lead and 1300ppb for Copper but the focus on Lead in drinking has increased dramatically. Benton Harbor and nearly all Cities in Michigan are working very hard to protect the City water supply and our residents.

The lead sampling shown in the table of the report indicates that Lead is at very low or non-existent levels at most homes, but any Lead is still our focus to eliminate.

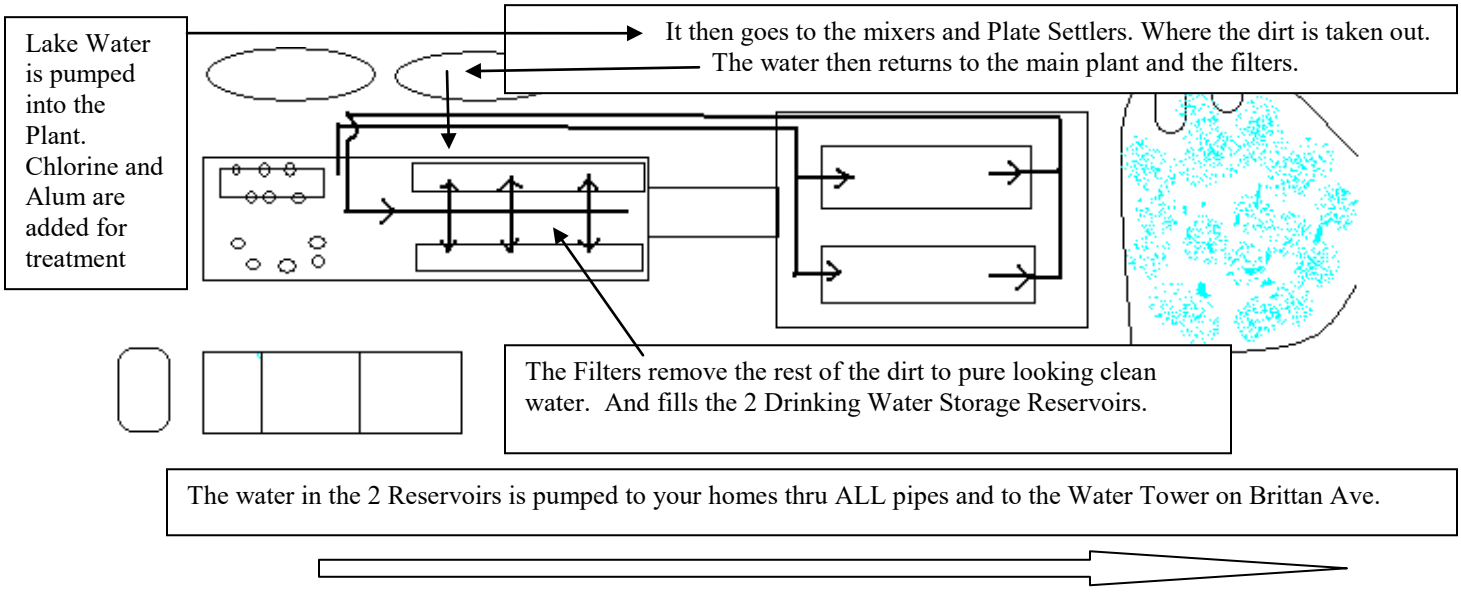
As stated above in the required MDEQ language, PLEASE, ALWAYS LET YOUR WATER RUN TILL COOL BEFORE YOU TAKE A DRINK. BE SURE TO TEACH YOUR CHILDREN AND GRANDCHILDREN TO DO THE SAME!

AND NOW OUR REVISED 2016 CCR

City of Benton Harbor Utility Services Department's 2016 Consumers Confidence Report

Contact Us: Michael O'Malley, Benton Harbor Water Plant (269) 927-8471
Darwin Watson, Benton Harbor City Manager (269) 927-
Kaye Jenkins, Utility Billing Payment Center (269) 934-7638

A diagram of the equipment and how we make Lake Michigan Safe for Drinking at the Benton Harbor Water Plant



2016 Benton Harbor Water Quality Report

The Benton Harbor Water Plant uses Lake Michigan as its source. There are presently 5 water plants in Berrien County that use Lake Michigan as its source, including: New Buffalo, Bridgman, Lake Township, St. Joseph, and Benton Charter Township Water Plant. Lake Michigan is a surface water supply and is vulnerable to a wide range of contaminates. Because of this the EPA and MDEQ have very strict guidelines for the proper operation and testing of the water processed in these types of plants. Our Lake Michigan water is collected through a 36" pipeline that extends 4800 feet west of the water plant's shoreline. The Benton Harbor Utility Service Department's number one priority is to provide safe, high quality water to all of its customers. In pursuit of that mission, we consistently meet, and often exceed, federal and state standards for safe water.

The State MDEQ performed an assessment of our source water in 2003 to determine the susceptibility or the relative potential of contamination. The susceptibility rating is on a six-tiered scale from "very-low" to "high" based primarily on geologic sensitivity, water chemistry and contaminant sources. The susceptibility of our source is moderately high. This is due to the fact that the source water area for the Benton Harbor intake includes 1,236 potential contaminant sources, 121 listed potential contaminant sources within the susceptible area, plus urban and agricultural runoff from the St. Joseph River watershed in the St. Joseph River. A copy of the full report can be obtained by calling the water plant at (269) 927-8471.

General Health Information Provided by EPA

To ensure that tap water is safe to drink, EPA prescribes limits on the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791).

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

A. Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
B. Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
C. Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm-water runoff, and residential uses.
D. Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also, come from gas stations, urban storm-water runoff and septic systems.
E. Radioactive contaminants, which can be naturally occurring or the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their healthcare providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (800-426-4791).

National Primary Drinking Water Regulation Compliance

For more information about our water quality, or to receive an additional copy of this report, please contact the Water Superintendent, Michael O'Malley (269) 927-8471 or e-mail to momalley@cityofbentonharbormi.gov .

Tours of the Water Plant are easily arranged for school or community groups by contacting the plant. For more information about safe drinking water, visit the U.S. Environmental Protection Agency (EPA) at www.epa.gov/safewater

Public Notices Required in 2016

There was one (1) event in the Benton Harbor Water System that required Public Notice to be made to you by MDEQ rules. The notice was a testing violation where, the water was not tested for Disinfection by Products in February of 2016 on the appropriate day, as was required.

Water Quality Detect Tables

Benton Harbor water personnel routinely monitor over 80 potential contaminants in our drinking water according to Federal and State laws. The following table lists detects of regulated contaminants found in our water for the year beginning January 1, 2016 and ending December 31, 2016, unless otherwise noted. Other contaminates are required as regulated monitoring, that the Water Plant

Test results in the next few tables are tests that our Water Plant personnel cannot do. These are sampled and sent to the MDEQ laboratory in Lansing and listed in the tables with various dates assigned. The last table in this report are tests routinely done at the water plant.

Regulated Monitoring at the Plant Done at the MDEQ Laboratory in Lansing, MI.

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected (RAA)	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
Arsenic◀	10*	0*	Less than 2 ppb	NA	No	9/6/10	Erosion of natural deposits; Runoff from Orchards; Runoff from glass and electronics production waste.
Nitrate (ppm)	10	N/A	0.5	0.4 to 0.5	No	9/30/16& 11/21/16	Naturally present in the environment.
Fluoride (ppm)	4	4	0.78	0.6 to 0.78	No	9/30/16& 11/21/16	Water additive, which promotes strong teeth.
Chlorine Residual	4	MRDL=4	1.86	1.37 to 3.14	No	2016	Disinfectant
TOC**	TT	N/A	1.97	1.35 to 1.97	No	2016	Naturally present in the environment
Bromodichloromethane (ppb)	80	N/A	11	11	No	9/30/16	Formed when chlorine is added to water containing naturally occurring organic material.
Chlorodibromomethane (ppb)	80	N/A	4.8	4.8	No	9/30/16	Formed when chlorine is added to water containing naturally occurring organic material.
Chloroform (ppb)	80	N/A	18	18	No	9/30/16	Formed when chlorine is added to water containing naturally occurring organic material.
Total Tri-halomethanes (ppb)	80	N/A		34	No	9/30/16	Formed when chlorine is added to water containing naturally occurring organic material.

Regulated Monitoring Distribution System (Stage 2 Disinfection Byproduct Rule) Testing in 2016

Detected Substance	LRRA is locational Running Annual Average	Benton Harbor city Samples LRRA Site 1	Benton Harbor city Samples LRRA Site 2	Likely Source of Contaminants. This testing is being conducted over a 12 month period to determine the vulnerability of various points in the 2 largest distribution systems served by the Benton Harbor Water Plant. Results listed are for tests run October to December 2008 only.
TTHM (ppb)	Each site is measured in ppb	**51.5**	**48.1**	Formed when chlorine is added to water containing naturally occurring organic material
HAA5 (ppb)	19/21 Each site is measured in ppb	**14.5**	**12.0**	Formed when chlorine is added to water containing naturally occurring organic material

TTHM's are Total Trihalomethanes and HAA5's are Haleoacetic Acids. They form when Chlorine is in contact with organic matter over time. The results are averaged at each location as a running annual average (LRAA) to assure the community that the waters are properly disinfected and do not pose a threat from these by-products.

Long Term 2 (Enhanced Surface Water Treatment Rule) Testing in 2008-2009

Detected Substance	Largest Number Detected	Range of organisms detected	Likely Source of Contaminants is Lake Michigan. Lake Michigan testing is was conducted over a 24 month period that began April 2008. Testing is complete in 2009
Cryptosporidium (# of organisms)	3	0 to 3	Open Lake Michigan. Cryptosporidium are microbes found in open water sources.
E. *coli* (# of organisms)	7	1 to 82	Open Lake Michigan. E. *coli* are bacteria found in open water sources.
Giardia	3	0 to 3	Open Lake Michigan. Giardia are microbes found in open water sources.

Turbidity Monitoring at the Plant

Water Clarity	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Highest Level Detected	Range	Violation Yes or No	Date of Sample	Likely Source of Contaminants
Filter Effulent NTU	0.3* or no sample above 1.00	N/A	1.8 & 0.33	0.07 to 1.8	Yes, 1.8 NTU	2011 Violation 6/18/11	Soil runoff.

* Turbidity is a measure of the cloudiness of the water.

Distribution System Monitoring Lead and Copper. Last Official Test Date 2008. And, Tests Not complete in 2011.

Detected Substance	Highest Level Allowed (AL)	EPA Goal Level (AL)	90 th Percentile Result Detected	Range	Sites Found Above AL of 15 ppb.	Violation	Likely Source of Contaminants
Lead (ppb)	15.0	0	12	0 to 38	2	No	Corrosion of Household plumbing
Copper (ppb)	1300	1300	0	0 to 670	0	No	Corrosion of Household plumbing

Lead and copper monitoring began in the early 1990's. The 9th round of Benton Harbor testing was conducted in September 2015. The 2 sites above the EPA action level were more than 12 ppb and one at 38 ppb. All homes on the list of sites are notified of their results and the site with 38 ppb had their water line replaced with copper. The next round of testing #10 is due in 2018.

Information about lead: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Benton Harbor is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Unregulated and Special Monitoring

Detected Substance	Highest Level Allowed (MCL)	EPA Goal Level (MCLG)	Level Detected	Likely Source
Sodium	N/A	N/A	17	Naturally present in the environment
Sulfate	N/A	N/A	29	Naturally present in the environment
Fluoride	2 Secondary and 4 Primary	N/A	0.6	Water Additive to help protect teeth from Dental Caries and for Public Health

A sample was taken at the Water Plant on September 9, 2016. A laboratory in South Bend analyzed it for total Cyanide and did not detect any. Cyanide is a dangerous chemical and the EPA is determining how it may be monitored in water systems in the future.

Definitions

MCL Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG Maximum Contaminant Level Goal: The level of a contaminant in drinking water below, which there is no known or expected risk to health. MCLG's allow for a margin of safety.

MRDL Maximum Residual Disinfectant Level or MRDL means the highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG Maximum residual disinfectant level goal, or MRDLG, means the level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

AL Action Level: The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements, which a water system must follow.

PPM parts per million or milligrams per liter (mg/l)

PPB parts per billion, or micrograms per liter (ug/l)

NTU Nephelometric Turbidity Units, a measure of the cloudiness of water

N/A Not applicable

RAA Running Annual Average.

LRAA Locational Running Annual Average.

TT Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.

Other Water Quality Parameters of Interest

At the plant we routinely perform other water quality tests. These tests are not for official reporting, but are useful when describing the quality of our drinking water.

Parameter	**2016Average**	**2016 Range**	**Units**
Chlorine	1.86	1.37 to 3.14	Mg/L as free Cl-
PH	7.67	7.3to 8.2	pH units
Total Alkalinity	105	93 to 133	Mg/L as CaCO3
Total Hardness	166	112 to 208	Mg/L as CaCO3
Calcium Hardness	48	30 to 67	Mg/L as Ca
Magnesium Hardness	11	2 to 18	Mg/L as Mg
Chloride	26.1	22.5 to 32.5	Mg/L as Cl-
Fluoride as F-ion	0.73	0.23 to 1.07	Mg/L as F-ion

- For Customers owning a new dishwasher the Benton Harbor average water hardness is *8-10 grains per gallon.*

APPENDIX E

SYSTEM ANALYSIS MAPS

Water Main Age

Remaining Useful Life

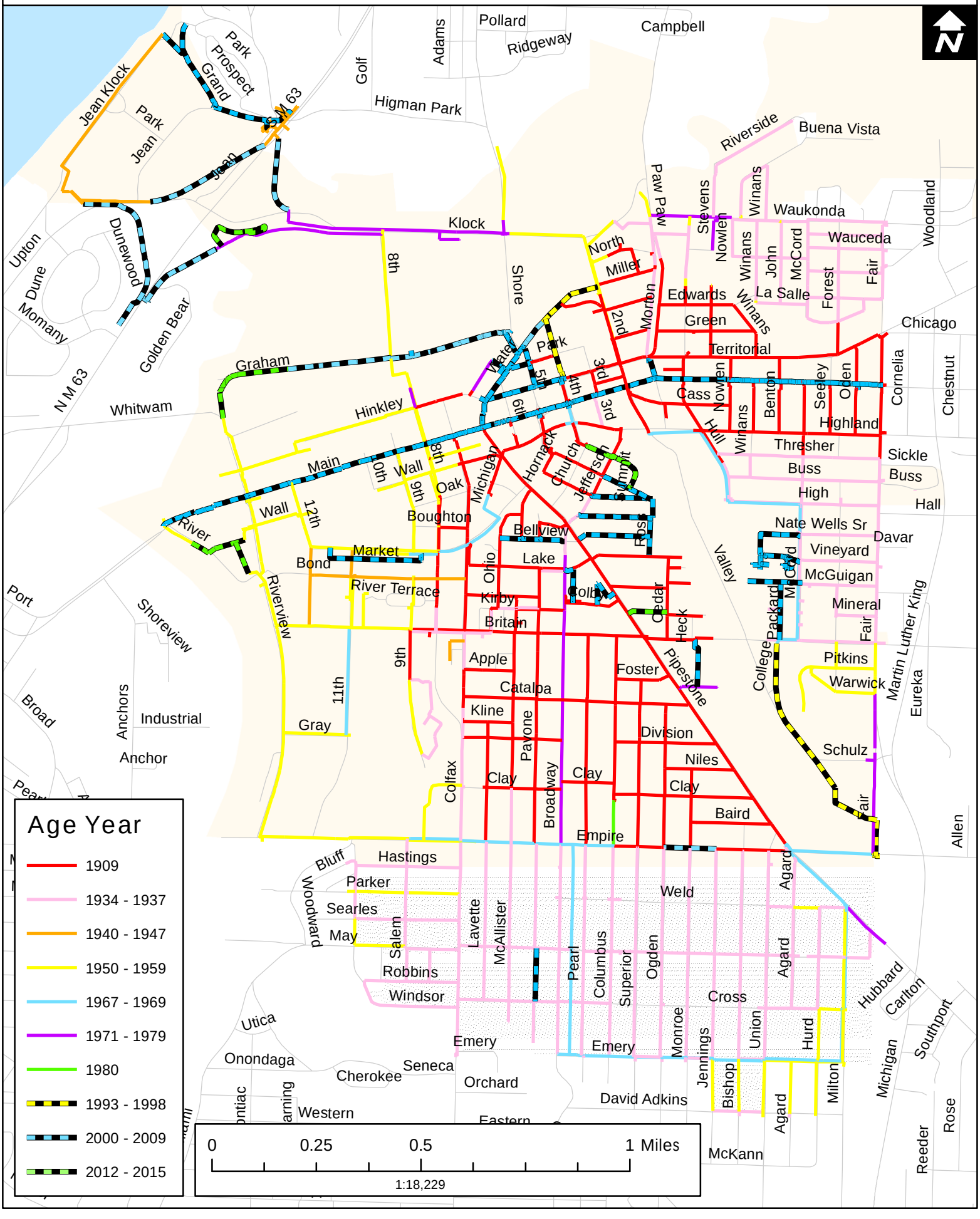
Probability of Failure

Consequence of Failure

Business Risk Evaluation Scores

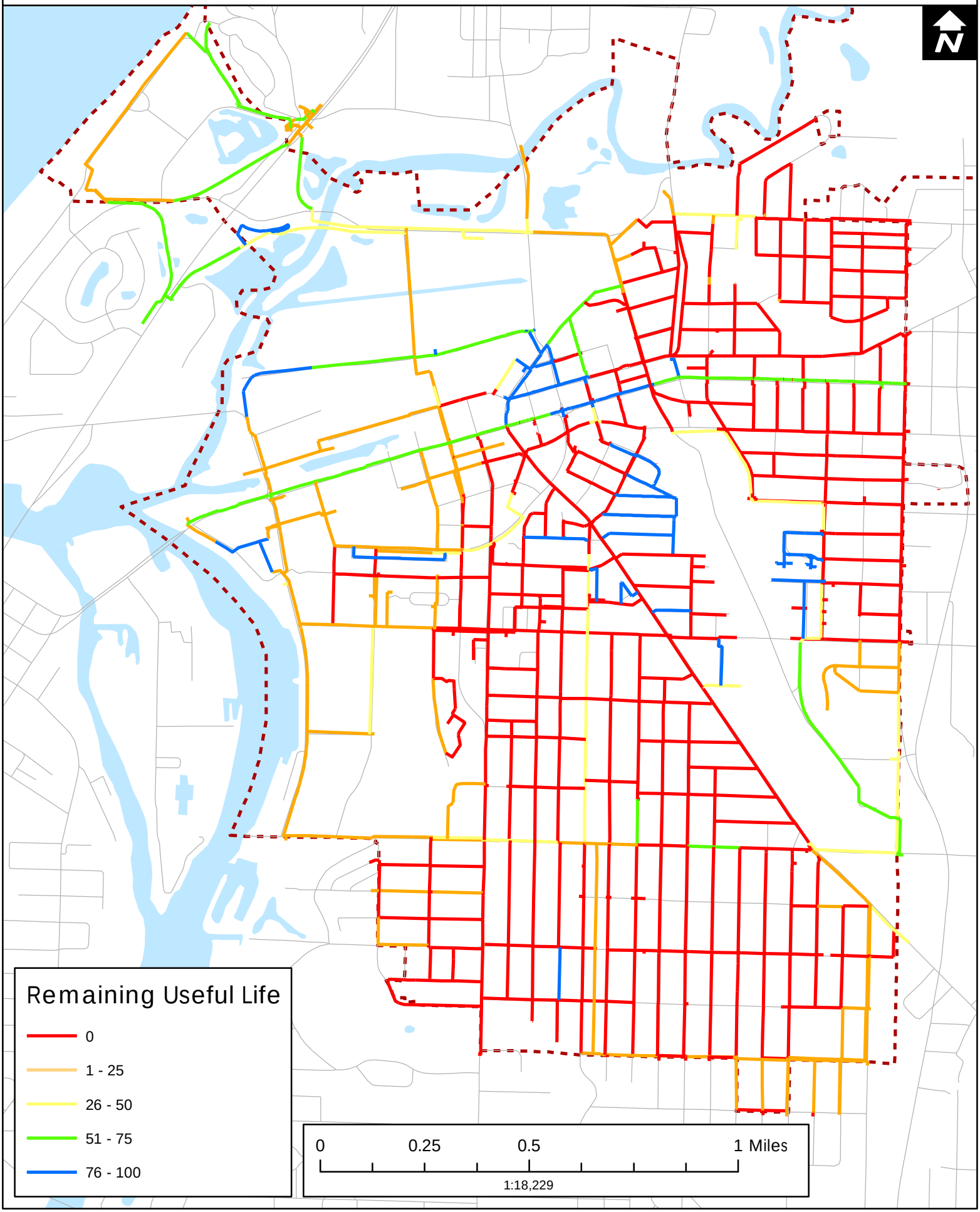
Water Mains

Benton Harbor, MI



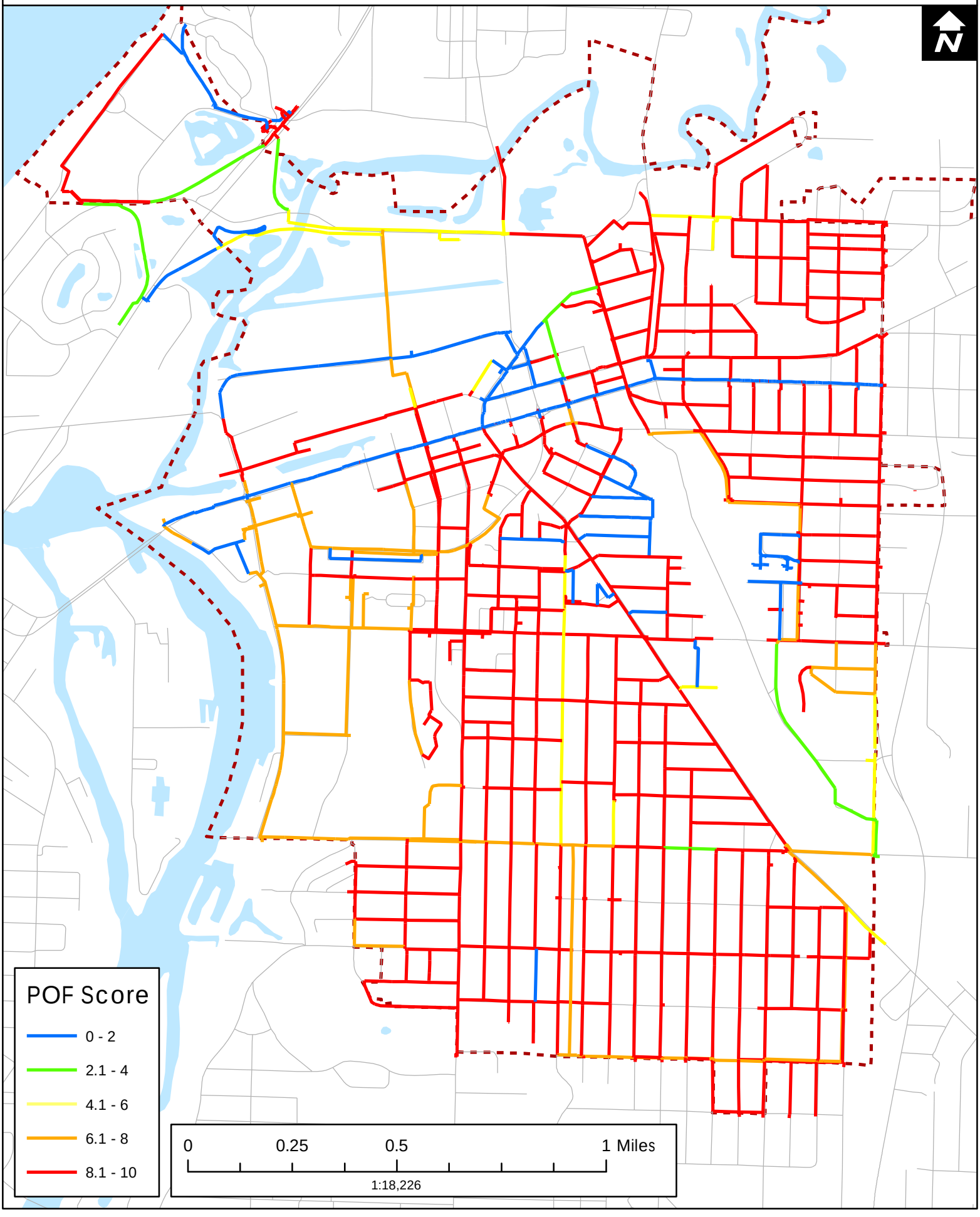
Water Mains

Benton Harbor, MI



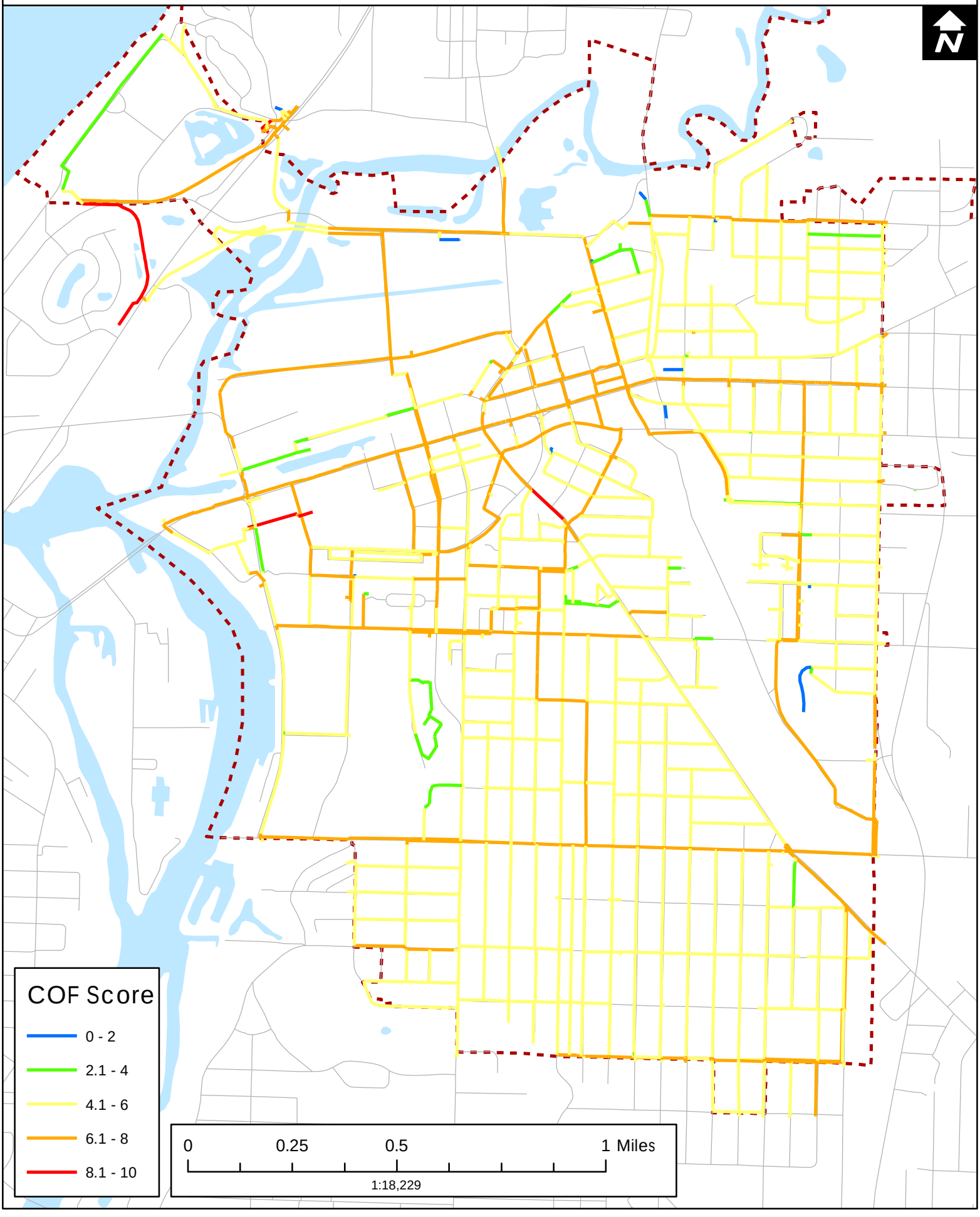
Water Mains

Benton Harbor, MI



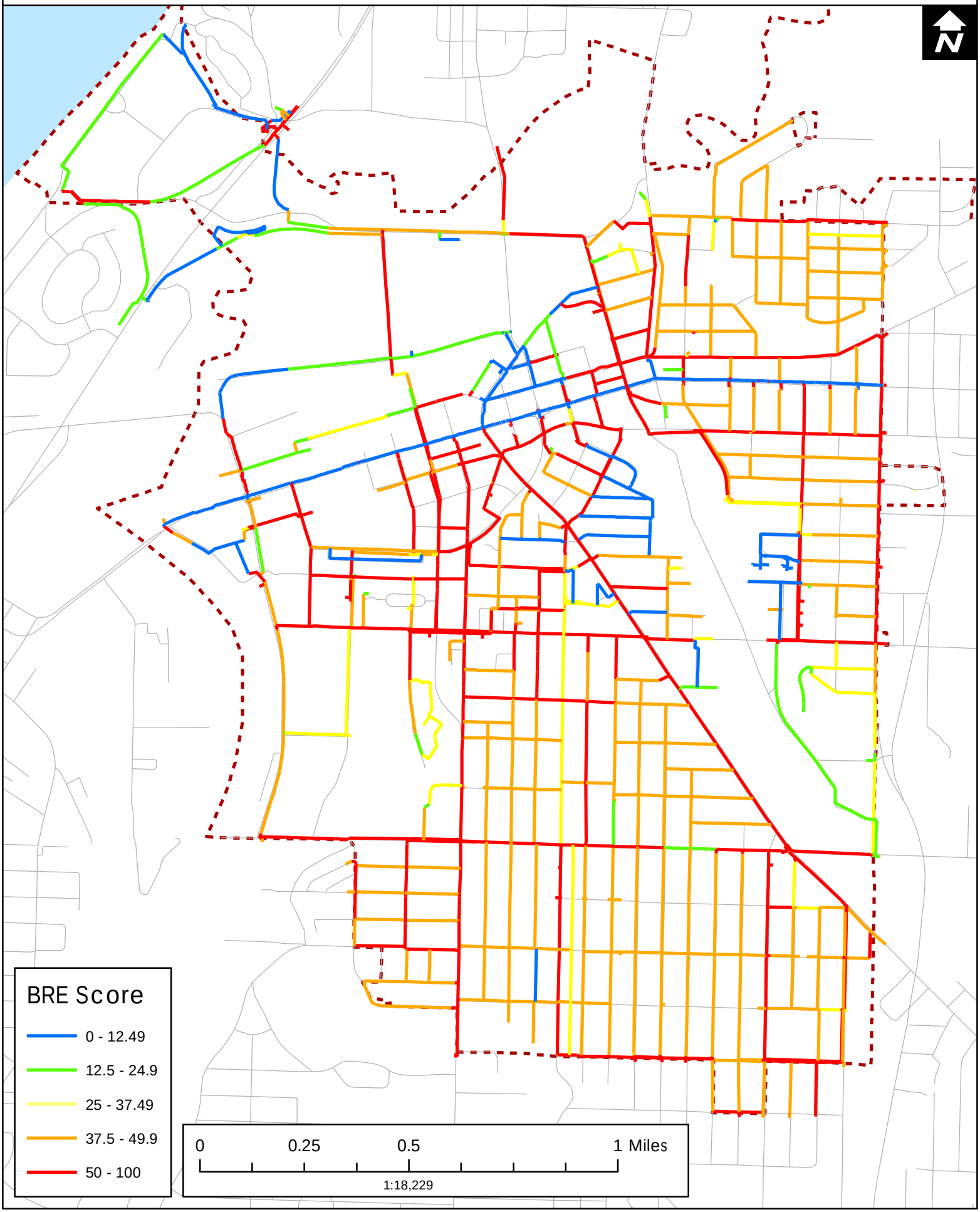
Water Mains

Benton Harbor, MI



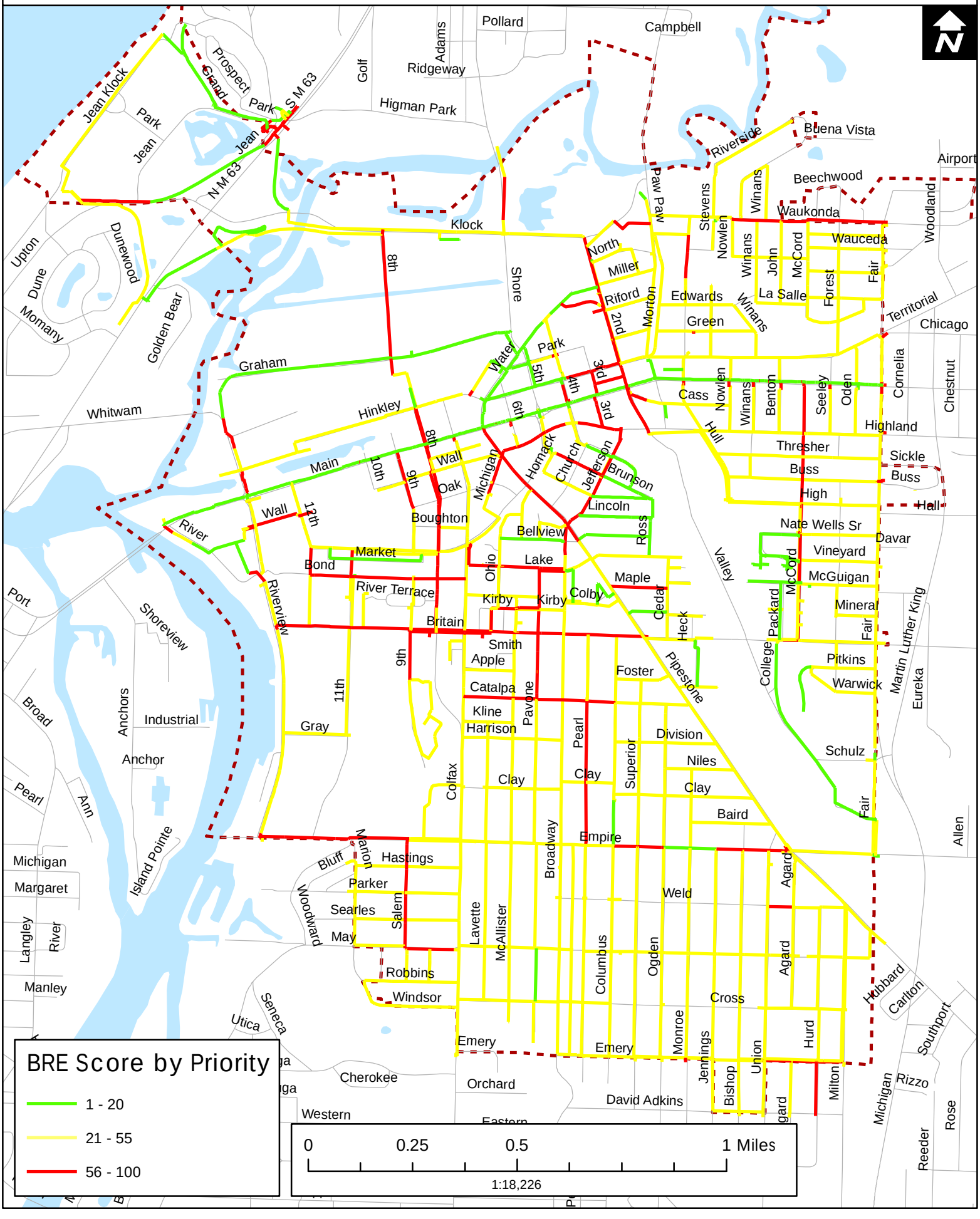
Water Mains

Benton Harbor, MI



Water Mains

Benton Harbor, MI



APPENDIX F

CIP PLAN ESTIMATES

5-Year CIP

20-Year CIP

95 West Main Street
P.O. Box 1088
Benton Harbor, MI 49023
T 269.927.2295
F 269.927.1017
www.abonmarche.com

Project Name: Benton Harbor Water Asset Management Plan
Project Location: Britain Avenue (Riverview to Pipestone)
Prepared By: Aaron Townley, EIT

