
City of Polson Infrastructure Update
Water, Sewer, and Streets
Public Meeting
April 11, 2022

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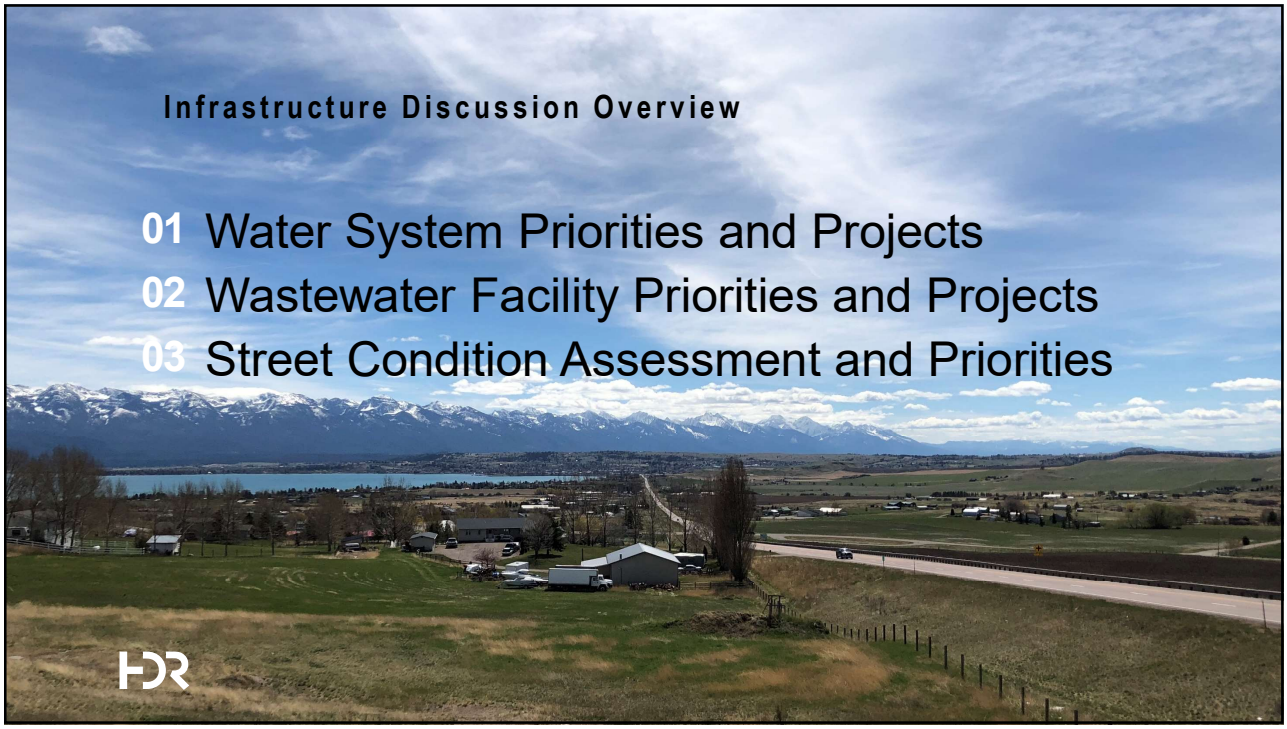
Infrastructure Discussion Overview
01 Water System Priorities and Projects
02 Wastewater Facility Priorities and Projects
03 Street Condition Assessment and Priorities

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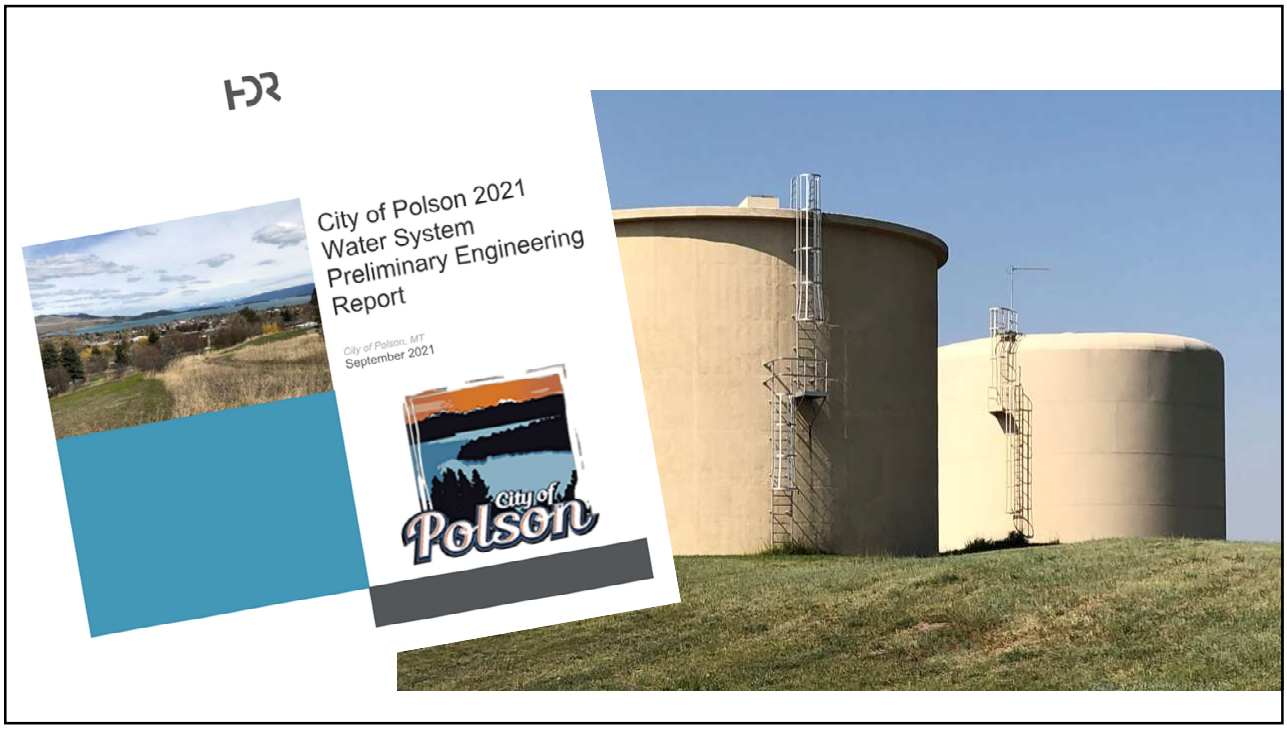

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- Review previous planning documents and determine which information is still applicable and which information needs to be updated.
- Update the previous water system analysis and document the findings in the current Preliminary Engineering Report format, so the City of Polson can apply for grant funding as needed.
- Evaluate the condition and the capacity of the water system to meet existing and projected future water demands, assess the general condition of above ground facilities, and describe potential future water quality regulatory implications.
- Identify and prioritize projects in 5 to 10-year phases.
- Identify funding sources and strategies.
- Identify design and operations and management strategies that leverage technology and promote environmental and economic sustainability.

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Table 1-4. Historical US Bureau of Census Data

Census Date	Population	Annual Average Growth Rate
1960	2,314	-
1970	2,464	0.65%
1980	2,798	1.36%
1990	3,291	1.76%
2000	4,041	2.28%
2010	4,488	1.11%
2019[1]	5,060	1.42%

[1]2020 Census results are expected to be available in Spring of 2021, the 2019 population is an estimate.

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Table 1-5. Population Projections at 0.65%, 1.37%, and 2.28%

Year	Actual Census Population	Population (Projections at 0.65% per year)	Population (Projections at 1.37% per year)	Population (Projections at 2.28% per year)
1990	3,291			
2000	4,041			
2010	4,488			
2019	5,060			
2021		5,126	5,200	5,293
2026		5,295	5,566	5,925
2031		5,469	5,957	6,632
2036		5,649	6,377	7,423
2041		5,835	6,826	8,309

0.65% = Historical 50-year growth rate. 1.37% = Growth rate in 2016 Growth Policy. 2.28% = Highest growth rate in last 50 years.

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Table 1-10. Polson Gallons Per Capita Per Day (GPCD)

Year	Annual Metered Water (million gallons)	Population Estimate for 2019[1]	Gallons Per Capita Per Day (GPCD)
2018	245		
2019	229		
2020	232		
Average Day Demand	644,749 GPD	5,060	127

Notes:

[1] The population for 2019 is the estimate from census data.

It should be noted that the gallons per capita per day represents the total metered water use (including commercial, industrial, and irrigation), divided by the total population. Given the wide variation in customer type and usage per zone, GPCD should not be used as a basis for actual per customer water use.

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Table 1-11. Projected Population and Water Demands for 2041

Growth Rates	0.65% per year	1.37% per year	2.28% per year
Population	5835	6826	8309
Average Day (Million Gallons per Day)	0.743	0.870	1.06
Average Day (Gallons Per Minute)	516	604	735
Maximum Day (Million Gallons per Day)	2.23	2.61	3.18
Maximum Day (Gallons Per Minute)	1,549	1,811	2,205
Peak Hourly Flow (Million Gallons Per Day)	5.58	6.53	7.95
Peak Hourly Demand (Gallons per Minute)	3,873	4,528	5,513
Average Year (Million Gallons)	271	317	386
Acre-feet per Year	833	974	1,186

For planning, modeling and design purposes, the data associated with the 1.37% annual population growth will be used moving forward.

