

PLWA Asset Inventory & Capital Replacement Costs

Version 1

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File: CapitalReplacement_Rev1

Summary

- The estimated replacement cost of our entire system is **1.7 ± 0.25 million** dollars.
 - **\$600 thousand** for the pumphouse & associated equipment, reservoir, generator, & well. That is, the equipment at the top of the hill.
 - **\$1.1 million** for the underground piping and associated equipment: hydrants valves, & meters.
 - There is a variation of about \$0.25 million based on differing cost estimates for installing underground water mains, \$150 to \$250 per linear foot.
- The association has begun replacement of the filtration system at the pumphouse. The total cost of this is estimated to be \$143,000. \$121,000 is required to complete this effort.
 - Engineering studies required by the WA Dept. Of Health (WA DOH) have been initiated and are ready for review. Approximately \$22 thousand has been spent on this effort to date.
- The board is also recommending that replacement of the well pump be provisioned for in the near term.
- Currently, there is about \$26,000 of capital available to apply to the cost to complete these projects
- Note: The association retains an emergency capital reserve of \$17,500 for dire contingencies that could shut down the system. This is not included in the available capital. The board also strives to maintain 6 months worth of operating costs in reserve. This is approximately \$7500.

Capital Fund Status

- Current Capital Fund Balance (as of 5/24/2024): \$45446.96
- Emergency Reserve: -\$17,500:
- Other Commitments, work performed but not yet invoiced: -\$2,000
- Available for spending : \$25946.96
- Potential capital revenue from access fees for new hookups is limited to \$22,000. Only 2 lots have not paid their access fees. No revenue, from this source, is expected in the near future.

Capital Needs & Benefits: 10 Year plan

Short Term, 2 years

- Replace the filtration plant.
 - Filter medium is spent resulting in black grit in the water & ineffective mineral removal.
 - Tanks are showing signs of water osmosis. Controls are unreliable and at the end of their useful life.
 - System is prone to leaks, especially the ozone generator.
- Provision for replacement of the (2nd generation) well pump.
 - Currently installed pump has lasted longer than the original one.
 - System is nearing capacity with 22 of 24 connections in use or in process. This results in more load on the system, making pump failure more likely.
- Capital needed to complete: \$121,000. \$2,500 per household for 2 years

Long Term, years 3 through 10 and beyond

- Generate sufficient reserves to replace the entire system based on depreciation and expected lifetime. Items would be replaced as they break or wear out.
- Average annual capital needed for 100% replacement: \$51,000.
- Annual cost per household: 2330.
- The state and Whidbey Island Water Systems Association (WIWSA) recommend a 10 year forward projection and an update every five years of the capital plan.

Polnell Landing Water Association System Replacement Cost Details

Component	Category	Replacement cost estimate	Summary Description	Total Expected lifetime, years
RESERVOIR		\$225,343		
	Long Life	\$199,920	Storage Tank	60
	Mid life	\$25,423	Piping & Valves at base	30
PUMP HOUSE EQUIPMENT		\$259,272	Equipment inside the pump house	
	Filtration	\$143,016	Filtration plant in pumphouse	
	Mid life	\$130,547	Engineering, Filter tanks, piping	30
	short life	\$12,469	Injectors, preassure valve	15
	Distribution	\$116,256	Distribute from reservoir to Piping	
	Long Life	\$102,724	Preassure tanks, valves, & Piping	60
	Mid Life	\$4,188	Pressure tank controls	25
	Short Life	\$9,343	Booster Pumps	15
PUMP HOUSE BUILDING		\$54,870		
	Long life	\$49,668	Building, less roof	60
	Mid Life	\$5,201	roof	30
WELL		\$20,116		
	Long life	\$13,315	well drilling & casing	40
	Short Life	\$6,801	pump & wiring	15
GENERATOR		\$14,937		
	Mid Life	\$14,937	Generator set, wiring & fuel storage	25
DISTRIBUTION PIPING		\$1,104,295	~4800' of underground piping	
	Long Life	\$982,393	pipes & installation	75
	Mid Life	\$71,971	valves & Hydrants	30
	Short Life	\$49,932	meters	15
SYSTEM ESTIMATED REPLACEMENT COST	Grand Total	\$1,678,833		

Note: Total expected lifetime is measured from installation, not the remaining lifetime.