Britain Avenue (Riverview to Pipestone)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 203,600.00	$ 203,600.00
2	Traffic Control	LSum	1	$ 97,000.00	$ 97,000.00
3	Machine Grading	Sta	59.1	$ 1,200.00	$ 70,920.00
4	Pavt, Rem, Modified	Syd	7224	$ 9.00	$ 65,016.00
5	Aggregate Base, 8 inch	Syd	7224	$ 9.00	$ 65,016.00
6	Subbase, CIP (12 Inches)	Cyd	2408	$ 13.50	$ 32,508.00
7	HMA Surface	Ton	2086	$ 80.00	$ 166,880.00
8	Fire Hydrant Assembly	Ea	15	$ 4,000.00	$ 60,000.00
9	Gate Valve & Box, 16 Inch	Ea	17	$ 6,500.00	$ 110,500.00
10	Water Main, DI, 16 Inch, Tr Det G	Ft	5910	$ 200.00	$ 1,182,000.00
11	Water Service	Ea	79	$ 1,750.00	$ 138,250.00
12	Curb Stop and Box	Ea	79	$ 500.00	$ 39,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	1580	$ 5.00	$ 7,900.00
Britain Avenue (Riverview to Pipestone) Estimate					$ 2,239,090.00
Contingency				**15%**	$ 335,900.00
Engineering & Construction Administration				**20%**	$ 447,900.00
Total Estimated Water Main Construction Costs					$ 3,022,890.00

ABONMARCHE
Confidence By Design

95 West Main Street
P.O. Box 1088
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T 269.927.2295
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www.abonmarche.com

Project Name: Benton Harbor Water Asset Management Plan
Project Location: 8th Street (Hinkley to Britain)
Prepared By: Aaron Townley, EIT

8th Street (Hinkley to Britain)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 119,300.00	$ 119,300.00
2	Traffic Control	LSum	1	$ 56,800.00	$ 56,800.00
3	Machine Grading	Sta	46.73	$ 1,200.00	$ 56,076.00
4	Pavt, Rem, Modified	Syd	5712	$ 9.00	$ 51,408.00
5	Aggregate Base, 8 inch	Syd	5712	$ 9.00	$ 51,408.00
6	Subbase, CIP (12 Inches)	Cyd	1904	$ 13.50	$ 25,704.00
7	HMA Surface	Ton	1650	$ 80.00	$ 132,000.00
8	Fire Hydrant Assembly	Ea	12	$ 4,000.00	$ 48,000.00
9	Gate Valve & Box, 12 Inch	Ea	14	$ 2,750.00	$ 38,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	4673	$ 125.00	$ 584,125.00
11	Water Service	Ea	63	$ 1,750.00	$ 110,250.00
12	Curb Stop and Box	Ea	63	$ 500.00	$ 31,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	1260	$ 5.00	$ 6,300.00
8th Street (Hinkley to Britain) Estimate					$ 1,311,371.00
Contingency				**15%**	$ 196,800.00
Engineering & Construction Administration				**20%**	$ 262,300.00
Total Estimated Water Main Construction Costs					$ 1,770,471.00

95 West Main Street
P.O. Box 1088
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www.abonmarche.com

Project Name: Benton Harbor Water Asset Management Plan
Project Location: Pipestone Rd (Main Street to Washington Street)
Prepared By: Aaron Townley, EIT

Pipestone Rd (Main Street to Washington Street)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 48,500.00	$ 48,500.00
2	Traffic Control	LSum	1	$ 23,100.00	$ 23,100.00
3	Machine Grading	Sta	18.86	$ 1,200.00	$ 22,632.00
4	Pavt, Rem, Modified	Syd	2306	$ 9.00	$ 20,754.00
5	Aggregate Base, 8 inch	Syd	2306	$ 9.00	$ 20,754.00
6	Subbase, CIP (12 Inches)	Cyd	769	$ 13.50	$ 10,381.50
7	HMA Surface	Ton	666	$ 80.00	$ 53,280.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1886	$ 125.00	$ 235,750.00
11	Water Service	Ea	26	$ 1,750.00	$ 45,500.00
12	Curb Stop and Box	Ea	26	$ 500.00	$ 13,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	520	$ 5.00	$ 2,600.00
Pipestone Rd (Main Street to Washington Street) Estimate					$ 532,751.50
Contingency				**15%**	$ 80,000.00
Engineering & Construction Administration				**20%**	$ 106,600.00
Total Estimated Water Main Construction Costs					$ 719,351.50

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P.O. Box 1088
Benton Harbor, MI 49023
T 269.927.2295
F 269.927.1017
www.abonmarche.com

Project Name:Benton Harbor Water Asset Management Plan
Project Location: Michigan St. / E. Wall St / Highland Ave (Pipestone St to Jefferson)
Prepared By: Aaron Townley, EIT

Michigan St. / E. Wall St / Highland Ave (Pipestone St to Jefferson)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 50,800.00	$ 50,800.00
2	Traffic Control	LSum	1	$ 24,200.00	$ 24,200.00
3	Machine Grading	Sta	19.89	$ 1,200.00	$ 23,868.00
4	Pavt, Rem, Modified	Syd	2431	$ 9.00	$ 21,879.00
5	Aggregate Base, 8 inch	Syd	2431	$ 9.00	$ 21,879.00
6	Subbase, CIP (12 Inches)	Cyd	811	$ 13.50	$ 10,948.50
7	HMA Surface	Ton	702	$ 80.00	$ 56,160.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1989	$ 125.00	$ 248,625.00
11	Water Service	Ea	27	$ 1,750.00	$ 47,250.00
12	Curb Stop and Box	Ea	27	$ 500.00	$ 13,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	540	$ 5.00	$ 2,700.00
Michigan St. / E. Wall St / Highland Ave (Pipestone St to Jefferson) Estimate					$ 558,309.50
Contingency				**15%**	$ 83,800.00
Engineering & Construction Administration				**20%**	$ 111,700.00
Total Estimated Water Main Construction Costs					$ 753,809.50

95 West Main Street
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Benton Harbor, MI 49023
T 269.927.2295
F 269.927.1017
www.abonmarche.com

Project Name: Benton Harbor Water Asset Management Plan
Project Location: Whitwam-Riverview Dr (Main Street to Whitwam Dr)
Prepared By: Aaron Townley, EIT

Whitwam-Riverview Dr (Main Street to Whitwam Dr)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 19,700.00	$ 19,700.00
2	Traffic Control	LSum	1	$ 9,400.00	$ 9,400.00
3	Machine Grading	Sta	7.54	$ 1,200.00	$ 9,048.00
4	Pavt, Rem, Modified	Syd	922	$ 9.00	$ 8,298.00
5	Aggregate Base, 8 inch	Syd	922	$ 9.00	$ 8,298.00
6	Subbase, CIP (12 Inches)	Cyd	308	$ 13.50	$ 4,158.00
7	HMA Surface	Ton	267	$ 80.00	$ 21,360.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 12 Inch	Ea	3	$ 2,750.00	$ 8,250.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	754	$ 125.00	$ 94,250.00
11	Water Service	Ea	11	$ 1,750.00	$ 19,250.00
12	Curb Stop and Box	Ea	11	$ 500.00	$ 5,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	220	$ 5.00	$ 1,100.00
Whitwam-Riverview Dr (Main Street to Whitwam Dr) Estimate					$ 216,612.00
Contingency				**15%**	$ 32,500.00
Engineering & Construction Administration				**20%**	$ 43,400.00
Total Estimated Water Main Construction Costs					$ 292,512.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Empire Ave (Riverview Dr to Salem Ave)
Prepared By: Aaron Townley, EIT

Empire Ave (Riverview Dr to Salem Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 49,600.00	$ 49,600.00
2	Traffic Control	LSum	1	$ 23,600.00	$ 23,600.00
3	Machine Grading	Sta	19.42	$ 1,200.00	$ 23,304.00
4	Pavt, Rem, Modified	Syd	2374	$ 9.00	$ 21,366.00
5	Aggregate Base, 8 inch	Syd	2374	$ 9.00	$ 21,366.00
6	Subbase, CIP (12 Inches)	Cyd	792	$ 13.50	$ 10,692.00
7	HMA Surface	Ton	686	$ 80.00	$ 54,880.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1942	$ 125.00	$ 242,750.00
11	Water Service	Ea	26	$ 1,750.00	$ 45,500.00
12	Curb Stop and Box	Ea	26	$ 500.00	$ 13,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	520	$ 5.00	$ 2,600.00
Empire Ave (Riverview Dr to Salem Ave) Estimate					$ 545,158.00
Contingency				**15%**	$ 81,800.00
Engineering & Construction Administration				**20%**	$ 109,100.00
Total Estimated Water Main Construction Costs					$ 736,058.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Empire Ave (Columbus Ave to Ogden Ave)
Prepared By: Aaron Townley, EIT

Empire Ave (Columbus Ave to Ogden Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 12,900.00	$ 12,900.00
2	Traffic Control	LSum	1	$ 6,200.00	$ 6,200.00
3	Machine Grading	Sta	6.28	$ 1,200.00	$ 7,536.00
4	Pavt, Rem, Modified	Syd	768	$ 9.00	$ 6,912.00
5	Aggregate Base, 8 inch	Syd	768	$ 9.00	$ 6,912.00
6	Subbase, CIP (12 Inches)	Cyd	256	$ 13.50	$ 3,456.00
7	HMA Surface	Ton	222	$ 80.00	$ 17,760.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 8 Inch	Ea	2	$ 1,750.00	$ 3,500.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	628	$ 75.00	$ 47,100.00
11	Water Service	Ea	9	$ 1,750.00	$ 15,750.00
12	Curb Stop and Box	Ea	9	$ 500.00	$ 4,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	180	$ 5.00	$ 900.00
Empire Ave (Columbus Ave to Ogden Ave) Estimate					$ 141,426.00
Contingency				**15%**	$ 21,300.00
Engineering & Construction Administration				**20%**	$ 28,300.00
Total Estimated Water Main Construction Costs					$ 191,026.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Empire Ave (Jennings Ave to Pipestone St)
Prepared By: Aaron Townley, EIT

Empire Ave (Jennings Ave to Pipestone St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 20,500.00	$ 20,500.00
2	Traffic Control	LSum	1	$ 9,800.00	$ 9,800.00
3	Machine Grading	Sta	10.09	$ 1,200.00	$ 12,108.00
4	Pavt, Rem, Modified	Syd	1234	$ 9.00	$ 11,106.00
5	Aggregate Base, 8 inch	Syd	1234	$ 9.00	$ 11,106.00
6	Subbase, CIP (12 Inches)	Cyd	412	$ 13.50	$ 5,562.00
7	HMA Surface	Ton	357	$ 80.00	$ 28,560.00
8	Fire Hydrant Assembly	Ea	3	$ 4,000.00	$ 12,000.00
9	Gate Valve & Box, 8 Inch	Ea	3	$ 1,750.00	$ 5,250.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	1009	$ 75.00	$ 75,675.00
11	Water Service	Ea	14	$ 1,750.00	$ 24,500.00
12	Curb Stop and Box	Ea	14	$ 500.00	$ 7,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	280	$ 5.00	$ 1,400.00
Empire Ave (Jennings Ave to Pipestone St) Estimate					$ 224,567.00
Contingency				**15%**	$ 33,700.00
Engineering & Construction Administration				**20%**	$ 45,000.00
Total Estimated Water Main Construction Costs					$ 303,267.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Salem Ave (Empire Ave to May St to Colfax Ave)
Prepared By: Aaron Townley, EIT

Salem Ave (Empire Ave to May St to Colfax Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 40,500.00	$ 40,500.00
2	Traffic Control	LSum	1	$ 19,300.00	$ 19,300.00
3	Machine Grading	Sta	20.13	$ 1,200.00	$ 24,156.00
4	Pavt, Rem, Modified	Syd	2461	$ 9.00	$ 22,149.00
5	Aggregate Base, 8 inch	Syd	2461	$ 9.00	$ 22,149.00
6	Subbase, CIP (12 Inches)	Cyd	821	$ 13.50	$ 11,083.50
7	HMA Surface	Ton	711	$ 80.00	$ 56,880.00
8	Fire Hydrant Assembly	Ea	6	$ 4,000.00	$ 24,000.00
9	Gate Valve & Box, 8 Inch	Ea	6	$ 1,750.00	$ 10,500.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	2013	$ 75.00	$ 150,975.00
11	Water Service	Ea	27	$ 1,750.00	$ 47,250.00
12	Curb Stop and Box	Ea	27	$ 500.00	$ 13,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	540	$ 5.00	$ 2,700.00
Salem Ave (Empire Ave to May St to Colfax Ave) Estimate					$ 445,142.50
Contingency				**15%**	$ 66,800.00
Engineering & Construction Administration				**20%**	$ 89,100.00
Total Estimated Water Main Construction Costs					$ 601,042.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Emery Ave (Union St to Milton and Hurd Ave south)
Prepared By: Aaron Townley, EIT

Emery Ave (Union St to Milton and Hurd Ave south)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 35,000.00	$ 35,000.00
2	Traffic Control	LSum	1	$ 16,700.00	$ 16,700.00
3	Machine Grading	Sta	17.36	$ 1,200.00	$ 20,832.00
4	Pavt, Rem, Modified	Syd	2122	$ 9.00	$ 19,098.00
5	Aggregate Base, 8 inch	Syd	2122	$ 9.00	$ 19,098.00
6	Subbase, CIP (12 Inches)	Cyd	708	$ 13.50	$ 9,558.00
7	HMA Surface	Ton	613	$ 80.00	$ 49,040.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 8 Inch	Ea	5	$ 1,750.00	$ 8,750.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	1736	$ 75.00	$ 130,200.00
11	Water Service	Ea	24	$ 1,750.00	$ 42,000.00
12	Curb Stop and Box	Ea	24	$ 500.00	$ 12,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	480	$ 5.00	$ 2,400.00
Emery Ave (Union St to Milton and Hurd Ave south) Estimate					$ 384,676.00
Contingency				**15%**	$ 57,800.00
Engineering & Construction Administration				**20%**	$ 77,000.00
Total Estimated Water Main Construction Costs					$ 519,476.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Pearl St (Catalpa Ave to Empire Ave)
Prepared By: Aaron Townley, EIT

Pearl St (Catalpa Ave to Empire Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 43,300.00	$ 43,300.00
2	Traffic Control	LSum	1	$ 20,600.00	$ 20,600.00
3	Machine Grading	Sta	18.21	$ 1,200.00	$ 21,852.00
4	Pavt, Rem, Modified	Syd	2226	$ 9.00	$ 20,034.00
5	Aggregate Base, 8 inch	Syd	2226	$ 9.00	$ 20,034.00
6	Subbase, CIP (12 Inches)	Cyd	742	$ 13.50	$ 10,017.00
7	HMA Surface	Ton	386	$ 80.00	$ 30,880.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1821	$ 125.00	$ 227,625.00
11	Water Service	Ea	19	$ 1,750.00	$ 33,250.00
12	Curb Stop and Box	Ea	19	$ 500.00	$ 9,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	380	$ 5.00	$ 1,900.00
Pearl St (Catalpa Ave to Empire Ave) Estimate					$ 475,492.00
Contingency				**15%**	$ 71,400.00
Engineering & Construction Administration				**20%**	$ 95,100.00
Total Estimated Water Main Construction Costs					$ 641,992.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Catalpa Ave (Colfax Ave to Columbus Ave)
Prepared By: Aaron Townley, EIT

Catalpa Ave (Colfax Ave to Columbus Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 45,400.00	$ 45,400.00
2	Traffic Control	LSum	1	$ 21,700.00	$ 21,700.00
3	Machine Grading	Sta	19.22	$ 1,200.00	$ 23,064.00
4	Pavt, Rem, Modified	Syd	2350	$ 9.00	$ 21,150.00
5	Aggregate Base, 8 inch	Syd	2350	$ 9.00	$ 21,150.00
6	Subbase, CIP (12 Inches)	Cyd	784	$ 13.50	$ 10,584.00
7	HMA Surface	Ton	407	$ 80.00	$ 32,560.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1922	$ 125.00	$ 240,250.00
11	Water Service	Ea	20	$ 1,750.00	$ 35,000.00
12	Curb Stop and Box	Ea	20	$ 500.00	$ 10,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	400	$ 5.00	$ 2,000.00
Catalpa Ave (Colfax Ave to Columbus Ave) Estimate					$ 499,358.00
Contingency				**15%**	$ 75,000.00
Engineering & Construction Administration				**20%**	$ 99,900.00
Total Estimated Water Main Construction Costs					$ 674,258.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Pavone St (Lake Ave to Catalpa Ave)
Prepared By: Aaron Townley, EIT

Pavone St (Lake Ave to Catalpa Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 39,300.00	$ 39,300.00
2	Traffic Control	LSum	1	$ 18,700.00	$ 18,700.00
3	Machine Grading	Sta	16.52	$ 1,200.00	$ 19,824.00
4	Pavt, Rem, Modified	Syd	2020	$ 9.00	$ 18,180.00
5	Aggregate Base, 8 inch	Syd	2020	$ 9.00	$ 18,180.00
6	Subbase, CIP (12 Inches)	Cyd	674	$ 13.50	$ 9,099.00
7	HMA Surface	Ton	350	$ 80.00	$ 28,000.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	5	$ 2,750.00	$ 13,750.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1652	$ 125.00	$ 206,500.00
11	Water Service	Ea	17	$ 1,750.00	$ 29,750.00
12	Curb Stop and Box	Ea	17	$ 500.00	$ 8,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	340	$ 5.00	$ 1,700.00
Pavone St (Lake Ave to Catalpa Ave) Estimate					$ 431,483.00
Contingency				**15%**	$ 64,800.00
Engineering & Construction Administration				**20%**	$ 86,300.00
Total Estimated Water Main Construction Costs					$ 582,583.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Ohio St Alleys (Britain Ave to Pavone St)
Prepared By: Aaron Townley, EIT

Ohio St Alleys (Britain Ave to Pavone St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 21,100.00	$ 21,100.00
2	Traffic Control	LSum	1	$ 10,100.00	$ 10,100.00
3	Machine Grading	Sta	8.78	$ 1,200.00	$ 10,536.00
4	Pavt, Rem, Modified	Syd	1074	$ 9.00	$ 9,666.00
5	Aggregate Base, 8 inch	Syd	1074	$ 9.00	$ 9,666.00
6	Subbase, CIP (12 Inches)	Cyd	358	$ 13.50	$ 4,833.00
7	HMA Surface	Ton	186	$ 80.00	$ 14,880.00
8	Fire Hydrant Assembly	Ea	3	$ 4,000.00	$ 12,000.00
9	Gate Valve & Box, 12 Inch	Ea	3	$ 2,750.00	$ 8,250.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	878	$ 125.00	$ 109,750.00
11	Water Service	Ea	9	$ 1,750.00	$ 15,750.00
12	Curb Stop and Box	Ea	9	$ 500.00	$ 4,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	180	$ 5.00	$ 900.00
Ohio St Alleys (Britain Ave to Pavone St) Estimate					$ 231,931.00
Contingency				**15%**	$ 34,800.00
Engineering & Construction Administration				**20%**	$ 46,400.00
Total Estimated Water Main Construction Costs					$ 313,131.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Lake Ave (Market St to Broadway Ave)
Prepared By: Aaron Townley, EIT

Lake Ave (Market St to Broadway Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 47,500.00	$ 47,500.00
2	Traffic Control	LSum	1	$ 22,700.00	$ 22,700.00
3	Machine Grading	Sta	18.51	$ 1,200.00	$ 22,212.00
4	Pavt, Rem, Modified	Syd	2263	$ 9.00	$ 20,367.00
5	Aggregate Base, 8 inch	Syd	2263	$ 9.00	$ 20,367.00
6	Subbase, CIP (12 Inches)	Cyd	755	$ 13.50	$ 10,192.50
7	HMA Surface	Ton	654	$ 80.00	$ 52,320.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1851	$ 125.00	$ 231,375.00
11	Water Service	Ea	25	$ 1,750.00	$ 43,750.00
12	Curb Stop and Box	Ea	25	$ 500.00	$ 12,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	500	$ 5.00	$ 2,500.00
Lake Ave (Market St to Broadway Ave) Estimate					$ 522,283.50
Contingency				**15%**	$ 78,400.00
Engineering & Construction Administration				**20%**	$ 104,500.00
Total Estimated Water Main Construction Costs					$ 705,183.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Broadway Ave / Jefferson St (Lake Ave to Highland Ave)
Prepared By: Aaron Townley, EIT

Broadway Ave / Jefferson St (Lake Ave to Highland Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 48,600.00	$ 48,600.00
2	Traffic Control	LSum	1	$ 23,100.00	$ 23,100.00
3	Machine Grading	Sta	18.9	$ 1,200.00	$ 22,680.00
4	Pavt, Rem, Modified	Syd	2310	$ 9.00	$ 20,790.00
5	Aggregate Base, 8 inch	Syd	2310	$ 9.00	$ 20,790.00
6	Subbase, CIP (12 Inches)	Cyd	770	$ 13.50	$ 10,395.00
7	HMA Surface	Ton	668	$ 80.00	$ 53,440.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1890	$ 125.00	$ 236,250.00
11	Water Service	Ea	26	$ 1,750.00	$ 45,500.00
12	Curb Stop and Box	Ea	26	$ 500.00	$ 13,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	520	$ 5.00	$ 2,600.00
Broadway Ave / Jefferson St (Lake Ave to Highland Ave) Estimate					$ 533,645.00
Contingency				**15%**	$ 80,100.00
Engineering & Construction Administration				**20%**	$ 106,800.00
Total Estimated Water Main Construction Costs					$ 720,545.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: McCord St (Main St to Britain Ave)
Prepared By: Aaron Townley, EIT

McCord St (Main St to Britain Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 89,000.00	$ 89,000.00
2	Traffic Control	LSum	1	$ 42,400.00	$ 42,400.00
3	Machine Grading	Sta	34.91	$ 1,200.00	$ 41,892.00
4	Pavt, Rem, Modified	Syd	4267	$ 9.00	$ 38,403.00
5	Aggregate Base, 8 inch	Syd	4267	$ 9.00	$ 38,403.00
6	Subbase, CIP (12 Inches)	Cyd	1423	$ 13.50	$ 19,210.50
7	HMA Surface	Ton	1233	$ 80.00	$ 98,640.00
8	Fire Hydrant Assembly	Ea	9	$ 4,000.00	$ 36,000.00
9	Gate Valve & Box, 12 Inch	Ea	10	$ 2,750.00	$ 27,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	3491	$ 125.00	$ 436,375.00
11	Water Service	Ea	47	$ 1,750.00	$ 82,250.00
12	Curb Stop and Box	Ea	47	$ 500.00	$ 23,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	940	$ 5.00	$ 4,700.00
McCord St (Main St to Britain Ave) Estimate					$ 978,273.50
Contingency				**15%**	$ 146,800.00
Engineering & Construction Administration				**20%**	$ 195,700.00
Total Estimated Water Main Construction Costs					$ 1,320,773.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: 2nd St, Klock Rd to Highland Ave
Prepared By: Aaron Townley, EIT

2nd St, Klock Rd to Highland Ave					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 107,500.00	$ 107,500.00
2	Traffic Control	LSum	1	$ 51,200.00	$ 51,200.00
3	Machine Grading	Sta	31.16	$ 1,200.00	$ 37,392.00
4	Pavt, Rem, Modified	Syd	3809	$ 9.00	$ 34,281.00
5	Aggregate Base, 8 inch	Syd	3809	$ 9.00	$ 34,281.00
6	Subbase, CIP (12 Inches)	Cyd	1270	$ 13.50	$ 17,145.00
7	HMA Surface	Ton	1100	$ 80.00	$ 88,000.00
8	Fire Hydrant Assembly	Ea	8	$ 4,000.00	$ 32,000.00
9	Gate Valve & Box, 16 Inch	Ea	9	$ 6,500.00	$ 58,500.00
10	Water Main, DI, 16 Inch, Tr Det G	Ft	3116	$ 200.00	$ 623,200.00
11	Water Service	Ea	42	$ 1,750.00	$ 73,500.00
12	Curb Stop and Box	Ea	42	$ 500.00	$ 21,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	840	$ 5.00	$ 4,200.00
2nd St, Klock Rd to Highland Ave Estimate					$ 1,182,199.00
Contingency				**15%**	$ 177,400.00
Engineering & Construction Administration				**20%**	$ 236,500.00
Total Estimated Water Main Construction Costs					$ 1,596,099.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Waukonda Ave (Nowlen St to Fair Ave)
Prepared By: Aaron Townley, EIT

Waukonda Ave (Nowlen St to Fair Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 48,000.00	$ 48,000.00
2	Traffic Control	LSum	1	$ 22,900.00	$ 22,900.00
3	Machine Grading	Sta	20.23	$ 1,200.00	$ 24,276.00
4	Pavt, Rem, Modified	Syd	2473	$ 9.00	$ 22,257.00
5	Aggregate Base, 8 inch	Syd	2473	$ 9.00	$ 22,257.00
6	Subbase, CIP (12 Inches)	Cyd	825	$ 13.50	$ 11,137.50
7	HMA Surface	Ton	429	$ 80.00	$ 34,320.00
8	Fire Hydrant Assembly	Ea	6	$ 4,000.00	$ 24,000.00
9	Gate Valve & Box, 12 Inch	Ea	6	$ 2,750.00	$ 16,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	2023	$ 125.00	$ 252,875.00
11	Water Service	Ea	21	$ 1,750.00	$ 36,750.00
12	Curb Stop and Box	Ea	21	$ 500.00	$ 10,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	420	$ 5.00	$ 2,100.00
Waukonda Ave (Nowlen St to Fair Ave) Estimate					$ 527,872.50
Contingency				**15%**	$ 79,200.00
Engineering & Construction Administration				**20%**	$ 105,600.00
Total Estimated Water Main Construction Costs					$ 712,672.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Bond St (Market St to Colfax Ave)
Prepared By: Aaron Townley, EIT

Bond St (Market St to Colfax Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 53,500.00	$ 53,500.00
2	Traffic Control	LSum	1	$ 25,500.00	$ 25,500.00
3	Machine Grading	Sta	26.77	$ 1,200.00	$ 32,124.00
4	Pavt, Rem, Modified	Syd	3272	$ 9.00	$ 29,448.00
5	Aggregate Base, 8 inch	Syd	3272	$ 9.00	$ 29,448.00
6	Subbase, CIP (12 Inches)	Cyd	1091	$ 13.50	$ 14,728.50
7	HMA Surface	Ton	945	$ 80.00	$ 75,600.00
8	Fire Hydrant Assembly	Ea	7	$ 4,000.00	$ 28,000.00
9	Gate Valve & Box, 8 Inch	Ea	8	$ 1,750.00	$ 14,000.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	2677	$ 75.00	$ 200,775.00
11	Water Service	Ea	36	$ 1,750.00	$ 63,000.00
12	Curb Stop and Box	Ea	36	$ 500.00	$ 18,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	720	$ 5.00	$ 3,600.00
Bond St (Market St to Colfax Ave) Estimate					$ 587,723.50
Contingency				**15%**	$ 88,200.00
Engineering & Construction Administration				**20%**	$ 117,600.00
Total Estimated Water Main Construction Costs					$ 793,523.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: 9th St (Main St to Oak St)
Prepared By: Aaron Townley, EIT

9th St (Main St to Oak St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 19,800.00	$ 19,800.00
2	Traffic Control	LSum	1	$ 9,500.00	$ 9,500.00
3	Machine Grading	Sta	7.57	$ 1,200.00	$ 9,084.00
4	Pavt, Rem, Modified	Syd	926	$ 9.00	$ 8,334.00
5	Aggregate Base, 8 inch	Syd	926	$ 9.00	$ 8,334.00
6	Subbase, CIP (12 Inches)	Cyd	309	$ 13.50	$ 4,171.50
7	HMA Surface	Ton	268	$ 80.00	$ 21,440.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 12 Inch	Ea	3	$ 2,750.00	$ 8,250.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	757	$ 125.00	$ 94,625.00
11	Water Service	Ea	11	$ 1,750.00	$ 19,250.00
12	Curb Stop and Box	Ea	11	$ 500.00	$ 5,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	220	$ 5.00	$ 1,100.00
9th St (Main St to Oak St) Estimate					$ 217,388.50
Contingency				**15%**	$ 32,700.00
Engineering & Construction Administration				**20%**	$ 43,500.00
Total Estimated Water Main Construction Costs					$ 293,588.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Territorial Rd (4th St to 2nd St)
Prepared By: Aaron Townley, EIT

Territorial Rd (4th St to 2nd St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 19,300.00	$ 19,300.00
2	Traffic Control	LSum	1	$ 9,200.00	$ 9,200.00
3	Machine Grading	Sta	7.43	$ 1,200.00	$ 8,916.00
4	Pavt, Rem, Modified	Syd	909	$ 9.00	$ 8,181.00
5	Aggregate Base, 8 inch	Syd	909	$ 9.00	$ 8,181.00
6	Subbase, CIP (12 Inches)	Cyd	303	$ 13.50	$ 4,090.50
7	HMA Surface	Ton	263	$ 80.00	$ 21,040.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 12 Inch	Ea	3	$ 2,750.00	$ 8,250.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	743	$ 125.00	$ 92,875.00
11	Water Service	Ea	10	$ 1,750.00	$ 17,500.00
12	Curb Stop and Box	Ea	10	$ 500.00	$ 5,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	200	$ 5.00	$ 1,000.00
Territorial Rd (4th St to 2nd St) Estimate					$ 211,533.50
Contingency				**15%**	$ 31,800.00
Engineering & Construction Administration				**20%**	$ 42,400.00
Total Estimated Water Main Construction Costs					$ 285,733.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: 3rd St / East Alley (Territorial to Highland Ave)
Prepared By: Aaron Townley, EIT

3rd St / East Alley (Territorial to Highland Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 28,200.00	$ 28,200.00
2	Traffic Control	LSum	1	$ 13,400.00	$ 13,400.00
3	Machine Grading	Sta	10.88	$ 1,200.00	$ 13,056.00
4	Pavt, Rem, Modified	Syd	1330	$ 9.00	$ 11,970.00
5	Aggregate Base, 8 inch	Syd	1330	$ 9.00	$ 11,970.00
6	Subbase, CIP (12 Inches)	Cyd	444	$ 13.50	$ 5,994.00
7	HMA Surface	Ton	384	$ 80.00	$ 30,720.00
8	Fire Hydrant Assembly	Ea	3	$ 4,000.00	$ 12,000.00
9	Gate Valve & Box, 12 Inch	Ea	4	$ 2,750.00	$ 11,000.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	1088	$ 125.00	$ 136,000.00
11	Water Service	Ea	15	$ 1,750.00	$ 26,250.00
12	Curb Stop and Box	Ea	15	$ 500.00	$ 7,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	300	$ 5.00	$ 1,500.00
3rd St / East Alley (Territorial to Highland Ave) Estimate					$ 309,560.00
Contingency				**15%**	$ 46,500.00
Engineering & Construction Administration				**20%**	$ 62,000.00
Total Estimated Water Main Construction Costs					$ 418,060.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: 8th St (Klock Rd to Graham Ave)
Prepared By: Aaron Townley, EIT

8th St (Klock Rd to Graham Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 64,400.00	$ 64,400.00
2	Traffic Control	LSum	1	$ 30,700.00	$ 30,700.00
3	Machine Grading	Sta	18.48	$ 1,200.00	$ 22,176.00
4	Pavt, Rem, Modified	Syd	2259	$ 9.00	$ 20,331.00
5	Aggregate Base, 8 inch	Syd	2259	$ 9.00	$ 20,331.00
6	Subbase, CIP (12 Inches)	Cyd	753	$ 13.50	$ 10,165.50
7	HMA Surface	Ton	653	$ 80.00	$ 52,240.00
8	Fire Hydrant Assembly	Ea	5	$ 4,000.00	$ 20,000.00
9	Gate Valve & Box, 16 Inch	Ea	6	$ 6,500.00	$ 39,000.00
10	Water Main, DI, 16 Inch, Tr Det G	Ft	1848	$ 200.00	$ 369,600.00
11	Water Service	Ea	25	$ 1,750.00	$ 43,750.00
12	Curb Stop and Box	Ea	25	$ 500.00	$ 12,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	500	$ 5.00	$ 2,500.00
8th St (Klock Rd to Graham Ave) Estimate					$ 707,693.50
Contingency				**15%**	$ 106,200.00
Engineering & Construction Administration				**20%**	$ 141,600.00
Total Estimated Water Main Construction Costs					$ 955,493.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Wall St (Riverview Dr to 12th St)
Prepared By: Aaron Townley, EIT

Wall St (Riverview Dr to 12th St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 33,900.00	$ 33,900.00
2	Traffic Control	LSum	1	$ 16,200.00	$ 16,200.00
3	Machine Grading	Sta	9.73	$ 1,200.00	$ 11,676.00
4	Pavt, Rem, Modified	Syd	1190	$ 9.00	$ 10,710.00
5	Aggregate Base, 8 inch	Syd	1190	$ 9.00	$ 10,710.00
6	Subbase, CIP (12 Inches)	Cyd	397	$ 13.50	$ 5,359.50
7	HMA Surface	Ton	344	$ 80.00	$ 27,520.00
8	Fire Hydrant Assembly	Ea	3	$ 4,000.00	$ 12,000.00
9	Gate Valve & Box, 16 Inch	Ea	3	$ 6,500.00	$ 19,500.00
10	Water Main, DI, 16 Inch, Tr Det G	Ft	973	$ 200.00	$ 194,600.00
11	Water Service	Ea	13	$ 1,750.00	$ 22,750.00
12	Curb Stop and Box	Ea	13	$ 500.00	$ 6,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	260	$ 5.00	$ 1,300.00
Wall St (Riverview Dr to 12th St) Estimate					$ 372,725.50
Contingency				**15%**	$ 56,000.00
Engineering & Construction Administration				**20%**	$ 74,600.00
Total Estimated Water Main Construction Costs					$ 503,325.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Hull Ave (Frank St to ~350 ft North of Edwards Ave)
Prepared By: Aaron Townley, EIT

Hull Ave (Frank St to ~350 ft North of Edwards Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 10,300.00	$ 10,300.00
2	Traffic Control	LSum	1	$ 4,900.00	$ 4,900.00
3	Machine Grading	Sta	5.5	$ 1,200.00	$ 6,600.00
4	Pavt, Rem, Modified	Syd	673	$ 9.00	$ 6,057.00
5	Aggregate Base, 8 inch	Syd	673	$ 9.00	$ 6,057.00
6	Subbase, CIP (12 Inches)	Cyd	225	$ 13.50	$ 3,037.50
7	HMA Surface	Ton	117	$ 80.00	$ 9,360.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 8 Inch	Ea	2	$ 1,750.00	$ 3,500.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	550	$ 75.00	$ 41,250.00
11	Water Service	Ea	6	$ 1,750.00	$ 10,500.00
12	Curb Stop and Box	Ea	6	$ 500.00	$ 3,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	120	$ 5.00	$ 600.00
Hull Ave (Frank St to ~350 ft North of Edwards Ave) Estimate					$ 113,161.50
Contingency				**15%**	$ 17,000.00
Engineering & Construction Administration				**20%**	$ 22,700.00
Total Estimated Water Main Construction Costs					$ 152,861.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Klock Rd, Water Plant to East
Prepared By: Aaron Townley, EIT