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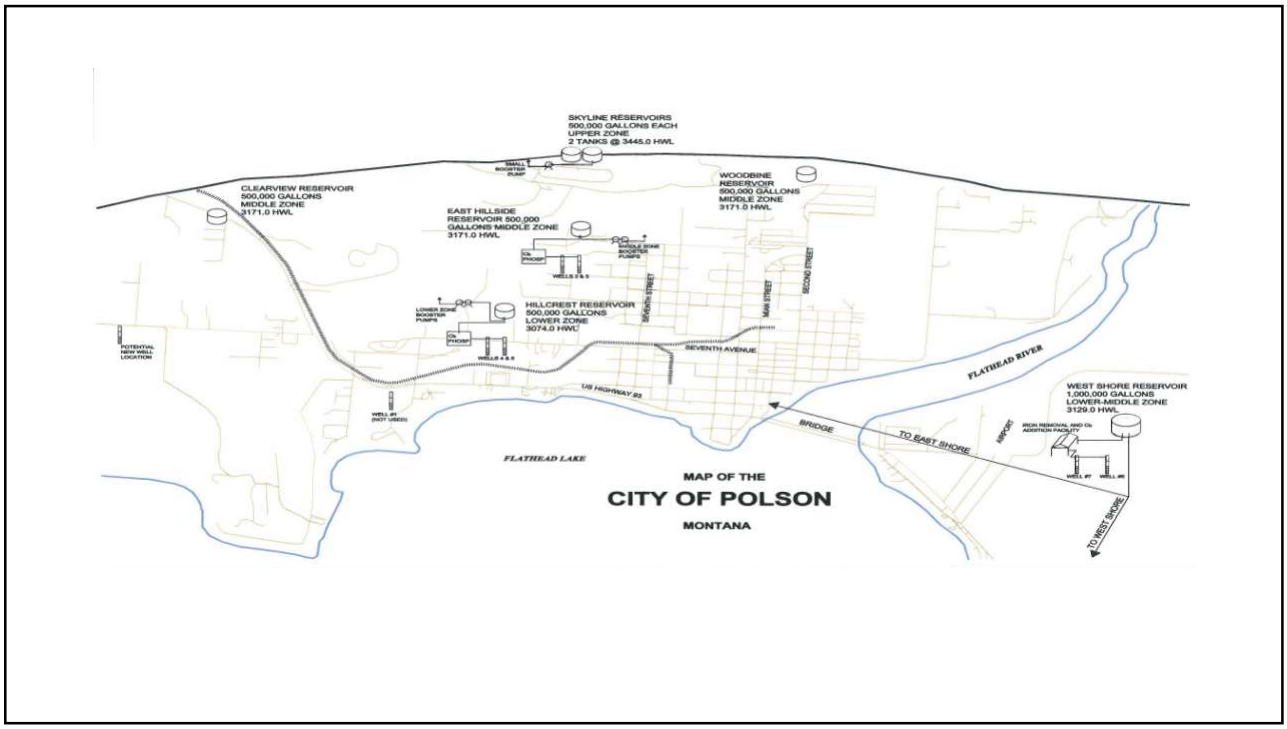
SKYLINE RESERVOIRS
500,000 GALLONS EACH
UPPER ZONE
2 TANKS @ 3445.0 HWL
CLEARVIEW RESERVOIR
500,000 GALLONS
MIDDLE ZONE
3171.0 HWL
EAST HILLSIDE
RESERVOIR 500,000
GALLONS MIDDLE ZONE
3171.0 HWL
WOODBINE
RESERVOIR
500,000 GALLONS
MIDDLE ZONE
3171.0 HWL
HILLCREST RESERVOIR
500,000 GALLONS
LOWER ZONE
3074.0 HWL
SEVENTH STREET
MAIN STREET
SECOND STREET
SEVENTH AVENUE
US HIGHWAY 93
FLATHEAD RIVER
BRIDGE
TO EAST SHORE
WEST SHORE RESERVOIR
1,000,000 GALLONS
LOWER-MIDDLE ZONE
3129.0 HWL
TO WEST SHORE
FLATHEAD LAKE
MAP OF THE
CITY OF POLSON
MONTANA

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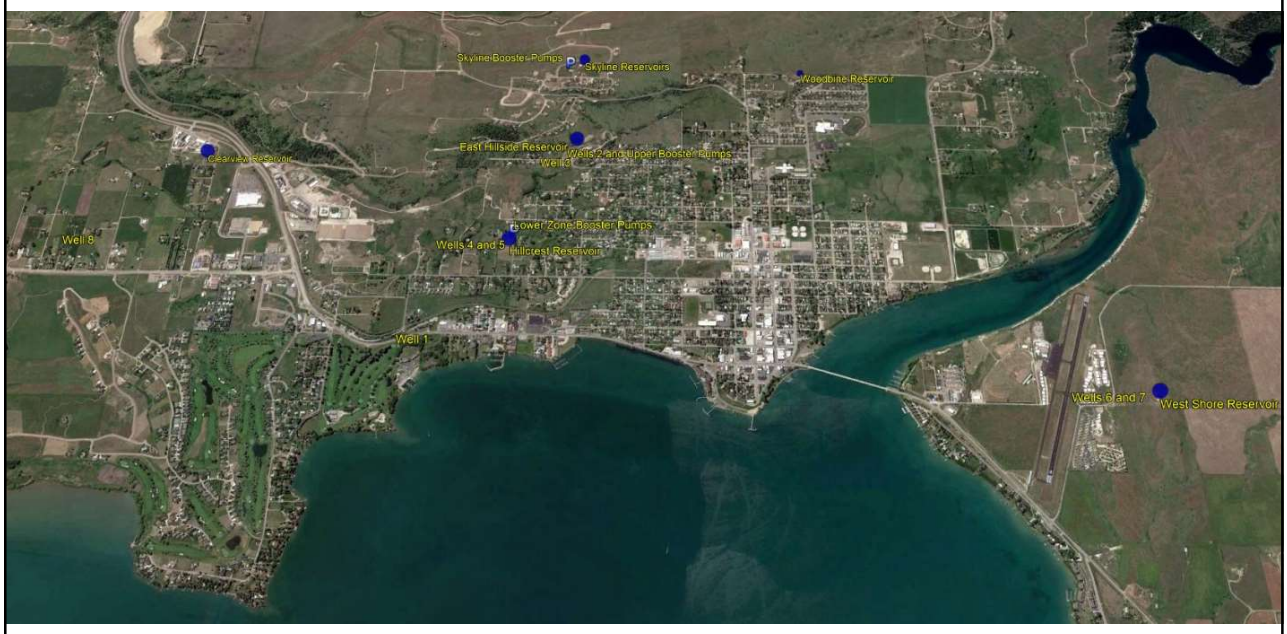
Skyline Booster Pumps
Skyline Reservoirs
Woodbine Reservoir
East Hillside Reservoir
Wells 2 and Upper Booster Pumps
Well 3
Clearview Reservoir
Well 8
Lower Zone Booster Pumps
Wells 4 and 5
Hillcrest Reservoir
Well 1
Wells 6 and 7
West Shore Reservoir

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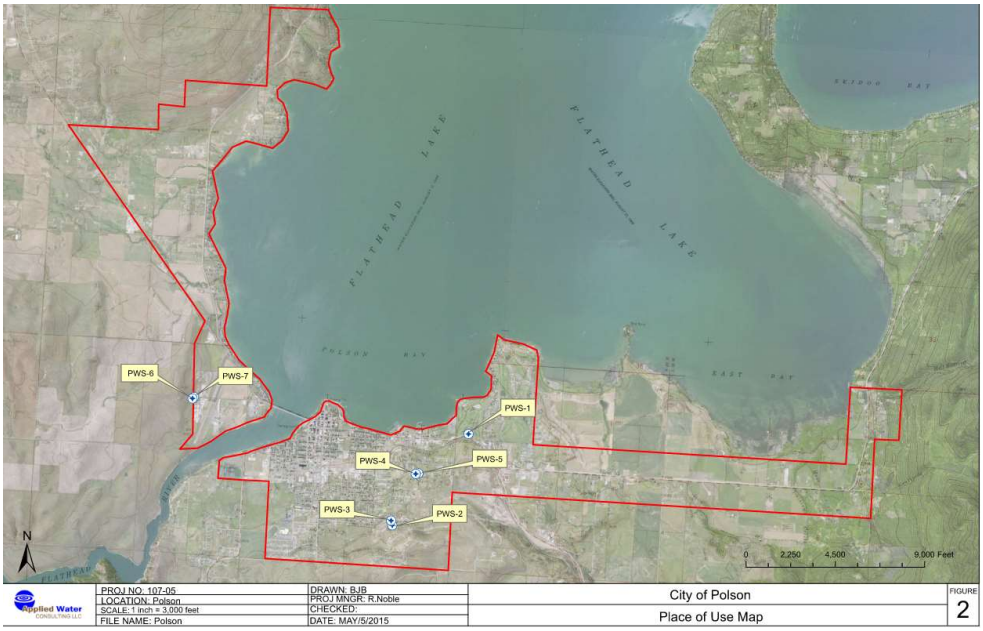