Capital Replacement Plan Methodology

1. Divide the System into assemblies. Perform a detailed inventory of the components in each assembly.
 - Use current price of each component (e.g., Grainger catalog).
 - Use estimates for labor & alternatives for components which no longer are available or were custom built.
2. Use estimates provided by FACET (formerly DCG) Engineering for the filtration subassembly.
3. Use \$200 per linear foot for replacement of distribution mains. This is the middle cost range of \$150 to \$250. The higher number is taken from WA DOH documentation The lower number from conversations at WIWSA meetings.
4. Group components into subassemblies based on lifetimes & calculate replacement cost of each subassembly.
5. For each subassembly, straight line depreciate cost over the remaining lifetime. Determine baseline annual depreciation.
6. Determine depreciation on an annual basis for the next 10 years. Adjust for inflation (3%-5%) and potential income (%1) each year.
7. Plan for Replacement of the filtration system & well pump in 2 years. Start collecting for replacement of the entire system starting in year 3.
8. Sum and average over the final 8 years to determine annual cost for all assemblies.
9. Divide by number of connections (22) to determine annual cost per connection.
10. A 30% contingency and 8.7% tax has been incorporated in the estimates. These are the same values used engineer's estimates for the filtration system replacement. For the generator, only, the actual contracted cost was used.
11. For determining remaining lifetimes, it was assumed that the system has been in operation for 23 years.

Capital Replacement Study, Sample Asset Inventory

DISTRIBUTION					\$116,255.74	
didtribution, short life						
	3 HP booster pump	2	\$2,557.00	\$5,114.00	Granger catalog; matches pipe size & power; Goulds 3BF1H1C0	https://www.grainger.com/product/GOULDS-WATER-TECHNOLOGY-Centrifugal-Pump-3-hp-3CCT9
	well head buffer tank	1	\$470.00	\$470.00	Well Trol WX203 32 gal, well head buffer	https://www.supplyhouse.com/Amtrol-WX-203-WX-203-146S30-32-Gal-WELL-X-TROL-Well-Tank-Stand
	backwash Preasure buffer tank	1	\$287.00	\$287.00	Well Trol WX201, 14 gal	WX-201 - Amtrol WX-201 - WX-201 (143S29), 14 Gal WELL-X-TROL Well Tank (Stand) (supplyhouse.com)
	Sum of above items		\$5,871.00			
	allowance for Misc & missed parts, taxes & contingencies	0.387	\$2,272.08	\$2,272.08	30% contingency 8.7% taxes	
	Sub Total			\$8,143.08		
	Labor	8	\$150.00	\$1,200.00		
	distribution, short life assembly subtotal				\$9,343.08	
didtribution, mid life						
	Hydropneumatic tank controls					
	air volume control for Hydropneumatic tanks	1	\$2,587.00	\$2,587.00	This appears to be of the tanks drive	Air Compressor (Whitewater Mfg) - \$2,576.87 - Water Softner Parts, Water Softner Parts (parts.com)
	misc. parts, contingencies taxes	0.387	\$1,001.17	\$1,001.17		
	sub total			\$3,588.17		
	labor	4	\$150.00	\$600.00		
	distribution, mid life assembly sub total				\$4,188.17	
distribution, long life						
	Hydroneumatic tanks	4.5	\$3,459.00	\$15,565.50	The current tanks are custom built. Here is an air tank of smaller volume. Estimate based on equivalent volume	Industrial Air 021-0414, Vertical Receiver Tank, 30" Diameter, 200 Gallon, 175 PSI (globalindustrial.com)



- Some items, e.g. hydropneumatics tanks & reservoir, were custom built. In these cases, prices for multiple lower capacity tanks were used that provided similar capabilities.
- In most cases Labor was estimated at 2 to 4 man weeks for each major subassembly. In other cases, a percentage of the component costs was used, typically 50%.
- Lifetimes were based on state supplied information or our operating experience, for example, the O3 generator & well pump. Lifetime monikers (short, mid, long) are not uniform across subassemblies.