Klock Rd, Water Plant to East					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 31,100.00	$ 31,100.00
2	Traffic Control	LSum	1	$ 14,800.00	$ 14,800.00
3	Machine Grading	Sta	8.8	$ 1,200.00	$ 10,560.00
4	Pavt, Rem, Modified	Syd	1076	$ 9.00	$ 9,684.00
5	Aggregate Base, 8 inch	Syd	1076	$ 9.00	$ 9,684.00
6	Subbase, CIP (12 Inches)	Cyd	359	$ 13.50	$ 4,846.50
7	HMA Surface	Ton	311	$ 80.00	$ 24,880.00
8	Fire Hydrant Assembly	Ea	3	$ 4,000.00	$ 12,000.00
9	Gate Valve & Box, 16 Inch	Ea	3	$ 6,500.00	$ 19,500.00
10	Water Main, DI, 16 Inch, Tr Det G	Ft	880	$ 200.00	$ 176,000.00
11	Water Service	Ea	12	$ 1,750.00	$ 21,000.00
12	Curb Stop and Box	Ea	12	$ 500.00	$ 6,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	240	$ 5.00	$ 1,200.00
Klock Rd, Water Plant to East Estimate					$ 341,254.50
Contingency				**15%**	$ 51,200.00
Engineering & Construction Administration				**20%**	$ 68,300.00
Total Estimated Water Main Construction Costs					$ 460,754.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: North Shore Dr, Klock Rd to North
Prepared By: Aaron Townley, EIT

North Shore Dr, Klock Rd to North					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 11,300.00	$ 11,300.00
2	Traffic Control	LSum	1	$ 5,400.00	$ 5,400.00
3	Machine Grading	Sta	5.41	$ 1,200.00	$ 6,492.00
4	Pavt, Rem, Modified	Syd	662	$ 9.00	$ 5,958.00
5	Aggregate Base, 8 inch	Syd	662	$ 9.00	$ 5,958.00
6	Subbase, CIP (12 Inches)	Cyd	221	$ 13.50	$ 2,983.50
7	HMA Surface	Ton	191	$ 80.00	$ 15,280.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 8 Inch	Ea	2	$ 1,750.00	$ 3,500.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	541	$ 75.00	$ 40,575.00
11	Water Service	Ea	8	$ 1,750.00	$ 14,000.00
12	Curb Stop and Box	Ea	8	$ 500.00	$ 4,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	160	$ 5.00	$ 800.00
North Shore Dr, Klock Rd to North Estimate					$ 124,246.50
Contingency				**15%**	$ 18,700.00
Engineering & Construction Administration				**20%**	$ 24,900.00
Total Estimated Water Main Construction Costs					$ 167,846.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Paw Paw Ave, West of Paw Paw Ave between Waukonda Ave and Frank St
Prepared By: Aaron Townley, EIT

Paw Paw Ave, West of Paw Paw Ave between Waukonda Ave and Frank St					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 18,000.00	$ 18,000.00
2	Traffic Control	LSum	1	$ 8,600.00	$ 8,600.00
3	Machine Grading	Sta	5.3	$ 1,200.00	$ 6,360.00
4	Pavt, Rem, Modified	Syd	648	$ 9.00	$ 5,832.00
5	Aggregate Base, 8 inch	Syd	648	$ 9.00	$ 5,832.00
6	Subbase, CIP (12 Inches)	Cyd	216	$ 13.50	$ 2,916.00
7	HMA Surface	Ton	113	$ 80.00	$ 9,040.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 16 Inch	Ea	2	$ 6,500.00	$ 13,000.00
10	Water Main, DI, 16 Inch, Tr Det G	Ft	530	$ 200.00	$ 106,000.00
11	Water Service	Ea	6	$ 1,750.00	$ 10,500.00
12	Curb Stop and Box	Ea	6	$ 500.00	$ 3,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	120	$ 5.00	$ 600.00
Paw Paw Ave, West of Paw Paw Ave between Waukonda Ave and Frank St Estimate					$ 197,680.00
Contingency				**15%**	$ 29,700.00
Engineering & Construction Administration				**20%**	$ 39,600.00
Total Estimated Water Main Construction Costs					$ 266,980.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Building Lot (Water St to 2nd St)
Prepared By: Aaron Townley, EIT

Building Lot (Water St to 2nd St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 12,000.00	$ 12,000.00
2	Traffic Control	LSum	1	$ 5,700.00	$ 5,700.00
3	Machine Grading	Sta	4.88	$ 1,200.00	$ 5,856.00
4	Pavt, Rem, Modified	Syd	597	$ 9.00	$ 5,373.00
5	Aggregate Base, 8 inch	Syd	597	$ 9.00	$ 5,373.00
6	Subbase, CIP (12 Inches)	Cyd	199	$ 13.50	$ 2,686.50
7	HMA Surface	Ton	104	$ 80.00	$ 8,320.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 12 Inch	Ea	2	$ 2,750.00	$ 5,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	488	$ 125.00	$ 61,000.00
11	Water Service	Ea	5	$ 1,750.00	$ 8,750.00
12	Curb Stop and Box	Ea	5	$ 500.00	$ 2,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	100	$ 5.00	$ 500.00
Building Lot (Water St to 2nd St) Estimate					$ 131,558.50
Contingency				**15%**	$ 19,800.00
Engineering & Construction Administration				**20%**	$ 26,400.00
Total Estimated Water Main Construction Costs					$ 177,758.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Maple St (Pipestone St to Cedar St)
Prepared By: Aaron Townley, EIT

Maple St (Pipestone St to Cedar St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 13,500.00	$ 13,500.00
2	Traffic Control	LSum	1	$ 6,500.00	$ 6,500.00
3	Machine Grading	Sta	7.32	$ 1,200.00	$ 8,784.00
4	Pavt, Rem, Modified	Syd	895	$ 9.00	$ 8,055.00
5	Aggregate Base, 8 inch	Syd	895	$ 9.00	$ 8,055.00
6	Subbase, CIP (12 Inches)	Cyd	299	$ 13.50	$ 4,036.50
7	HMA Surface	Ton	156	$ 80.00	$ 12,480.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 8 Inch	Ea	3	$ 1,750.00	$ 5,250.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	732	$ 75.00	$ 54,900.00
11	Water Service	Ea	8	$ 1,750.00	$ 14,000.00
12	Curb Stop and Box	Ea	8	$ 500.00	$ 4,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	160	$ 5.00	$ 800.00
Maple St (Pipestone St to Cedar St) Estimate					$ 148,360.50
Contingency				**15%**	$ 22,300.00
Engineering & Construction Administration				**20%**	$ 29,700.00
Total Estimated Water Main Construction Costs					$ 200,360.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Riverview Dr and River St
Prepared By: Aaron Townley, EIT

Riverview Dr and River St					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 9,700.00	$ 9,700.00
2	Traffic Control	LSum	1	$ 4,600.00	$ 4,600.00
3	Machine Grading	Sta	2.67	$ 1,200.00	$ 3,204.00
4	Pavt, Rem, Modified	Syd	327	$ 9.00	$ 2,943.00
5	Aggregate Base, 8 inch	Syd	327	$ 9.00	$ 2,943.00
6	Subbase, CIP (12 Inches)	Cyd	109	$ 13.50	$ 1,471.50
7	HMA Surface	Ton	95	$ 80.00	$ 7,600.00
8	Fire Hydrant Assembly	Ea	1	$ 4,000.00	$ 4,000.00
9	Gate Valve & Box, 16 Inch	Ea	1	$ 6,500.00	$ 6,500.00
10	Water Main, DI, 16 Inch, Tr Det G	Ft	267	$ 200.00	$ 53,400.00
11	Water Service	Ea	4	$ 1,750.00	$ 7,000.00
12	Curb Stop and Box	Ea	4	$ 500.00	$ 2,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	80	$ 5.00	$ 400.00
Riverview Dr and River St Estimate					$ 105,761.50
Contingency				**15%**	$ 15,900.00
Engineering & Construction Administration				**20%**	$ 21,200.00
Total Estimated Water Main Construction Costs					$ 142,861.50

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: 9th St, Britain Ave to South
Prepared By: Aaron Townley, EIT

9th St, Britain Ave to South					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 15,400.00	$ 15,400.00
2	Traffic Control	LSum	1	$ 7,300.00	$ 7,300.00
3	Machine Grading	Sta	6.39	$ 1,200.00	$ 7,668.00
4	Pavt, Rem, Modified	Syd	781	$ 9.00	$ 7,029.00
5	Aggregate Base, 8 inch	Syd	781	$ 9.00	$ 7,029.00
6	Subbase, CIP (12 Inches)	Cyd	261	$ 13.50	$ 3,523.50
7	HMA Surface	Ton	136	$ 80.00	$ 10,880.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 12 Inch	Ea	2	$ 2,750.00	$ 5,500.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	639	$ 125.00	$ 79,875.00
11	Water Service	Ea	7	$ 1,750.00	$ 12,250.00
12	Curb Stop and Box	Ea	7	$ 500.00	$ 3,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	140	$ 5.00	$ 700.00
9th St, Britain Ave to South Estimate					$ 168,654.50
Contingency				**15%**	$ 25,300.00
Engineering & Construction Administration				**20%**	$ 33,800.00
Total Estimated Water Main Construction Costs					$ 227,754.50

ABONMARCHE
Confidence By Design

95 West Main Street
P.O. Box 1088
Benton Harbor, MI 49023
T 269.927.2295
F 269.927.1017
www.abonmarche.com

Project Name: Benton Harbor Water Asset Management Plan
Project Location: Brunson Ave (Hornack Rd to Jefferson St)
Prepared By: Aaron Townley, EIT

Brunson Ave (Hornack Rd to Jefferson St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 12,100.00	$ 12,100.00
2	Traffic Control	LSum	1	$ 5,800.00	$ 5,800.00
3	Machine Grading	Sta	6.57	$ 1,200.00	$ 7,884.00
4	Pavt, Rem, Modified	Syd	803	$ 9.00	$ 7,227.00
5	Aggregate Base, 8 inch	Syd	803	$ 9.00	$ 7,227.00
6	Subbase, CIP (12 Inches)	Cyd	268	$ 13.50	$ 3,618.00
7	HMA Surface	Ton	140	$ 80.00	$ 11,200.00
8	Fire Hydrant Assembly	Ea	2	$ 4,000.00	$ 8,000.00
9	Gate Valve & Box, 8 Inch	Ea	2	$ 1,750.00	$ 3,500.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	657	$ 75.00	$ 49,275.00
11	Water Service	Ea	7	$ 1,750.00	$ 12,250.00
12	Curb Stop and Box	Ea	7	$ 500.00	$ 3,500.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	140	$ 5.00	$ 700.00
Brunson Ave (Hornack Rd to Jefferson St) Estimate					$ 132,281.00
Contingency				**15%**	$ 19,900.00
Engineering & Construction Administration				**20%**	$ 26,500.00
Total Estimated Water Main Construction Costs					$ 178,681.00

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Project Name: Benton Harbor Water Asset Management Plan
Project Location: Weld St (Union St to Agard Ave)
Prepared By: Aaron Townley, EIT

Weld St (Union St to Agard Ave)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 6,200.00	$ 6,200.00
2	Traffic Control	LSum	1	$ 3,000.00	$ 3,000.00
3	Machine Grading	Sta	3.3	$ 1,200.00	$ 3,960.00
4	Pavt, Rem, Modified	Syd	404	$ 9.00	$ 3,636.00
5	Aggregate Base, 8 inch	Syd	404	$ 9.00	$ 3,636.00
6	Subbase, CIP (12 Inches)	Cyd	135	$ 13.50	$ 1,822.50
7	HMA Surface	Ton	70	$ 80.00	$ 5,600.00
8	Fire Hydrant Assembly	Ea	1	$ 4,000.00	$ 4,000.00
9	Gate Valve & Box, 8 Inch	Ea	1	$ 1,750.00	$ 1,750.00
10	Water Main, DI, 8 Inch, Tr Det G	Ft	330	$ 75.00	$ 24,750.00
11	Water Service	Ea	4	$ 1,750.00	$ 7,000.00
12	Curb Stop and Box	Ea	4	$ 500.00	$ 2,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	80	$ 5.00	$ 400.00
Weld St (Union St to Agard Ave) Estimate					$ 67,754.50
Contingency				**15%**	$ 10,200.00
Engineering & Construction Administration				**20%**	$ 13,600.00
Total Estimated Water Main Construction Costs					$ 91,554.50

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95 West Main Street
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Project Name: Benton Harbor Water Asset Management Plan
Project Location: 4th St (Territorial Rd to Main St)
Prepared By: Aaron Townley, EIT

4th St (Territorial Rd to Main St)					
#	Item Description	Unit	Quantity	Unit Price	Total
1	Mobilization	LSum	1	$ 6,700.00	$ 6,700.00
2	Traffic Control	LSum	1	$ 3,200.00	$ 3,200.00
3	Machine Grading	Sta	2.45	$ 1,200.00	$ 2,940.00
4	Pavt, Rem, Modified	Syd	300	$ 9.00	$ 2,700.00
5	Aggregate Base, 8 inch	Syd	300	$ 9.00	$ 2,700.00
6	Subbase, CIP (12 Inches)	Cyd	100	$ 13.50	$ 1,350.00
7	HMA Surface	Ton	87	$ 80.00	$ 6,960.00
8	Fire Hydrant Assembly	Ea	1	$ 4,000.00	$ 4,000.00
9	Gate Valve & Box, 12 Inch	Ea	1	$ 2,750.00	$ 2,750.00
10	Water Main, DI, 12 Inch, Tr Det G	Ft	245	$ 125.00	$ 30,625.00
11	Water Service	Ea	4	$ 1,750.00	$ 7,000.00
12	Curb Stop and Box	Ea	4	$ 500.00	$ 2,000.00
13	Restoration (Grass, Seed, & Topsoil)	Syd	80	$ 5.00	$ 400.00
4th St (Territorial Rd to Main St) Estimate					$ 73,325.00
Contingency				**15%**	$ 11,000.00
Engineering & Construction Administration				**20%**	$ 14,700.00
Total Estimated Water Main Construction Costs					$ 99,025.00

APPENDIX G

BENTON HARBOR WATER SYSTEM

CASH FLOW

City of Benton Harbor, Michigan

Historical and Projected Water System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	Preliminary 2017 (2)	Projected 2018 (2)	Projected 2019 (3)	Projected 2020 (3)	Projected 2021 (3)	Projected 2022 (3)	Projected 2023 (3)	Projected 2024
Operating Revenues											
Water RTS/Commodity	$ 1,854,525	$ 2,028,776	$ 1,970,829	$ 1,631,024	$ 1,631,024	$ 1,631,024	$ 1,631,024	$ 1,631,024	$ 1,631,024	$ 1,631,024	$ 1,631,024
Water Capital Charge		-	-	253,385	253,385	253,385	253,385	253,385	253,385	253,385	253,385
Sprinkler, Hydrant, Fire		-	-	37,333	37,333	37,333	37,333	37,333	37,333	37,333	37,333
Other		-	-	32,540	32,540	32,540	32,540	32,540	32,540	32,540	32,540
Fines	17,160	177	-	20,340	20,340	20,340	20,340	20,340	20,340	20,340	20,340
Total Operating Revenues	$ 1,871,685	$ 2,028,953	$ 1,970,829	$ 1,974,622	$ 1,974,622	$ 1,974,622	$ 1,974,622	$ 1,974,622	$ 1,974,622	$ 1,974,622	$ 1,974,622
Operating Expenses (4)											
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 570,662	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Customer Service	178,106	63,627	54,432	51,079	-	-	-	-	-	-	-
Water Treatment	721,683	414,240	457,036	408,751	-	-	-	-	-	-	-
Water Distribution	893,856	554,709	585,567	622,208	-	-	-	-	-	-	-
Other	8,994	5,138	5,336	-	-	-	-	-	-	-	-
Depreciation	306,949	296,727	299,373	-	-	-	-	-	-	-	-
Total Operating Expenses	$ 2,673,947	$ 1,751,275	$ 1,889,207	$ 1,652,700	$ 1,702,281	$ 1,753,349	$ 1,805,950	$ 1,860,128	$ 1,915,932	$ 1,915,932	$ 1,915,932
Operating Income (Loss)	$ (802,262)	$ 277,678	$ 81,623	$ 321,922	$ 272,341	$ 221,273	$ 168,672	$ 114,494	$ 58,690	$ 58,690	$ 58,690
Non-Operating Revenues (Expenses)											
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/FDCVT Proceeds	-	185,108	194,777	300,000	-	-	-	-	-	-	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-	-	-	-
Income From Joint Venture	153,247	172,888	(40,562)	-	-	-	-	-	-	-	-
Depreciation	306,949	296,727	299,373	-	-	-	-	-	-	-	-
Total Non-Operating Revenues (Expenses)	$ 318,838	$ 654,722	$ 455,896	$ 300,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (483,425)	$ 932,400	$ 537,519	$ 621,922	$ 272,341	$ 221,273	$ 168,672	$ 114,494	$ 58,690	$ 58,690	$ 58,690
Debt Service Requirements											
Drinking Water Revolving Fund Revenue Bonds, Series 2009	$ 11,125	$ 8,105	$ 7,980	$ 7,855	$ 7,730	$ 7,605	$ 7,480	$ 7,335	$ 7,230	$ 7,105	$ 6,980
Drinking Water Revolving Fund Revenue Bonds, Series 2010	410,375	410,250	410,000	409,625	414,125	413,375	412,500	411,500	410,375	414,125	412,625
Water Storage Projects						15,279 #	15,279 #	15,279 #	15,279 #	15,279 #	15,279
Water Supply Projects							47,777	47,777 #	47,777 #	47,777 #	47,777
Water Distribution Projects							-			691,765	691,765
Water Supply System Revenue Bonds, Series 2018, for SAW	-	-	-	-	-	41,600	41,243	45,887	45,412	44,937	44,462
Water Supply System Revenue Bonds, Series 2023, for SAW						-	-	-	-	-	50,875
Total	$ 421,500	$ 418,355	$ 417,980	$ 417,480	$ 421,855	$ 477,859	$ 524,279	$ 527,778	$ 526,073	$ 1,220,988	$ 1,269,763
Debt Service Coverage Ratio	**(1.15x)**	**2.23x**	**1.29x**	**1.49x**	**0.65x**	**0.46x**	**0.32x**	**0.22x**	**0.11x**	**0.05x**	**0.05x**

Utilities Revenue and SRF Bonds

Annual Excess with 1.2x Coverage.	**# $ 84,370**	**$ 95,571**	**$ 104,855**	**$ 105,554**	**$ 105,213**	**$ 244,196**	**$ 253,951**	
Cumulative Excess with 1.2x Coverage.	**# $ 84,370**	**$ 179,941**	**$ 284,795**	**$ 390,350**	**$ 495,563**	**$ 739,759**	**$ 993,711**	
Annual Increase in Revenue Necessary for 1.2x Coverage.	**$233,884**	**$118,273**	**$108,304**	**$58,377**	**$53,758**	**$833,898**	**$58,530**	
Annual Increase Necessary to Produce 1.2x Coverage.	**14.34%**	**6.34%**	**5.46%**	**2.79%**	**2.50%**	**37.84%**	**1.93%**	

(1) Actual.
(2) As projected, pursuant to the May 2017 Revenue Test Update.
(3) Operating revenues for the fiscal years ending June 30, 2018 and thereafter are not assumed to change.
Projected rate increases applied only to RTS and Commodity Charges.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2018 through 2022 are assumed to grow 3% annually.

Source: City of Benton Harbor

(3)	Projected 2025	(3)	Projected 2026	(3)	Projected 2027	(3)	Projected 2028	(3)	Projected 2029	(3)	Projected 2030	(3)	Projected 2031	(3)	Projected 2032	(3)	Projected 2033	(3)	Projected 2034	(3)	Projected 2035	(3)	Projected 2036	(3)	Projected 2037	(3)
	$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024		$ 1,631,024	
	253,385		253,385		253,385		253,385		253,385		253,385		253,385		253,385		253,385		253,385		253,385		253,385		253,385	
	37,333		37,333		37,333		37,333		37,333		37,333		37,333		37,333		37,333		37,333		37,333		37,333		37,333	
	32,540		32,540		32,540		32,540		32,540		32,540		32,540		32,540		32,540		32,540		32,540		32,540		32,540	
	20,340		20,340		20,340		20,340		20,340		20,340		20,340		20,340		20,340		20,340		20,340		20,340		20,340	
	$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622		$ 1,974,622	
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	$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932		$ 1,915,932	
	$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690	
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	$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690		$ 58,690	
	$ 6,855		$ 6,730		$ 6,605		$ 6,480		$ 6,355		$ 6,230		$ 6,105		$ 5,980		$ 5,855		$ 5,730		$ 5,605		$ 5,480		$ 5,355	
	411,000		409,250		412,375		410,250		413,000		410,500		412,875		410,000		412,000		413,750		410,250		411,625		412,750	
#	15,279	#	15,279	#	15,279	#	15,279	#	15,279	#	15,279	#	15,279	#	15,279	#	158,610	#	158,610	#	158,610	#	158,610	#	158,610	
#	47,777	#	47,777	#	47,777	#	47,777	#	47,777	#	47,777	#	47,777	#	47,777	#	71,665	#	71,665	#	71,665	#	71,665	#	71,665	
#	691,765	#	691,765	#	691,765	#	691,765	#	691,765	#	691,765	#	691,765	#	691,765		2,219,336		2,219,336	#	2,219,336	#	2,219,336	#	2,219,336	
	43,987		43,512		43,037		42,562		42,087		41,612		46,137		45,544		44,950		44,356		43,762		43,169		42,575	
	50,400		49,925		49,450		48,975		48,500		53,025		52,431		51,837		51,244		50,650		50,056		49,462		48,868	
	$ 1,267,063		$ 1,264,238		$ 1,266,288		$ 1,263,088		$ 1,264,763		$ 1,266,188		$ 1,272,369		$ 1,268,182		$ 2,963,660		$ 2,964,097		$ 2,959,284		$ 2,959,347		$ 2,959,159	
	0.05x		**0.05x**		**0.05x**		**0.05x**		**0.05x**		**0.05x**		**0.05x**		**0.05x**		**0.02x**		**0.02x**		**0.02x**		**0.02x**		**0.02x**	
	$ 256,651		**$ 259,476**		**$ 257,426**		**$ 260,626**		**$ 258,951**		**$ 257,526**		**$ 254,473**		**$ 258,660**		**$ 592,731**		**$ 592,818**		**$ 597,631**		**$ 597,568**		**$ 597,756**	
	$ 1,250,362		**$ 1,509,839**		**$ 1,767,265**		**$ 2,027,892**		**$ 2,286,843**		**$ 2,544,370**		**$ 2,798,842**		**$ 3,057,502**		**$ 3,650,233**		**$ 4,243,051**		**$ 4,840,682**		**$ 5,438,251**		**$ 6,036,007**	
	$0		**$0**		**$0**		**$0**		**$0**		**$0**		**$3,127**		**$0**		**$2,029,549**		**$524**		**$0**		**$0**		**$0**	
	0.00%		**0.00%**		**0.00%**		**0.00%**		**0.00%**		**0.00%**		**0.10%**		**0.00%**		**65.49%**		**0.01%**		**0.00%**		**0.00%**		**0.00%**	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
LANSING

RICK SNYDER
GOVERNOR

C. HEIDI GRETHER
DIRECTOR

March 8, 2019

CERTIFIED MAIL

The Honorable Marcus Muhammad
Mayor of Benton Harbor
200 East Wall Street
Benton Harbor, Michigan 49022

Dear Mayor Muhammad:

SUBJECT: Administrative Consent Order (ACO); City of Benton Harbor; WSSN: 00600

Enclosed please find a fully executed ACO between the City of Benton Harbor and the Department of Environmental Quality (DEQ), Drinking Water and Municipal Assistance Division (DWMAD), regarding the water supply at the City of Benton Harbor. The compliance schedule in this ACO is meant to bring the water supply into compliance with the Michigan Safe Drinking Water Act, 1976 PA 399, as amended. The effective date of the ACO is March 5, 2019.

If you have any questions regarding the ACO, please contact me at 616-490-9590; lachancea1@michigan.gov; or DEQ, P.O. Box 30817, Lansing, Michigan 48909-8311.

Sincerely,

Amy Lachance
Assistant Division Director
Drinking Water and Municipal Assistance Division

Enclosure
cc: Mr. Darwin Watson, City of Benton Harbor
Mr. Eric J. Oswald, DEQ
Mr. Brian Thurston, DEQ
Mr. Mike Bolf, DEQ
Mr. Ernie Sarkipato, DEQ
Mr. Dave Willard, DEQ

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER AND MUNICIPAL ASSISTANCE DIVISION

ADMINISTRATIVE CONSENT ORDER

In the matter of: DWMAD Order No. ACO-399-07 -2019

SECTION I

FACILITY OWNER/OPERATOR

NAME City of Benton Harbor	OWNER☒	OPERATOR☐
DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS BUSINESS IDENTIFICATION NUMBER		
ADDRESS 200 East Wall Street		
CITY Benton Harbor	STATE Michigan	ZIP CODE 49022
CONTACT NAME/TITLE Darwin Watson, City Manager	PHONE # 269-927-8408	

FACILITY NAME AND LOCATION

FACILITY NAME Benton Harbor Public Water Supply		WATER SUPPLY SERIAL NUMBER 00600
FACILITY OWNER IF NOT IDENTIFIED ABOVE City of Benton Harbor		
ADDRESS 200 East Wall Street		
CITY Benton Harbor	STATE Michigan	ZIP CODE 49022
COUNTY Berrien		
CONTACT NAME Darwin Watson	PHONE # 269-927-8408	

1.1 This document results from allegations by the Department of Environmental Quality (DEQ), Drinking Water and Municipal Assistance Division (DWMAD). The DEQ alleges that the City of Benton Harbor, owner/operator of the city's public water supply, is in violation of the Safe Drinking Water Act, 1976 PA 399, as amended (Act 399), and the administrative rules promulgated thereunder.

1.2 Specific violations are referenced in the DEQ Significant Deficiency Violation Notice (SDVN) attached to this Administrative Consent Order (Consent Order) as Exhibit A. The Owner/Operator and the DEQ agree to resolve the violations set forth therein through entry of this Consent Order. The Owner/Operator agrees to resolve all compliance issues set forth in Exhibit A in accordance with the requirements contained in this Consent Order. This Consent Order, in its entirety, shall consist of Section I, the attached Sections II, III, and IV, Exhibit A, and any other referenced attachments, exhibits, or appendices. This Consent Order shall be considered null and void if it does not include, at a minimum, Sections I, II, III, and IV and Exhibit A. The Owner/Operator further agrees that this Consent Order shall become effective on the date it is signed by the DWMAD Director, designee of the DEQ Director.

1.3 The Owner/Operator agrees to pay a civil fine of $500 per day for failure to complete corrective actions as specified in Section II, Compliance Schedule, unless an extension has been approved under Section 4.14. Failure to make a timely payment constitutes a violation of this Consent Order.

1.4 The Owner/Operator agrees to make payment of all funds due pursuant to this agreement by certified check made payable to the "State of Michigan" and mailed to the Accounting Services Division, Cashier's Office for the DEQ, P.O. Box 30657, Lansing, Michigan 48909-8157. To ensure proper credit, all payments made pursuant to this Consent Order must include "Payment Identification Number RMD90044" on the check. The Owner/Operator agrees not to contest the legality of the civil fine.

Signatories

DEPARTMENT OF ENVIRONMENTAL QUALITY

Eric Oswald, Director
Drinking Water and Municipal Assistance Division

5-Mar-19
Date

I undersigned CERTIFY that I am fully authorized by the party identified above to enter into this Consent Order to comply by consent and to EXECUTE and LEGALLY BIND that party to it. I further attest that all information provided herein is accurate and true.

CITY OF BENTON HARBOR

Marcus Muhammad, Mayor

2/25/2019
Date

SECTION II - COMPLIANCE SCHEDULE

IT IS THEREFORE AGREED AND ORDERED THAT the Owner/Operator shall take the following actions to prevent further violations of Act 399 and the administrative rules promulgated thereunder and/or to correct the significant deficiencies identified in the SDVN attached to this Consent Order as Exhibit A.

2.1 Submit to the DWMAD a completed rate study from a qualified professional consultant, along with a plan to implement rate increases as recommended by the study, no later than April 1, 2019.

2.2 Upgrade the water plant supervisory and data acquisition (SCADA) system to allow for storage and easy access to required regulatory data including turbidity and chlorine, alarming for regulatory minimum levels, and potentially automation of some water plant operations, no later than April 1, 2019.

2.3 Install metering capabilities on the finished water no later than April 1, 2019.

2.4 Make necessary improvements to the water treatment facility in order to have a functioning and reliable continuous chlorine analyzer on the finished water tap no later than April 1, 2019.

2.5 Obtain an adequately licensed operator in charge, solely dedicated to the water distribution system, no later than April 1, 2019.

2.6 Submit a proposal for optimal corrosion control treatment or a corrosion control study to the DWMAD no later than April 31, 2019.

2.7 Submit to the DWMAD an implementation plan for a consistent and equitable rate collection program to minimize the number of unpaid bills and streamline the collections process, no later than May 1, 2019.

2.8 Submit an updated cross connection program for DWMAD approval, incorporating the City's plan for implementing control of residential accounts, and for obtaining adequate personnel to implement the City's cross connection control program, no later than June 1, 2019.

2.9 Install necessary modifications at the water treatment plant to inject coagulant chemical at a DWMAD-approved rapid mix location, and develop a standard operating procedure for feeding coagulant, no later than June 1, 2019.

2.10 Submit a plan to the DWMAD for inventorying and ongoing maintenance of distribution valves and hydrants, no later than June 1, 2019.

2.11 Conduct professional inspection of the elevated tank interior and exterior no later than June 30, 2019.

2.12 Install working mussel control system at the intake no later than June 30, 2019.

2.13 Repair filter to waste valves no later than January 1, 2020.

Sections III and IV of this Consent Order shall not be altered in any way, including adding or eliminating any language, striking terms or parts of terms, retyping in whole or in part, or using a different format. Any changes to this document without written approval from the DEQ renders the Consent Order null and void.

SECTION III - STIPULATIONS

The Owner/Operator and the DEQ stipulate as follows:

3.1 The DEQ is authorized to enter this Consent Order requiring the Owner/Operator to comply with state law under Section 15 of Act 399.

3.2 The Owner/Operator consents to the issuance and entry of this Consent Order and stipulates that the entry of this Consent Order constitutes a final order of the DEQ and is enforceable as such under the appropriate provisions of state law identified in this Consent Order. The Owner/Operator agrees not to contest the issuance of this Consent Order and that the resolution of this matter by the entry of this Consent Order is appropriate and acceptable.

3.3 The Owner/Operator and the DEQ agree that the signing of this Consent Order is for settlement purposes only and does not constitute an admission by the Owner/Operator that the law has been violated.

3.4 The Signatory to this Consent Order on behalf of the Owner/Operator agrees and attests that he/she is fully authorized to ensure that the Owner/Operator will comply with all requirements under this Consent Order.

3.5 The Owner/Operator shall achieve compliance with the aforementioned regulations in accordance with the requirements contained in Section II of this Consent Order.

SECTION IV - GENERAL PROVISIONS

The Owner/Operator and the DEQ further stipulate as follows:

4.1 With respect to any violations not specifically addressed and resolved by this Consent Order, the DEQ reserves the right to pursue any other remedies to which it is entitled for any failure on the part of the Owner/Operator to comply with the requirements of Act 399 and the administrative rules promulgated thereunder.

4.2 The DEQ and the Owner/Operator consent to enforcement of this Consent Order in the same manner and by the same procedures for all final orders entered pursuant to the provisions of Act 399.

4.3 This Consent Order in no way affects the Owner/Operator's responsibility to comply with any other applicable local, state, or federal laws or regulations.

4.4 The DEQ reserves its right to pursue appropriate action, including injunctive relief to enforce the provisions of this Consent Order, and applicable statutory fines for any violation of this Consent Order.

4.5 Nothing in this Consent Order is or shall be considered to affect any liability the Owner/Operator may have for natural resource damages caused by the

Owner/Operator's acts or omissions at the facility. The State of Michigan does not waive any rights to bring an appropriate action to recover such damages to the natural resources.

4.6 In the event the Owner/Operator sells or transfers the facility, he/she shall advise any purchaser or transferee of the existence of this Consent Order in connection with such sale or transfer. Within 30 calendar days, the Owner/Operator shall also notify the DWMAD Engineering Unit, in writing, of such sale or transfer, the identity and address of any purchaser or transferee, and confirm the fact that notice of this Consent Order has been given to the purchaser and/or transferee. The purchaser and/or transferee of this Consent Order must agree, in writing, to assume all of the obligations of this Consent Order. A copy of that agreement shall be submitted to the DWMAD Engineering Unit within 30 days of assuming the obligations of this Consent Order.

4.7 The provisions of this Consent Order shall apply to and be binding upon the parties to this action and their successors and assigns.

4.8 This Consent Order constitutes a civil settlement and satisfaction as to the resolution of the violations specifically addressed herein; however, it does not resolve any criminal action that may result from these same violations.

Reporting

4.9 The Owner/Operator shall make all submittals and written notifications required by this Consent Order, to the DWMAD Engineering Unit, DEQ, Grand Rapids District Office, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49503. The cover letter with each submittal or notification shall identify the specific paragraph and requirement of this Consent Order that the submittal or notification is intended to satisfy.

4.10 The Owner/Operator shall verbally report any violation(s) of the terms and conditions of this Consent Order to the DWMAD Engineering Unit Supervisor at 231-590-3430 by no later than the close of the next business day following detection of such violation(s) and shall follow such notification with submittal of a written report within five business days following detection of such violation(s). The written report shall include a detailed description of the violation(s), as well as a description of any actions proposed or taken to correct the violation(s). The Owner/Operator shall report any anticipated violation(s) of this Consent Order to the above-referenced individual in advance of the relevant deadlines whenever possible.

Retention of Records

4.11 Upon request by an authorized representative of the DEQ, the Owner/Operator shall make available to the DEQ all records, plans, logs, and other documents required to be maintained under this Consent Order or pursuant to applicable laws or rules. All such documents shall be retained by the Owner/Operator for at least a period of three years from the date of generation of the record unless a longer period of record retention is required by the applicable law or its rules.

Right of Entry

4.12 The Owner/Operator shall allow any authorized representative or contractor of the DEQ, upon presentation of proper credentials, to enter upon the premises of the facility at all

reasonable times for the purpose of monitoring compliance with the provisions of this Consent Order. This paragraph in no way limits the authority of the DEQ to conduct tests and inspections pursuant to Act 399 and the administrative rules promulgated thereunder or any other applicable statutory provision.