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Table 2-1. Well Pumping Capacities

Well Name	Recorded Pumping Rate (gpm)	Design Rated Capacity (gpm)	Reservoir
Well 1	--	450	N/A
Well 2	377	500	Hillside
Well 3	508	520	Hillside
Well 4	220	200	Devlin/ Hillcrest
Well 5	--	50	Devlin/ Hillcrest
Well 6	450	425	West Shore
Well 7	--	425	West Shore
Well 8[1]	625	625	Will Tie-in to existing main

Additionally, the City has Surface Water Rights for Hell Roaring Creek Surface Water Supply

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Table 2-2. Pressure Zones

Pressure Zone	Upper Elevation	Lower Elevation
Lower	2,902	3,073
Lower-Middle	2,890	2,966
Middle	2,927	3,162
Upper	3,044	3,418

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Table 2-4. Pipe Material by Length

Material	Total Length (ft)	Total Length (miles)	Percent of System
PVC	234,913	44.49	79.07%
Cast Iron	46,385	8.79	15.61%
Ductile Iron	819	0.16	0.28%
Asbestos Cement	317	0.06	0.11%
Galvanized Iron	12,725	2.41	4.28%
Steel	214	0.04	0.07%
Galvanized	1,715	0.32	0.58%
Total	**297,086**	**56.27**	**100.00%**

Table 2-5. City of Polson Water Storage Reservoirs

Water System Reservoirs	Reservoir Capacity (Gallons)	Type	Zone
Hillcrest	500,00	Concrete	Lower Zone
West Shore	1,000,000	Concrete	Lower-Middle Zone
Clearview	500,000	Concrete	Middle Zone
East Hillside	500,000	Steel	Middle Zone
Woodbine	500,000	Concrete	Middle Zone
Skyline 1	500,000	Steel	Upper Zone
Skyline 2	500,000	Concrete	Upper Zone

Table 2-6. Booster Stations

Booster Pump Station	Zone	Total Capacity (MGD)
Devlin/ Hillcrest Booster Pumps	Lower Zone	940 gpm
East Hillside Booster Pumps	Middle Zone	600 gpm
Skyline Booster Pumps	Upper Zone	1783 gpm

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Water Rights: The City of Polson has ample water rights for the planning period, even at the highest population growth rate considered. The City of Polson will need to reach a population of 20,706, assuming the GPCD value does not change, before water demands exceed their water rights

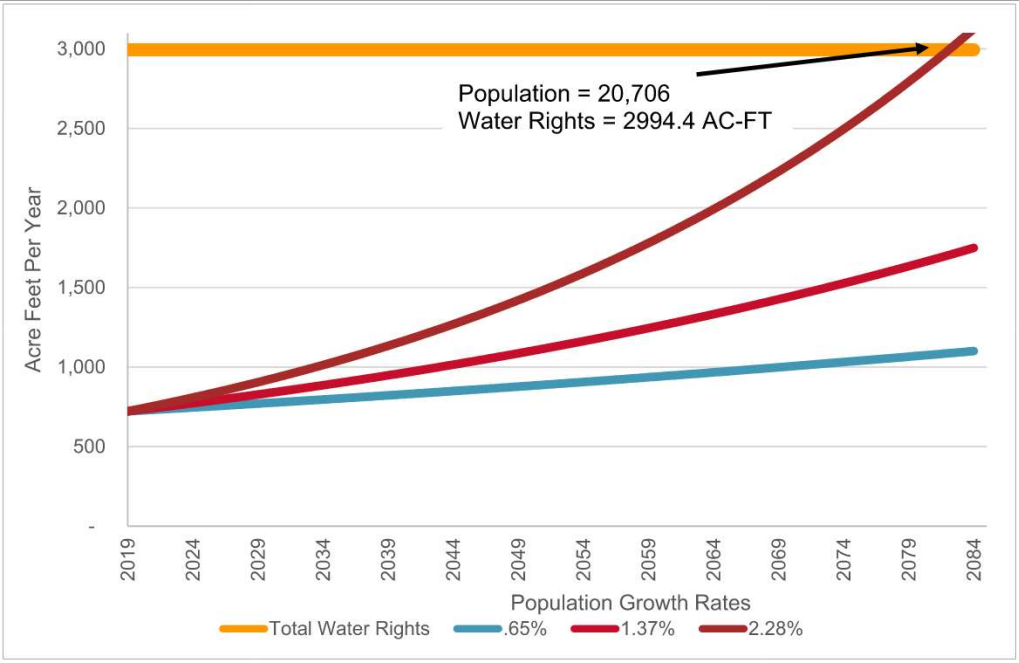

Figure 2-3. Existing Water Rights versus Water Demands

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Table 2-10. Condition Assessment Summary

Facility	Items Noted
Water Storage	
East Hillside	Built in 1960, steel. The East Hillside Steel Reservoir is in very poor condition. According to City staff, the internal support beams are heavily corroded, and the shell of the reservoir is significantly warped beyond repair. The City would prefer to demolish this steel reservoir and replace with a concrete in-ground alternative at the same site location.
Booster Stations	
Devlin/ Hillcrest Booster Pumps (Lower)	The Hillcrest and East Hillside booster pump stations are both aged and replacement of major equipment should be completed soon as replacement parts are located (they have been difficult to find). Pump house and piping are in good condition. Electrical upgrades, SCADA, and pump replacement are necessary.
East Hillside Booster Pumps (Upper)	The Hillcrest and East Hillside booster pump stations are both aged and replacement of major equipment should be completed soon as replacement parts are located (they have been difficult to find). Electrical upgrades, SCADA, and pump replacement are necessary.

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Wells	
#1	Built in 1969. Original capacity was 425 gpm, but in 1999 it started pumping fine material and capacity was reduced to 100 gpm. The pump sand pack collapsed due to over pumping during installation of a well pump and attempts to renovate the well have been unsuccessful.
#5	Built in 2000. Treated with polyphosphate corrosion inhibitor and sodium hypochlorite for disinfection. Staff indicates that this well pumps sand, therefore, it has not been used in almost 20 years. Well 5 is currently not running due to sand issues that will be resolved with investigations including an air burst test and potentially redeveloping the well or a sand separator.
#7	Built in 2011. Includes an iron removal treatment system. No emergency power. Well #7 is not currently running. The electrical controls for the iron removal filter are not operating properly and need to be reprogrammed.

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PRVs	
	Demers needs to be replaced. The PRV sags really bad due to no supports being used at initial installation.
	Off of Claffey (maybe called 'hillside'? PRV) from 1970's and never been opened or touched, never been repaired. "Oldest valves ever seen"
	1st street and 12th ave west, a PRV is in poor condition
	PRV across from 4-B's on Hwy 35 and poor condition and 25 feet below ground.
Controls	
	New SCADA system is necessary. Forthcoming replacement of entire system.

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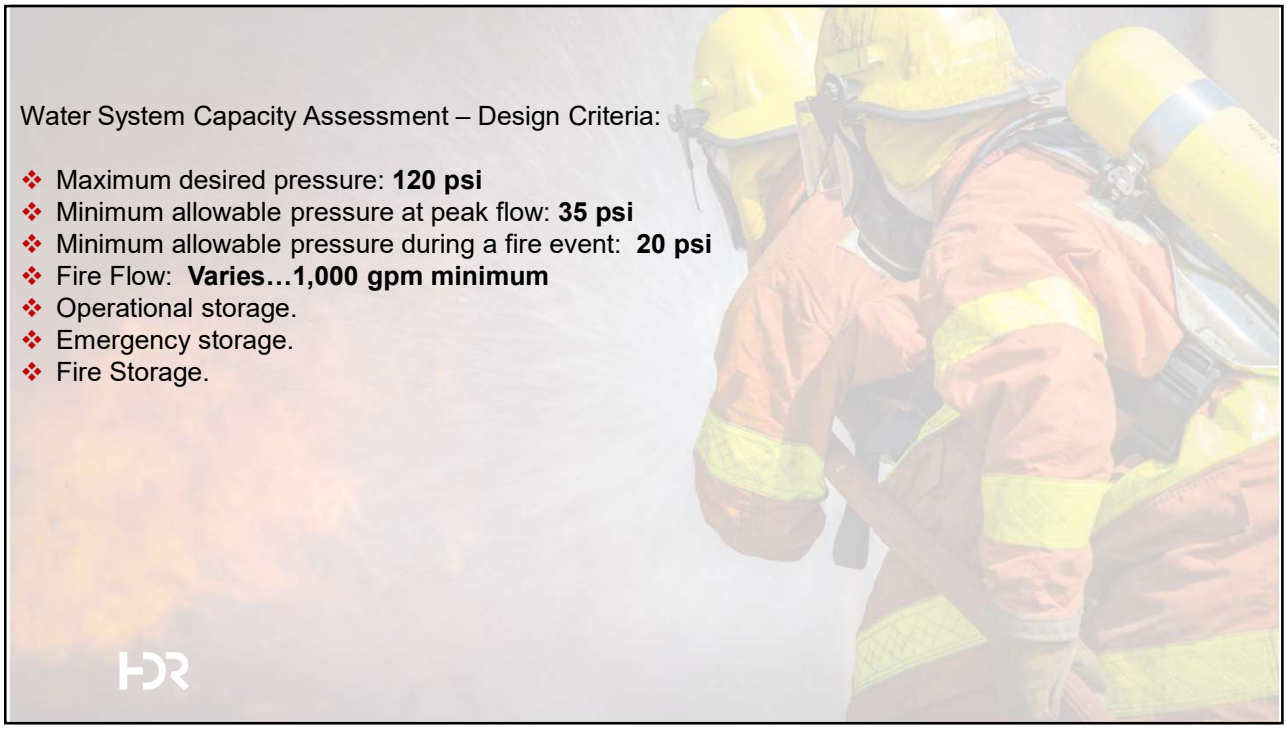