DEQ Approval of Submittals

4.13 For any work plan, proposal, or other document, excluding applications for permits or licenses, that are required by this Consent Order to be submitted to the DEQ by the Owner/Operator, the following process and terms of approval shall apply:

a. All work plans, proposals, and other documents required to be submitted by this Consent Order shall include all of the information required by the applicable statute and/or rule and all of the information required by the applicable paragraph(s) of this Consent Order.

b. In the event the DEQ disapproves a work plan, proposal, or other document, it will notify the Owner/Operator, in writing, specifying the reasons for such disapproval. The Owner/Operator shall submit, within 30 days of receipt of such disapproval, a revised work plan, proposal, or other document that adequately addresses the reasons for the DEQ's disapproval. If the revised work plan, proposal, or other document is still not acceptable to the DEQ, the DEQ will notify the Owner/Operator, in writing, of this disapproval.

c. In the event the DEQ approves with specific modifications, a work plan, proposal, or other document, it will notify the Owner/Operator, in writing, specifying the modifications required to be made to such work plan, proposal, or other document prior to its implementation and the specific reasons for such modifications. The DEQ may require the Owner/Operator to submit, prior to implementation and within 30 days of receipt of such approval with specific modifications, a revised work plan, proposal, or other document that adequately addresses such modifications. If the revised work plan, proposal, or other document is still not acceptable to the DEQ, the DEQ will notify the Owner/Operator, in writing, of this disapproval.

d. Upon DEQ approval, or approval with modifications, of a work plan, proposal, or other document, such work plan, proposal, or other document shall be incorporated by reference into this Consent Order and shall be enforceable in accordance with the provisions of this Consent Order.

e. Failure by the Owner/Operator to submit an approvable work plan, proposal, or other document, within the applicable time periods specified above, constitutes a violation of this Consent Order and shall subject the Owner/Operator to the enforcement provisions of this Consent Order.

f. Any delays caused by the Owner/Operator's failure to submit an approvable work plan, proposal, or other document when due shall in no way affect or alter the Owner/Operator's responsibility to comply with any other deadline(s) specified in this Consent Order.

g. No informal advice, guidance, suggestions, or comments by the DEQ regarding reports, work plans, plans, specifications, schedules, or any other writing submitted

by the Owner/Operator will be construed as relieving the Owner/Operator of his/her obligation to obtain written approval, if and when required by this Consent Order.

Extensions

4.14 The Owner/Operator and the DEQ agree that the DEQ may grant the Owner/Operator a reasonable extension of the specified deadlines set forth in this Consent Order. Any extension shall be preceded by a written request to the DWMAD Engineering Unit no later than ten business days prior to the pertinent deadline and shall include:

a. Identification of the specific deadline(s) of this Consent Order that will not be met.

b. A detailed description of the circumstances that will prevent the Owner/Operator from meeting the deadline(s).

c. A description of the measures the Owner/Operator has taken and/or intends to take to meet the required deadline(s).

d. The length of the extension requested and the specific date on which the obligation will be met.

No change or modification to this Consent Order shall be valid unless in writing from the DEQ and, if applicable, signed by both parties.

Termination

4.15 This Consent Order shall remain in full force and effect until terminated by a written Termination Notice (TN) issued by the DEQ. Prior to issuance of a written TN, the Owner/Operator shall submit a request consisting of a written certification that the Owner/Operator has fully complied with the requirements of this Consent Order and has made payment of any fines required in this Consent Order. Specifically, this certification shall include:

a. The date of compliance with each provision of the compliance program in Section II of this Consent Order, and the date any fines or penalties were paid.

b. A statement that all required information has been reported to the DWMAD Engineering Unit.

c. Confirmation that all records required to be maintained pursuant to this Consent Order are being maintained at the facility.

The DEQ may also request additional relevant information. The DEQ shall not unreasonably withhold issuance of a TN.

Exhibit A
Administrative Consent Order

Enforcement Type	Issue Date
Significant Deficiency Violation Notice	October 3, 2018

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
GRAND RAPIDS DISTRICT OFFICE

C. HEIDI GRETHER
DIRECTOR

October 3, 2018

CERTIFIED MAIL

Mr. Marcus Muhammad, Mayor
Mr. Darwin Watson, City Manager
City of Benton Harbor
200 Wall Street
Benton Harbor, MI 49022

SIGNIFICANT DEFICIENCY VIOLATION NOTICE
WSSN: **00600**

Dear Sirs:

SUBJECT: City of Benton Harbor (City) - Water System Sanitary Survey and Significant Deficiency Violation Notice – Financial and Managerial Capacity

This letter will confirm meetings with Benton Harbor staff on multiple dates in 2017 and 2018; representing the Department of Environmental Quality (DEQ), Drinking Water and Municipal Assistance Division (DWMAD), and summarize the subsequent review and discussion of the water supply facilities serving the City of Benton Harbor (City). The purpose of these meetings and subsequent review is to evaluate the water system with respect to the requirements of the Michigan Safe Drinking Water Act, 1976 PA 399, as amended (Act 399). **Findings from the survey, listed below, have led to the determination the water supply currently lacks the financial and managerial capacity to meet all the requirements of Act 399.** Findings of significant deficiency have been identified as having the potential to introduce contamination to the public water supply and must be addressed within 120 days or be outlined in a corrective action plan and schedule approved by this office.

Since the previous sanitary survey in 2015, staff at the City of Benton Harbor have made significant efforts to maintain and improve the historically neglected water system. The distribution pipe network alone represents $124 million in replacement value, according to the 2017 asset management program by Abonmarche. Along with the City's complex treatment plant, this represents a significant challenge for the City in terms of maintenance costs. Proper care and maintenance of the system is necessary to protect the health of all customers.

The major findings below indicate a number of areas needing immediate attention by the City, many of which have the potential to impact public health by allowing or introducing contamination to the water supply. Of utmost importance, a review of financial information finds the City presently lacks an adequate financial mechanism to conduct necessary improvements or hire necessary staff to properly maintain and operate the water system. **We strongly advise the City to work with a qualified financial consultant to identify the revenue necessary to support operation and maintenance and to implement effective revenue collection methodologies.** Investment from the City's rate payers is essential for resolving the below (significant) deficiencies and for ensuring the long term vitality of the water system assets.

The following table summarizes our findings from our survey of the water system:

Survey Element	Findings
Source	**Deficiencies Identified**
Treatment	**Significant Deficiencies Identified**
Distribution System	**Significant Deficiencies Identified**
Finished Water Storage	**Deficiencies Identified**
Pumps	Recommendations made
Monitoring & Reporting	**Significant Deficiencies Identified**
Management & Operations	**Significant Deficiencies Identified**
Operator Compliance	Recommendations made
Security	No Deficiencies or Recommendations
Financial	**Significant Deficiencies Identified**
Other	**Significant Deficiencies Identified**

The following significant deficiencies are violations of Act 399 with the potential to allow or introduce contamination to the public water supply, and must either be resolved within 120 days or be included in an approved corrective action plan.

D1. Our review included the City's asset management program, submitted in December 2017, as well as the bill payment and collections process. Current revenues are not sufficient to cover capital improvement costs, and necessary improvements identified in this survey are likely to increase operations and maintenance costs beyond the current revenues. In addition, the current water bill collection process is inadequate and creates a significant drain on staff resources and time, which would be better spent towards resolution of significant deficiencies and performance of routine maintenance activities. **In order to maintain the required financial capacity to operate a public water supply, the City must:**

a. Conduct a rate study with a qualified professional consultant, and implement findings to generate sufficient revenue to cover costs.
b. Implement a consistent and equitable program to minimize the number of unpaid bills, and streamline the collections process.

D2. An increasing trend in the number of violations of Act 399 in the past year indicates the need for increased managerial oversight of the water supply. In addition, maintenance of the water plant and distribution system components is severely lacking. The lack of separate designated distribution and plant managers prevents staff from spending adequate time and energy on managing the water system. **In order to maintain the managerial capacity to operate the public water supply and meet the requirements of Act 399, the City must hire separate certified operators to oversee the distribution system and the water treatment facility.**

D3. R 325.11008 (2) requires a sufficient primary coagulant dose shall be added to create a settleable or filterable floc at all times. Currently the City adds coagulant to an injection point in the raw water influent pipe rather than the engineered rapid mix basins in the new plate settler building. It has become apparent, through a near violation of turbidity standards in February of 2018, as well as an ongoing treatment technique violation of R 325.10610c, this coagulation practice is not acceptable to meet the requirements of Act 399. Lack of proper mixing also impacts the pathogen removal credit awarded to properly operated conventional treatment facilities. **Adequate rapid mix for the primary coagulant must be installed.**

The current raw water pH of Lake Michigan is above the optimum operating range of the City's current coagulant, aluminum sulfate. At these elevated pH ranges, iron based coagulants, such as ferric sulfate or ferrous sulfate may be more suited for creating a settleable or filterable floc. The City should hire a consultant to explore the steps necessary to explore a switch of the primary coagulant.

D4. R 325.10720 (3) requires continuous monitoring for residual disinfectant at an entry point to the distribution system (EPTD) on a continual basis, and requires the minimum to be recorded for each day. The chlorine analyzer at the City's EPTD was reading less than 0.2 mg/L, the minimum required residual under R325.10611a(2)(b). The readings were identified as unreliable by the operator, and are not recorded as required above. Moreover, plant staff were not familiar with the operational setpoints necessary to achieve sufficient disinfection. **Accurate chlorine analyzer must be in place, minimum levels recorded daily and reported to the DEQ, and connected to SCADA with callout alarms in the event of low residual.**

D5. R 325.11404 requires a water supply to develop a comprehensive control program for the elimination and prevention of all cross connections. The program must include education, inspection, preventer testing in all customer sectors including residential. In addition, an annual report summarizing activities must be submitted to the DEQ. The City has insufficient staff to conduct any activities for the last few years, as evidenced by the lack of annual reporting. **The City must dedicate a trained staff person to implement this program or obtain a contract with a qualified professional company to implement the program.**

D6. R325.11108 requires a water supply to have sufficient valves in the distribution system to minimize interruptions in service and minimize sanitary hazards during construction or repairs. In addition, R 325.11111 requires adequate records be maintained on the distribution system components including hydrants and valves. The City has struggled to conduct necessary inventory and maintenance on valves in the system. **A plan for valve inventory and maintenance must be submitted, approved and implemented consistently.**

D7. R 325.11105 requires a water supply distribution system to maintain a minimum pressure of 20psi throughout the system during emergencies such as firefighting, and allows the department to prohibit installation of fire hydrants in areas where fire flow is not sufficient. From our discussion with staff and through the hydrant flow testing activities conducted during the reliability study, a number of hydrants in town have no flow or zero flow. This may be related to closed valves in the system, which significantly impacts public safety should an emergency occur. **A plan for hydrant inventory and maintenance must be submitted,**

approved and implemented consistently.

D8. The water plant's supervisory control and data acquisition (SCADA) system is in need of upgrades to achieve the following requirements:

a. Storage and access to regulatory data such as EPTD chlorine residuals (R 325.10720), plant flow, and individual filter turbidity profiles (R10720a).
b. Alarming capabilities to call out during unstaffed hours for low chlorine residual, low tower level, high turbidity at the filter confluence point and other undesirable conditions.
c. Automation of water plant operations may be enhanced to allow staff to focus on maintenance activities.

The following deficiencies are also violations of Act 399, and must be resolved to return to compliance with Act 399.

D9. Install finished water meters at the water plant to facilitate accurate calculations and reporting of chemical treatment, calculation of non-revenue water, and more accurate calculation of CT.

D10. Significant amounts of unlined cast iron water main are in need of replacement. With funding in place, the City must prioritize replacement of old water main that is unreliable and undersized.

D11. The monthly operating report must accurately reflect the data collected at the water plant. For example, treated water has been estimated using raw water meters, and chlorine at the plant tap should be the minimum recorded for the day from the EPTD continuous analyzer as opposed to bench top analysis.

D12. Conduct a professional inspection on the elevated tank, including necessary maintenance and cleaning. This may be facilitated by installing variable frequency drive(s) on high service pumps, which would allow operating on pressure rather than on tower level.

If you have any information you would like us to consider regarding the significant deficiencies identified in this Significant Deficiency Violation Notice, please provide it in a written response by November 2, 2018.

Representatives from the City and DEQ met on September 14, 2018 to discuss preliminary findings of the sanitary survey, and to begin discussion of a corrective action plan such as an administrative consent order (ACO), to return to compliance. It is understood that a significant amount of time will be required to address many of these issues. Therefore, we recognize that this ACO contains a schedule, which is both systematic and flexible, to bring the City back into compliance with the SDWA and providing a safe and reliable source of drinking water to its residents. Upon hearing from the City of its desire to move forward with an ACO, we will forward a draft ACO for the City's review and comment. At that time, DEQ staff will be available to meet with City officials to discuss the ACO in an attempt to execute it prior to the 120 day deadline.

A reliable supply of quality drinking water is critical to the growth and strength of any community. We are committed to working with the City to improve the water distribution system and treatment plant. With a strong commitment and swift effort from the City, we believe these deficiencies can be resolved and lead to long term water system sustainability.

We anticipate and appreciate your cooperation in resolving this matter. If you have any questions regarding this Significant Deficiency Violation Notice, please contact me by telephone at 616-307-0261; by e-mail at sarkipatoe@michigan.gov; or DEQ-DWMAD, 350 Ottawa Avenue NW, Unit 10, Grand Rapids, Michigan 49506.

Sincerely,

Ernie Sarkipato, P.E.,
Surface Water Treatment Specialist
Drinking Water and Municipal Assistance Division

Enclosure

cc: Berrien County Health Department
cc/enc: Mr. Mike O'Malley, Operator in Charge, City of Benton Harbor
Mr. Eric Oswald, Director, DEQ (via email)
Ms. Sue Maul, Enforcement Specialist, DEQ (via email)
Mr. Jon Bloemker, Engineering Unit Supervisor, DEQ (via email)

City of Benton Harbor, Michigan

Historical and Projected Sewage Disposal System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	Budgeted 2018 (2)	Budgeted 2019 (2)	Projected 2020 (3)	Projected 2021 (3)	Projected 2022 (3)
Operating Revenues									
Sewer RTS/Commodity	$ 1,123,520	$ 1,299,381	$ 1,204,840	$ 1,255,507	$ 1,305,205	$ 1,327,351	$ 1,327,351	$ 1,327,351	$ 1,327,351
Transmission Fees	-	-	-	10,457	9,774	6,354	6,354	6,354	6,354
Billing Fees	-	-	-	182,024	-	-	-	-	-
Fines	-	-	-	20,198	19,069	19,333	19,333	19,333	19,333
Other	17,160	177	-	29,080	35,746	41,722	41,722	41,722	41,722
Total Operating Revenues	$ 1,140,680	$ 1,299,558	$ 1,204,840	$ 1,497,266	$ 1,369,794	$ 1,394,760	$ 1,394,760	$ 1,394,760	$ 1,394,760
Operating Expenses (4)									
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 1,536,020	$ 533,718	$ 602,040	$ -	$ -	$ -
Customer Service	178,106	63,627	54,432	50,591	57,609	51,147	-	-	-
Sewer Lift Stations	595,364	728,022	535,147	658,270	471,836	461,840	-	-	-
Storm Drains	22,840	146,957	48,132	233,726	51,201	16,091	-	-	-
Other	8,994	5,138	5,336	-	-	-	-	-	-
Repair and Replacement	-	-	-	-	-	-	34,982	34,982	34,982
Depreciation	306,949	296,727	299,373	-	-	-	-	-	-
Total Operating Expenses	$ 1,676,612	$ 1,657,305	$ 1,429,883	$ 2,478,606	$ 1,114,364	$ 1,131,118	$ 1,183,066	$ 1,200,288	$ 1,217,767
Operating Income (Loss)	$ (535,932)	$ (357,748)	$ (225,043)	$ (981,341)	$ 255,430	$ 263,642	$ 211,693	$ 194,472	$ 176,992
Non-Operating Revenues (Expenses)									
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/SAW/FDCVT	-	185,108	194,777	1,486,368	398,043	606,438	-	-	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-	-
Income From Joint Venture	153,247	172,888	(40,562)	-	-	-	-	-	-
Depreciation	306,949	296,727	299,373	-	-	-	-	-	-
Total Non-Operating Revenues (Expenses)	$ 318,838	$ 654,722	$ 455,896	$ 1,486,368	$ 398,043	$ 606,438	$ -	$ -	$ -
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (217,095)	$ 296,975	$ 230,854	$ 505,028	$ 653,473	$ 870,080	$ 211,693	$ 194,472	$ 176,992
Debt Service Requirements									
Sewage Disposal System Revenue Bonds, Series 2009	$ 30,553	$ 185,431	$ 182,306	$ 184,118	$ 180,868	$ 182,556	$ 179,181	$ 180,743	$ 177,243
Sewage Disposal System Revenue Bonds, Series 2011	84,006	101,137	99,512	102,887	101,137	99,387	102,637	100,762	98,887
Sewage Disposal System Revenue Bonds, Series 2018	-	-	-	-	-	65,312	215,625	213,606	216,587
Sewage Disposal System Revenue Bonds, Series 2023	-	-	-	-	-	-	-	-	-
Sewage Disposal System Revenue Bonds, Series 2028	-	-	-	-	-	-	-	-	-
Sewage Disposal System Revenue Bonds, Series 2033	-	-	-	-	-	-	-	-	-
Total	$ 114,559	$ 286,568	$ 281,818	$ 287,005	$ 282,005	$ 347,255	$ 497,443	$ 495,111	$ 492,717
Debt Service Coverage Ratio	**(1.90x)**	**1.04x**	**0.82x**	**1.76x**	**2.32x**	**2.51x**	**0.43x**	**0.39x**	**0.36x**

Utilities Revenue and SRF Bonds					
Annual Excess with 1.2x Coverage.	#	**$ 522,825**	**$ 99,487**	**$ 99,021**	**$ 98,542**
Cumulative Excess with 1.2x Coverage.	#	**$ 522,825**	**$ 622,313**	**$ 721,334**	**$ 819,876**
Annual Increase in Revenue Necessary for 1.2x Coverage.		**$0**	**$385,237**	**$14,423**	**$14,607**
Annual Increase Necessary to Produce 1.2x Coverage.		**0.00%**	**29.02%**	**0.84%**	**0.85%**

(1) Actual.
(2) Budgeted information provided by the City on May 29, 2018.
(3) Operating revenues for the fiscal years ending June 30, 2020 and thereafter are not assumed to change.
Operating revenues for the fiscale years ending June 30, 2020 and thereafter reflect billing improvements relating to new meters installed in 2016.
Projected rate increases applied only to Commodity and Ready to Serve Charges. Other revenues are not assumed to change.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2020 through 2022 are assumed to grow 1.5% annually.

Source: City of Benton Harbor

City of Benton Harbor, Michigan

Historical and Projected Water System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	Budgeted 2018 (2)	Budgeted 2019 (2)	Projected 2020 (3)
Operating Revenues							
Water RTS/Commodity	$ 1,854,525	$ 2,028,776	$ 1,970,829	$ 1,622,705	$ 1,665,738	$ 1,682,395	$ 1,682,395
Water Capital Charge		-	-	-	-	-	-
Sprinkler, Hydrant, Fire		-	-	38,774	35,000	45,020	45,020
Other		-	-	29,080	35,746	41,722	41,722
Fines	17,160	177	-	20,198	19,069	19,333	19,333
Total Operating Revenues	$ 1,871,685	$ 2,028,953	$ 1,970,829	$ 1,710,757	$ 1,755,553	$ 1,788,470	$ 1,788,470
Operating Expenses (4)							
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 1,536,020	$ 533,718	$ 602,040	$ -
Customer Service	178,106	63,627	54,432	50,591	57,609	51,147	-
Water Treatment	721,683	414,240	457,036	415,496	578,727	364,617	-
Water Distribution	893,856	554,709	585,567	566,087	791,920	2,004,183	-
Other	8,994	5,138	5,336	-	-	-	-
Depreciation	306,949	296,727	299,373	462,167	-	-	-
Total Operating Expenses	$ 2,673,947	$ 1,751,275	$ 1,889,207	$ 3,030,360	$ 1,961,974	$ 3,021,987	$ 3,112,646
Operating Income (Loss)	$ (802,262)	$ 277,678	$ 81,623	$ (1,319,604)	$ (206,421)	$ (1,233,517)	$ (1,324,177)
Non-Operating Revenues (Expenses)							
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/FDCVT Proceeds	-	185,108	194,777	44,054	398,043	890,438	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-
Income From Joint Venture	153,247	172,888	(40,562)	-	-	-	-
Depreciation	306,949	296,727	299,373	462,167	-	-	-
Total Non-Operating Revenues (Expenses)	$ 318,838	$ 654,722	$ 455,896	$ 506,221	$ 398,043	$ 890,438	$ -
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (483,425)	$ 932,400	$ 537,519	$ (813,383)	$ 191,622	$ (343,079)	$ (1,324,177)
Debt Service Requirements							
Drinking Water Revolving Fund Revenue Bonds, Series 2009	$ 11,125	$ 8,105	$ 7,980	$ 7,855	$ 7,730	$ 7,605	$ 7,480
Drinking Water Revolving Fund Revenue Bonds, Series 2010	410,375	410,250	410,000	409,625	414,125	413,375	412,500
Water Supply System Revenue Bonds, Series 2018	-	-	-	-	-	41,600	41,243
Water Supply System Revenue Bonds, Series 2023	-	-	-	-	-	-	-
Total	$ 421,500	$ 418,355	$ 417,980	$ 417,480	$ 421,855	$ 462,580	$ 461,223
Debt Service Coverage Ratio	**(1.15x)**	**2.23x**	**1.29x**	**(1.95x)**	**0.45x**	**(0.74x)**	**(2.87x)**

Utilities Revenue and SRF Bonds				
Annual Excess with 1.2x Coverage.	#	**$ 92,515**	**$ 92,243**	
Cumulative Excess with 1.2x Coverage.	#	**$ 92,515**	**$ 184,758**	
Annual Increase in Revenue Necessary for 1.2x Coverage.		**$898,174**	**$979,469**	
Annual Increase Necessary to Produce 1.2x Coverage.		**53.39%**	**37.96%**	

(1) Actual.
(2) As budgeted, received from the City on May 29, 2018.
(3) Operating revenues for the fiscal years ending June 30, 2020 and thereafter are not assumed to change.
Projected rate increases applied only to RTS and Commodity Charges.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2020 through 2022 are assumed to grow 3% annually.

Source: City of Benton Harbor

Projected 2021 (3)	Projected 2022 (3)	Projected 2023 (3)	Projected 2024 (3)	Projected 2025 (3)	Projected 2026 (3)	Projected 2027 (3)	Projected 2028 (3)	Projected 2029 (3)	Projected 2030 (3)
$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395
-	-	-	-	-	-	-	-	-	-
45,020	45,020	45,020	45,020	45,020	45,020	45,020	45,020	45,020	45,020
41,722	41,722	41,722	41,722	41,722	41,722	41,722	41,722	41,722	41,722
19,333	19,333	19,333	19,333	19,333	19,333	19,333	19,333	19,333	19,333
$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
$ 3,206,025	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206
$ (1,417,556)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ (1,417,556)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)
$ 7,335	$ 7,230	$ 7,105	$ 6,980	$ 6,855	$ 6,730	$ 6,605	$ 6,480	$ 6,355	$ 6,230
411,500	410,375	414,125	412,625	411,000	409,250	412,375	410,250	413,000	410,500
45,887	45,412	44,937	44,462	43,987	43,512	43,037	42,562	42,087	41,612
-	-	-	50,875	50,400	49,925	49,450	48,975	48,500	53,025
$ 464,722	$ 463,017	$ 466,167	$ 514,942	$ 512,242	$ 509,417	$ 511,467	$ 508,267	$ 509,942	$ 511,367
(3.05x)	**(3.27x)**	**(3.25x)**	**(2.94x)**	**(2.96x)**	**(2.97x)**	**(2.96x)**	**(2.98x)**	**(2.97x)**	**(2.96x)**
$ 92,943	**$ 92,602**	**$ 93,232**	**$ 102,987**	**$ 105,687**	**$ 108,512**	**$ 106,462**	**$ 109,662**	**$ 107,987**	**$ 106,562**
$ 277,702	**$ 370,304**	**$ 463,536**	**$ 566,523**	**$ 672,211**	**$ 780,723**	**$ 887,185**	**$ 996,847**	**$ 1,104,835**	**$ 1,211,397**
$97,578	**$94,134**	**$3,780**	**$58,530**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
2.74%	**2.57%**	**0.10%**	**1.56%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Projected 2031 (3)	Projected 2032 (3)	Projected 2033 (3)	Projected 2034 (3)	Projected 2035 (3)	Projected 2036 (3)	Projected 2037 (3)
$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395	$ 1,682,395
-	-	-	-	-	-	-
45,020	45,020	45,020	45,020	45,020	45,020	45,020
41,722	41,722	41,722	41,722	41,722	41,722	41,722
19,333	19,333	19,333	19,333	19,333	19,333	19,333
$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470	$ 1,788,470
$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206	$ 3,302,206
$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)
$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-
$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)	$ (1,513,737)
$ 6,105	$ 5,980	$ 5,855	$ 5,730	$ 5,605	$ 5,480	$ 5,355
412,875	410,000	412,000	413,750	410,250	411,625	412,750
46,137	45,544	44,950	44,356	43,762	43,169	42,575
52,431	51,837	51,244	50,650	50,056	49,462	48,868
$ 517,548	$ 513,361	$ 514,049	$ 514,486	$ 509,673	$ 509,736	$ 509,548
(2.92x)	**(2.95x)**	**(2.94x)**	**(2.94x)**	**(2.97x)**	**(2.97x)**	**(2.97x)**
$ 103,508	**$ 107,695**	**$ 107,007**	**$ 106,570**	**$ 111,383**	**$ 111,320**	**$ 111,508**
$ 1,314,905	**$ 1,422,601**	**$ 1,529,608**	**$ 1,636,179**	**$ 1,747,562**	**$ 1,858,882**	**$ 1,970,391**
$3,127	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
0.08%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

CITY OF BENTON HARBOR

Summary of Funding Needed for Sewer/Water Projects to be completed from 2020-2022

	2020	2021	2022	2023	2024	2025	Notes
FUNDING SUMMARY							
Utility Budget Shortfall	$ (900,000)	$ (932,613)	$ (937,934)	$ (250,472)	$ 35,558	$ 345,133	Gets Sewer/Water Fund self supportive
New Debt	$ -	$ (108,474)	$ (213,006)	$ (212,343)	$ (211,681)	$ (211,018)	
Transfer In from General Fund & Road Fund	$ 300,000	$ -	$ -	$ -	$ -	$ -	To-Date
Refund Transfer from General & Road Funds	$ (300,000)	$ -	$ -	$ -	$ -	$ -	
Transfer In from Income Tax	$ 900,000	$ 645,000	$ 740,000	$ 32,000	$ -	$ -	To Refund Transfers and Balance Budget/Expenses
Transfer In from PPI	$ -	$ 200,000	$ 200,000	$ 200,000	$ 25,000	$ -	For Water Tower
Rate Adjustments	$ -	$ 237,000	$ 259,000	$ 280,000	$ 308,000	$ 335,000	
NET FUNDS	**$ -**	**$ 40,913**	**$ 48,060**	**$ 49,185**	**$ 156,877**	**$ 469,115**	
PPI Fund							
PPI Fund Balance	$ 238,500	$ 188,500	$ 138,500	$ 88,500	$ 38,500	$ 163,500	
Receipts	$ -	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	No Increase (budgeted $168k in 2020)
Expenses Committed	$ (50,000)	$ -	$ -	$ -	$ -	$ -	DPW Work
Transfers Out to Utility Fund	**$ -**	**$ (200,000)**	**$ (200,000)**	**$ (200,000)**	**$ (25,000)**	**$ -**	For Water Tower Construction
New Balance	$ 188,500	$ 138,500	$ 88,500	$ 38,500	$ 163,500	$ 313,500	Good for other expenditures By 2024
Income Tax Fund							
Income Tax Fund Balance	$ 2,400,000	$ 1,100,000	$ 855,000	$ 965,000	$ 2,033,000	$ 3,133,000	
Less Reserves	$ (400,000)	$ (600,000)	$ (400,000)	$ (400,000)	$ (400,000)	$ (400,000)	Higher Reserves in 2021 due to COVID
Receipts	$ -	$ 1,000,000	$ 1,250,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	Lower Receipts in 2021/22 due to COVID
Transfers Out to Utility Fund	**$ (900,000)**	**$ (645,000)**	**$ (740,000)**	**$ (32,000)**	**$ -**	**$ -**	
New Balance	$ 1,100,000	$ 855,000	$ 965,000	$ 2,033,000	$ 3,133,000	$ 4,233,000	Good for other road work by 2023
Rate Adjustments							
Water Rate Increase		9.95%	9.95%	9.95%	9.95%	9.95%	
Cost per Service/month		$ 5.00	$ 5.50	$ 6.00	$ 6.67	$ 7.33	
Funds Raised		$ 150,000	$ 165,000	$ 180,000	$ 200,000	$ 220,000	
Sewer Rate Increase		7%	7%	7%	7%	7%	
Cost per Service/month		$ 2.90	$ 3.13	$ 3.33	$ 3.60	$ 3.83	
Funds Raised		$ 87,000	$ 94,000	$ 100,000	$ 108,000	$ 115,000	
Street Fund							
Street Fund Balance	$ 1,493,000	$ 1,493,000	$ 491,000	$ 575,000	$ 515,000	$ 410,000	
Less Normal Expenditures for Maintenance	$ -	$ (875,000)	$ (875,000)	$ (875,000)	$ (875,000)	$ (875,000)	
Empire Avenue		$ (622,000)	$ 339,000	$ 45,000			Advance Construct - Reimbursement
Receipts	$ -	$ 875,000	$ 1,000,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	Plan for a reduction the first couple years (50% in year 1)
Transfers Out for Debt on Loan Ineligible Costs - Storm/Roads	**$ -**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	
New Balance	$ 1,493,000	$ 491,000	$ 575,000	$ 515,000	$ 410,000	$ 305,000	Will remain relatively healthy

From: Chris J Cook
To: Sarkipato, Ernest (EGLE)
Subject: BH Summary
Date: Wednesday, June 10, 2020 1:40:38 PM
Attachments: Copy of 2020 BH Financing Summary.xlsx

Christopher J. Cook, PE
President
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CITY OF BENTON HARBOR

Summary of Funding Needed for Sewer/Water Projects to be completed from 2020-2022

	2020	2021	2022	2023	2024	2025	Notes
FUNDING SUMMARY							
Utility Budget Shortfall	$ (900,000)	$ (932,613)	$ (937,934)	$ (250,472)	$ 35,558	$ 345,133	Gets Sewer/Water Fund self supportive
New Debt	$ -	$ (108,474)	$ (213,006)	$ (212,343)	$ (211,681)	$ (211,018)	
Transfer In from General Fund & Road Fund	$ 300,000	$ -	$ -	$ -	$ -	$ -	To-Date
Refund Transfer from General & Road Funds	$ (300,000)	$ -	$ -	$ -	$ -	$ -	
Transfer In from Income Tax	$ 900,000	$ 645,000	$ 740,000	$ 32,000	$ -	$ -	To Refund Transfers and Balance Budget/Expenses
Transfer In from PPI	$ -	$ 200,000	$ 200,000	$ 200,000	$ 25,000	$ -	For Water Tower
Rate Adjustments	$ -	$ 237,000	$ 259,000	$ 280,000	$ 308,000	$ 335,000	
NET FUNDS	**$ -**	**$ 40,913**	**$ 48,060**	**$ 49,185**	**$ 156,877**	**$ 469,115**	
PPI Fund							
PPI Fund Balance	$ 238,500	$ 188,500	$ 138,500	$ 88,500	$ 38,500	$ 163,500	
Receipts	$ -	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	No Increase (budgeted $168k in 2020)
Expenses Committed	$ (50,000)	$ -	$ -	$ -	$ -	$ -	DPW Work
Transfers Out to Utility Fund	**$ -**	**$ (200,000)**	**$ (200,000)**	**$ (200,000)**	**$ (25,000)**	**$ -**	For Water Tower Construction
New Balance	$ 188,500	$ 138,500	$ 88,500	$ 38,500	$ 163,500	$ 313,500	Good for other expenditures By 2024
Income Tax Fund							
Income Tax Fund Balance	$ 2,400,000	$ 1,100,000	$ 855,000	$ 965,000	$ 2,033,000	$ 3,133,000	
Less Reserves	$ (400,000)	$ (600,000)	$ (400,000)	$ (400,000)	$ (400,000)	$ (400,000)	Higher Reserves in 2021 due to COVID
Receipts	$ -	$ 1,000,000	$ 1,250,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	Lower Receipts in 2021/22 due to COVID
Transfers Out to Utility Fund	**$ (900,000)**	**$ (645,000)**	**$ (740,000)**	**$ (32,000)**	**$ -**	**$ -**	
New Balance	$ 1,100,000	$ 855,000	$ 965,000	$ 2,033,000	$ 3,133,000	$ 4,233,000	Good for other road work by 2023
Rate Adjustments							
Water Rate Increase		9.95%	9.95%	9.95%	9.95%	9.95%	
Cost per Service/month		$ 5.00	$ 5.50	$ 6.00	$ 6.67	$ 7.33	
Funds Raised		$ 150,000	$ 165,000	$ 180,000	$ 200,000	$ 220,000	
Sewer Rate Increase		7%	7%	7%	7%	7%	
Cost per Service/month		$ 2.90	$ 3.13	$ 3.33	$ 3.60	$ 3.83	
Funds Raised		$ 87,000	$ 94,000	$ 100,000	$ 108,000	$ 115,000	
Street Fund							
Street Fund Balance	$ 1,493,000	$ 1,493,000	$ 491,000	$ 575,000	$ 515,000	$ 410,000	
Less Normal Expenditures for Maintenance	$ -	$ (875,000)	$ (875,000)	$ (875,000)	$ (875,000)	$ (875,000)	
Empire Avenue		$ (622,000)	$ 339,000	$ 45,000			Advance Construct - Reimbursement
Receipts	$ -	$ 875,000	$ 1,000,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	Plan for a reduction the first couple years (50% in year 1)
Transfers Out for Debt on Loan Ineligible Costs - Storm/Roads	**$ -**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	
New Balance	$ 1,493,000	$ 491,000	$ 575,000	$ 515,000	$ 410,000	$ 305,000	Will remain relatively healthy

From:	Chris J Cook
To:	Sarkipato, Ernest (EGLE)
Subject:	FW: City of Benton Harbor -- DWRF and SRF Loans :: UPDATED DOCUMENTS FOR STATE REVIEW AND DISCUSSION
Date:	Wednesday, June 10, 2020 1:43:15 PM
Attachments:	050420 Benton Harbor Water System Cash Flow Update 2020 DWRF REVISED MDM v1.xls 050420 Benton Harbor Sewer System Cash Flow Update 2020 SRF REVISED MDM v1.xls

Pretty sure these are the latest cash flows.

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City of Benton Harbor, Michigan

Historical and Projected Water System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	2018 (1)	2019 (1)	Budgeted 2020 (2)	Projected 2021 (3)	Projected 2022
Operating Revenues									
Water RTS/Commodity	$ 1,854,525	$ 2,028,776	$ 1,970,829	$ 1,622,705	$ 1,599,806	$ 1,507,820	$ 1,507,820	$ 1,657,848	$ 1,822,804
Water Capital Charge		-	-	-	-	-	-	-	-
Sprinkler, Hydrant, Fire		-	-	38,774	38,522	34,649	32,708	32,708	32,708
Other		-	-	160,383	175,818	146,825	158,884	158,884	158,884
Fines	17,160	177	-	20,198	20,421	21,015	19,477	19,477	19,477
Total Operating Revenues	$ 1,871,685	$ 2,028,953	$ 1,970,829	$ 1,842,060	$ 1,834,567	$ 1,710,309	$ 1,718,889	$ 1,868,917	$ 2,033,873
Operating Expenses (4)									
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 518,532	$ 584,531	$ 547,282	$ 573,478	$ -	$ -
Customer Service	178,106	63,627	54,432	50,591	53,132	54,019	52,865	-	-
Water Treatment	721,683	414,240	457,036	415,496	389,570	470,232	502,693	-	-
Water Distribution	893,856	554,709	585,567	566,087	630,490	617,840	597,255	-	-
Repair and Replacement	-	-	-	-	-	-	-	81,421	81,421
Other	8,994	5,138	5,336	-	-	-	-	-	-
Depreciation	306,949	296,727	299,373	462,167	516,765	532,215	557,215	-	-
Total Operating Expenses	$ 2,673,947	$ 1,751,275	$ 1,889,207	$ 2,012,872	$ 2,174,488	$ 2,221,588	$ 2,283,506	$ 1,782,250	$ 1,833,275
Operating Income (Loss)	$ (802,262)	$ 277,678	$ 81,623	$ (170,813)	$ (339,921)	$ (511,279)	$ (564,617)	$ 86,667	$ 200,598
Non-Operating Revenues (Expenses)									
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/FDCVT Proceeds	-	185,108	194,777	438,953	65,243	146,280	75,000	-	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-	-
Income From Joint Venture	153,247	172,888	(40,562)	-	-	-	-	-	-
Engineering Allocation from project	-	-	-	-	-	-	(216,666)	(163,431)	(253,235)
Transfer from Income Tax	-	-	-	-	-	-	575,000	380,000	405,000
Transfer from PPI Funds - Tower reimbursement	-	-	-	-	-	-	-	150,000	150,000
Budgeted Funds on Hand	-	-	-	-	-	-	-	50,000	50,000
Depreciation	306,949	296,727	299,373	462,167	516,765	532,215	557,215	-	-
Total Non-Operating Revenues (Expenses)	$ 318,838	$ 654,722	$ 455,896	$ 901,120	$ 582,008	$ 678,495	$ 990,549	$ 416,569	$ 351,765
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (483,425)	$ 932,400	$ 537,519	$ 730,308	$ 242,087	$ 167,216	$ 425,932	$ 503,236	$ 552,363
Debt Service Requirements									
Drinking Water Revolving Fund Revenue Bonds, Series 2009	$ 11,125	$ 8,105	$ 7,980	$ 7,855	$ 7,730	$ 7,605	$ 7,480	$ 7,335	$ 7,230
Drinking Water Revolving Fund Revenue Bonds, Series 2010	410,375	410,250	410,000	409,625	414,125	413,375	412,500	411,500	410,375
Water Supply System Revenue Bonds, Series 2020 (5)	-	-	-	-	-	-	-	59,817	106,050
Total	$ 421,500	$ 418,355	$ 417,980	$ 417,480	$ 421,855	$ 420,980	$ 419,980	$ 478,652	$ 523,655
Debt Service Coverage Ratio	**(1.15x)**	**2.23x**	**1.29x**	**1.75x**	**0.57x**	**0.40x**	**1.01x**	**1.05x**	**1.05x**

Utilities Revenue and SRF Bonds		
Annual Excess with 1.05x Coverage.	**$ 24,584**	**$ 28,708**
Cumulative Excess with 1.05x Coverage.	**$ 24,584**	**$ 53,293**
Annual Increase in Revenue Necessary for 1.05x Coverage.	**$0**	**$0**
Annual Increase Necessary to Produce 1.05x Coverage.	**0.00%**	**0.00%**

(1) Actual.
(2) As budgeted, received from the City on February 14, 2020.
(3) Consumption for the fiscal years ending June 30, 2021 and thereafter is not assumed to change.
Assumes annual rate increaes of 9.95% for the fiscal years ending June 30, 2021 through and including June 30, 2025.
Projected rate increases applied only to RTS and Commodity Charges.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2021 through 2023 are assumed to grow 3% annually.
(5) Assumes a 30-year DWRF loan totaling $5,065,000.

Source: City of Benton Harbor

	Projected 2023 (3)	Projected 2024 (3)	Projected 2025 (3)	Projected 2026 (3)	Projected 2027 (3)	Projected 2028 (3)	Projected 2029 (3)	Projected 2030 (3)	Projected 2031 (3)	Projected 2032 (3)	Projected 2033 (3)	Projected 2034 (3)
	$ 2,004,173	$ 2,203,588	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845
	-	-	-	-	-	-	-	-	-	-	-	-
	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708
	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884
	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477
	$ 2,215,242	$ 2,414,657	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830
	$ 329,412	$ 528,827	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	27,000	-	-	-	-	-	-	-	-	-	-	-
	150,000	25,000	-	-	-	-	-	-	-	-	-	-
	50,000											
	-	-	-	-	-	-	-	-	-	-	-	-
	$ 227,000	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ 556,412	$ 553,827	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084
	$ 7,105	$ 6,980	$ 6,855	$ 6,730	$ 6,605	$ 6,480	$ 6,355	$ 6,230	$ 6,105	$ 5,980	$ 5,855	$ 5,730
	414,125	412,625	411,000	409,250	412,375	410,250	413,000	410,500	412,875	410,000	412,000	413,750
	105,950	105,850	105,750	115,550	115,250	114,950	114,650	208,400	211,150	208,850	211,500	209,100
	$ 527,180	$ 525,455	$ 523,605	$ 531,530	$ 534,230	$ 531,680	$ 534,005	$ 625,130	$ 630,130	$ 624,830	$ 629,355	$ 628,580
	1.06x	**1.05x**	**1.43x**	**1.41x**	**1.40x**	**1.41x**	**1.40x**	**1.20x**	**1.19x**	**1.20x**	**1.19x**	**1.19x**
	$ 29,232	**$ 28,372**	**$ 224,479**	**$ 216,554**	**$ 213,854**	**$ 216,404**	**$ 214,079**	**$ 122,954**	**$ 117,954**	**$ 123,254**	**$ 118,729**	**$ 119,504**
	$ 82,524	**$ 110,896**	**$ 335,375**	**$ 551,928**	**$ 765,782**	**$ 982,186**	**$ 1,196,265**	**$ 1,319,219**	**$ 1,437,172**	**$ 1,560,426**	**$ 1,679,155**	**$ 1,798,659**
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
	0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

(3)	Projected 2035	(3)	Projected 2036	(3)	Projected 2037	(3)
	$ 2,422,845		$ 2,422,845		$ 2,422,845	
	-		-		-	
	32,708		32,708		32,708	
	158,884		158,884		158,884	
	19,477		19,477		19,477	
	$ 2,633,914		$ 2,633,914		$ 2,633,914	
	$ -		$ -		$ -	
	-		-		-	
	-		-		-	
	-		-		-	
	81,421		81,421		81,421	
	-		-		-	
	-		-		-	
	$ 1,885,830		$ 1,885,830		$ 1,885,830	
	$ 748,084		$ 748,084		$ 748,084	
	$ -		$ -		$ -	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	$ -		$ -		$ -	
	$ 748,084		$ 748,084		$ 748,084	
	$ 5,605		$ 5,480		$ 5,355	
	410,250		411,625		412,750	
	211,650		209,150		211,600	
	$ 627,505		$ 626,255		$ 629,705	
	1.19x		**1.19x**		**1.19x**	
	$ 120,579		**$ 121,829**		**$ 118,379**	
	$ 1,919,237		**$ 2,041,066**		**$ 2,159,445**	
	$0		**$0**		**$0**	
	0.00%		**0.00%**		**0.00%**	

City of Benton Harbor, Michigan

Historical and Projected Sewage Disposal System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	2018 (1)	2019 (1)	Budgeted 2020 (2)	Projected 2021 (3)
Operating Revenues								
Sewer RTS/Commodity	$ 1,123,520	$ 1,299,381	$ 1,204,840	$ 1,255,507	$ 1,293,284	$ 1,252,031	$ 1,252,031	$ 1,339,673
Transmission Fees	-	-	-	10,457	7,398	9,524	8,935	8,935
Billing Fees	-	-	-	-	-	-	-	-
Fines	-	-	-	20,198	20,421	21,014	19,477	19,477
Other	17,160	177	-	160,383	175,818	146,825	158,884	158,884
Total Operating Revenues	$ 1,140,680	$ 1,299,558	$ 1,204,840	$ 1,446,545	$ 1,496,921	$ 1,429,394	$ 1,439,327	$ 1,526,969
Operating Expenses (4)								
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 518,532	$ 584,532	$ 547,281	$ 573,478	$ -
Customer Service	178,106	63,627	54,432	50,591	53,131	54,019	52,865	-
Sewer Lift Stations	595,364	728,022	535,147	658,270	635,981	763,049	575,122	-
Storm Drains	22,840	146,957	48,132	233,726	33,284	21,451	26,511	-
Other	8,994	5,138	5,336	-	-	-	-	-
Repair and Replacement	-	-	-	-	-	-	34,982	34,982
Depreciation	306,949	296,727	299,373	163,285	163,285	163,285	-	-
Total Operating Expenses	$ 1,676,612	$ 1,657,305	$ 1,429,883	$ 1,624,403	$ 1,470,213	$ 1,549,085	$ 1,262,958	$ 1,281,378
Operating Income (Loss)	$ (535,932)	$ (357,748)	$ (225,043)	$ (177,859)	$ 26,708	$ (119,691)	$ 176,369	$ 245,592
Non-Operating Revenues (Expenses)								
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/SAW/FDCVT	-	185,108	194,777	88,108	-	-	-	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-
Income From Joint Venture	-	-	-	-	-	-	-	-
Engineering Allocation from Project	-	-	-	-	-	-	(216,666)	(163,431)
Income Tax Transfer/Funds on Hand	-	-	-	-	-	-	325,000	265,000
Depreciation	306,949	296,727	299,373	163,285	163,285	163,285	-	-
Total Non-Operating Revenues (Expenses)	$ 165,591	$ 481,835	$ 496,458	$ 251,393	$ 163,285	$ 163,285	$ 108,334	$ 101,569
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (370,342)	$ 124,087	$ 271,416	$ 73,535	$ 189,993	$ 43,594	$ 284,703	$ 347,161
Debt Service Requirements								
Sewage Disposal System Revenue Bonds, Series 2009	$ 30,553	$ 185,431	$ 182,306	$ 184,118	$ 180,868	$ 182,556	$ 179,181	$ 180,743
Sewage Disposal System Revenue Bonds, Series 2011	84,006	101,137	99,512	102,887	101,137	99,387	102,637	100,762
Sewage Disposal System Revenue Bonds, Series 2020 (5)	-	-	-	-	-	-	-	48,657
Total	$ 114,559	$ 286,568	$ 281,818	$ 287,005	$ 282,005	$ 281,943	$ 281,818	$ 330,162
Debt Service Coverage Ratio	**(3.23x)**	**0.43x**	**0.96x**	**0.26x**	**0.67x**	**0.15x**	**1.01x**	**1.05x**

Utilities Revenue and SRF Bonds	
Annual Excess with 1.05x Coverage.	**$ 16,998**
Cumulative Excess with 1.05x Coverage.	**$ 16,998**
Annual Increase in Revenue Necessary for 1.05x Coverage.	**$0**
Annual Increase Necessary to Produce 1.05x Coverage.	**0.00%**

(1) Actual.
(2) Budgeted information provided by the City on February 14, 2020.
(3) Consumption for the fiscal years ending June 30, 2021 and thereafter is not assumed to change.
Assumes annual rate increases of 7% for the fiscal years ending June 30, 2021 through and including June 30, 2025.
Projected rate increases applied only to Commodity and Ready to Serve Charges. Other revenues are not assumed to change.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2021 through 2023 are assumed to grow 1.5% annually.
(5) Assumes a 30-year SRF loan totaling $3,660,000.

Source: City of Benton Harbor

Projected 2022 (3)	Projected 2023 (3)	Projected 2024 (3)	Projected 2025 (3)	Projected 2026 (3)	Projected 2027 (3)	Projected 2028 (3)	Projected 2029 (3)	Projected 2030 (3)	Projected 2031 (3)	Projected 2032 (3)
$ 1,433,450	$ 1,533,792	$ 1,641,157	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038
8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935
-	-	-	-	-	-	-	-	-	-	-
19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477
158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884
$ 1,620,746	$ 1,721,088	$ 1,828,453	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982
-	-	-	-	-	-	-	-	-	-	-
$ 1,300,074	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050
$ 320,673	$ 402,038	$ 509,403	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
(253,235)	-	-	-	-	-	-	-	-	-	-
335,000	5,000	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
$ 81,765	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 402,438	$ 407,038	$ 509,403	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ 177,243	$ 178,680	$ 175,055	$ 176,368	$ 172,618	$ 173,805	$ 174,868	$ 175,805	$ 176,618	$ 181,970	$ -
98,887	102,012	100,012	98,012	101,012	98,887	101,762	99,512	102,262	98,887	103,002
106,956	106,393	105,831	105,268	104,706	104,143	103,581	103,018	201,331	198,518	200,650
$ 383,086	$ 387,085	$ 380,898	$ 379,648	$ 378,336	$ 376,835	$ 380,211	$ 378,335	$ 480,211	$ 479,375	$ 303,652
1.05x	**1.05x**	**1.34x**	**1.64x**	**1.65x**	**1.66x**	**1.64x**	**1.65x**	**1.30x**	**1.30x**	**2.06x**
$ 19,351	**$ 19,953**	**$ 128,505**	**$ 244,636**	**$ 245,948**	**$ 247,449**	**$ 244,073**	**$ 245,949**	**$ 144,073**	**$ 144,909**	**$ 320,632**
$ 36,350	**$ 56,302**	**$ 184,808**	**$ 429,444**	**$ 675,392**	**$ 922,842**	**$ 1,166,915**	**$ 1,412,864**	**$ 1,556,937**	**$ 1,701,847**	**$ 2,022,479**
$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Projected 2033 (3)	Projected 2034 (3)	Projected 2035 (3)	Projected 2036 (3)	Projected 2037 (3)
$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038
8,935	8,935	8,935	8,935	8,935
-	-	-	-	-
19,477	19,477	19,477	19,477	19,477
158,884	158,884	158,884	158,884	158,884
$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
34,982	34,982	34,982	34,982	34,982
-	-	-	-	-
$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050
$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
$ -	$ -	$ -	$ -	$ -
$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
197,725	199,743	196,706	198,612	200,406
$ 197,725	$ 199,743	$ 196,706	$ 198,612	$ 200,406
3.16x	**3.13x**	**3.17x**	**3.14x**	**3.12x**
$ 426,559	**$ 424,541**	**$ 427,578**	**$ 425,672**	**$ 423,878**
$ 2,449,038	**$ 2,873,580**	**$ 3,301,158**	**$ 3,726,830**	**$ 4,150,709**
$0	**$0**	**$0**	**$0**	**$0**
0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**

From:	Chris J Cook
To:	Henderson, Shannon (EGLE)
Cc:	momalley@cityofbentonharbormi.gov; Sarkipato, Ernest (EGLE); Darwin Watson (dwatson@cityofbentonharbormi.gov)
Subject:	FW: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions
Date:	Monday, August 5, 2019 2:59:44 PM
Attachments:	MI0600 Benton Harbor Water Plant Asset Management 07 31 2019.pdf

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Please see the attached copy of the WAMP Chart for the asset inventory.

Christopher J. Cook, PE
President/CEO
Abonmarche
D 269.926.4548
C 269.876.9290
O 269.927.2295 ext 132
W www.abonmarche.com

From: Mike O'Malley <momalley@cityofbentonharbormi.gov>
Sent: Wednesday, July 31, 2019 5:39 PM
To: Clendenon, Cynthia (EGLE) <CLENDENONC@michigan.gov>; Sarkipato, Ernest (DEQ) <sarkipatoe@michigan.gov>
Cc: Darwin Watson <dwatson@cityofbentonharbormi.gov>; Tricia Bulson <tbulson@abonmarche.com>; Mike OMalley <momalley@cityofbentonharbormi.gov>; Chris J Cook <cjcook@abonmarche.com>
Subject: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions

Cynthia,
I made the deadline by the skin of my teeth.
Attached is a scanned copy of the Printed Excel Table I filled in.
It is likely more detail than you may have been expecting, but I hope it is satisfactory for your purposes.
Darwin, The other day, Ernie was somewhat concerned that I had proposed not to send this to Abonmarche.
He was right in his thought. We need record at our City Engineer's office.
Ernie,
You better be enjoying your vacation!
I do want to put in a request for an extension on The ACO also due today.
EGLE Permit to construct water system: Changes of Alum Treatment from Raw Water Line to the Rapid Mixers in the Plate Settling chain.
I had everything ready, but I had to work all day to make this somewhat easy to read.
Attached: *MI0600 Benton Harbor Water Plant Asset Management 07 31 2019.pdf*
Thanks,
Mike O'Malley
Benton Harbor Water Superintendent
7/31/2019 5:38 pm
Look at that; it came in under the 25k max EGLE attachment size!

MI0600 Benton Harbor Water Plant Mike O'Malley Water Superintendent (1)

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
BH 1950 Lake Filter Plant										
Water Plant Building	A Lake Michigan Filter Plant built in 1950 to replace the existing 1923 Well System, water softening plant. Determined to be the best Solution in a study done by Consor Townsend & Associates	1949	Chosen to provide the water that is anticipated to be needed by the City into the Furture. Study was done by CTE, Chicago.							
Floor 1 Basement Level	Lowest level poured concrete; 1 off room; a sump pump in stairwell and elevator access. Adjacent to the Clearwell for HS suction loop on floor and HS discharge East and West to Distribution Main.	1949	Suction pipeing from floor of drinking water suction well. High service vertical turbine pumps to 2 20-inch distribution Main.							
Floor 2 Pump Room Level	Southwest corner Raw water lift pumps and associated piping; North side, high service Pump and motor mount. East side backwash pump and motor mount. North east raw water treatment line tunnel to pre-treatement. South side top of Clearwell with 2 20-inch distribution main. With valving and metering.	1949	High Service and Low Service Pump and Motor support level. Traveling Screen Support; All Motor Control Panels: High Service to the South; and Low Service farther South. Valve operators for HS Suction Lines and HS Discharge mains; Room in southwest corner for Inatke valve operation and Chlorine treatment to Intake piping; above all necessary treatment chemical piping. Elevator Access for Equipment.	Demolition of HS switch gear and re-location farther South; Demolition of LS switch gear from east wall, relocated to South wall. Alter existing and add new chemical treatment piping. Add new lighting; HVAC; and air circulation fans. HVAC system is outside in the immediate Northwest corner. Opto 22 control panel is left behing and running because no one knows if it is needed or not.	2011					
Floor 3 Main Level	Front enterance of the plant. 2 Offices West End North and South. Truck delivery bay to elevator. Laboratory on South. Maintenance room, Men and Woman bathrooms, shower in Mens room.	1949	This is the Operations Level of the Water Plant. Rooms for offices, laboratory, restrooms, and public access. Truck access to elevator on south side near bathrooms.	A fairly large room between the front office and the stairwell was refitted as 2 rooms. The West side was largest with Alum Day tank and treatment pumps to the north; Fluoride Day tank and treatment pumps to the south. A new east wall with an observation window to the adjacent room that was smaller. 5 Chlorinators, gas regulators and meters and associated piping in this room.	1988	DWRLF Project removes existing Fluoride and Alum Day tank and piping and replaces it. Adds 2 day tanks for Liquid Sodium Hypochlorite and piping. All day tanks are withing block containment. Former Cl2 gaseous treatment is re-fitted with Liquid Chlorine feed pumps 6 of them and associated piping.	2011			
Pump 4 Chemical Storage and Feed Level	Top Level of the Water Plant. Large Rooms in 1 Smaller Area walled off for Chlorine feed. 1 Large Open Area for Dry Alum, Lime and eventually Dry Fluoride granual Source.	1949	A secured block walled room for Gaseous Chlorine feed on the South, a large open area to accommodate bag storage of Alum and Lime then eventually Hydrofluoro Granular Chemical. Dry Hoppers; water jet carrier to the Clarifiers. Elevator Access on southeast side for bags of chemical and equipment pieces.	The Dry Feeders and Chlorine were removed from the 4th Floor and replaced with Liquid and gas storage in the Distribution Department building and liquid and gas feed systems were put into 2 rooms on the main floor North side.	1989	Adapted for Office Space, Storage Space and Break Room. Painted; HVAC duct work and new lighting. New commercial style windows.	2011			
Exterior of exposed Main plant and Filter building.	Brick vaneer over most of exposed surfaces; windows in all rooms and both sides of filter galleries. Glass block decrative in curved form on 3rd and 4th level Northwest and southwest corners of both floors.	1949	Traditional 1950 architecture of commericial/municipal buildings. Including decorative touches	Windows replaced in 1980's		DWRLF project restored the original water plant exterior. Much of brick vaneer, glass block and cap stone was repaired and replaced. Roofs over the Filter Building were replaced with new.	2011			

(2)

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Roof Over 4 floor West End	Open area without penetrations. Parapet wall around all 4 sides. West side supports decorative signage. Southeast is raised room for Elevator equipment; north east is raised space for stairwell access.	1950	Roof for Main building.	Roof was replaced lastly in 2003 with low grade EDPM membrane and an insignificant volume of insulation.	2003	2 HVAC Units set on roof. A few penetrations added. A non-functioning weather station was mounted on the south parapet.	2011			
Roof Over Filter Gallery	3 section roof: North flat with parapets; center raised and curved up to flat roof; South flat with parapets.	1950	Roof over filters, Curved roof over filter hallway for decorative aspects.	DWRLF project replaced all 3 roofs. Much brick work and tuck pointing necessary on parapet walls. HVAC equipment on North roof near west end.	2011					
Out Building Distribution Department Building.	Block and Brick single story high ceiling building with large bays (3) office and locker room.	1950	Traditional Block/Brick building. Long E/W building and deep enough for trucks, probably 2 garages, a work shop; a equipment storage; an office and Locker room.	The East end of the building was secured and outfitted for Gaseous Storage and tranfer pipe fittings. To the west of that, a Liquid Chemical Storage for Alum and HFS Acid. Transfer pumps and controls. Storgage tanks were dug in below floor as a containment. The garage and West end room left as is.	1989	DWRLF Project: Repurposed the building. West Room was the Electic Main room and Generator switch over. Generator was place next to this room. The gas Chlorine room was to be modified but kept for gas. Change Order revised that to a Liquid Chlorine Storage and Pump Transfer room. An added change order was a 1500 gallon Alum Storage tank on ground level and piped into the 2 original tanks.	2011			
Chemical transfer tunnel Pipe Chase	Pipe Chase Tunnel from Chemical Feed Building and Main Plant.	1989	Dug into driveway N/S between Main Building and Liquid Chemical Storage. Concrete tunnel Pipe chase for Alum, HFS, and Chlorine. Had 1 access point near Main Plant.	DWRLF Project: The existing tunnel was refitted with a 2nd access portal next to the Alum Storage room. New Chemical pipes were added. 2 PVC Pipes for each chemical. New Lighting and telecommunications lines added; Forced Air heat was added from the main plant.	2011					
Heat System	Boiler in the basement in a separate room from the piping room. Piping all through plant.	1950	Started out as a Oil burning boiler in a separate room adjacent to Distribution suction, pumping and high pressure System Piping.							
Electrical System	The original Electric System for the Main Plant stayed in place up until 2011with some alterations with the New Liquid feed in 1989. As Well as the Water Distribution Center on the South Side of the driveway.	1950	Power all components in the New Lake Michigan Water Filter Plant and Pumping Station in 1950 and Water Distribution Department Building.	In 1989 the dry chemical treatment and gaseous Chlorine changes required a new Electrical components.						
Elevator	Otis MFG Freight Elevator. Goes to each of 4 floors. Cargo Delivery is floor 3 Main Enterence and Loading Dock.	1949	The elevator goes to all 4 floors. The outside delivery door is for loading and unloading equipment, supplies and original dry chemical bagged treatment chemicals and the 150 pound gas Cl2 cylinders.	Nothing was planned if the DWRLF project. At the contractors request the City had the elevator inspected and a few problems were repaired.						

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Clarifier Tunnel	A cast concrete tunnel from the North side of the Wetwell and Low lift pump area. The Settled Water 30" CIP is above. Immediately below it is the Raw Water 24" CIP. Near the North end of the tunnel the Concrete wall are curved. Past that is a small room. The floor is the cover for the 3 piped blow offs for each clarifier and the main center drain for the clarifier.	1949	The common CIP head pipes for raw and settled are valved and split to 2 raw and settled CIP lines to the West & East Clarifier.	The DWRLF project removes the concrete roof of the tunnel. Then cuts into the Raw and Settled water main about midway through the tunnel. The new piping is pre- assembled. A crane removes the settled piece and then the Raw piece. The raw assembly is lowered in and bolted to the existing. Then the settled assembly the same. The plant kept as much water on hand as could be stored. The project took from 8:00 pm to 6:00 am to complete. The roof is repaired later.	2011					
Filter Mechanical Tunnel	The tunnel enters a plant wall west and ends on the East Outside wall and stairwell. The ceiling is the filter gallery floor. The north and south walls are the filter basin walls.	1949	The mechanical equipment is in this tunnel. The Settled water runs under the filter floor and has CIP valve and pipe to each of the 6 dual filter basins. The Drain is under the tunnel floor, the CIP drain valve and pipe is also common to the dual filter basins. All 12 filters in the dual filter basins have CIP effluent/backwash valves and piping. And 4-inch surface wash CIP valve and piping.	The DWRLF project does little to the Filter mechanical tunnel. The Drain line is cut into and piped to 2 filter to waste collection boxes. There are new valve actuators and electric MCC for filters 9&10 and 11&12. All piping is painted. The doors are replaced, fans and cabinet de-humidifiers , and improved lighting are put in.	2011					
Lake Michigan Raw Water										
Intake Crib	Located ~3,375 feet offshore, the vertical riser is 10 ft in diameter at the base and cones up to 12 ft in diameter at the top rim	1950	Steel structure connected to a 30-inch raw water pipe. Located in about 40-feet of water depth. Upper cone has wood slats to keep larger debris from coming in.	New slats purchased treated and re-installed on Crib by Divers during Cleaning Project	1993	Divers clean structure, get Chlorine Halo cleared. Found hatch missing and replaced.	2016	Semi-annual preventative maintenance performed by contractor		
Raw Water Intake Pipe	36" steel pipe draws water 3,375' from shore, under 27' of water	1949	Carries Lake Michigan water to Wet well.							
Standby Emergency Intake	2 36" emergency risers at 1500' and 2500' from shore	1950	In a situation where the intake rizer will not provide raw water and cannot be quickly repaired. One or both of the emergency risers can be located and opened.			Inspected approximately every two years (last inspection completed 2017)		Next 2019		
Dry well just west of wet well	Concrete Chamber, from WW ground level to Raw Water Pipe. Has wall set ladder and bar steel grating for maintencanc and observation.	1950	To secure and support equipment and allow for inspection, valve operation, and maintenance.	Placed a 2-inch PVC Pipe into the intake line for the new Chlorination treatment for protection of Zebra Mussels after the line was pigged.	1995	Cleaned and painted walls and ladder. Added better lighting. No care for the intake valve.	2011			
36-inch Raw Water Valve	Iron Gate Valve 30-inch. On the Intake Line in the Dry Well, its Operating stem goes to operation grating floor with large wheel operator. Around 120 turns to close and open.	1950	Desigened to allow raw water to be stopped for maintenance and cleaning of the raw water suction well.	Needs backing plate and lubrication port to be repaired. Not included in DWRLF Project.	2012			2012 The well was sumped dry; The valve was lubricated. And operated several times open and closed for well cleaning.		Needs cover on one side but does work
Blow back house water. A Water Main and valve, 12 inch.	12-inch cast iron pipe from High Service Pump discharge. Valved and tied to a 12-inch CIP to the 30-inch Raw Water Main.	1950	Primarily to use system pressure to blow ice clear from the intake structure in the event of icing.	At some time the piping connection was remvoed				Actually, this system was used in 1995 to attempt to dislodge a pigging tool It worked.		Valve has been removed?

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Inlet Screen FMC Link Belt Self-cleaning Traveling Screen	Just after the raw water inlet pipe a structure designed to accept Screen assembly.The assembly is: Covered assembly of Chain; screen trays; trash box; drive motor; and jet wash.	1950	Screen Trays fastened to Link Chain on either side. Sprocket w/axel top and bottom to drive it. Jet wash to clean screens as pass by. Screened tray and outlet pipig to catch solids and remove water.	The entire structure was disassembled and removed. Replaced new screen. Contractor Allied Mechanical	1996	Trouble with outboard drive socket. Field adjustments and parts by Allied Mechanical	2009	1997 new traveling screen installed and new spool piece installed on the 36-inch pipe. 1999 motor/gears replaced. 2005 wet well cleaned.		
Wet Well; Raw Water Pumping Well	30,000 gallons concrete basin, termination of Lake intake as a wetwell source Lift pumps	1950	Suction well for Low Lift pumps. Includes operator section, valves for each raw water pump and 2 types of sump pump. Includes large drain traugh that heads on the North side and west out of the plant to the main drain loop.There is equipment for pump to waste but we have not been able to open it.	DWRL fund spent little time in well. Did add 1 water jet sump pump in northwest corner.	2012	Very deep well and has to be cleaned by hand. Once cleaned by divers in 1994 with a hydraulic submersible pump.				
Pump Low Service #1	2 MGD Vertical turbine Pump is Layne Motor is US Motor	1950	High volume low head raw water lift pump from wet well to the Plant's treatment system in consistent flow volume and head. In original Lake Plant.	Completely Rebuilt in DWRLF Project.	2012			annual preventative maintenance performed by contractor		
LS Pump 1 Drive	south side motor room floor. North side of MCC; 1st panel from West.	2011	Drive power to pump motor.							good
LS Pump 1 Disconnect at pump	Pump Disconnect 60 amp adjacent to pump.	2011	Pump Disconnect 60 amp adjacent to pump. Local Discconect for Major Maintenance.							
Pump Low Service #2	3 MGD Vertical turbine Pump is Layne Motor is US Motor	1950	High volume low head raw water lift pump from wet well to the Plant's treatment system in consistent flow volume and head. In original Lake Plant.	Completely Rebuilt in DWRLF Project.	2012			annual preventative maintenance performed by contractor		
LS Pump 2 VFDrive	In 480 V Low Service MCC Panel south side motor room floor. South side of MCC; 2nd panel from East.	2011	Variable Frequency Drive power to pump motor.							good
LS Pump 2 Disconnect at pump	Pump Disconnect 100 amp adjacent to pump.	2011	Pump Disconnect 100 amp adjacent to pump. Local Discconect for Major Maintenance.							
Pump Low Service #3	5 MGD Vertical turbine Pump is Layne Motor is US Motor	1955	High volume low head raw water lift pump from wet well to the Plant's treatment system in consistent flow volume and head. Added to original Lake Plant.	Completely Rebuilt in DWRLF Project.	2012			annual preventative maintenance performed by contractor		
LS Pump 3 VFDrive	In 480 V MCC Low Service Panel south side motor room floor. North side of MCC Top of panel 3rd from West end.	2011	Variable Frequency Drive power to pump motor.							good
LS Pump 3 Disconnect at pump	Pump Disconnect 100 amp adjacent to pump.	2011	Pump Disconnect 100 amp adjacent to pump. Local Discconect for Major Maintenance.							
Pump Low Service #4	4 MGD vertical turbine Pump is Layne Motor is US Motor	1968	High volume low head raw water lift pump from wet well to the Plant's treatment system in consistent flow volume and head. Added to meet the additional demand for Township Water System.	Completely Rebuilt in DWRLF Project.	2011			annual preventative maintenance performed by contractor		
LS Pump 4 VFDrive	In 480 V MCC Low Service Panel south side motor room floor. North side of MCC 2nd panel from West.	2011	VF Drive power to pump motor.	2011						good
LS Pump 4 Disconnect at pump	Pump Disconnect 100 amp adjacent to pump.	2011	Pump Disconnect 100 amp adjacent to pump. Local Discconect for Major Maintenance.							

(5)

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Pump Low Service #5	6 MGD Vertical turbine Out in 2012	1968	High volume low head raw water lift pump from wet well to the Plant's treatment system in consistent flow volume and head. Added to meet the additional demand for Township Water System.	Completely Rebuilt in DWRLF Project.	2011	Destroyed by running dry by running it while the Wet Well was in a cleaning operation. Pulled and inspected found nearly total failure. Not fixed.	2012	annual preventative maintenance performed by contractor; out of service indefinitely (2018)		Removed and not replaced 2012
LS Pump 5 VFDrive	In 480 V MCC Low Service Panel south side motor room floor. South side of MCC panel 3rd panel from West end.	2011	60 hp VF Drive power to pump motor.			Disconnect and available for possible repurposing to a 60 HP motor Working on getting quotes for Horizontal spit case pump to use. Particularly when the Brittan Tower is off Line.	2019	This has been locked out since 2012.		Practically brand new.
Low Service #5 Local Breaker	Locked open pump is gone	2012	Pump Disconnect 100 amp adjacent to pump. Local Discconect for Major Maintenance.							
Wet Well Sump Pump	300 gpm vertical turbine Pump is Flow Way; Motor is US Motor.	1950	Intended to pump wetwell solids to waste.	Replaced in DWRLF Project.	2011	Struggled with zebra mussel solids in 2012 Jetting with high pressure tends to help.				good
Wet Well Sump Pump Electric Starter Source.	In 480 V Low Service MCC south side motor room floor. South Side of MCC Bottom of panel 2 from West end.	2011	Breaker and starter.							
Sump Pump Disconnect at pump	Pump Disconnect 30 amp adjacent to pump.	2011	Electric protection.							
Wet Well Water Jet Sump Pump	50 gpm hydro suction lift waste pump	2011	Use of open throat jet of water to remove solids from the floor. Where impellers of trash pump may fail.							Okay
Low Service Discharge Pipe	24" CIP- splits to two 20" CI pipes	1949	Carries Low Lift Pumped water from wet well into Treatment Chain.	Repurposed in the DWRLF project extended with new 24"x 36" DIP Reducer to a 36" DIP pipe to the Plate Settler building. Tied into Clarifier Tunnel just north of original plant building and into new plate settling building just north of the Stairwell.	2011					
Raw Water and Settled Water Transmission Main. Original 1950 30-inch CIP.	Original to Clarifiers. Still in place with Valving to control if necessary. Abandonded in place.	1950	DWRLF project cut in new 30-inch DIP main and valving to carry raw water to Plate Settlers and return Settled Water to Main Plant	Mix of New and Existing still in place to and from Clarifiers	2011	Equipment was re-routed to new plate settlers. Piping and valves still in place but closed. If a plant flush is needed, these valves can be usefull to dump into the drain line.		Cut in piping installed 2011. All original piping from 1950.		2018 = new; not being used
Infilco Up-flow Clarifier West and East	Infilco Up-flow Clarifiers for raw water pre-treatment. 2 of West and East on North Side of Main Plant	1950	Infilco Up-flow Clarifiers built to process raw water with Rapid Mix above Flocculation in one package unit.	Abandonded in place still connected to all original piping, valves are closed.4	2011	Need to be secured if to be left in place.	2019 to			
Raw Water and Settled Water Transmission Main between Original Plant and New Mixing and Settling Building.	Cut in and connected to original piping. Valved in original Clarifier Tunnel and underground to the Plate Settler Building. North Side of both plants.	2011	Move raw water to the new treatment system in the new plate settler building. And return settled water to the original plant for filtration.	In DWRLF project an interconnect was installed with valve between raw and settled waters. Cannot be used for treatment but has been helpful for major water dumping.	2011	2011 installed but not used.		In 2011 water was pumped from the lake without treatment. The interconnect in the plate settler bldg and the valves to the old Clarifier were used to dump this water to waste.		
Raw Water Metering	Large turbine meter in the influent line of the original Clarifiers. No longer in service.	1950	To measure raw water flow into treatment.	DWRLF There are 2 20-inch mag meters on the raw water line between the isolation valve and the Rapid Mix Chamber. Of both Plate Settler North and South	2011	North Plate settler meter callbrated 2017				
Plate Settler Waste Metering	2 ABB Mag Meters on 6-inch waste piping for each the North and South Plate Settler.	2011	Metered waste can be a useful tool in determineing house water use and flows into the lagoon.							