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Table 3-8. Locations of Fire Flow Deficiency

Pressure Zone	Figure Number	General location	Available Fire Flow (gpm) at 20 psi	Needs/Recommendation
Lower Zone	3-19	Bayview Drive/Polson Bay Golf Course	667.5-960.7	• Additional supply, new location in area for Well 1 and bringing back in service.
	3-19	Polson Bay Golf Course	115.7	• Increase 2" main at golf course
	3-20	1st St E and 2nd St E	788.3-926.7	• Increase 2" main on 1st St. E to 8", and connect 6" main from 1st Ave E to US Hwy. 93.
	3-21	8th St E and 5th Ave E	14.16-916.7	• Construct 6" main on 8th St E from 5th Ave E to US Hwy 93, and connect existing hydrant at intersection of US Hwy 93 and 8th St E.
	3-21	Lindeman School vicinity	717.1-831.9	• Connect 6" main along 4th Ave E, and connect 6" main along 6 Ave E.
	3-22	6th Ave W and 4th St W	176.3	• Increase 2" main along 4th St W to 6".
	3-22	Polson Sports Complex Vicinity	881.8-985.8	• Construct 8" main down Kerr Dam Rd to connect loop.
	3-22	11th Ave W and 3rd St W	901.1	• Connect 6" main along 11th Ave W.
	3-23	Division St and 1st St E	112.9/420.5	• Reconnect hydrants to 6" main along 2nd St E
Middle Zone	3-24	16th Ave E and 8th St E	819.2	• Construct 8" main down 8th St E.
	3-25	Providence St. Joseph Hospital Vicinity	637.5-997.7	• Connect 6" main and 12" main on 2nd St W in front of Polson High School.
	3-26	Southlake Crest	951.7-979.6	• Connect 8" main on Skyview Lane to 8" main on Mission View Dr.
	3-27	Lavista Dr.	116.9	• Increase 3" main along Lavista Dr to 6".
	3-19	Montana Landing	972.11-999.9	• Connect 8" main on Skyview Lane to 8" main on Mission View Dr.
Upper Zone	3-28	Mission View Dr	988.6-997.8	• Connect 8" main on Skyview Lane to 8" main on Mission View Dr.
Middle/Skyline	3-29	Hillside Tank Vicinity	750.6/979.8	• Increase PRV 9 setting to 25 psi.

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Table 3-10. Zone Pump/Well Supply, Storage, and Demands

Zone	Supply Design Point (gpm)	Storage (MG)	2 Hour Demand (gpm) 2041 Projection
Lower Middle	Well 6 – 600 gpm Well 7 – Off	Westshore – 1.03 MG	155 (max day) + 1,500 (fire flow)
Middle	Well 2 – 1,000 gpm Well 3 - Off Well 8 – 625 gpm Hillcrest PS – 800 gpm Full	Woodbine – 0.49 MG Clearview – 0.5 MG Hillside – 0.53 MG	883 (max day) + 1,500 (fire flow)
Lower	Well 4 – 300 gpm Well 5 - Off	Hillcrest – 0.54 MG	802 (max day) + 1,500 (fire flow)
Greater Upper (Skyline, Upper, End, Intermediate)	Hillside PS – 310 gpm Full	Skyline 1 – 0.5 MG Skyline 2 – 0.5 MG	427 (max day) + 1,500 (fire flow)

Table 3-11. Storage and Pumping Capacity Analysis – Two-Hour Storage Deficit/Surplus (2041)

Zone	Storage Needed Maximum Day Demands	Storage Needed Maximum Day Demands + Fire Flow	Half-Full Storage (gallons)
Lower Middle	Sources > Demands	127,000 gallons needed	515,000
Middle	Sources > Demands	Sources > Demands	761,000
Lower	60,000 Gallons Needed	240,000 gallons needed	268,000
Greater Upper (Skyline, Upper, End, Intermediate)	70,000 Gallons Needed	194,000 gallons needed	503,000

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Capacity Assessment – Does Polson have a Water Supply Problem (Summer 2021)?

Polson initiates water restrictions within city limits

By **Lake County Leader**
| July 6, 2021 11:00 AM

The city of Polson on Tuesday implemented restrictions regarding the use of outdoor watering within city limits due to current drought conditions and water demand concerns.

Montana Gov. Greg Gianforte declared a statewide drought emergency last week and asked the U.S. Department of Agriculture to declare all 56 of the state's counties as primary natural disaster areas.

More than 92% of Montana faces abnormally dry conditions.

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Table 3-13. Summary of Needs

Need	Category	Project Type	Recommended Timeline	Consequence if not Corrected
Construct new Well 1	Fire Flow Deficiency	Supply Well	Near Term -1 to 3 years	Fire flow deficiencies in northern section of Lower Zone.
East Hillside Reservoir Replacement and SCADA	Aging Infrastructure	Water Storage	Near Term -1 to 3 years	The tank will continue to deteriorate and eventually fail.
Hillcrest Booster Rehabilitation	Aging Infrastructure	Booster Station	Near Term -1 to 3 years	Aging pumps are nearing their point of failure and parts are impossible to replace due to age. Building is in good condition. Project include new pumps, and SCADA and electrical upgrades.
Increase 3" main along Lavista Dr to 6".	Fire Flow Deficiency	Water main	Mid Term – 3 to 5 years	No fire flow to Lavista Drive.
Connect 8" main on Skyview Lane to 8" main on Mission View Dr.	Fire Flow Deficiency	Water main	Mid Term – 3 to 5 years	Fire flow deficiencies on Mission View Drive and Southlake Crest.
Construct 6" main on 8th St E from 5th Ave E to US Hwy 93, and connect existing hydrant at intersection of US Hwy 93 and 8th St E.	Fire Flow Deficiency	Water main	Mid Term – 3 to 5 years	Fire flow deficiencies on 8th Street East in heavily residential area.
Connect 6" main along 4th Ave E from 5th St E west to the main in front of the Linderman School. Tie in the 6" main along 6 Ave E.	Fire Flow Deficiency	Water main	Near Term -1 to 3 years	Fire flow deficiencies near Linderman School.
Connect 6" main and 12" main on 2nd St W in front of Polson High School.	Fire Flow Deficiency	Water main	Mid Term – 3 to 5 years	Fire flow deficiencies near Polson High School.
Increase PRV 9 setting to 25 psi.	Fire Flow Deficiency	PRV	Near Term -1 to 3 years	Fire flow deficiencies on 15th Ave East.
Additional hydrants in 11th Street E Vicinity	Fire Flow Deficiency	Hydrant Installations	Mid Term – 3 to 5 years	No fire flow coverage in area, additional hydrants required.
Additional hydrants in 12th Avenue E Vicinity	Fire Flow Deficiency	Hydrant Installations	Mid Term – 3 to 5 years	No fire flow coverage in area, additional hydrants required.
Additional hydrants along South Shore Route	Fire Flow Deficiency	Hydrant Installations	Mid Term – 3 to 5 years	No fire flow coverage in area, additional hydrants required.
Water System SCADA Improvements/Upgrades	Aging Infrastructure	SCADA	Near Term -1 to 3 years	SCADA system is out of date and in need of upgrades and additional functionality

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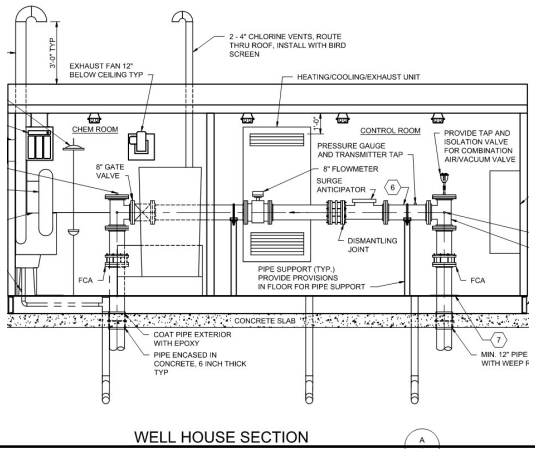
Current Well 8 Project:

- Emergency DEQ Approval
- Pump Station Design
- Spring Bidding



WELL HOUSE SECTION

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2022 Water System Improvements – No Grants