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Pre-Treatment Chemicals										
Chlorine Chemical Storage	Repurposed former Cl2 Gas in ton containers. To Liquid chlorine feed system consists of three bulk tanks (2,800 gal each) located in the chemical storage building and two day tanks (50 gal and 200 gal).	2011	To allow for delivery of 1 full commercial tanker truck, approximately 4,500 gallons. Bulk Sodium hypochlorite is stored here and pumped to the day tanks on an as needed basis							
Chlorine Storage HVAC	Building Common HVAC; separate inflow and vent piping to Chlorine Storage. Common Unit is AbsolutAire Labeled MAUCS 25208	2011	To keep a proper environment in the Liquid Chlorine storage room.	Failures are frequent enough to be considered normal maintenance						
NaOCl storage extraneous fixtures.	The Chlorine (NaOCl) feed room was a change order from its original Gaseous (Cl2) feed storage tanks. Piping from each of the 3 tanks for bulk transfer and Filling; 2 fill ports for tanker truck delivery; piping from the 3 tanks to 2 transfer pumping assemblies. 2 pumps; a sump pump with alarm; 3 tank level sensors connected to 3 level transmitters; block wall containment	2011	To allow for delivery of 1 full commercial tanker truck, approximately 4,500 gallons. Bulk Sodium hypochlorite is stored here and pumped to the day tanks on an as needed basis. Pump control is engaged in the Chemical Day Tank room. To contain and alarm any spill. To transfer NaOCl to the Day tanks. To allow for operator monitoring of the storage level tanks.	Operator's have gone through several pump changes through the last 9 years. Up to the point where an emergency pump assembly was required. The Alarm system is inactive. The tank level sensors and likely the level transmitters all failed with in a few years. They are in-operable. And unlikely to ever be replaced.	2013 to present (2019)	Pumps fail frequently and are changed as soon as possible. A back up pump is stored in another room and piping for its use is in place at all times. Level determination is Worthless and will not be replaced.		Tend to break before any maintenance is required. Tank levels are monitored with a flash light shining through the tank onto the 100 gallon markers.		
Chemical Day Room; Fluoride; Alum Chlorine	Traditional Liquid Aum and HFS Acid Day Supply tanks and Pumping systems. Replaced in 1989/90	1990	Traditional Means to Treat Water with Liquid Chemicals. Chlorine was Gaseous and in an adjacent room.							
Chemical Day Tank Room Forced Air out door venting.	Chemical Storage tanks vented to outside. A forced air system has an intake above the Fluroide Day tank and expels air at west side of North wall above windows	2011	To expel vapors and such from Day Tank room. HFS Acid the Fluoride source is very corrosive and will destroy equipment and surfaces if left to linger for long.							
Chemical Room Eye Wash Station	Plumbed in Place Eye Wash and Safety Shower.	2011	Located near the west windows of the Day Tank room.							
Day Tank Chlorine Feed Day Tank room	Repurpose existing Alum and Fluoride Feed room. There are 2 day tanks on scales inside a block containment wall. Piped from the storage room and to the feeder room.	2011	The raw water chlorine treatment day tank is approximately 1,000 gallons. The finished water day tank is approximately 500 gallons. Both sit on a scale and the weight is displayed on a rack. Transfer from Storage to day tank is activated from a switch. A valve must be turned to move that delivery into each tank seperately.					Routine cleaning is maintained on a semi annual basis.		Okay

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Chlorine Chemical Feeders	Replace former Cl2 gaseous feed with Regal Chlorinators. There were 6 Watson Marlow pumps originally installed in the Chlorine chemical Feed room. With piping from Day tanks, piping to discharge points; pressure valving; coupling and 1 calibration column for each treatment destination; Raw; Treated and Finished waters.	2011	There are 3 designated treatment points and 3 sections of pumps (2 each) Point one on the north: Pump for Raw Water Treatment and Pump to Floc Chamber 1 in plate settlers. Point 2 is for locations in the treatment stream: 1 pump for standard raw water main just after the low lift; the 2nd pump to a settled water point (past plate settlers). The 3rd if for post type treatment: 1 pump to combined filter effluent North and South lines; pump to to clearwell.	Watson Marlow pump 1 for raw water treatment point failed and abandonded. Set up pump 3 to use. Discharge point failed and this point is temporary out of service. Raw water treatment point failed clogged up with scale. Still working on a way to restore operation. Pump 3 failed, removed and replaced with new Stenner Pump. Pump 6 failed and replaced with a New Stenner Pump.		Pump 1 2016; abandonded and pipe adjacent WM pump Pump 3 2017; pump 6 2019		Routine Replace tubing on an as needed basis. WM pumps Usually break before any maintence is needed. And then replaced with an alternate standard pump like Stenner.		4 Watson Marlow pumps are fair, but expeted to fail fairly soon. 2 Stenner pumps new.
Chlorine Raw Water Treatment	A Cl2 pre-treatment line from Chlorine feed room to raw water intake structure. PVC Piping inside, booster pump, HDPE Piping inside intake; to a PVC Halo just below crib openings.	1994	The threat of Zebra Mussles had all Great Lakes water plants install a means to destroy the mussles and keep them away.	Existing pipe connected to the new Liquid Hypochlorite Watson Marlow peristaltic pump. Included a raw water pumping interlock and a 2-inch tap water carrier support.	2011	The combination of the high pH of NaOCl and the tap water total hardness caused the halo at the intake to scale out and eventually stopped all flow.	Not rebuilt to date, 2019			
Alum Chemical Storage	2 tanks 3,800 gallon; 1 kicker tank 800 gallons; 1 pressure transmitter; 1 truck coupler; 3 individual fill lines.	big tanks 1990 kicker 2011	To take delivery of 4500 gallan tanker truck. Store as needed. And Transfer from storage to Day tank as needed.	New fill piping to the 2 tanks 3,800 gallon; all new fill piping 1 kicker tank 800 gallons and interconnected piping to transfer pumps ; 1 pressure transmitter; 1 truck coupler; 3 individual fill lines.	2011	Routine cleaning tank and room. Serious freezing problem for pump suction and/or transfer piping Feb 2019				Okay
Alum Storage room Electrical Controls.	On west wall are the main; large breakers in cabinet; small breakers in cabinet; and Transfer pump controls for Alum Pump 1 and Pump 2; and Fluroide Pump (out of service, 2017)	1989	The electric components; devices; Pressure transmitters, (Fluoride is out of service 2017) Alarms, both are not working correctly. HVAC controls.	Added 1 gas fired overhead heat unit in February 2019. Alarm in alum sump pit is failed and inactivated. Need to close breaker in order to activate NaOCl motorized valves, 2 of them.		2019 furnace; 2018 failed sump alarm				
Alum Room HVAC	Building Common HVAC; separate inflow and vent piping to Alum Storage. Common Unit is AbsolutAire Labeled MAUCS 25208	2011	To keep a proper environment in the Liquid Alum storage room.	Gas fired forced overhead unit heater was not replaced in 2011, Replaced completely in February 2019.	2019					
Alum Chemical Transfer Pumping	2 units Hydroflo 21.58 gph @ 60 psi max feed rate, 95 ml/min min feed rate	1990	To transfer alum from storage to day tank	Replaced as they fail. Since 1990 there have been 6 replacements		Failures are frequent enough to be considered normal maintenance				
Chemical Storage Room Eye Wash Station	Plumbed in Place Eye Wash and Safety Shower.	2011	Located next to the Double Doors of the Alum/Fluoride Storage Room.			Maintenance is cleaning and is often just replacement when failed.				
Alum Day Tank	1 4500 pound day tank on scale in containment.	2011	To store 1 or more days of use. Maximum number of days has shown to be 8 Piped from Storage bldg; piped to 2 feeders.							
Alum Chemical Feeders	Pump Rack with piping; drawdown columns; VFD Digital Controller Alum Pumps 40 gph diaphram.	2011	Provide Alum treatment to Raw Water Main in Clarifier Tunnel.	1st pump died replaced with spare	2014	2nd pump failed replace with new. 3rd pump failed purchased new VFD . Manufacturer explained this was the fatal failure of their pumps.	2017&2018	MDEQ ACO demands that Alum be added to Plate Settler Rapid Mix. The present system will be turned off and kept for back up.	2018 &2019	We still have 1 complete pump that we can purchase a VFD Replacement for.
Fluoride Chemical Storage	5,700 gallon tank; transfer pumps: one 56 gpm @ 56' TDH	2090	HFS Acid 23% liquid storage tank. 1 transfer pump Hydroflow. Prone to serious leaks 4 times from 1990 to 2016	Abandonded in place after last leak stopped. Tank was rinsed out several times 2017	2017					
Fluoride Day Tank	1 Fiberglass tank holds 700 pounds sits on scale.	2011	Store appropriate day use of Fluride Source.	Repurposed to store NaF salt from Saturator	2017					

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Fluoride Chemical Feeders	2 LMI, max feed rate: 36 gpd @ 150 psi, min feed rate: 30 ml/min	2011	Feed HFS Acid to Settled Water line. Meant to be SCADA controlled, but only really is interlocked with Raw Water Pump Running mode.	Repuropsed to pump NaF. Feed rate higher but pumps can keep up with normal flow rates.	2017			Simple cleaning and tube changes originally designed to handle very Corrosive Acid. Now only handles NaF salt solution 4%		Good, originally designed to handle very Corrosive Acid.
Fluoride source Replacement	Replace with LMI Saturator. A platic tank that can produce a % NaF solution, enough to treat up to 5.0 MGD tap water to desired levels. Includes an LMI Metering pump. All interlocked with Raw Water Flow.	2017	Uses bagged Sodium Fluride 99% screened granular salt. Up flow saturator with softened tap water generates 4% solution. Piped to day repurposed Day tank and Feed system. With LMI Pump. Also interlocked with Raw Wate Pumping.							
Polymer Feed System, room and equipment	A complete block room was constructed for the purpose of feeding polymer as a coagulant aid in the new plate settler building. 2 of Everything was provided.	2011	All constructed, 4 barrels of polymer had to be purchased. Entire system NEVER TURNED ON. Almost ruined in the beginning by Engineer Required water test.	Repurpose Room for Alum Feed Room. Bring Alum supply piping 1 1/2 Inch from under existing chemical feed to the Plate settler North Day Tank. The South Day tank and all other Polymer related equipment will be kept in place if needed.	2018	Brand new in place. Vendor spent his 3 days of Trainning to clear out all water from tanks, pumps and piping.		None. Never used since 2011 to present 2019.		
Polymer Feed Day tank and barrel Transfer	2 200-gallon day tanks on scales. 2 Barrell Transfer pump, mixing system in each. Supply piping and valves go to each or a combination of each Pump System.	2011	Designed to store Polymer, keep in solution to assure homogeneous state. Source to pumping system.	Intend to re-purpose MDEQ mandated Alum day tank ACO 2018 on scale and associated piping. New Alum transfer line installed from Alum Storage to day tank. Dead man transfer switch installed.	March 2019.	New transfer line from Alum Storage to this day tank. Have used pumps to vactor up liquid material		Brand new in place. Vendor spent his 3 days of Trainning to clear out all water from tanks, pumps and piping.		
Polymer feed system: make up water; pumps, and feed lines.	2 sets of water make up; mixing with polymer and piping to 3 Raw water pipes to Rapid mix basins.	2011	Will not conduct anything other than polymer. No purpose for Benton Harbor Water. As turbidity troubles of past were mitigated by abandonding the Clarifiers (2) with New Plate Settling Technoledgy (2)	Abandon in place. Will keep in place if needed in future.	2011					
New Alum Feed System in response of Administrative Consent Order 2018	Repurposing Polymer room North End. Install 2 LMI pumps; suction Header on the North end of suction Piping; Build 2 point Alum treatment system. IN order to take advantage to the rapid mixer on each plate settler system.	2019	Alum feed system uses: Alum supply line repurposed from N Polymer Day Tank; 2 LMI diaphram chemical pumps; Piping to repurposed discharge piping: North side to North Rapid Mix; South side to South rapid Mix. With valve for bypass or interconnect.							
Pre-Treatment Chain										
Settled water effluent pipe	36" CIP	1949	Carries processed Water (Settled) from pre treatment to Filters.	Repurposed in the DWRLF project extended with new 36' DIP pipe from the Plate Settler building. Tied into Clarifier Tunnel just north of original plant building. And into new plate settling building on the north Wall.	2011					
Filtered water effluent pipe	30" CIP.	1949	Combines North and South Filter effluent out side under surface to the 2 reservoirs/Clear Well							
High service suction header	2 36" CIP for loop out of clear well.	1949	Feeds all High Lift Pumps and 2 Backwash Pumps and Plant Tap pump.							
High service discharge	2 20" CIP pipes 1 12" CIP	1949	Carries Tap Water to the Distribution System.							

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Backwash Pipe	24" CIP	1949	Carries back wash water from selected pump and selected filter. One only of each. Connects to the valve in all 12 filters.							
Surface wash pipe	4" CIP	1949	House water to Surface sweeps to all 12 filters.							
Wash water drain	24" to 30" sewer	1949	Carries backwash waste to the Water Plant's Main Drain pipe. Exits Filter gallery North Wall just north of the old East Clarifier.							
Sludge drain	24" CIP	1949	In between the 2 old clarifiers. Takes water from original Clarifier Drains (2) and from original Clarifier blow down concentrators; 3 each clarifier.							
Plant service line	6" CIP; source is High Service distribution main.	1949	Carries plant service water from High Lift header into the plant for domestic use; sampling; Maintenance use;	Repurposed in the DWRLF project extended with new pipe to the Plate Settler building. Domestic service and Clarifier Cleaning Hoses.	2011					
Plant service to CL2 feeders	2" CIP: source is High Service distribution Main. Includes RPZ backflow protection device.	1949	Carries plant tap water to the Chlorine Feed Room. Formerly ran Cl2 Gas Chlorinators.	Repurposed in the DWRLF project to carrier water to Intake feed and to Plate Settler Floc Chamber 1 Feed.	2011					
Pre-Treatment Chain New DWRLF 2011										
New Treatment Building for Plate Settlers	A massive concrete poured building with brick vaneer to west, combination brick vaneer lower and siding with windows North and South and all brick vaneer to the east with full glazed windo panels up middle area. Built to house the 2 plate settlers. Built to the east of the existing water plant.	2011	Essentially to house the new treatment system basins. Major piping is Raw and Settled. Has room for Polymer treatment and mechanical and maintenance rooms.							10 years new.
Rapid Mixing Chambers North and South	2 units, 8,600 gallons each. Concrete vaults with inlet piping and outlet mix piping. Propeller blade on rotating shaft provides energy to properly disperse coagulant.	2011	Rapid mixers intended to flash mix Alum coagulant to assure charge reduction and assure floc creation.	Turns out the engineers intended the rapid mix for a new Polymer Feed system against the operator's desire. Mixing system is turned off and not used.	Disable 1st day in 2011	Rapid mixers required by 2018 MDEQ Administrative Consent Order to be used as Flash Mix for Alum Treatment by August 2019	2018/ 2019			New in place.
Rapid mix equipment drive and breaker	In Electric Room Northwest of Plate Settlers upper floor.	2011								
Murer Research Inc (MRI) North & South (N&S) Flocculation Basins	Floculation basins; 2 units: North and South; 3 basins seperated by baffled walls; 168,300 gallons each	2011	Flocculation chambers designed at 3 slow mixing energies; to enable Alum collissions and building to create larger and heavier Alum Floc for settling and elimination.	Modifying baffle walls to allow proper basin cleaning. The bottom baffle to be replaced with a swinging style that can be opened and allow maintenance cleaning of settled alum floc in each of the 1st & 2nd chamber into the 3rd settling chamber where the waste drains are located.	2018 & 2019	Baffles purchased from Mfg, MRI in 2018. 1st attept at replacement in March 2019 but shut down by MIOSHA				
Murer Research Inc (MRI) N&S Flocculation Basin 1st	Rapid mix water enters on West Wall about 1/2 way down. A pre-treatment Chlorine Line is in place. Basin is ft N/S; ft E/W and 18 feet deep.	2011	1st set of flocculation energy to create collissions to alum floc. Energy added to basin with 2 sets of 3 paddle assemblies with 3 paddles on each.	Ditto statement above.	2018 & 2019					
Murer Research Inc (MRI) N&S Flocculation Basin 2nd	Basin is ft N/S; ft E/W and 18 feet deep.	2011	2nd set of flocculation energy to create collissions to alum floc. Energy added to basin with 2 sets of 3 paddle assemblies with 2 paddles on each.	Ditto statement above.	2018 & 2019					

10

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Floc equipment North & South basin 3.	Basin is ft N/S; ft E/W and 18 feet deep.	2011	3rd set of flocculation energy to create collissions to alum floc. Energy added to basin with 2 sets of 2 paddle assemblies with 2 paddles on each.	Ditto statement above.	2018 & 2019					
Murer Research Inc (MRI) N&S Flow reduction, stilling basin.	Floculation flow velocity reduction chambers. 2 units North and South basins.	2011	Chamber designed to reduce flow velocity in order to remove disruption in plate settler operation	Modify the west baffle wall to allow for basin cleaning. The bottom baffle to be replaced with a swinging style that can be opened to the 3rd floc chamber where the waste drain is located.	2018 & 2019					
Settling Basins	Plate Settlers; 2 units, North and South; 2 MRI packages each; 134,640 gallons each, stainless steel plates set at 55 degree inclination.	2011	Plate settlers are designed to create a massive surface area for floc to settle against and fall out of the settled water coulmn. Settled water is drawn off in the top 6-inches in peforated stainless steel tubes and decanted into settled water collection traughs.	Upper surfaces of Stainless Steel began to rust immediately after put in service	2011	Upper area of all stainless steel panels and top of Plates very heavy rust. Going to try a coating in 2020.				
Settling Basins Sludge Handling Vacuum system.	Vacuum sludge collection and wasted to lagoon, Complete set in each North and South Plate Settler chambers. Automated MRI cabling system to seep the vacuum piping from one end of the plate settler chamber to the other.	2011	The head pressure is assisted by a waste pump to vacuum up settled solids in the plate settlers and transfer them to the Waste Treatment Lagoon. The vacums are a set of traveling pipes to vacum back and forth from the floor by a system with control and cable use.							
Remote operation of waste controls	Auto controls on MRI Cabinet east end of each Plate Settler North and South.	2011	MRI Waste control system remote control in cabinet on east end. Initiate start, start interval when in remote operation.							
Sludge Pump, valving, discharge, by-pass, local Control and Meter. North and South are the same.	Sludge removal is identical on each basin and is adjacent to each other. Water and solids are vacuumed up by piping on floor; Pumps provide extra vacuum; valving available for bypassing pumps; a meter, display and telemetry is on both discharge pipes. Both combine to each other and flow to the Lagoon Isolation Structure.	2011	The sludge pump system works in conjuction with the MRI waste vacuum system to help vacuum up the solids, measure the flow and move the waste to a common header and then to the Southwest corner of primary sludge lagoon. One identical set up for the North and South Plate Settler basin.							
Local operation of waste controls	Switch on wall changes from local to remote control.	2011								
HVAC Unit(s) in new Plate Settler Building.	Forced air unit in room to the north of the stairwells. AbsolutAire MAU3 25025	2011	Air flow is in blue fabric tubes North side and west side. Also controls the louvered fresh air systems.							
Heat coils gas fired	celing, center walkway ceiling, south ceiling. Thermostats on wall	2011	good job of keeping the upper floor warm enough.							
Settled water collection drop piping, connected to 30-inch settled water line. Includes analysis of 3 parameters on line.	Settled water collection, analysis and transfer chambers and piping back to the Original plant as settled water for the filters.	2011	Settled water from the North and South Plate Settler chambers is collected and connected to the 30-inch settled water piping to be returned to the Filter plant. Measurment equipment is mounted on each of the 2 falling water pipe.	The temprature probes fail immediately as their thin stainless steel probes are mounted in a water fall. There is a 30-inch cross connection pipe and valve from the raw water line and Settled water line in the new building. This cross connection is valved off and cannot be used during any drinking water treatment except as a waste tool in event of a treatment concern.	2012	Little by little the analysis tools on the settled water drop piping either fail or are re-used in a more appropriate location in the plant.	2012 thru 2018	Some operable, mostly worthless by this point. Installation of this automated equipment was meaningless.		

(1)

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Electric to New DWRLF Building										
Electrical Equipment Room for New Building Motor Control Center (MCC).	Electrical room in Plate Settlers, Up stairs between maintenance closet and Crane.	2011	Has Incoming Electric to this building. Has local breakers large and small. Has Motor Control Center MCC B301, for Mixers VFDs and Breakers for all.							
South Wall RQ1 Transformer	Transformer for electrical to various electrical fixtures.	2011	Transformer of incoming electric service RQ1							
South Wall RR1 Transformer	Transformer for electrical to various electrical fixtures.	2011	Transformer of incoming electric service RP1							
B301 Electrical Panel Top Row	South panel 1: RQI: PAK A200, 2084/120 VAC. South panel 2: RR1: MOKA200, 2084/120 VAC. South panel 3: DPK: NF, 225 max amp, 4wire.	2011	Routing Electric Service from Transformer to various Controllers.							
Motor control and telemetry Panel West Wall.	DPK Transformer; Top left: Main 600 amp Breaker;	2011	Breaker Panel for West Wall MCC.							
Motor and Motor Control and Telemetry North and South Basins Rapid Mixer	Lower left: North Rapid mix VFD, start, stop, speed control, and Display. 2nd Top Panel: South Rapid Mix ditto North.	2011	MCC for Rapid Mix Speed control with Variable Frequency Drive (VFD)							
Motor and Motor Control and Telemetry North and South Basins Floc Chamber 1	2nd Panel lower: North Floc 1 motor control VFD start /stop and motor controll; 3rd Panel bottom; South Floc 1 motor VFD, Start/Stop and motor controls	2011	MCC for Floc 1 primary mixer; Initial Mix Speed control with Variable Frequency Drive (VFD)							
Motor and Motor Control and Telemetry North and South Basins Floc Chamber 2	3rd Panel Top: North Floc 2 motor control VFD start /stop and motor controll; Bottom ; South Floc 2 motor VFD, Start/Stop and motor controls.	2011	MCC for Floc Chamber 2 reduced Mixer Speed control with Variable Frequency Drive (VFD)							
Motor and Motor Control and Telemetry North and South Basins Floc Chamber 3	3rd Panel Middle: North Floc 3 motor control VFD start /stop and motor controll; 4th Panel Middle South Floc 3 motor control VFD, start/stop and motor control.	2011	MCC for Floc Chamber 3 lowest reduced Mixer Speed control with Variable Frequency Drive (VFD)							
HVAC Unit Control	AbsolutAire HVA Unit with 30 amp breaker.	2011	To temper the air in Plate settler room coupled with gas radiator over head heaters 3 of North wall Middle walkway and south wall.							
MRI Sludge Vacuum System control and telemetry	MRI Sludge system East end Plate Settler floor vacuum equipment operation with pully; Pump initiate; valve control and North/South Metering.	2011	Control of MRI sludge collection systems. 1 each for north and south Plate Settlers. Removes settled solids from settlers and pumps them to the primary lagoon.							
Sludge pump and Metering Control and Operation	North Sludge system control 4th Panel bottom; South Sludge system control 5th Panel Top.	2011	Provides power to MRI sludge Collection equipment.							

Asset Filtration Treatment.	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Main Plant Filter Gallery.	Filter Gallery Main Floor: North side are the chambers and 2 filters in each: 1&2; 5&6; 9&10. South sider are the chambers and 2 filters each: 3&4; 7&8; 11&12. Wall vaneer is Fired tile and windows. Ceiling and roof are curved arch with attractive trim at base. Supports of fired tile vaneer and Archways are in front of their respective filter bank edges and have built in Leopold control panels.	1950	Originally built with 3 common filter basins on North side and South side. 2 filter units per chamber. 12 filters installed through the years 1950 to 1960	Overflow protection was cut off when the Clarifier Settled water piping was valved off. No additional Overflow protection was provided during the DWRLF project. In 2019 the filter gallery floors adjacent to filter 10 to the north and 12 to the south were core drilled and a new 8-inch drain was installed in each.	Mar-19					
Filter Gallery Main Floor HVAC	Filter Gallery Main Floor HVAC	2011	Roof top AbsolutAire HVAC units MAUL 25206 York LX5 Series. Mounted on North Filter Roof. 2 Window fans installed; a celing Sock and blower installed.							
North Filter Effluent Pipe	North Filter bank, CFE North Bank Effluent Header. 30-inch CIP pipe starts at connection to Filter 1 effluent. Ends at Filter 10 Effluent. Drops through floor to eventually combine and fill the Reservoirs between Filters 6 & 9.	1950	Filters 1&2; 5&6; 9&10 effluent water was collected in the North Collection CIP Main above the surface and underground to combine with Main Filter Effluent to Reservoir.	LT1E SWTR requirements to meet Combined Filter Effluent turbidity monitoring a tap was installed for this sampling requirement as the North CFE.	1989					
South Filter Effluent Pipe	Effluent Header. 30-inch CIP pipe starts at connection to Filter 3 effluent. Ends at Filter 12 Effluent. Drops through floor to eventually	1950	Filters 3&4; 7&8;11&12 effluent water was collected in the North Collection CIP Main above the surface and underground to combine with Main Filter Effluent to Reservoir.	LT1E SWTR requirements to meet Combined Filter Effluent turbidity monitoring a tap was installed for this sampling requirement as the South CFE.	1989					
All Filter piping CI original	All Filter piping CI original Date stamped: Filter piping to filters 1-8 original plant construction stamped 1948 & 1949. Filters 9&10 piping stamped 1951; Filters 11&12 piping stamped 1952.	1950	All piping to convey settled water, effluent water; wash water; and surface wash water CIP construction.							
Rapid Sand media Filter #1 2g/sqft/min 1MGD	In Filter # 1 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; supported by: Leopold filter Cast Iron underdrains with gravel media support; 350 sqft area	1950	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1998 new underdrains				
Filter 1 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, In CIP valve and pipe for drain common to bank 1&2; Filter Effluent pipe valve and Meter for Filter 1; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1950	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Infijuent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	Feb-06					
Rapid Sand media Filter #2 2g/sqft/min 1MGD	In Filter #2 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; supported by: Leopold filter Cast Iron underdrains with gravel media support; 350 sqft area	1950	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1998 new underdrains				

(13)

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Filter 2 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, In CIP valve and pipe for drain common to bank 1&2; Filter Effluent pipe valve and Meter for Filter 2; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1950	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Infiluent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	Feb-06					
Filter 1 & 2 Control Panel	Not sure in the original Plant, likely same pneumatic contols adjacent to the Support columns .	1950	For operational control of filter valves, flows and metering And to control Influent and Drain including during backwashing filters.	Control panel embeded in the wall, electric operation of Hydraulic selenoid valves. 3 common controls: Hydralaulic Pump; Influent line; Drain. Individual valve controlls: Filter effluent; filter backwash sequence and pump; stop. Turbidity start/stop relay; and filter flow metering.	1988	DWRLF Project wireing and relays essentially the same but Master Computer for display and storage. New cabinet doors and light displays.	2011			
Rapid Sand Media Filter #3 2g/sqft/min 1MGD	In Filter 3 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; supported by: Leopold filter Cast Iron underdrains with gravel media support: 350 sqft area	1950	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1995 new media and underdrains				
Filter 3 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, In CIP valve and pipe for drain common to bank 3&4; Filter Effluent pipe valve and Meter for Filter 3; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1950	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Infiluent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	February 2006 purchase and February 2007 install				
Rapid Sand Media Filter #4 2g/sqft/min 1MGD	In Filter 4 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; supported by: Leopold filter Cast Iron underdrains with gravel media support; 350 sqft area	1955	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1995 new media and underdrains				
Filter 4 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, In CIP valve and pipe for drain common to bank 3&4; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1955	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Infiluent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	February 2006 purchase and February 2007 install				
Filter 3 & 4 Control Panel	Not sure in the original Plant, likely same pneumatic contols adjacent to the Support columns .	1950	For operational control of filter valves, flows and metering And to control Influent and Drain including during backwashing filters.	Control panel embeded in the wall, electric operation of Hydraulic selenoid valves. 3 common controls: Hydralaulic Pump; Influent line; Drain. Individual valve controlls: Filter effluent; filter backwash sequence and pump; stop. Turbidity start/stop relay; and filter flow metering.	1988	DWRLF Project wireing and relays essentially the same but Master Computer for display and storage. New cabinet doors and light displays.	2011			
Rapid Sand Media Filter #5 2g/sqft/min 1MGD	In Filter #5 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; supported by: Leopold filter Cast Iron underdrains with gravel media support; 350 sqft area	1955	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1998 new underdrains. 2002 new media				

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Filter 5 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, in CIP valve and pipe for drain common to bank 5&6; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1955	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Influent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	February 2006 purchase and February 2007 Install				
Rapid Sand Media Filter #6 2g/sqft/min 1MGD	In Filter #6 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; supported by: Leopold filter Cast Iron underdrains with gravel media support; 350 sqft area	1955	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1998 new underdrains. 2002 new media				
Filter 6 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, in CIP valve and pipe for drain common to bank 5&6; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1955	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Influent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	February 2006 purchase and February 2007 Install				
Filter 5 & 6 Control Panel	Not sure in the original Plant, likely same pneumatic contols adjacent to the Support columns .	1950	For operational control of filter valves, flows and metering And to control Influent and Drain including during backwashing filters.	Control panel embeded in the wall, electric operation of Hydraulic selenoid valves. 3 common controls: Hydralaulic Pump; Influent line; Drain. Individual valve controlls: Filter effluent; filter backwash sequence and pump; stop. Turbidity start/stop relay; and filter flow metering.	1988	DWRLF Project wireing and relays essentially the same but Master Computer for display and storage. New cabinet doors and light displays.	2011			
Rapid Sand Media Filter #7 2g/sqft/min 1MGD	In Filter #7 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; supported by: Leopold filter Cast Iron underdrains with gravel media support; 350 sqft area	1955	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1995 new media and underdrains				
Filter 7 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, in CIP valve and pipe for drain common to bank 7&8; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1955	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Influent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	February 2006 purchase and February 2007 Install				
Rapid Sand Media Filter #8 2g/sqft/min 1MGD	In Filter #8 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: graded gravel on top of Leopold cast iron drains and a center backwash flume; 350 sqft area	1968	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	1997 new media and underdrains				

(15)

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Filter 8 Valves, valve actuators, meters, etc.	in CIP pipe and valve for Influent, in CIP valve and pipe for drain common to bank 7&8; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1968	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Inffjuent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	February 2006 purchase and February 2007 Install				
Filter 7 & 8 Control Panel	Not sure in the original Plant, likely same pneumatic contols adjacent to the Support columns .	1950	For operational control of filter valves, flows and metering And to control Influent and Drain including during backwashing filters.	Control panel embeded in the wall, electric operation of Hydraulic selenoid valves. 3 common controls: Hydralaulic Pump; Influent line; Drain. Individual valve controlls: Filter effluent; filter backwash sequence and pump; stop. Turbidity start/stop relay; and filter flow metering.	1988	DWRLF Project wireing and relays essentially the same but Master Computer for display and storage. New cabinet doors and light displays.	2011			
Booster puming system for hydraulic Filter Valve actuators.	Hydro-pneumatic Pressure tank south west corner of filter gallery. Has a pump coupled to 2" x 1" booster pump on a 2-inch house water line; plumbed into all Hydralic valve actuators.	1988	To increase the pressure to valve actuators. Initiated during filter operation and Backwash from filter operations panel.	Original system of filter operation and valve operators was likely also hydraulic with operator handles in cabinets in filter gallery? 1950s removed long ago or in 1988?						
Dual Media Anthracite and Sand Media Filter #9 2g/sqft/min 1MGD	In Filter #9 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: graded gravel on top of Leopold cast iron drains and a center backwash flume; 350 sqft area	1968	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	In DWRLF Project: Filters 9 & 10 Media and support were removed and replaced with Leopold Plastic underdrains with IMS cap, a 12" layer of filter sand and a 16" cap of Anthracite Coal.	2011			
Filter 9 Valves, valve actuators, meters, etc.	in CIP pipe and valve for Influent, in CIP valve and pipe for drain common to bank 9&10; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1968	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Inffjuent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	DWRLF Project: Filter to Waste 12" PVC Piping tee'd into Filter Effluent valve of # 9 and carried to the New Waste Drain installed. Valve Actuators were replaced for all operating valves for filters 9&10.	2011			
Dual Media Anthracite and Sand Media Filter #10 2g/sqft/min 1MGD	In Filter #10chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: graded gravel on top of Leopold cast iron drains and a center backwash flume; 350 sqft area	1968	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	In DWRLF Project: Filters 9 & 10 Media and support were removed and replaced with Leopold Plastic underdrains with IMS cap, a 12" layer of filter sand and a 16" cap of Anthracite Coal.	2011			
Filter 10 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, in CIP valve and pipe for drain common to bank 9&10; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1968	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Inffjuent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	DWRLF Project: Filter to Waste 12" PVC Piping tee'd into Filter Effluent valve of # 10 and carried to the New Waste Drain installed. Valve Actuators were replaced for all operating valves for filters 9&10.	2011			

(16)