Category	Cost
Total Project Cost	$ 3,829,000
Treasure State Endowment Program Grant (TSEP)	$ 0
ARPA Grant	$ 0
USDA Rural Development Grant	$ 0
Total Grants	$ 0
Total Cost to be Financed	$ 3,829,000
Interest Rate	3.75%
Number of Years	20
Coverage	20%
Monthly Debt Service including Coverage	$ 27, 242
Monthly Increase in O&M	$ 0
Number of EDU's	3,179
Monthly Rate Per EDU	**$ 8.56**

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2022 Water System Improvements – ARPA Grants

Category	Cost
Total Project Cost	$ 3,829,000
Treasure State Endowment Program Grant (TSEP)	$ 0
ARPA Grant	$ 2,375,353
USDA Rural Development Grant	$ 0
Total Grants	$ 0
Total Cost to be Financed	$ 908,647
Interest Rate	3.75%
Number of Years	20
Coverage	20%
Monthly Debt Service including Coverage	$ 6,464
Monthly Increase in O&M	$ 0
Number of EDU's	3,179
Monthly Rate Per EDU	**$ 2.03**

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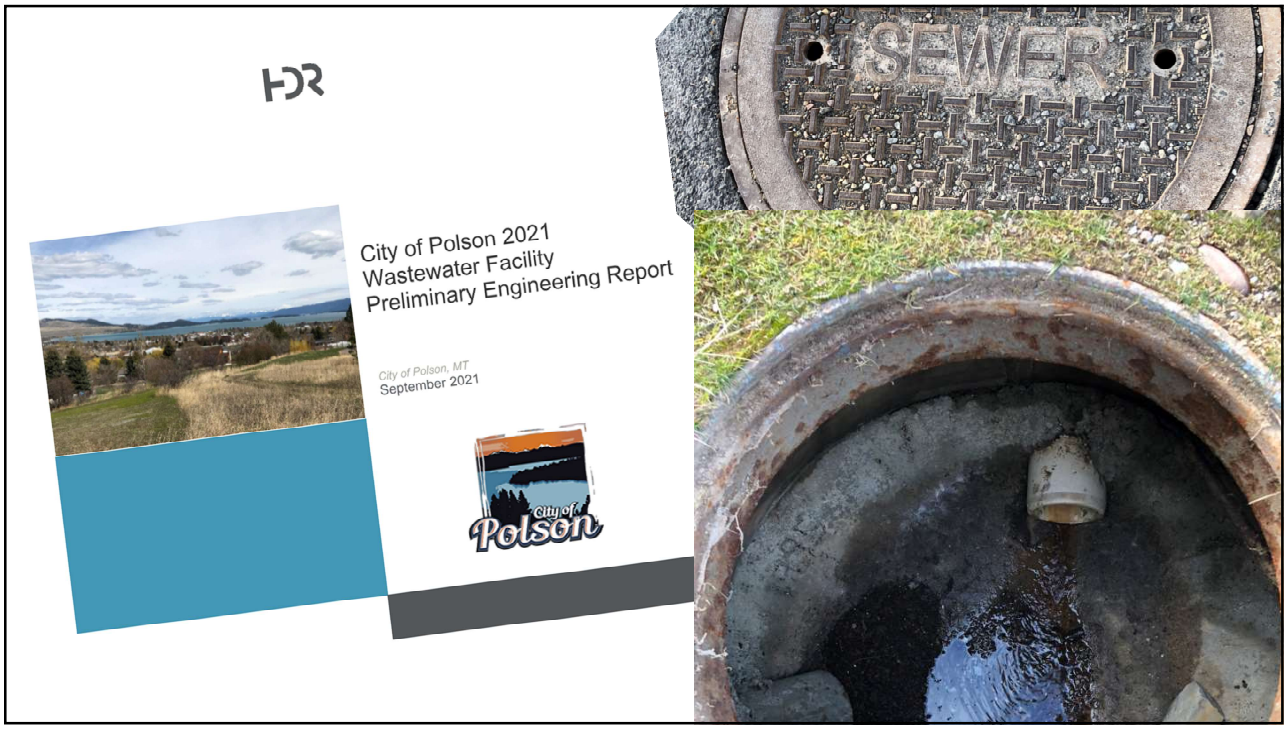

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Historical Per Capita Wastewater Flow

Table 1-10 Polson Gallons Per Capita Per Day (GPCD)

Timeframe	Total Volume, Day of Accumulation	Population Estimate for 2019[1]	Gallons Per Capita Per Day (GPCD)
April 23, 2019 – December 31, 2019	141.4 MG, 253 days		
January 1, 2020 – December 31, 2020	202.9 MG, 365 days [2]		
January 1, 2021, February 2, 2021	17.1 MG, 33 days		
Total	361.4 MG, 651 days		
Average Day Flow	*555,105 GPD 385 GPM*	*5060*	***109.7***

Notes:

[1] The population for 2019 is the estimate from Census data. The years 2020 were not available at this time of this report.

[2] While 2020 was a leap year, the WRRF Plant SCADA skipped February 17th, 2020 for an unknown reason therefore there are 365 days of data.

It should be noted that the gallons per capita per day represents the total metered water use (including commercial, industrial, and irrigation), divided by the total population. Given the wide variation in customer type and usage per zone, GPCD should not be used as a basis for actual per customer wastewater flows.

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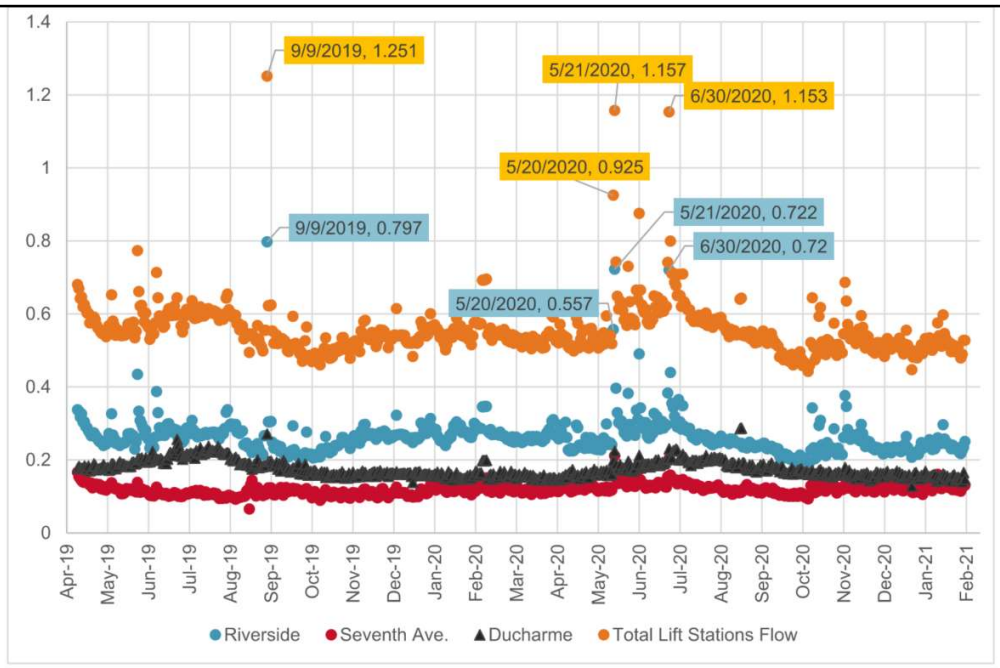

Figure 1-6 Flows to the WRRF in Million Gallons, April 23, 2019- February 2, 2021

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Projected Wastewater Demands

Table 1-11 Projected Population and Wastewater Flows for 2041

Growth Rates	0.65% per year	1.37% per year	2.28% per year
Population	5835	**6826**	8309
Peaking Factor	3.18	**3.12**	3.03
Average Day Volume (Million Gallons)	0.642	**0.751**	0.914
Average Flow (Gallons Per Minute)	446	**521**	635
Maximum Day Volume (Million Gallons)	1.01	**1.19**	1.44
Maximum Flow (Gallons Per Minute)	704	**824**	1003
Peak Hourly Demand (Gallons per Minute)	1417	**1627**	1923
Average Year (Million Gallons)	234	**274**	337

For planning, modeling and design purposes, the data associated with the 1.37% annual population growth will be used moving forward.