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Electric Valve Controllers for Filters 9&10	East end of Filter Gallery North of Door. 2 rows of 5 controllers: Top row West to East: 9 backwash; 9 surface wash; 9/10 influent; 10 backwash; 10 surface wash; Bottom west to east: 9 filter to waste; 9 effluent; 9/10 waste; 10 effluent; 10 filter to waste.	2011	Replaced hydraluic Operations of Henry Pratt valves actuators to electric for filters 9&10	Filter 9&10 basin drain will not open with electric, only by hand. North bank filters under MDEQ Administration Consent Order wants all Filter to waste valves to function.		ACO 2018; to do by end of 2019				
Filter 9 & 10 Control Panel	Not sure in the original Plant, likely same pneumatic contols adjacent to the Support columns .	1950	For operational control of filter valves, flows and metering And to control Influent and Drain including during backwashing filters.	Control panel embeded in the wall, electric operation of Hydraulic selenoid valves. 3 common controls: Hydralaulic Pump; Influent line; Drain. Individual valve controlls: Filter effluent; filter backwash sequence and pump; stop. Turbidity start/stop relay; and filter flow metering.	1988	DWRLF Project wireing and relays essentially the same but Master Computer for display and storage. New cabinet doors and light displays.	2011			
Dual Media Anthracite and Sand Media Filter #11 2g/sqft/min 1MGD	In Filter #11 chambers constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: graded gravel on top of Leopold cast iron drains and a center backwash flume; 350 sqft area	1968	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	In 2018 Filters 11 & 12 Media and support were removed and replaced with Leopold Plastic underdrains with IMS cap, a 12" layer of filter sand and a 16" cap of Anthracite Coal.	2008 / 2009	2011 new underdrains		
Filter #11 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, In CIP valve and pipe for drain common to bank 3&4; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1968	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Inflijent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	DWRLF Project: Filter to Waste 12" PVC Piping tee'd into Filter Effluent valve of # 11 and carried to the New Waste Drain installed. Valve Actuators were replaced for all operating valves for filters 9&10.	2011			
Dual Media Anthracite and Sand Filter #12 2g/sqft/min 1MGD	In Filter chambers #12 constructed in 1950 2 filters each. Media is a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: graded gravel on top of Leopold cast iron drains and a center backwash flume:350 sqft area	1968	The 1950 standard sand filter with gravel support; Center flume Effluent/backwash; Waste traughs; and Leopold Cast Iron underdrain used for final filter of coagulated; mixed and settled Lake Water.	Replace filter Media and CI Drain and Gravel support is replaced by a 12-inch layer of filter sand; topped off with a 16" Anthrcite Coal cap; supported by: Leopold filter Plastic underdrains with a 1" IMS caps 350 sqft area	1988	In 2018 Filters 11 & 12 Media and support were removed and replaced with Leopold Plastic underdrains with IMS cap, a 12" layer of filter sand and a 16" cap of Anthracite Coal.	008/200	2011 new underdrains		
Filter #12 Valves, valve actuators, meters, etc.	In CIP pipe and valve for Influent, In CIP valve and pipe for drain common to bank 3&4; Filter Effluent pipe valve and Meter for Filter 4; Filter Backwash CIP valve and pipe; and 4" CIP for Surface sweep.	1968	Function to operate all Declining Rate filter operation valves: Influent; Effluent metered; Drain; backwash; surface wash.	Included in the purchase of Henry Pratt valves to replace the 6 common 16" Inflijent Valves; and the 6 common 18" Drain valves and associated actuators purchased in 2006 and the replacement project began in 2007 by a mechanical contractor. Need to Replace was due to heavy leakage.	2006 & 2007	DWRLF Project: Filter to Waste 12" PVC Piping tee'd into Filter Effluent valve of # 12 and carried to the New Waste Drain installed. Valve Actuators were replaced for all operating valves for filters 9&10.	2011			
Electric Valve Controllers for Filters 11&12	East end of Filter Gallery 2 rows of 5 controllers: South side of Door: Top East to west: 12 Surface Wash; 12 Backwash; 11&12 Influent; 11 Surface Wash; 11 Backwash. Bottom East to West: 12 filter to waste; 12 Effluent; 11/12 Waste; 11 Effluent; 11 Filter to waste.	2011	Replaced hydraluic Operations of Henry Pratt valves actuators to electric for filters 11&12	South bank filters under MDEQ Administration Consent Order wants all Filter to waste valves to function.	2019	ACO 2018; to do by end of 2019				

17

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Filter 11 & 12 Control Panel	Not sure in the original Plant, likely same pneumatic contols adjacent to the Support columns .	1950	For operational control of filter valves, flows and metering And to control Influent and Drain including during backwashing filters.	Control panel embeded in the wall, electric operation of Hydraulic selenoid valves. 3 common controls: Hydralaulic Pump; Influent line; Drain. Individual valve controlls: Filter effluent; filter backwash sequence and pump; stop. Turbidity start/stop relay; and filter flow metering.	1988	DWRLF Project wireing and relays essentially the same but Master Computer for display and storage. New cabinet doors and light displays.	2011			
North Bank Filter to Waste valves, actuators; piping; and discharge to waste. Switch to each filter on Control panel.	Each filter has a 12-inch Henry Pratt valve; PVC pipe connection to common Filter to Waste Drain Header.	2011	Control Open and Close Filter to waste valve for the filter to waste valves on the North Filter Bank.	Difficulty to operate. Added to Administrative Consent Order.						
Filter Gallery Filter piping; valves; and valve Actuator Filter 1-8	All valves are Henry Pratt; Hydraulic driven actuators; venturi Metering on Effluent line; Rosemont DP transmitters.	1950/ replaced 1988	Valve operation for Filters, operator interface in upper level gallery							
Filter Gallery Filter piping; valves; and valve Actuator Filter 9-12	All valves are Henry Pratt; Electric driven actuators; venturi Metering on Effluent line; Rosemont DP transmitters.	original replaced 1988 and 2011	Valve operation for Filters, operator interface in upper level gallery							
South Bank Filter to Waste valves, actuators; piping; and discharge to waste. Switch to each filter on Control panel.	Each filter has a 12-inch Henry Pratt valve; PVC pipe connection to common Filter to Waste Drain Header.	2011	Control Open and Close Filter to waste valve for the filter to waste valves on the South Filter Bank.							Difficulty to operate. Added to Administrative Consent Order.
Necessary equipment and software to generate the necessary LTESWTR CFE Turbidity and IFE Turbidity values.	HACH Turbidity instruments; HACH SC Controllers; Operator Displays in Filter Gallery; and data collection mechanisms.	1996	Particularly to monitor Individual Filter Effluent (IFE) Turbidity to meet the "every 15-min" requirement of the Long Term Enhancaed Surface Water Treatment Rule (LTESWTR). Intended to monitor for any anolymies that may lead to a regulated Combined Effluent Turbidity that carry MCLs.	Replaced all after a flood in the Pump Room Level destroyed them and their electrical components. Also installed the necessary equipment to have a constant Operator Interface in a small Computer on the desk in the laboratory.	the 200(	Several instances where data from the new computer violated the IFE Turbidity levels; and the bench top Turbidity measurements vilolated the North/South CFEs ; was one of the main requirement of the DWRLF Project. The existing computer was scrapped after the engineers confirmed that the new equipment was satisfactory.	2011	Turbidimeters are calibrated by operators annually. Data is to be reviewed at a minimum.		Several SC100s were kept in place, even though now obsolete. 2 new SC200 controllers were installed on 2 filters.
North Bank Filters 1,2, 5,6, 9,10 Filter Turbidity displays and Data Storage Panel.	Sixth Sense Data Graph 2 Series Datagraphic Recorder Display Panel: Top 1: Filters 1&2, Middle: Filters 5&6; Bottom : Filters 9&10	2011	Visual display of collected turbidity for operators to See passing through the Gallery. They have memory cards to access, but no one has been able to in years.	MDEQ Administrative Consent Order for reliable turbidity records, satisfied with Wonderware Historian. Leaving Panel in place.	Mar-19					
South Bank Filters 3,4, 7,8, 11,12 Filter turbidity displays and data storage panel.	Sixth Sense Data Graph 2 Series Datagraphic Recorder Display Panel: Top 1: Filters 3&4, Middle: Filters 7&8; Bottom : Filters 11&12	2011	Visual display of collected turbidity for operators to See passing through the Gallery. They have memory cards to access, but no one has been able to in years.	MDEQ Administrative Consent Order for reliable turbidity records, satisfied with Wonderware Historian. Leaving Panel in place.	Mar-19					
Filter Backwash Equipment										

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Pump Filter Backwash #1	North Pump 7.5 MGD Low Lift Vertical low Lift High volume single stage turbine Pump is Layne, Motor is US Motor.	1950	Delivers 7.5 MGD or 5208 gpm to wash away solids accumulated in filter after run.	Fully Rebuilt	2011			annual preventative maintenance performed by contractor and Staff.		
Backwash Pump Starter Select pump 1	Soft start 4160 V 3 ph Starter. South MCC Panel 3 from West.	1950	Soft start 4160 V 3 ph Starter. Square D Medium Voltage Panel series: Panel 3West: Backwash Pump 1	Replaced with a 4160 V 3 ph Soft Start and controllers in cabinet.	2011					
Backwash Air Relief Valve 1	A 30 inch Henry Pratt valve Positioner with a adjustable (Start/Stop) actions. Controlled at each Dual Filter Panel	1950	To release any Air in the backwash pipe line when the pump starts in order to not have an inrush of pressurized air at start of Backwash.	Badly corroded valve, piping, and couplers replaced in 1994. All replaced again in 2006	94 2nd in 2006					
Pump Filter backwash #2	South Pump 7.5 MGD Low Lift High Volume single stage Vertical turbine Pump is Layne, Motor is US Motor.	1950	Delivers 7.5 MGD or 5208 gpm to wash away solids accumulated in filter after run.	Rebuilt as part of the project after the failure in filter 5	Oct-96	Fully Rebuilt	2011	annual preventative maintenance performed by contractor		
Backwash Pump Starter Select pump 2	Soft start 4160 V 3 ph Starter.	1950	Soft start 4160 V 3 ph Starter. Square D Medium Voltage Panel series: Panel 3West: Backwash Pump 1	Replaced with a 4160 V 3 ph Soft Start and controllers in cabinet South MCC Panel 3 from West.	2011					
Backwash Throttling Valve 1	A 30 inch valve with a adjustable (Start/Stop) actions. Controlled at each Dual Filter Panel	1950	Soft start 4160 V 3 ph Starter.	Replaced with a 4160 V 3 ph Soft Start and controllers in cabinet.	2011					
Backwash Throttling Valve 2	A 30 inch Henry Pratt valve Positioner with a adjustable (Start/Stop) actions. Controlled at each Dual Filter Panel	1950	To allow throttling the backwash flow to minimize the up-lift flow of water from slow flow to Maximum required flow for full cleaning.	Replaced with a replacement due to filter 5 failure.	1993			annual preventative maintenance performed by contractor and staff		
Surface wash pipe	4" pipe main line on south side crosses North to South; feeder to filter cap to 2 SS Leopold surface sweeps in each of the 12 filters.	988 and	Surface sweeps use water jet nozzles to break up and surface encrustration. Not in original filters but added to filters once developed.							
Back Wash Metering	1 turbine meter in the Common Backwash Pipe.	1950	Metered backwash water to assure a slow and gradual increase of water flow. This is needed as to not disrupt the media support and media. The wash water flow is needed to account for its use.							
Treatment and Backwash Waste Handling.										
Waste and Backwash Water Lagoon	Ground excavation on the East Edge of the Water Plant is unlined to dry out Alum sludge for removal. There are 2 cells West & East separated by a concrete wall	2011	To store treated and backwash waste to allow for settling and drying Alum Sludge for allowed removal and disposal. Recommend keeping 2' of freeboard .	Dredged out gound to the East of the water plant to allow all waste water from treatment to dry for proper removal.	2012	A road bed was constructed to facilitate Truck and Equipment use.	2012	Presently, high ground water levels are inhibiting the drying process.		2012 Dried sludge stacked up on side walls. 2017 Dried sludge satcked up along side walls. 2018 Dried sludge stacked up along sidewalls
Waste water and Backwash Water Piping.	30 inch Concrete pipe starting at the Clearwell overflow; then the Raw Water Waste line; then Clarifier 1 & 2 Drain; Clarifier 1&2 Overlows; Filter Backwash water; Reservoir West & East Drains and Overflows.	1950	Carry Wastewater from treatment and filter backwash water	Diverted from original outfall at the east edge of the old Jean Klock Road to remove new illegal Discharge to the Pawpaw River.	2011					Good

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Waste and Backwash Water Diversion Well	Waste line and Backwash water in the original waste and backwash transfer piping. Is redirected from it's original outlet and into this well.	2012	Allow to divert waste water to West or East Lagoon for maintenance					Erosion around it was shored up with rip rap, topsoil and grass seed.		Good
Primary Inlet to West Lagoon	Outlet valve and piping from Diversion well	2012	To direct water to West Lagoon for primary settling.							
Primary Inlet to East Lagoon	Outlet valve and piping from Diversion well	2012	To direct water to East Lagoon for Maintenance.							
Finished Water Storage and Distribution										
Drinking Water Storage Resovoirs 2 basins West and East	2 MG (two 1 MG abutting reservoirs with common wall between both) Underground in Northeast corner of Plant property.	1950	Store filtered water interconnected with High Lift Suction well.	Both reservoirs were dewatered and cleaned with an isolation valve installed in-between the 2.	Dec-04	2 inspection covers found badly corroded in Dec 2004 inspection. 2 covers were fabricated and installed in June 2005	Jun-05	In 2008 MDEQ inspection was required and completed in May 2008. As part of that The DWRLF Project ask that both reservoirs be: Outfitted with level metering		2004 east half inspected; 2008 west half inspected; 12" isolation valve recently replaced (2018); entry hatches recently replaced (2018)
Finished Water Suction Well	108,856 gallons storage reservoir for feeding the high service and backwash pumps	1950	located on the South side of Plant . On line with reservoirs supplies High Lift Pumps and backwas pumps	New level metering and a post Cl2 treatment.	2011					
Water Distribution from Clearwell to 3 Distribution Main										
Pump High Service #1	2 MGD 200 hp Vertical turbine Pump is Layne; Motor is US Motor	1950	Deliveres 2 MGD flow of tap water at 70 psi	Fully Rebuilt	2011			annual preventative maintenance performed by contractor; out of service indefinitely (2018)		
Pump 1 Schneider Soft Starter	4160 V 3ph 200hp Soft Start	2011	Initiates a soft start of the motor and pump.	Failed 2015. Stole useable parts from Pump 5 Schneider Soft Start	2015	New SCRs New Mother Board	2019	Added drive for pump 1 SCRs fail in 2015. Tried to re-build in 2017 failed immediately,. Out of service until 2019.		
Pump High Service #2	4 MGD 400 hp vertical turbine Pump is Layne; Motor is US Motor	1950	Deliveres 4 MGD flow of tap water at 70 psi	Fully Rebuilt	2011			annual preventative maintenance performed by staff		
Pump 2 Schneider Soft Starter	Schneidler 4160 V 3ph 400hp Soft Start	1950/ replaced 2011	Initiates a soft start of the motor and pump.	Fully Replaced	2011			annual preventative maintenance performed by contractor		
Pump High Service #3	4 MGD 400 hp vertical turbine Pump is Layne; Motor is US Motor	1950	Deliveres 4 MGD flow of tap water at 70 psi	Fully Rebuilt	2011			annual preventative maintenance performed by staff		
Pump 3 Schneider Soft Starter	4160 V 3ph 400hp Soft Start	1950/ replaced 2011	Initiates a soft start of the motor and pump.	Fully Replaced	2011			annual preventative maintenance performed by contractor		

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Pump High Service #4	4 MGD 400 hp vertical turbine Pump is Layne; Motor is US Motor	1960	Deliveres 4 MGD flow of tap water at 70 psi	Fully Rebuilt	2011			annual preventative maintenance performed by contractor		
Pump 4 General Electric Starter and Breaker Panel	Manual start/start 4160 V motor controller for High Service lift pump 4	2011	Manual start/start 4160 V motor controller for 4 MGD High Service lift pump 4	Previously rebuilt in 1988; required a rebuild in 2008	1988 & 2008	Pump 4 Schneider Soft Starter. 4160 V 3ph 400hp Soft Start initiates a soft start of the motor and pump.	2011	Trouble assuring start of Pump 4. Need new mother board ordered and waiting.	2019	Starter frequently fails to start pump. Technician determine the Mother board is failing.
Pump High Service #5	2 MGD 200 hp Vertical turbine Pump is Layne; Motor is US Motor Titan II 4160V 13.7a	1960	Deliveres 2 MGD flow of tap water at 70 psi	Fully Rebuilt	2011	Pump will not turn shaft seems stuck. Arranging to have it pulled and check for needs.	2019	2019 offline: Need to be pulled and inspected. Have quote		
Pump 5 HS Motor Starter	4160 V 200 HP Soft Start Motor starter lower cabinet west end of original MCC	1950 & 2011	Motor starter for 2 MGD high lift pump	Fully Replaced	2011	Starter needed emergency Repair and Rebuild.	2019	Motor control needs new SCRs and Mother Board. However, the pump itself must be pulled and inspected as the motor cannot drive it	2019	annual preventative maintenance performed by contractor
New Corrosion Treatment for Tap Water Only										
Orthopolyphosphate 70/30 Treatment. Necessary for Lead Action Level Exceedenc for October 2019	The system includes 2 taps on the 30" Suction line for High Pumps: 1 1" live tap for injection; 1 2" live tap for metering control. A parastaltic pump with flow control. A floor scale for amount used during pumping.	Mar 26 2019	The City 2018 Tri-annual Lead and Copper testing results exceeded the Action Level for Lead. MDEQ Piolot Grant (2018/2019) funds were used to begin treatment with a 70%/30% Orthopolyphosphate corrossion inhibitor as is the alternate treatment option in the Lead and Copper rule.							
High Service Source water Metering	A McCrommeter 2-inch insertion mag meter in the 30" suction line of the HS Pumps.	Jul 23 2019	The meter was intended to control the treatment pump's OPP flow in automatic mode. It will also serve as the Administrative Consent Order (ACO) from the MDEQ to measure and track flow into the water distribution system.							
High Service Source water OPP Injection point	30" CIP HS Suction Line East a 1" tap on slight angle northwest. Plastic injection piping secured into tap.	Mar 26 2019	Injection Port on High Lift Suction Line East. The West valve is closed to make the East valve the only source in the loop.							
OPP Treatment Pump	Stenner peristaltic Pump with flow pacing inter face. Model S3007AA101N; 100 psi; 0.6a; 40 gpd	Mar 26 2019	To suck out of 55 gallon barrel and discharge into the HS Pump Suction Line.							
Opp Barrel Scale with weight Readout.	Force Flow SOLO XT floor scale and read out display. Model XT600	Mar 26 2019	To track the amount of Orthopolyphosphate added during treatment.							
OPP AC power, HS Pump Only on charged outlet.	2 110V power receptacles available to the Stenner metering pump. One recept is house power; the 2nd recept is powered only if 1 or more HS Pumps are running. Keep pump on Motor ON/Off Recpt Only.	Mar 26 2019	2 110V power receptacles available to the Stenner metering pump. One recept is house power to power the pump in automatic mode. The 2nd recept is powered only if 1 or more HS Pumps are running, to run in manual for several months prior to installing meter.							

2.1

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Distribution Metering										
High Service Metering North 20-inch CIP Main and South 20-inch CIP Main.	2 venturii tube metering tubes, one on each 20" line, connected to pressure transmitters and a differential pressure transmitter. Endress Hauser PDT north and south main venturii connection.	1950	The venturii meter and pressure differentials can yield a flow volume of water leaving plant and used in the distribution system.	The 2 Ventrii manufacturer's internal pipe dimensions could not be found. The engineer had all of the piping and pressure transmitters installed any way. No attempt to derive a flow characteristic was done, and of course: NO Flow metering has been done on the water distributed.	2011	This situation became part of the Administrative Consent Order (ACO). failure to meter water to the distribution system. Our first attempt was to take advantage of the limited time we treat water. Water pumped overnight for 16 hours changes the Cleawell level a known volume. Applying that to the time pumps run during treatment creates a fairly accurate calculation of water pumped to the system. Add to that, the new OPP treatment devised by MDEQ requires that the suction line be metered to control the treatment. This can be used as a Distribution flow meter by FGLE.	Jan 1, 2019 Calculated flows;	July 15, 2019, meter in for Suction Line; July 2019 same output will be in Operator's computer.		
High Service 12-inch water main metering	At some time a 12-inch water main was added to the 2 20-inch mains, it was connected to the west and headed north on Jean Klock Beach Drive.	1950 ?	Not sure how it was metered.	A Siemens 12-inch mag meter and a transmitter as well as a SCADA connection were installed on the West 12" Distribution main.	2011	Same solution as for the 2 20-inch main.		This meter has not logged flow, pretty much from the day it was installed.		
Finished Water Metering	No such thing at Benton Harbor							2018 None are working		
Plant Water Metering	4" sensus	1989	The water use at the plant is metered: Surface wash for filters; make up water for Fluoride; carrier water for intake treatment; lab analysis; and domestic needs.							Okay
SCADA										
Water Equipment Control and recording. Digitized Water Plant record keeping with OPTO 22. Later in SCADA in DWRLF Project	Original were likely Paper charts, and written records. Around the turn of the centruy (2000s) Peerless Midwest installed a great deal of Opto 22 components. And put displays at various points around the laboratory and control room.	1999/ 2000	To provide operators with data of various processes that need to be logged in the operations sheet each day. To start certain pieces of equipment; to hold certain chemical treatments based on pump flow yes/no;	A SCADA System in a server using Wonderware In-Tuch program. Is set up to control, monitor and record all existing and new Treatment Equipment, Pumps and Motors, and status monitoring. It did not include a Historian Package.	2011	Still functions as it did in, 2011. Many of the extraneous tags no longer work but are not essential to fix. The key component tags such as Tap Water Cl2 residual, Turbidity, and soon metered flows have been replace.	2018 & 2019	1 computer technician believes it to be on its last leg. Another believed it to be fine.		Data Back up done in late 2017. The data was also backed up in 2018. Routine maintenance, mainly cleaning is on going.
Main computer Operator Display	In front Southwest office of water plant. Uses Wonderware Intuition software. Has visual display screens for operators to look at. But did not include an operator interface other than trend screens.	2011	Operators can toggle through various screens to review operations data. Have some start up access; have trend screens of many systems. Can make some alterations, but only to equipment that has that available on certain screens. The computer has approximately 2-years of data storage.	In early 2018, MDEQ noted that the trend screens were not satisfactory for Digital Data interface. This became part of the Administrative Consent Order, to install up to date and past data access to certain Safe Drinking Water Act Parameters and valous other data pieces.	2018	City purchased a stand alone computer to access all available data from the server and provided Windows Office tools for data use. Had Windimuller Electric bring a technician in to hook all this up, do some training and set up key parameters in Excel. This ACO order was satisfied by the MDEQ.	Mar-19			Routine cleaning and 1 back up made by an outside vendor. Back up not made available.
Redundant Display Plate Settler Building.	A redundant display of the Operator's room computer but as a touch screen.	2011	A limited acces that Operators can access; when they are on their rounds to the Pre-treatment in the Plate Settler Building. They can toggle through various screens to review operations data. Have some start up access; have trend screens of many systems.					Keep it dry and clean routinely. Any configuration or maintenance would be done by an Instrumentation Contractor.		Okay

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Redundant Display Generator Control Center and Main Buss cabinets accros driveway.	Smaller touch screen available to control modify and control the Automatic Switch over of the generator.	2011	Touch screen available to control modify and control the Automatic Switch over of the generator.	Touch screen failed somewhere between 2012 to 2016. Technician in 2016 stated that the back light controller failed. It could not be replaced, only a new replacement of the panel is the solution. Technician stated that the panel has power and should function in Automatic mode. Nothing more was done.	2016	Service was provided on the main generator. A electronics technician accompanied the maintenance man. After generator service this technician attempted to test the automatic switch over and it did not work. Technician taught us what steps to take for manual switch over.	2018			
Main computer hardware and software.	A Server in the black steel cabinet. Wired to all necessary components.	2011	To hold all software applications necessary for Wonderware Intuition. Seems to only have memory for 2 years of the vast data that is used.							
Main PLC Control Center	In a large cabinet just inside door to right. All cabling into and out of the server and the various controlled and recorded are cabled into this cabinet.	2011	A PLC signal conditioner from various inputs to convert to the required tabs in the Wonderware Software.							
Water Distribution to Benton Harbor City Only										
North 20-inch CIP Main	20-inch CIP main. Starts on south side of plant. Follows a North East path to Grand Blvd; Crosses M-63 (old -US31). Follows a South East path from M-63 and crosses Klock road to south. Makes a Pawpaw River Crossing; continues East on the north side of Klock road and a gravel road after North Shore Drive; finally turns south on 2nd Street and continued to Main Street.	1950	Carried water to the existing system to points in the original CIP main distribution system.	Extended in Berrien County Water Improvement project. Started at Main Street and carried on the East Side of the OX Creek Valley to an to point at South Fair Avenue and Valley Drive. Turned south to Empire to an intercept point turning Due East on Empire. A 12-inch DIP Main that turned west to Pipestone.	1969					
South 20-inch CIP Main	20-inch CIP main. Starts on south side of plant. Follows a South East path to a BH/SJ Interconnect metering station; Crosses M-63 (old -US31). Follows a South East path from M-63 along the south side of Klock Road. Makes a Pawpaw River Crossing; continues East on the south side of Klock road; Interconnects with North line; turns south on 8th Street; spits into 2 seperate main a 12"CIP and 16" CIP; both make RR crossing in sleeves; and continues into downtown.	1950	Carried water to the existing system to points in the original CIP main distribution system.							
West 12-inch DIP Main	A 12-inch DIP main added to go west then south to Jean Klock Beach.	960s/197	To provide water to the beach facilities and loop around to Grand Blvd.							
Elevated Storage Tank at Britain and 8th	Located in Southwest corner of Brittan and 8th St. Multi legged elevated storage. Bowl is 30-feet base to overflow with 0.65 MG capacity	1938	Replaced a 0.6 MG similar tower farther east and Up hill on Brittan. Keeps a volume of drinking water on line with adequate pressure maxed at 72 psig at base.	Completely re-painted inside and out	1990	Interior and exterior painting is getting close to the end of its useful life. Cathodic Protection is completely failed in 2017 Steel failures found in a 2007 inspection have been left un-done. Application for a DWRLF is in progress.	Apply for DWRLF 2019	Interior and exterior painted in . Cathotic Protection added 5 years later. Inspected and found some structural damage and paint issues 2007.		Needs help to remain in service much longer.

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Emergency Supply Municipal Water Interconnection	one interconnection with St. Joseph City at M-63; Metered interconnect with Benton Charter Township 20-inch Main at South Fair and old Valley DRive installed in mahhole 2009; another interconnection with St. Joe Charter Township on Woodward and Empire, metered in vault built 2015; a few Valve Normally closed interconnections with Benton Twp 2009.	SJC M63 meter 1950 BCT Meter 2009; BCT closed valves 2009; SJCT meter 2015	Typically for emergenchy use and occasssionaly used to perform maintenance. IN recent years, interconnects need to have contractual agreements. The only agreement Benton Harbor has is with the City of St. Joseph	St. Joseph and Benton Harbor Interconnection building was re-built 2005.	2005	SJ/BH meter has been used about 15 times from 1993 to 2019. Keep large pipe wrenches on hand if there is a pressure difference on either side. Original electric valve operators from 1950 are no good.				operable on M63, and Woodward, but the meter has already failed at Woodward.
Benton Charter Township (BCT) Water Seperation system.	In 2009 BCT embarked on a project to creating their own water system. Interconnections with BH Water System were disconnected; looped; or left intact with a closed valve; and 1 20" DIP metered interconnect.	2009	In 2009, BCT chose to not renew the City Water Contract. They built their own WTP and Distribution System. 100% Bonding was provided by Berrien County.	FYI Boundry mains list: Grand Blvd north from M-63 to lakeshore; North of the Pawpaw River; East of Fair Ave; South of Empire; East of Empire to Alley; South of Milton Street; South of Emery and Ravine; to East of Colfax.						
St. Joe Charter Township (SJCT) Fairplain Water Seperation System.	In 2012/2013 SJCT embarked on a project to remove themselves and Join The St. Joseph Water System. Interconnnections were disconnected; looped; or left intact with a closed valve; and 1 12-inch Metered Interconnect.	2012/201	SJCT chose to leave the City Water Contract. The made the nessessary disconnections from the City of Benton Harbor and connections to The City of St. Joseph water system and the SWMWS&SA system.	FYI Boundry mains list: Colfax south and west at Emery Pl.; South of Windsor; West of Marion; and South of Empire at Woodward, where there is a Metered DIP Valve.						
Electric Service from Utility to Primary MCCS including Emergency Power.										
AEP (I&M Utility Electric Power	There is a dual fed Electrical Junction in the North west corner of the Water Plant Property.	1950	The plant was considered to have a fully reliable Power supply with this Dual Feed Junction on site.	Ocassionaly the power would drop off through the years. In 2005 the plant was without power for 3 days. This prompted the MDEQ Requirement to install a Generator to assure power in the event of Outages for the DWRLF Project.	2011					
AEP (I&M Utility Electric Power Plant Connection	A new metered service drop for the water Plant, near the I&M Junction. 2140 Volt Metering transformer #445210889; Meter # AEP-G3NA1	2011	Replaced existing Power connection to the original plant. Mounted on a pad near but clear of the I&M Substation.							
Un-interupted Power Supply Utility Lost	Diesel powered backup generator, capable of running the entire treatment system and all 5 High Lift pumps.	2011	There is a dual fed I&M (AEP) substation in the southwest corner of the Water Plant Property. A 3 day power outage in Berrien County suggested the need of Emergency power.							
Generator	MTU OnSite Energy Mfg. 4160 V	2011	Designed to run the water plant under full load up to 5 High Lift pumps at 4160 V.							
Disel Fuel Generator Engine	8 Cylinder Disel: Model 16V 145IB; Engine #536 109 614; Power 1115 KW; Mass 3100 Kg; 1800 rpm.	2011	Drive Engine for the Generator.							

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Disel Fuel Tank under Generator	A 3-wall self contained tank; Zierke Built Mfg; Serial #C910353 Maximum Capacity: 34,498 lbs; 2,400 gallons	2011	Self contained Diesel fuel tank to run the engine. Likely up to 40 hours of continious service.							
Utility to Generator Switch gear	An Independent Schneider Electric switch gear was chosen to drive the automatic switch from AEP utility power to generator power. In the old store room of the Utility Out buildings at the plant.	2011	Designed to automatically start the generator and switch the electric connection from Utility to Generator. Controlled by separate process controller that is connected for communications but not control.			The last time the generator was excersised under load in automatic was 2012. From 2012 to 2018 it was excersised in idle, presumed not under load. In 2018-2019 it is excersized under load by manual switch over.		The touch screen PC that controls the operation of the automatic switch gear has failed. The manual switch over works fine.		
Utility Metering Switch Gear and room and Equipment.	A room of the original Distribution Center fitted out to contain the Main Electrical Components of the Plant and the Generator Switch Gear.	2011	The room specifically houses the Square D Master Clad Switch Gear. And the link to the main plant computer. There are additional items in this room; see Auxiliary Equip.							
Square D Master Clad Switch Gerar panel.	Square D Master Clad Switch Gear has 5 components: 5 breakers; 2 panels for Switch over Utility to Generator.	2011	Clean, safe and secure Electrical Gear for Plant and Generator switch over use.							
Master Clad Panel 1 east end	Top: Breaker Panel Feeder XMFR500; Bottom: Breaker Feeder XMFR 750	2011	each a 4160 Transformer to 500 V and to 750 V Services into Main Plant.							
Master Clad Panel 2nd east end	Top: Breaker Panel Feeder XMFR500; Bottom: Breaker Feeder to MCC4160 B for Generator Power. Bottom Breaker Panel Feeder to 4160V Utility Power.	2011	Breaker disconnects for 4160V Power.							
Master Clad Panel 3rd east end	Top: Generator VT & CPT Compartment; Schneider Magilis touch pad computer interface local controller: Bottom: Switch Gear to drive Open/Close Breakers Utility and Generator.	2011	Computer controlled drive unit to Automatically or Manually drive the I&M utility breaker and Generator Breaker open or closed.	Magelis touch screen computer does not function, effectively eliminating the Automatic Control. Some time between 2012 and 2016. Manual Control is fully functional.	2016	Discovered July 2016 sought help but could not restore yet. 2019				
Master Clad Panel 4th east end	Top: PLC and ATS Control cabinet; Bottom BUS VTs and CPT Compartment; and UPS Compartment.	2011	It does something with the computer switch over in automatic.							
Master Clad Panel 5th east end actually west end	Top: AEP Utility VT & CPT compartment. Bottom: AEP Breaker	2011	A means to secure incoming Utility power for the entire plant.							
Original Switch Gear 4160 V MCC High Lift Pump Electrical Breaker and Starters	2 4160 lines from I&M Electric Sub Station to Metering Point and to 2 Breakers in Electrical Switch Gear.	1949	Original General Electric High Lift Breaker and starter gear.	2 4160V breakers on incoming line needed rebuild.	Mar-04	DWRLF Plant removes and replaces	2011			
Miscellaneous Electric Gear										
Medium Voltage Soft Start and Close Out Breaker Panel West RV33	Square D Medium Voltage Panel series: Panel 1 North: HVL MCC Breaker; Panel 2 North: Backwash 2; Panel 3 North: HS Pump 1; Panel 4 North: HS Pump 1; Panel 5 North: HS Pump 3	2011								
Medium Voltage Soft Start and Close Out Breaker Panel South	Square D Medium Voltage Panel series: Panel 1 West: HVL MCC Breaker; Panel 2 West: HS Pump 4; Panel 3West: Backwash Pump 1	2011								

Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
Low Service Pump MCC West End of Panel Left Side	Top1: Surge Logic Surge Arrestor; 2nd: 60 amp breaker; 3rd: 75 Kva Transfer to Panel A&C AT; 4th: Breaker 75KVa Transfer to Panel RP1110AT; 5th: 45KVA transfer to panel B60AT.	2011								
Low Service Pump MCC West end of Panel Right Side	Top Right 800 a Breaker; 1 down: 480V to panel 225AT; 2nd down: 480 KA to panel DPJ18-2; 3rd panel down: 480KA to panel 75KA trans; 4th down: to panel LPG 100AT	2011								
Transformer Demark Unit outside SW corner	Large Transformer Demark Unit outside SW corner conduit feeds through Window Well.	2011								
1 4160 V 3 ph Transformers Inside from same	up high south conduit in from outside 4160 V 3ph Transformer.	2011								
1 480 V 3 ph Transformers Inside from same	Up high North conduit in from outside 4160 V 3ph Transformer.	2011								
Breaker Panel LPF west wall below transformers.	100 amp breaker 1 to 42 Breakers.									
Breaker Panel DPG west wall under Transformer (old)	100 amp breaker 1 to 42 Breakers.									
Breaker panel DPG west wall under window	3 3-ph breakers.									
1 480/240 Transformer Alum West Wall North	Transformer	1988								
1 240/110 Transformer Alum West Wall south	Transformer	1988								
1 480/240 Transformer Pump Level West Wall.	Transformer	1950								
480/240 Trasformer On Post LS Pump Area	Transformer	2011								
480/240 Trasformer Northeast corner 4th floor break room	Transformer	2011								
Large 480/240 Trasformer Outside Plate Settler Room South West grassy Area.	Transformer	2011								
480/240 Trasformer South Wall Plate Settler electric room East	Transformer	2011								
480/240 Trasformer South Wall Plate Settler electric room West	Transformer	2011								
HVAC Units										

	Asset	Description	Install Date	Purpose and Use	Rebuilt 1	Rebuilt 1 date	Rebuilt 2/Maintenance	Rebuilt 2 date	Rebuilt 3/ Maintenance	Rebuilt 3 Date	Condition
	All AbsolutAire Packaged Units.	DWRLF 2011 Project Removed all Boiler piping with Asbestos Abatement construction. Boiler abandonded in Place In Room with doors off North East Corner of Level 1.	2011								
	All AbsolutAire Packaged Units. With Airconditioner outside package.	Outside Main Entry North west corner.	2011								
	All AbsolutAire Packaged Units.	Roof Top Unit Distribution building over Alum Store room	2011								
	All AbsolutAire Packaged Units, Includes Air Conditioner.	2 complete units on 4th Floor Roof Top	2011								
	All AbsolutAire Packaged Units.	On Roof Top of North Filter Bank.	2011								
	All AbsolutAire Packaged Units.	In new Plate Settler Building Upper floor Northwest.	2011								

From:	Sarkipato, Ernest (EGLE)
To:	Henderson, Shannon (EGLE); Chris J Cook
Cc:	Darwin Watson (dwatson@cityofbentonharbormi.gov); momalley@cityofbentonharbormi.gov
Subject:	RE: BH WAMP Review Comments
Date:	Thursday, May 30, 2019 8:07:38 AM

Luckily our meeting to discuss the DWRF project meshes well with Asset Management. I'm largely interested in seeing how the selected projects align with the capital improvements plan and asset management program, so please have those items available to review and discuss.