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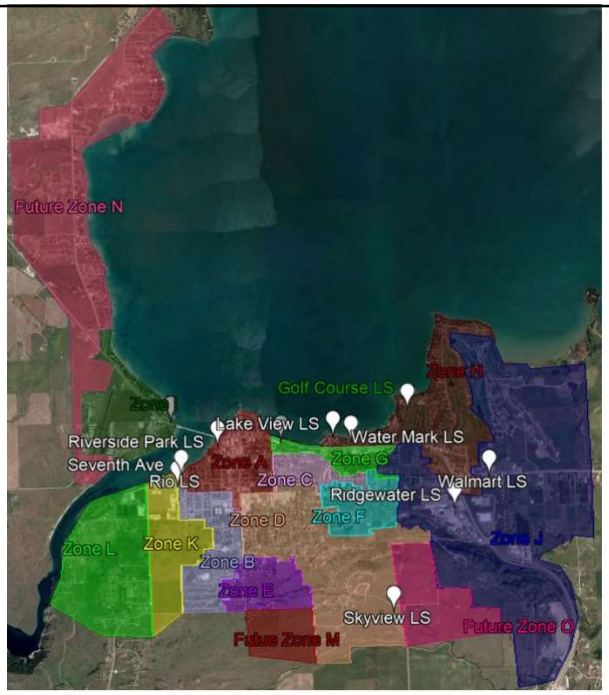

Figure 2-6. Polson Collection System Zones

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Wastewater Collection System – Sewer Mains

Table 2-1. City of Polson Collection System

Diameter (in)	Length (ft)
6	4,813
8	148,060
10	14,166
12	11,603
15	5,420
18	697
24	700

6-inch mains are out of compliance

35 Miles Total

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Wastewater Collection System – Lift Stations

Table 2-14: Polson Lift Station Installation/Upgrade Year

Lift Station	Installation Date	Upgrade Date	No. of Pumps	Pump Manufacturer	Capacity (gpm)
Golf Course	2003		2	Gorman Rupp	719
T.P. Mark	Unknown		2	GR-JSV3B60-X2.7	100
Lake View Village	1975	2013	2	Flygt 3102, N type impellers	290
West Shore	1996		3	Unknown	265
Riverside Park	1993	2013	3	Cornell	863
DuCharme Park	1994	2006	2	71 HP G.R. Big Grinders	1117
Rio	1989	2000	2	Flygt 3092, N type impellers	150
Seventh Avenue	1999		2	Gorman Rupp	640
Skyview	2010		2	Gorman Rupp	250
Tundra	2008		2	Gormunn Rupp and “Samurai Pump”	215
Walmart	2012		2	GR-SFV4C / Japan	150

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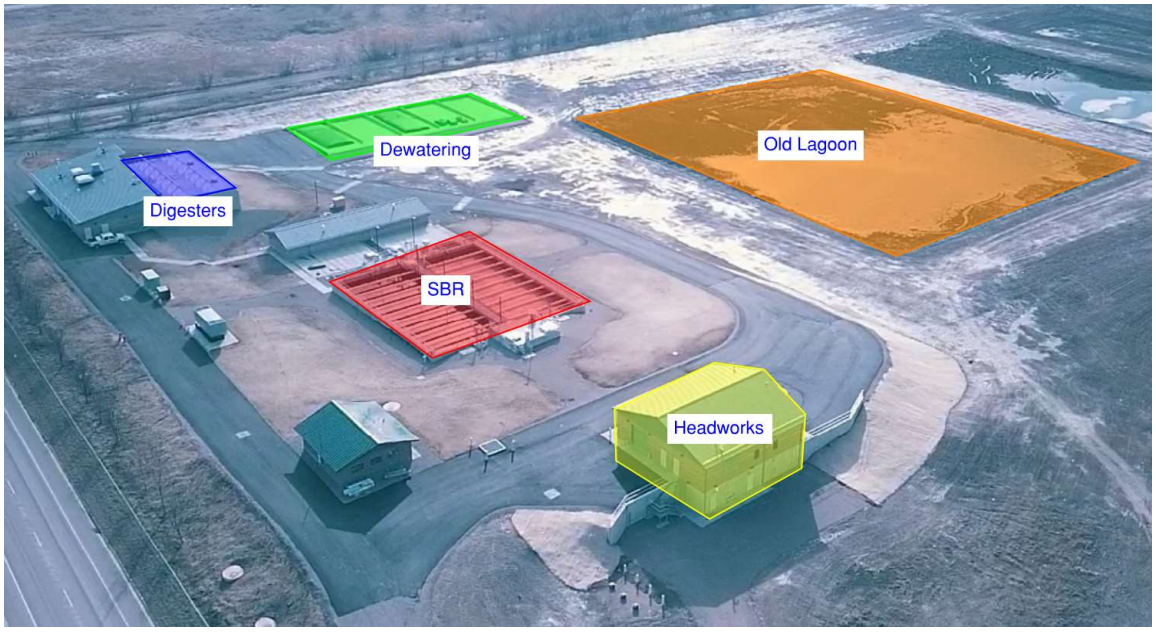
Wastewater Resource Recovery Facility



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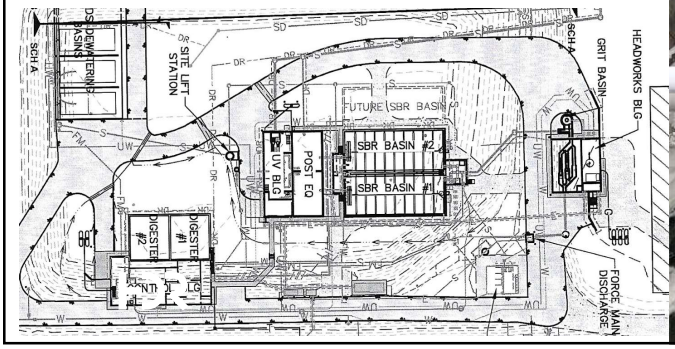
Wastewater Resource Recovery Facility

- Been in operation since 2019.
- Due to the age of the facility, a detailed evaluation was not included in the Wastewater PER
- No identified capacity or condition issues.
- There have been some treatment process issues that we have been working to address.



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Condition Assessment – Collection System

Table 2-15. Collection System Condition Assessment

Collection System Zone	Sewer Line Location	Project Name	Dia. (in)	Condition Assessment	MOC	Condition Notes
Zone A	Between 5th Ave W / 6th Ave W and Between Main St / 1st St E	Bank Alley	8	Failing	Clay Tile	Gravel, cannot camera
Zone A	5th Ave W, between 4th St W and 2nd St W	Riverside Addition Lines	8	Failing	Clay Tile	Separated clay tile
Zone A	Between 4th Ave W / 5th Ave W and 2nd St W and 1st St W	Riverside Addition Lines	8	Failing	Clay Tile	Separated clay tile
Zone C	Between 3rd Ave E / 4th Ave E and Between 5th St E / 7th St E	Subway Line	10	Failing	Clay Tile	Grease, shallow slope
Zone C	Between 4th Ave E / 5th Ave E and Between 5th St E / Immaculate Conception Catholic Church	Church Line	10	Failing	Clay Tile	Aggregate exposed, drop
Zone D	Between 11th Ave E / 12th Ave E and 1st St E / 2nd St E	City Shop Alley	8	Failing	Clay Tile	Several backups
Zone D	Between 12th Ave E / 15th Ave E and5th St E / 6th St E	Brown's Line	8	Failing	Clay Tile	Roots, backup
Zone H	Country Club Dr.	Golf to Lakeview Line	8	Failing	Clay Tile	

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Condition Assessment – Lift Stations

Table 2-16: Lift Station Condition Assessment

Lift Station	Comments
Golf Course Lift Station	New backup generator
T.P. Mark Lift Station	New backup generator
Lake View Village Lift Station	Complete replacement
West Shore Lift Station	New backup generator and move the control panel above ground
Riverside Park Lift Station	Remodel and update, install second wet well to increase wet well capacity, and eliminate overflow to the Flathead River
All Lift Stations	Tie all lift stations into SCADA with remote monitoring at WWTP

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Capacity Assessment – Collection System 2021

Figure 3-3 Existing System 2021

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Figure 3-5 Model Results 2031

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Recommended Improvements – Near Term

Table 7-1. 2021 Phase 1

Project Description	Location	Need	Priority	Recommended Timeline	Consequence if not Corrected	Recommended Alternative	Cost Estimate (2020)	Funding Sources	Schedule
Lift Station: Riverside Park	Riverside Park LS	Remodel and update, install second wet well to increase wet well capacity, and eliminate overflow to the Flathead River	High	Near term - 1 to 3 years	• Backup of raw sewage into basements and overflow into Flathead Lake • 1, 2 & 3	• Update and remodel LS	$1,200,000	ARPA Minimum Allocation Grant ARPA Local Fiscal Recovery Funds ARPA Competitive Grant	September 2021 through December 2022
Lift Station: Lake View	Lake View LS	Complete Replacement	High	Near term - 1 to 3 years	• Backup of raw sewage into basements and overflow into Flathead Lake • 1, 2 & 3	• Replace LS	$500,000		
Collection System: Hillcrest	Line to run along Hillcrest to Seventh LS	New line to alleviate system capacity issues	High	Near term - 1 to 3 years	• Backup of raw sewage into basements and overflow into Flathead Lake • 1, 2 & 3	• Replace clay tile pipes	$200,000		
Lift Station: All	All Lift Stations	Tie all lift stations into SCADA with remote monitoring at WWTP	High	Near term - 1 to 3 years	• Failure to have network control of entire collection system resulting in backup of raw sewage into basements and overflow into Flathead Lake • 1, 2 & 3	• Upgrade SCADA	$250,000		

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2022 Wastewater System Improvements – Potential Rate Determination
No Grants

Category	Cost
Total Project Cost	$ 2,150,000
Treasure State Endowment Program Grant (TSEP)	$ 0
ARPA Grant	$ 0
USDA Rural Development Grant	$ 0
Total Grants	$ 0
Total Cost to be Financed	$ 2,150,000
Interest Rate	3.75%
Number of Years	20
Coverage	20%
Monthly Debt Service including Coverage	$ 15,296
Monthly Increase in O&M	$ 0
Number of EDU's	3,179
Monthly Rate Per EDU	**$ 4.81**

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2022 Wastewater System Improvements – Potential Rate Determination
ARPA Grant

Category	Cost
Total Project Cost	$ 2,150,000
Treasure State Endowment Program Grant (TSEP)	$ 0
ARPA Grant	$ 2,150,000
USDA Rural Development Grant	$ 0
Total Grants	$ 0
Total Cost to be Financed	$ 0
Interest Rate	3.75%
Number of Years	20
Coverage	20%
Monthly Debt Service including Coverage	$ 0
Monthly Increase in O&M	$ 0
Number of EDU's	3,179
Monthly Rate Per EDU	**$ 0.00**

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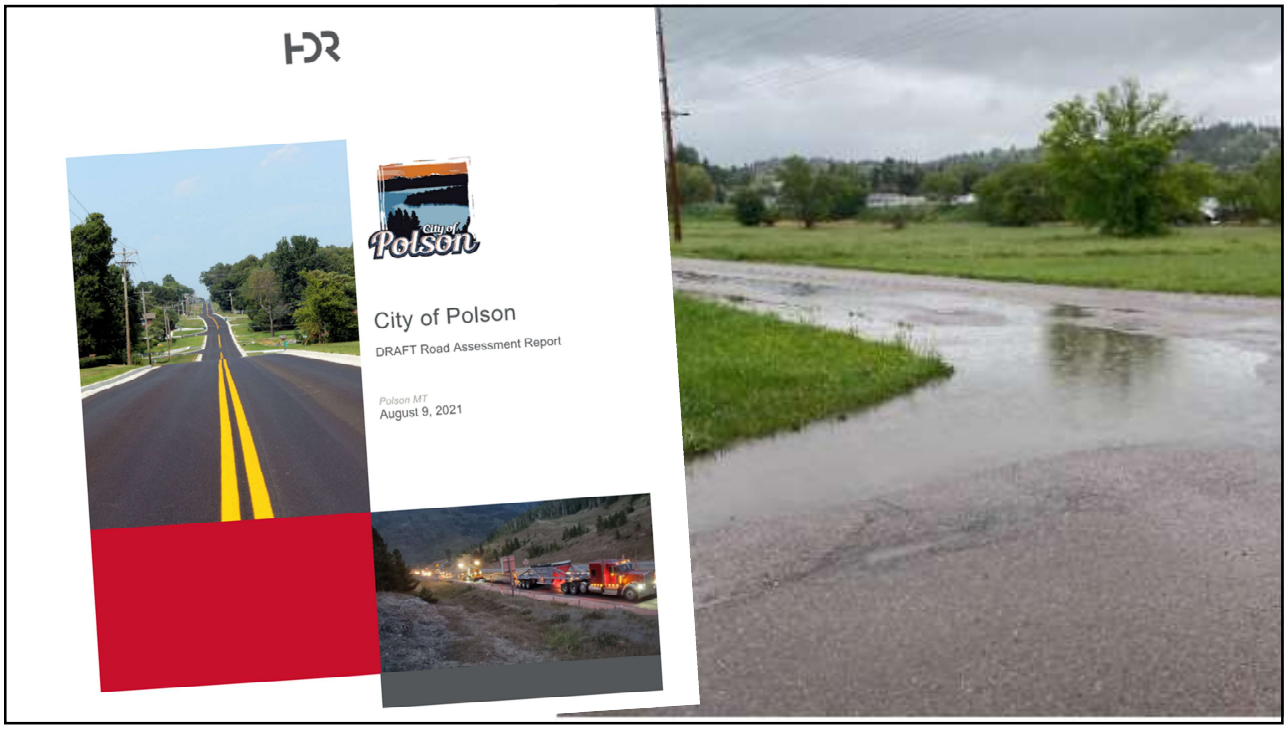

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Roadway Classifications

- Residential roadways are characterized as having low speeds and traffic volumes while serving as local streets that provide direct access to adjacent properties (Road Design Manual, MDT 2016). An example of a residential roadway is 15th Ave. E. as it serves to connect private residents to the 7th St. E. collector.
- Collectors are characterized as systems that move less volumes of traffic than arterials and serve as intermediate links between the arterials and points of origin (Road Design Manual, MDT 2016). The City's 12th Ave. E. is an example of a collector roadway as it connects residential and local roads to the two primary arterials, 1st. St. E. and 2nd St. W.
- Arterials are generally characterized as road systems that move and provide travel between major points while also serving adjacent properties. These systems play an important role in inter- and intra-urban circulation (A Policy on Geometric Design of Highways and Streets: AASHTO 2018).

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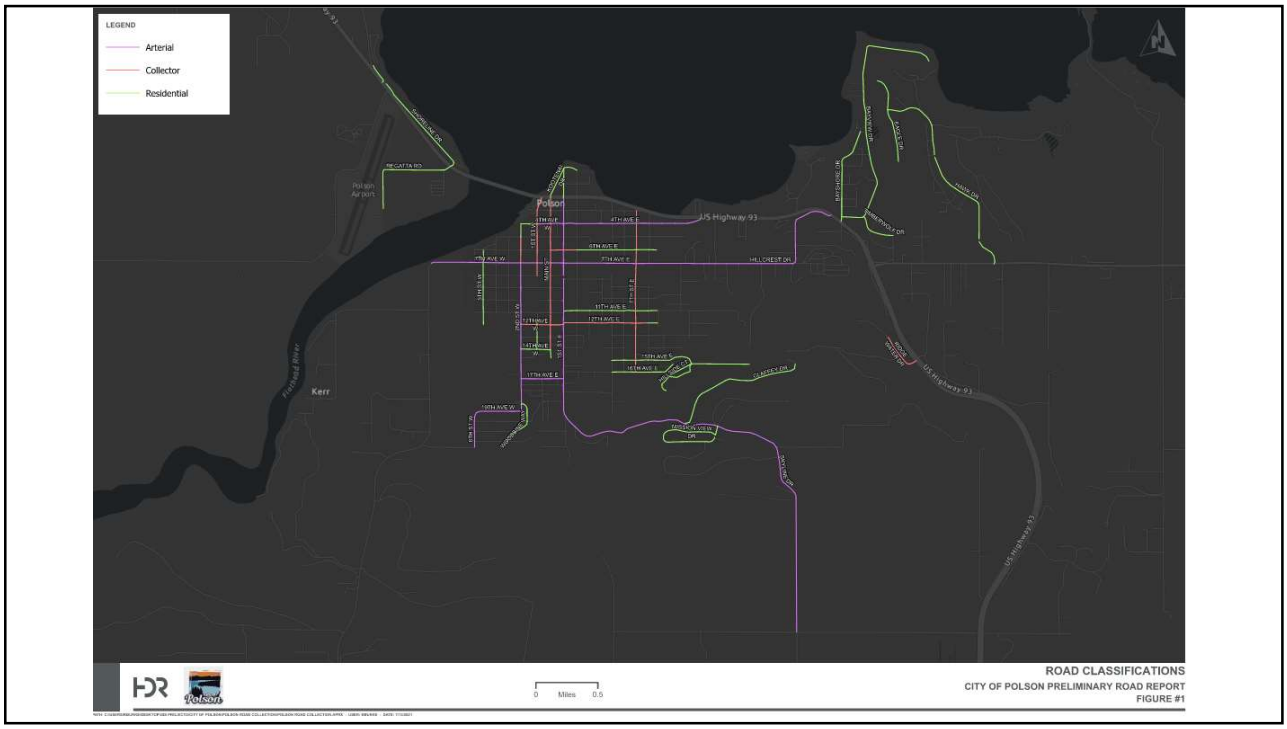

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Table 1. Severity Characteristics

RATING	PAVEMENT CONDITION	SUBGRADE PERFORMANCE	DRAINAGE PERFORMANCE	ADA COMPLIANCE
1	Minor cracking and pavement deterioration	No evidence of settlement	No evident ponding	Pedestrian ramps, crossings, and walkways meet ADA/PROWAG requirements
2	Moderate cracking and minor potholing	Minor alligator cracking and settlement evident	Minor ponding and lack of adequate drainage features	Pedestrian ramps, crossings, and walkways do not meet ADA/PROWAG requirements
3	Major cracking, potholing, and rutting. Evident failure of the pavement surface	Major settlement with depressed road section.	Major ponding and no drainage features provided	Pedestrian facilities missing where required

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17th Ave. E. – Cracking and Pavement Deterioration

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2nd Street – Crack and Chip Seal Candidate

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1st Street E. – Pavement Deterioration