From: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Sent: Wednesday, May 29, 2019 5:24 PM
To: Chris J Cook <cjcook@abonmarche.com>; Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov>
Cc: Darwin Watson (dwatson@cityofbentonharbormi.gov) <dwatson@cityofbentonharbormi.gov>; momalley@cityofbentonharbormi.gov
Subject: RE: BH WAMP Review Comments

That is fine. I will grant a temporary extension until August 1, 2019 until you have a better estimate of when you can submit revisions.

The comments on the funding structure were made by the financial specialists who reviewed the Asset Management Plans. As for the Asset Inventory, there appeared to be a descriptive overview of the plant, but nothing stating specifically which assets would be tracked in the inventory and which parameters would be tracked for those assets.

If you have further questions, please feel free to call me.

Thank you,

Shannon Henderson
Environmental Engineer
Drinking Water and Environmental Health Division - Engineering Unit
Michigan Department of Environment, Great Lakes, and Energy
Grand Rapids District Office
517-539-1687 | HendersonS8@Michigan.gov

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EGLE
MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

From: Chris J Cook <cjcook@abonmarche.com>
Sent: Tuesday, May 28, 2019 5:52 PM
To: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>; Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov>
Cc: Darwin Watson (dwatson@cityofbentonharbormi.gov) <dwatson@cityofbentonharbormi.gov>; momalley@cityofbentonharbormi.gov
Subject: BH WAMP Review Comments

Thank you for providing review comments on the City of Benton Harbor's Water Asset Management

Plan (WAMP).
We have the calculations that were used to develop the rates and charges with the detail identified in your letter. We also have the current rate resolution(s) that are in place for the city to meet their loan covenants.
We believe that we have met the Safe Drinking Water Act requirements for the distribution system and we can pull together a more detailed inventory of the water treatment plant and pumping assets in relatively short order.
However, we have a meeting already set with Ernie Sarkipato on June 3 to review our DWRF Application. We would like to review the materials we have in place and discuss specifically what more is needed at that meeting.
After the meeting on June 3 we will have a better idea of how long it will take to complete the update to the WAMP document per your request.

Christopher J. Cook, PE
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W www.abonmarche.com

From:	Schneider, Robert (EGLE)
To:	Henderson, Shannon (EGLE)
Subject:	RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions
Date:	Monday, February 3, 2020 7:50:52 AM

Yes, That would be acceptable. Just remind me if I forget to enter the approval date on the AM tracking

From: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Sent: Friday, January 31, 2020 2:02 PM
To: Chris J Cook <cjcook@abonmarche.com>
Cc: Schneider, Robert (EGLE) <SCHNEIDERR@michigan.gov>
Subject: RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions
I believe that will be acceptable. Bob, let me know if I am mistaken.
Shannon Henderson
Environmental Engineer
Drinking Water and Environmental Health Division - Engineering Unit
Michigan Department of Environment, Great Lakes, and Energy
Grand Rapids District Office
517-539-1687 | HendersonS8@Michigan.gov
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From: Chris J Cook <cjcook@abonmarche.com>
Sent: Wednesday, January 29, 2020 9:58 AM
To: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Subject: RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions
We are currently working toward approval of a DWSRF/CWSRF Loan. The rate ordinances will likely be updated through that process. Can I get you the rates when approved in February/March?
Christopher J. Cook, PE
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From: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Sent: Friday, January 17, 2020 1:47 PM
To: Chris J Cook <cjcook@abonmarche.com>

Subject: RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions

Hello Mr. Cook,

Thank you for sending the Asset Management files for Benton Harbor some time ago. The financial specialist has reviewed them and says that the budgets and calculations check out, but we still need the rate resolution or ordinance implementing the rates and charges they show before we can approve their Asset Management Plan. Would you be able to send that to me?

Thank you,

Shannon Henderson
Environmental Engineer
Drinking Water and Environmental Health Division - Engineering Unit
Michigan Department of Environment, Great Lakes, and Energy
Grand Rapids District Office
517-539-1687 | HendersonS8@Michigan.gov

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From: Chris J Cook <cjcook@abonmarche.com>
Sent: Monday, August 05, 2019 2:57 PM
To: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Cc: momalley@cityofbentonharbormi.gov; Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov>; Darwin Watson (dwatson@cityofbentonharbormi.gov) <dwatson@cityofbentonharbormi.gov>
Subject: FW: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions

Please see the attached copy of the WAMP Chart for the asset inventory.

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From: Mike O'Malley <momalley@cityofbentonharbormi.gov>
Sent: Wednesday, July 31, 2019 5:39 PM
To: Clendenon, Cynthia (EGLE) <CLENDENONC@michigan.gov>; Sarkipato, Ernest (DEQ) <sarkipatoe@michigan.gov>
Cc: Darwin Watson <dwatson@cityofbentonharbormi.gov>; Tricia Bulson <tbulson@abonmarche.com>; Mike OMalley <momalley@cityofbentonharbormi.gov>; Chris J Cook <cjcook@abonmarche.com>
Subject: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions

Cynthia,
I made the deadline by the skin of my teeth.
Attached is a scanned copy of the Printed Excel Table I filled in.
It is likely more detail than you may have been expecting, but I hope it is satisfactory for your purposes.
Darwin, The other day, Ernie was somewhat concerned that I had proposed not to send this to Abonmarche.
He was right in his thought. We need record at our City Engineer's office.
Ernie,
You better be enjoying your vacation!
I do want to put in a request for an extension on The ACO also due today.
EGLE Permit to construct water system: Changes of Alum Treatment from Raw Water Line to the Rapid Mixers in the Plate Settling chain.
I had everything ready, but I had to work all day to make this somewhat easy to read.
Attached: *MI0600 Benton Harbor Water Plant Asset Management 07 31 2019.pdf*
Thanks,
Mike O'Malley
Benton Harbor Water Superintendent
7/31/2019 5:38 pm
Look at that; it came in under the 25k max EGLE attachment size!

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From:	Chris J Cook
To:	Sarkipato, Ernest (EGLE); Henderson, Shannon (EGLE)
Cc:	Schneider, Robert (EGLE)
Subject:	RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions
Date:	Tuesday, October 13, 2020 9:49:06 PM
Attachments:	image002.png Copy of 2020 BH Financing Summary.xlsx 050420 Benton Harbor Sewer System Cash Flow Update 2020 SRF REVISED MDM v1.xls 050420 Benton Harbor Water System Cash Flow Update 2020 DWRF REVISED MDM v1.xls

The attached spreadsheets indicate the SRF Project funding scenarios that the CC approved. I hope this helps.
Please let me know if you need anything else.

Christopher J. Cook, PE
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From: Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov>
Sent: Tuesday, October 13, 2020 12:06 PM
To: Chris J Cook <cjcook@abonmarche.com>; Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Cc: Schneider, Robert (EGLE) <SCHNEIDERR@michigan.gov>
Subject: RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions

Hi Chris,

We received the “all clear” with respect to the action taken by the commission, but to my recollection never received the actual document that shows the rates and plans for increases. It’s possible that it’s buried in the email!

I think we are looking for the numbers: current rate structure and plans for increases.

Ernie

From: Chris J Cook <cjcook@abonmarche.com>
Sent: Monday, October 12, 2020 4:21 PM
To: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Cc: Schneider, Robert (EGLE) <SCHNEIDERR@michigan.gov>; Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov>
Subject: RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions

The new rates were approved as part of the SRF process. I understood from city staff that they had provided that information as part of the ACO review process and that they were acceptable. Do you need anything specifically from me to verify that or any other information on the rates that were approved?

Christopher J. Cook, PE
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From: Henderson, Shannon (EGLE) <HendersonS8@michigan.gov>
Sent: Monday, October 12, 2020 3:25 PM
To: Chris J Cook <cjcook@abonmarche.com>
Cc: Schneider, Robert (EGLE) <SCHNEIDERR@michigan.gov>; Sarkipato, Ernest (EGLE) <SARKIPATOE@michigan.gov>
Subject: RE: MI 0600 Benton Harbor Water Plant Asset Management Plan Additions

Hello,

I just wanted to check in with you regarding the below email chain to see if the new rates had been approved and if all the amendments/revisions to Benton Harbor's Asset Management Plan were completed. If so, please submit them to us at EGLE.

Thank you,

Shannon Henderson
Environmental Engineer

Drinking Water and Environmental Health Division - Engineering Unit
Michigan Department of Environment, Great Lakes, and Energy
Grand Rapids District Office
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Sent: Wednesday, July 31, 2019 5:39 PM

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Attached: *MI0600 Benton Harbor Water Plant Asset Management 07 31 2019.pdf*

Thanks,

Mike O'Malley
Benton Harbor Water Superintendent
7/31/2019 5:38 pm

Look at that; it came in under the 25k max EGLE attachment size!

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LET'S STAY SAFE TOGETHER

CITY OF BENTON HARBOR

Summary of Funding Needed for Sewer/Water Projects to be completed from 2020-2022

	2020	2021	2022	2023	2024	2025	Notes
FUNDING SUMMARY							
Utility Budget Shortfall	$ (900,000)	$ (932,613)	$ (937,934)	$ (250,472)	$ 35,558	$ 345,133	Gets Sewer/Water Fund self supportive
New Debt	$ -	$ (108,474)	$ (213,006)	$ (212,343)	$ (211,681)	$ (211,018)	
Transfer In from General Fund & Road Fund	$ 300,000	$ -	$ -	$ -	$ -	$ -	To-Date
Refund Transfer from General & Road Funds	$ (300,000)	$ -	$ -	$ -	$ -	$ -	
Transfer In from Income Tax	$ 900,000	$ 645,000	$ 740,000	$ 32,000	$ -	$ -	To Refund Transfers and Balance Budget/Expenses
Transfer In from PPI	$ -	$ 200,000	$ 200,000	$ 200,000	$ 25,000	$ -	For Water Tower
Rate Adjustments	$ -	$ 237,000	$ 259,000	$ 280,000	$ 308,000	$ 335,000	
NET FUNDS	**$ -**	**$ 40,913**	**$ 48,060**	**$ 49,185**	**$ 156,877**	**$ 469,115**	
PPI Fund							
PPI Fund Balance	$ 238,500	$ 188,500	$ 138,500	$ 88,500	$ 38,500	$ 163,500	
Receipts	$ -	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	No Increase (budgeted $168k in 2020)
Expenses Committed	$ (50,000)	$ -	$ -	$ -	$ -	$ -	DPW Work
Transfers Out to Utility Fund	**$ -**	**$ (200,000)**	**$ (200,000)**	**$ (200,000)**	**$ (25,000)**	**$ -**	For Water Tower Construction
New Balance	$ 188,500	$ 138,500	$ 88,500	$ 38,500	$ 163,500	$ 313,500	Good for other expenditures By 2024
Income Tax Fund							
Income Tax Fund Balance	$ 2,400,000	$ 1,100,000	$ 855,000	$ 965,000	$ 2,033,000	$ 3,133,000	
Less Reserves	$ (400,000)	$ (600,000)	$ (400,000)	$ (400,000)	$ (400,000)	$ (400,000)	Higher Reserves in 2021 due to COVID
Receipts	$ -	$ 1,000,000	$ 1,250,000	$ 1,500,000	$ 1,500,000	$ 1,500,000	Lower Receipts in 2021/22 due to COVID
Transfers Out to Utility Fund	**$ (900,000)**	**$ (645,000)**	**$ (740,000)**	**$ (32,000)**	**$ -**	**$ -**	
New Balance	$ 1,100,000	$ 855,000	$ 965,000	$ 2,033,000	$ 3,133,000	$ 4,233,000	Good for other road work by 2023
Rate Adjustments							
Water Rate Increase		9.95%	9.95%	9.95%	9.95%	9.95%	
Cost per Service/month		$ 5.00	$ 5.50	$ 6.00	$ 6.67	$ 7.33	
Funds Raised		$ 150,000	$ 165,000	$ 180,000	$ 200,000	$ 220,000	
Sewer Rate Increase		7%	7%	7%	7%	7%	
Cost per Service/month		$ 2.90	$ 3.13	$ 3.33	$ 3.60	$ 3.83	
Funds Raised		$ 87,000	$ 94,000	$ 100,000	$ 108,000	$ 115,000	
Street Fund							
Street Fund Balance	$ 1,493,000	$ 1,493,000	$ 491,000	$ 575,000	$ 515,000	$ 410,000	
Less Normal Expenditures for Maintenance	$ -	$ (875,000)	$ (875,000)	$ (875,000)	$ (875,000)	$ (875,000)	
Empire Avenue		$ (622,000)	$ 339,000	$ 45,000			Advance Construct - Reimbursement
Receipts	$ -	$ 875,000	$ 1,000,000	$ 1,150,000	$ 1,150,000	$ 1,150,000	Plan for a reduction the first couple years (50% in year 1)
Transfers Out for Debt on Loan Ineligible Costs - Storm/Roads	**$ -**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	**$ (380,000)**	
New Balance	$ 1,493,000	$ 491,000	$ 575,000	$ 515,000	$ 410,000	$ 305,000	Will remain relatively healthy

City of Benton Harbor, Michigan

Historical and Projected Sewage Disposal System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	2018 (1)	2019 (1)	Budgeted 2020 (2)	Projected 2021 (3)
Operating Revenues								
Sewer RTS/Commodity	$ 1,123,520	$ 1,299,381	$ 1,204,840	$ 1,255,507	$ 1,293,284	$ 1,252,031	$ 1,252,031	$ 1,339,673
Transmission Fees	-	-	-	10,457	7,398	9,524	8,935	8,935
Billing Fees	-	-	-	-	-	-	-	-
Fines	-	-	-	20,198	20,421	21,014	19,477	19,477
Other	17,160	177	-	160,383	175,818	146,825	158,884	158,884
Total Operating Revenues	$ 1,140,680	$ 1,299,558	$ 1,204,840	$ 1,446,545	$ 1,496,921	$ 1,429,394	$ 1,439,327	$ 1,526,969
Operating Expenses (4)								
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 518,532	$ 584,532	$ 547,281	$ 573,478	$ -
Customer Service	178,106	63,627	54,432	50,591	53,131	54,019	52,865	-
Sewer Lift Stations	595,364	728,022	535,147	658,270	635,981	763,049	575,122	-
Storm Drains	22,840	146,957	48,132	233,726	33,284	21,451	26,511	-
Other	8,994	5,138	5,336	-	-	-	-	-
Repair and Replacement	-	-	-	-	-	-	34,982	34,982
Depreciation	306,949	296,727	299,373	163,285	163,285	163,285	-	-
Total Operating Expenses	$ 1,676,612	$ 1,657,305	$ 1,429,883	$ 1,624,403	$ 1,470,213	$ 1,549,085	$ 1,262,958	$ 1,281,378
Operating Income (Loss)	$ (535,932)	$ (357,748)	$ (225,043)	$ (177,859)	$ 26,708	$ (119,691)	$ 176,369	$ 245,592
Non-Operating Revenues (Expenses)								
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/SAW/FDCVT	-	185,108	194,777	88,108	-	-	-	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-
Income From Joint Venture	-	-	-	-	-	-	-	-
Engineering Allocation from Project	-	-	-	-	-	-	(216,666)	(163,431)
Income Tax Transfer/Funds on Hand	-	-	-	-	-	-	325,000	265,000
Depreciation	306,949	296,727	299,373	163,285	163,285	163,285	-	-
Total Non-Operating Revenues (Expenses)	$ 165,591	$ 481,835	$ 496,458	$ 251,393	$ 163,285	$ 163,285	$ 108,334	$ 101,569
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (370,342)	$ 124,087	$ 271,416	$ 73,535	$ 189,993	$ 43,594	$ 284,703	$ 347,161
Debt Service Requirements								
Sewage Disposal System Revenue Bonds, Series 2009	$ 30,553	$ 185,431	$ 182,306	$ 184,118	$ 180,868	$ 182,556	$ 179,181	$ 180,743
Sewage Disposal System Revenue Bonds, Series 2011	84,006	101,137	99,512	102,887	101,137	99,387	102,637	100,762
Sewage Disposal System Revenue Bonds, Series 2020 (5)	-	-	-	-	-	-	-	48,657
Total	$ 114,559	$ 286,568	$ 281,818	$ 287,005	$ 282,005	$ 281,943	$ 281,818	$ 330,162
Debt Service Coverage Ratio	**(3.23x)**	**0.43x**	**0.96x**	**0.26x**	**0.67x**	**0.15x**	**1.01x**	**1.05x**

Utilities Revenue and SRF Bonds	
Annual Excess with 1.05x Coverage.	**$ 16,998**
Cumulative Excess with 1.05x Coverage.	**$ 16,998**
Annual Increase in Revenue Necessary for 1.05x Coverage.	**$0**
Annual Increase Necessary to Produce 1.05x Coverage.	**0.00%**

(1) Actual.
(2) Budgeted information provided by the City on February 14, 2020.
(3) Consumption for the fiscal years ending June 30, 2021 and thereafter is not assumed to change.
Assumes annual rate increases of 7% for the fiscal years ending June 30, 2021 through and including June 30, 2025.
Projected rate increases applied only to Commodity and Ready to Serve Charges. Other revenues are not assumed to change.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2021 through 2023 are assumed to grow 1.5% annually.
(5) Assumes a 30-year SRF loan totaling $3,660,000.

Source: City of Benton Harbor

Projected 2022 (3)	Projected 2023 (3)	Projected 2024 (3)	Projected 2025 (3)	Projected 2026 (3)	Projected 2027 (3)	Projected 2028 (3)	Projected 2029 (3)	Projected 2030 (3)	Projected 2031 (3)	Projected 2032 (3)
$ 1,433,450	$ 1,533,792	$ 1,641,157	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038
8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935	8,935
-	-	-	-	-	-	-	-	-	-	-
19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477
158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884
$ 1,620,746	$ 1,721,088	$ 1,828,453	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982	34,982
-	-	-	-	-	-	-	-	-	-	-
$ 1,300,074	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050
$ 320,673	$ 402,038	$ 509,403	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
(253,235)	-	-	-	-	-	-	-	-	-	-
335,000	5,000	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
$ 81,765	$ 5,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
$ 402,438	$ 407,038	$ 509,403	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ 177,243	$ 178,680	$ 175,055	$ 176,368	$ 172,618	$ 173,805	$ 174,868	$ 175,805	$ 176,618	$ 181,970	$ -
98,887	102,012	100,012	98,012	101,012	98,887	101,762	99,512	102,262	98,887	103,002
106,956	106,393	105,831	105,268	104,706	104,143	103,581	103,018	201,331	198,518	200,650
$ 383,086	$ 387,085	$ 380,898	$ 379,648	$ 378,336	$ 376,835	$ 380,211	$ 378,335	$ 480,211	$ 479,375	$ 303,652
1.05x	**1.05x**	**1.34x**	**1.64x**	**1.65x**	**1.66x**	**1.64x**	**1.65x**	**1.30x**	**1.30x**	**2.06x**
$ 19,351	**$ 19,953**	**$ 128,505**	**$ 244,636**	**$ 245,948**	**$ 247,449**	**$ 244,073**	**$ 245,949**	**$ 144,073**	**$ 144,909**	**$ 320,632**
$ 36,350	**$ 56,302**	**$ 184,808**	**$ 429,444**	**$ 675,392**	**$ 922,842**	**$ 1,166,915**	**$ 1,412,864**	**$ 1,556,937**	**$ 1,701,847**	**$ 2,022,479**
$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Projected 2033 (3)	Projected 2034 (3)	Projected 2035 (3)	Projected 2036 (3)	Projected 2037 (3)
$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038	$ 1,756,038
8,935	8,935	8,935	8,935	8,935
-	-	-	-	-
19,477	19,477	19,477	19,477	19,477
158,884	158,884	158,884	158,884	158,884
$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334	$ 1,943,334
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
34,982	34,982	34,982	34,982	34,982
-	-	-	-	-
$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050	$ 1,319,050
$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
$ -	$ -	$ -	$ -	$ -
$ 624,284	$ 624,284	$ 624,284	$ 624,284	$ 624,284
$ -	$ -	$ -	$ -	$ -
-	-	-	-	-
197,725	199,743	196,706	198,612	200,406
$ 197,725	$ 199,743	$ 196,706	$ 198,612	$ 200,406
3.16x	**3.13x**	**3.17x**	**3.14x**	**3.12x**
$ 426,559	**$ 424,541**	**$ 427,578**	**$ 425,672**	**$ 423,878**
$ 2,449,038	**$ 2,873,580**	**$ 3,301,158**	**$ 3,726,830**	**$ 4,150,709**
$0	**$0**	**$0**	**$0**	**$0**
0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**

City of Benton Harbor, Michigan

Historical and Projected Water System Operating Cash Flow and Debt Service Coverage
Fiscal Years Ended or Ending June 30, 2014 Through 2037

	2014 (1)	2015 (1)	2016 (1)	2017 (1)	2018 (1)	2019 (1)	Budgeted 2020 (2)	Projected 2021 (3)	Projected 2022
Operating Revenues									
Water RTS/Commodity	$ 1,854,525	$ 2,028,776	$ 1,970,829	$ 1,622,705	$ 1,599,806	$ 1,507,820	$ 1,507,820	$ 1,657,848	$ 1,822,804
Water Capital Charge		-	-	-	-	-	-	-	-
Sprinkler, Hydrant, Fire		-	-	38,774	38,522	34,649	32,708	32,708	32,708
Other		-	-	160,383	175,818	146,825	158,884	158,884	158,884
Fines	17,160	177	-	20,198	20,421	21,015	19,477	19,477	19,477
Total Operating Revenues	$ 1,871,685	$ 2,028,953	$ 1,970,829	$ 1,842,060	$ 1,834,567	$ 1,710,309	$ 1,718,889	$ 1,868,917	$ 2,033,873
Operating Expenses (4)									
Utility Administration	$ 564,359	$ 416,835	$ 487,463	$ 518,532	$ 584,531	$ 547,282	$ 573,478	$ -	$ -
Customer Service	178,106	63,627	54,432	50,591	53,132	54,019	52,865	-	-
Water Treatment	721,683	414,240	457,036	415,496	389,570	470,232	502,693	-	-
Water Distribution	893,856	554,709	585,567	566,087	630,490	617,840	597,255	-	-
Repair and Replacement	-	-	-	-	-	-	-	81,421	81,421
Other	8,994	5,138	5,336	-	-	-	-	-	-
Depreciation	306,949	296,727	299,373	462,167	516,765	532,215	557,215	-	-
Total Operating Expenses	$ 2,673,947	$ 1,751,275	$ 1,889,207	$ 2,012,872	$ 2,174,488	$ 2,221,588	$ 2,283,506	$ 1,782,250	$ 1,833,275
Operating Income (Loss)	$ (802,262)	$ 277,678	$ 81,623	$ (170,813)	$ (339,921)	$ (511,279)	$ (564,617)	$ 86,667	$ 200,598
Non-Operating Revenues (Expenses)									
Interest Income	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Grants/FDCVT Proceeds	-	185,108	194,777	438,953	65,243	146,280	75,000	-	-
Gain from sale of capital assets	-	-	2,309	-	-	-	-	-	-
Repayment of federal debt previously forgiven	(141,358)	-	-	-	-	-	-	-	-
Income From Joint Venture	153,247	172,888	(40,562)	-	-	-	-	-	-
Engineering Allocation from project	-	-	-	-	-	-	(216,666)	(163,431)	(253,235)
Transfer from Income Tax	-	-	-	-	-	-	575,000	380,000	405,000
Transfer from PPI Funds - Tower reimbursement	-	-	-	-	-	-	-	150,000	150,000
Budgeted Funds on Hand	-	-	-	-	-	-	-	50,000	50,000
Depreciation	306,949	296,727	299,373	462,167	516,765	532,215	557,215	-	-
Total Non-Operating Revenues (Expenses)	$ 318,838	$ 654,722	$ 455,896	$ 901,120	$ 582,008	$ 678,495	$ 990,549	$ 416,569	$ 351,765
NET INCOME AVAILABLE FOR DEBT SERVICE	$ (483,425)	$ 932,400	$ 537,519	$ 730,308	$ 242,087	$ 167,216	$ 425,932	$ 503,236	$ 552,363
Debt Service Requirements									
Drinking Water Revolving Fund Revenue Bonds, Series 2009	$ 11,125	$ 8,105	$ 7,980	$ 7,855	$ 7,730	$ 7,605	$ 7,480	$ 7,335	$ 7,230
Drinking Water Revolving Fund Revenue Bonds, Series 2010	410,375	410,250	410,000	409,625	414,125	413,375	412,500	411,500	410,375
Water Supply System Revenue Bonds, Series 2020 (5)	-	-	-	-	-	-	-	59,817	106,050
Total	$ 421,500	$ 418,355	$ 417,980	$ 417,480	$ 421,855	$ 420,980	$ 419,980	$ 478,652	$ 523,655
Debt Service Coverage Ratio	**(1.15x)**	**2.23x**	**1.29x**	**1.75x**	**0.57x**	**0.40x**	**1.01x**	**1.05x**	**1.05x**

Utilities Revenue and SRF Bonds		
Annual Excess with 1.05x Coverage.	**$ 24,584**	**$ 28,708**
Cumulative Excess with 1.05x Coverage.	**$ 24,584**	**$ 53,293**
Annual Increase in Revenue Necessary for 1.05x Coverage.	**$0**	**$0**
Annual Increase Necessary to Produce 1.05x Coverage.	**0.00%**	**0.00%**

(1) Actual.
(2) As budgeted, received from the City on February 14, 2020.
(3) Consumption for the fiscal years ending June 30, 2021 and thereafter is not assumed to change.
Assumes annual rate increaes of 9.95% for the fiscal years ending June 30, 2021 through and including June 30, 2025.
Projected rate increases applied only to RTS and Commodity Charges.
(4) Operating expenditures, excluding depreciation, as projected for the fiscal years ending June 30, 2021 through 2023 are assumed to grow 3% annually.
(5) Assumes a 30-year DWRF loan totaling $5,065,000.

Source: City of Benton Harbor

	Projected 2023 (3)	Projected 2024 (3)	Projected 2025 (3)	Projected 2026 (3)	Projected 2027 (3)	Projected 2028 (3)	Projected 2029 (3)	Projected 2030 (3)	Projected 2031 (3)	Projected 2032 (3)	Projected 2033 (3)	Projected 2034 (3)
	$ 2,004,173	$ 2,203,588	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845	$ 2,422,845
	-	-	-	-	-	-	-	-	-	-	-	-
	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708	32,708
	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884	158,884
	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477	19,477
	$ 2,215,242	$ 2,414,657	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914	$ 2,633,914
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421	81,421
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830	$ 1,885,830
	$ 329,412	$ 528,827	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084
	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	27,000	-	-	-	-	-	-	-	-	-	-	-
	150,000	25,000	-	-	-	-	-	-	-	-	-	-
	50,000											
	-	-	-	-	-	-	-	-	-	-	-	-
	$ 227,000	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	$ 556,412	$ 553,827	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084	$ 748,084
	$ 7,105	$ 6,980	$ 6,855	$ 6,730	$ 6,605	$ 6,480	$ 6,355	$ 6,230	$ 6,105	$ 5,980	$ 5,855	$ 5,730
	414,125	412,625	411,000	409,250	412,375	410,250	413,000	410,500	412,875	410,000	412,000	413,750
	105,950	105,850	105,750	115,550	115,250	114,950	114,650	208,400	211,150	208,850	211,500	209,100
	$ 527,180	$ 525,455	$ 523,605	$ 531,530	$ 534,230	$ 531,680	$ 534,005	$ 625,130	$ 630,130	$ 624,830	$ 629,355	$ 628,580
	1.06x	**1.05x**	**1.43x**	**1.41x**	**1.40x**	**1.41x**	**1.40x**	**1.20x**	**1.19x**	**1.20x**	**1.19x**	**1.19x**
	$ 29,232	**$ 28,372**	**$ 224,479**	**$ 216,554**	**$ 213,854**	**$ 216,404**	**$ 214,079**	**$ 122,954**	**$ 117,954**	**$ 123,254**	**$ 118,729**	**$ 119,504**
	$ 82,524	**$ 110,896**	**$ 335,375**	**$ 551,928**	**$ 765,782**	**$ 982,186**	**$ 1,196,265**	**$ 1,319,219**	**$ 1,437,172**	**$ 1,560,426**	**$ 1,679,155**	**$ 1,798,659**
	$0	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
	0.00%	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

(3)	Projected 2035	(3)	Projected 2036	(3)	Projected 2037	(3)
	$ 2,422,845		$ 2,422,845		$ 2,422,845	
	-		-		-	
	32,708		32,708		32,708	
	158,884		158,884		158,884	
	19,477		19,477		19,477	
	$ 2,633,914		$ 2,633,914		$ 2,633,914	
	$ -		$ -		$ -	
	-		-		-	
	-		-		-	
	-		-		-	
	81,421		81,421		81,421	
	-		-		-	
	-		-		-	
	$ 1,885,830		$ 1,885,830		$ 1,885,830	
	$ 748,084		$ 748,084		$ 748,084	
	$ -		$ -		$ -	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	-		-		-	
	$ -		$ -		$ -	
	$ 748,084		$ 748,084		$ 748,084	
	$ 5,605		$ 5,480		$ 5,355	
	410,250		411,625		412,750	
	211,650		209,150		211,600	
	$ 627,505		$ 626,255		$ 629,705	
	1.19x		**1.19x**		**1.19x**	
	$ 120,579		**$ 121,829**		**$ 118,379**	
	$ 1,919,237		**$ 2,041,066**		**$ 2,159,445**	
	$0		**$0**		**$0**	
	0.00%		**0.00%**		**0.00%**	

EXHIBIT A

ACO Compliance Timeline Progress Summary for City of Benton Harbor

Item	Initial Deadline	Extended Deadline	Extension History
Submit a rate study	4/1/19	(completed)	
Upgrade SCADA system for data access and storage	4/1/19	(completed)	1-from 4/1/19 to 5/15/19
Install continuous chlorine analyzer on WTP tap	4/1/19	(completed)	1-from 4/1/19 to 5/15/19
Corrosion Treatment Study	4/1/19	(completed)	
Distribution Operator in charge	4/1/19	(completed)	1-from 4/1/19 to 5/1/19 2-from 5/1/19 to 5/22/19
Permit and Construct coagulant feed to existing rapid mix	6/1/19	(completed)	1-from 6/1/19 to 8/2/19
Submit plan to implement rate increases	4/1/19	7/1/20	1-from 4/1/19 to 9/30/19 2-from 9/30/19 to 7/1/20
Install flow meter on finished water	4/1/19	12/15/19	1-from 4/1/19 to 6/15/19 2-from 6/15/19 to 9/30/19 3-from 9/30/19 to 12/15/19 ***4-request not granted***
Submit updated rate collections plan	5/1/19	12/31/19	1-from 5/1/19 to 9/30/19 2-from 9/30/19 to 12/31/19 ***Deadline not met***
Updated cross connection program including residential accounts	6/1/19	3/31/20	1-from 6/1/19 to 12/31/19
Submit maintenance plan for valves and hydrants	6/1/19	6/30/20	1-from 6/1/19 to 9/30/19 2-from 9/30/19 to 6/30/20
Conduct professional inspection of water tower, or conduct cleaning and repaint interior	6/30/19	12/31/20	1-from 6/30/19 to 12/31/19 2-from 12/31/19 to 12/31/20
Install/repair mussel control system at intake	6/30/19	4/1/20	1-from 6/30/19 to 12/31/19 2-from 12/31/19 to 3/1/20
Repair filter to waste valves	1/31/20	9/1/20	1-from 1/31/20 to 9/1/20

GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
GRAND RAPIDS DISTRICT OFFICE

LIESL EICHLER CLARK
DIRECTOR

July 2, 2019

Mr. Darwin Watson, City Manager
City of Benton Harbor
200 East Wall Street
Benton Harbor, Michigan 49022

WSSN: **00600**

Dear Mr. Watson:

SUBJECT: **REVISED**: Administrative Consent Order: Progress Update and Revised Schedule

This letter is in response to a discussions with Benton Harbor staff regarding the compliance schedule established in the Administrative Consent Order (ACO) effective March 5, 2019. Extensions for Section II - Compliance Schedule (Compliance Schedule) of the ACO were granted on April 1, 2019 and on May 16, 2019. On June 20, 2019, the Department of Environment, Great Lakes, and Energy (EGLE) received another request for extensions of additional items in the Compliance Schedule. EGLE staff would like to acknowledge the competing timelines in the Compliance Schedule by spreading out the deadlines, and also reiterating the terms of the ACO.

Allowing sufficient time to complete tasks in the Compliance Schedule is necessary; however, timely implementation of items that will directly result in greater protection of public health must be prioritized. The table below includes an updated Compliance Schedule that satisfies the recent extension request from the City of Benton Harbor and sets interim deadlines for items requiring permitting.

Item	Initial Deadline	Extended Deadline	Status/Comment
Submit a rate study	4/1/2019	(completed)	
Submit plan to implement rate increases	4/1/2019	9/30/2019	
Upgrade SCADA system for data access and storage	4/1/2019	5/15/2019	(completed)
Install flow meter on finished water	4/1/2019	9/30/2019	Permit issued, waiting for manufacturer
Install continuous chlorine analyzer on WTP tap	4/1/2019	5/15/2019	(completed)
Distribution Operator in charge	4/1/2019	5/22/2019	(completed, need contract)
Corrosion Treatment Study	4/1/2019	(completed)	
Submit updated rate collections plan	5/1/2019	9/30/2019	
Updated cross connection program including residential accounts	6/1/2019	12/31/2019	
Permit and Construct coagulant feed to existing rapid mix	6/1/2019	8/30/2019	Submit permit application by 7/31/2019

Item	Initial Deadline	Extended Deadline	Status/Comment
Submit maintenance plan for valves and hydrants	6/1/2019	9/30/2019	
Conduct professional inspection of water tower	6/30/2019	12/31/2019	Not necessary if repainting is planned
Install/repair mussel control system at intake	6/30/2019	12/31/2019	Submit permit application by 11/29/2019
Repair filter to waste valves	1/31/2020		

Be advised that, per Paragraph 1.3 of the ACO, the City of Benton Harbor remains obligated to pay stipulated penalties of $500 per violation per day for failure to comply with a specific deadline set forth in the Compliance Program, including the extended deadlines set forth above.

It is our intention to work with you on resolving these issues in a timely manner. We anticipate and appreciate your cooperation in working together to resolve these matters. Additionally, if you have any questions regarding this Violation Notice, please contact me below or at sarkipatoe@michigan.gov.

Sincerely,

Ernie Sarkipato, Surface Water Treatment Specialist
Grand Rapids District Office
Drinking Water and Municipal Assistance Division
616-307-0261

cc: Mr. Mike O'Malley, Water Superintendent, Benton Harbor
Mr. Mike Bolf, P.E., Engineering Unit Supervisor, DEQ (via email)
Ms. Maureen Nelson, Enforcement Specialist, DEQ (via email)