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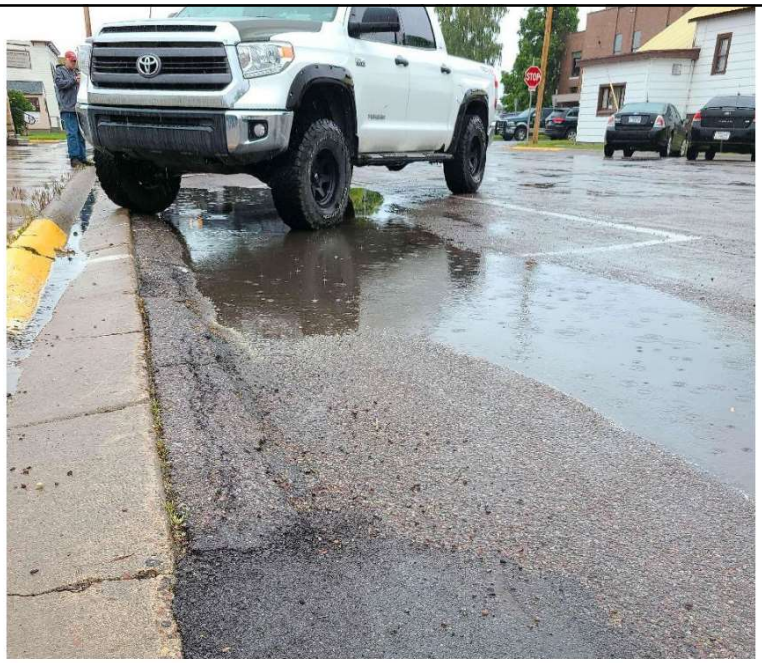

1st Street E. – Curb and Subgrade Failure

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4th Ave. and 7th Street Intersection – Severe Subgrade Failure

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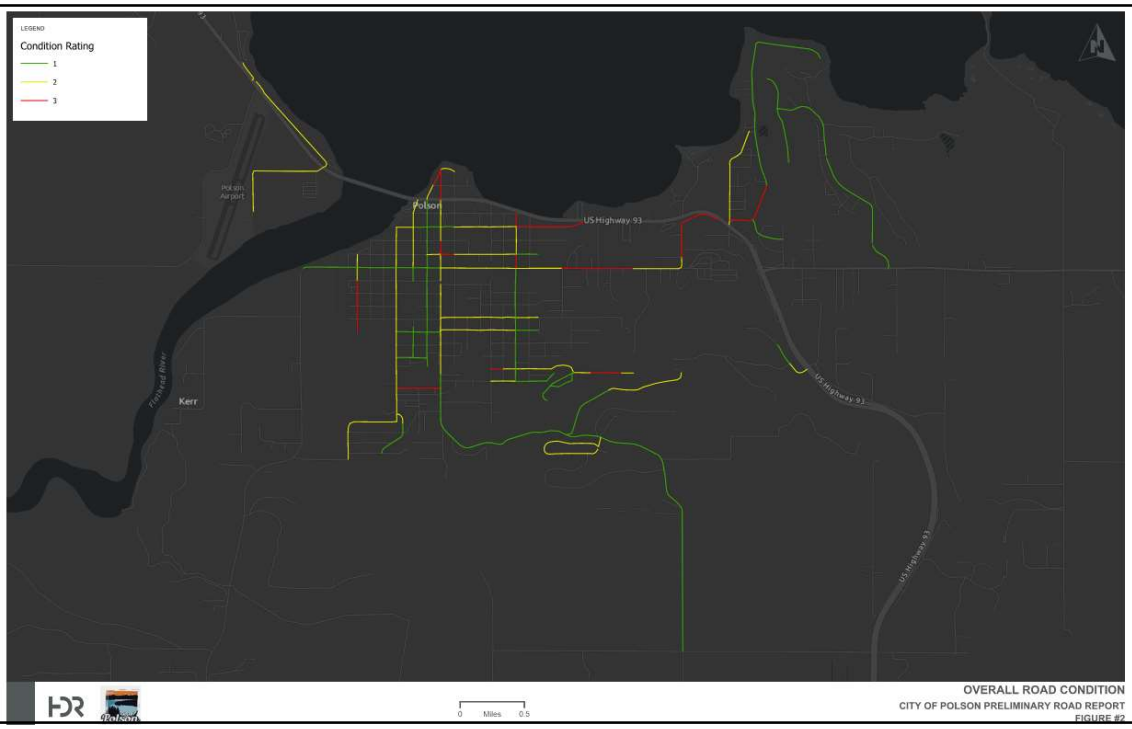

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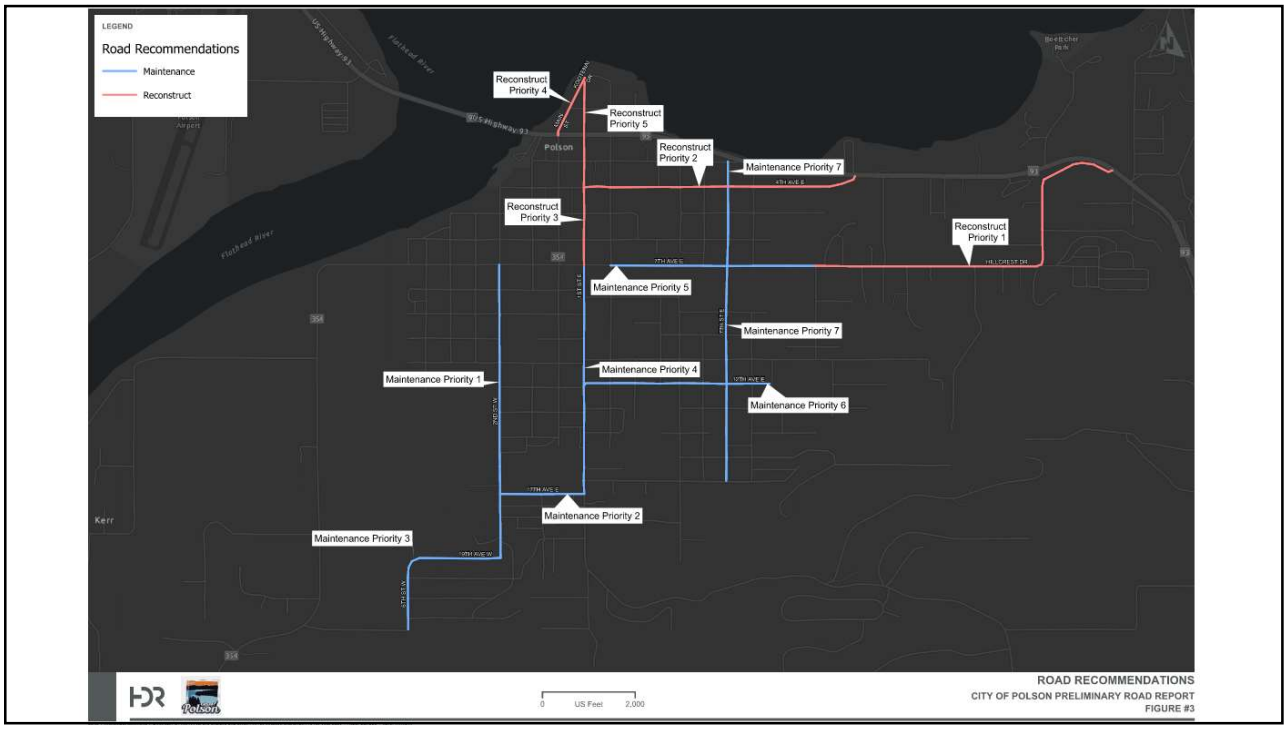

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Road Maintenance Recommendations

Table 2. Preliminary Roadway Maintenance Recommendations

Maintenance Recommendations				
Priority	**Street Name**	**Estimated Work Type**	**Estimated Cost**	**Comments**
1	2nd St W	Crack Seal, Chip Seal	$200k - $310k	$1.11/sf - $1.73/sf
2	17th Ave W/E	Overlay	$190k - $300k	$5.68/sf – $8.97/sf
3	19th Ave W	Chip Seal	$60k - $95k	$0.67/sf - $1.06/sf
4	1st St E – S of 7th	Mill/Fill	$550k - $865k	Pending Geotech analysis
5	7th Ave E	Overlay	$485k - $760k	$5.11/sf - $8.01/sf
6	12th Ave E	Overlay	$330k - $515k	$5.00/sf – $7.80/sf
7	7th St E	Chip Seal W/ Some Overlay	$380k - $590k	$3.14/sf – $4.88/sf

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Road Reconstruction Recommendations

Table 3. Preliminary Roadway Reconstruction Recommendations.

Reconstruction Recommendations				
Priority	**Street Name**	**Estimated Work Type**	**Estimate Cost**	**Comments**
1	Hillcrest Dr	Reconstruction & Widening	$1.55M - $2.35M	Address SUP crossing area, Drainage
2	4 Ave E	Full Reconstruction	$3.00M - $4.50M	C&G, Sidewalk, ADA
3	1st St E - South of 93	Shoulder Recon. & Mill/Fill	$1.50M - $2.25M	C&G failed, subgrade failure
4	Main St E - North of 93	Partial Reconstruction	$750K – $1.15M	Optional Mill/fill
5	1 St E - North of 93	Partial Reconstruction	$650K – $950k	Optional Mill/Fill

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Table 1-4. Historical US Bureau of Census Data

Census Date	Population	Annual Average Growth Rate
1960	2,314	-
1970	2,464	0.65%
1980	2,798	1.36%
1990	3,291	1.76%
2000	4,041	2.28%
2010	4,488	1.11%
2019[1]	5,060	1.42%

[1]2020 Census results are expected to be available in Spring of 2021, the 2019 population is an estimate.

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