Filtration Plant Replacement Cost Estimates

Filtration Plant upgrade costs based on engineer's estimate, Aug 2021. (#) references refer to the construction cost item in the original document. Contingencies have been incorporated into each item rather than lumped in at the end

Reference:	..\FilterPlantUpgrades\Probable Project Cost Estimate_Polnell Landing.pdf				
Inflation factor, short term		1.05			
Inflation factor, long term		1.03			
contingency factor (30%)		1.3			
Filter Plant Replacement	Original Estimates;	est.	30% contingency (see	inflation	2023
	8/2021	lifetime,	note 1)		estimate
		years			
Grand Total	\$104,400.00		\$129,720.00		\$143,016.32
Mid life Items					
<i>sub total</i>	<i>\$95,700.00</i>		<i>\$118,410.00</i>		<i>\$130,547.03</i>
Engineering Costs, Design Permitting & support	\$30,000.00	30	\$33,000.00	1.05	\$36,382.50
ATEC Filtration System; 3 18" filters (#1)	\$35,000.00	30	\$45,500.00	1.05	\$50,163.75
Backwash Infiltration area (#5)	\$2,000.00	30	\$2,600.00	1.05	\$2,866.50
Emergency eyewash station (#6)	\$3,000.00	30	\$3,900.00	1.05	\$4,299.75
Piping & Valves (#7)	\$10,000.00	30	\$13,000.00	1.05	\$14,332.50
Electrical (#8)	\$5,000.00	30	\$6,500.00	1.05	\$7,166.25
Removal of existing components (#9)	\$3,000.00	30	\$3,900.00	1.05	\$4,299.75
Taxes	\$7,700.00	30	\$10,010.00	1.05	\$11,036.03
Short life items					
<i>sub total</i>	<i>\$8,700.00</i>		<i>\$11,310.00</i>		<i>\$12,469.29</i>
Preassure sustaining valve (#2)	\$3,000.00	15	\$3,900.00	1.05	\$4,299.75
Chlorine injection system (#3)	\$2,500.00	15	\$3,250.00	1.05	\$3,583.13
Potassium Permanganate Injection System (#4)	\$2,500.00	15	\$3,250.00	1.05	\$3,583.13
Taxes	\$700.00	15	\$910.00	1.05	\$1,003.28
Engineering Expenditures to date:	\$21,561.55				
DCG, 12/4/2022	\$2,028.50				
DCG, 4/24/2023	\$3,068.50				
DCG, 12/2/2023	\$4,343.50				
DCG, 12/28/2023	\$1,623.00				
FACET, 4/22/2024	\$5,475.80				
FACET, 5/15/2024	\$5,022.25				
remaing engineering costs					\$14,820.95
Notes:					
1. DCG added a 30% contingency . This has been incorporated into each line line item individually with the exception of engineering. A 10% contingency has been added to that item.					

Capital Replacement Costs, Short Term, Years 1 & 2

Component	Category	Summary Description	Replacement Cost in 2023 \$	Remaing Lifetime	Inflation Factor	2023 replacement cost / remaining lifetime	2024	2025
RESERVOIR			\$225,343					
	Long Life	Storage Tank	\$199,920	37	0.03	\$5,403.24	\$0.00	\$0.00
	Mid life	Piping & Valves at base	\$25,423	12	0.03	\$2,118.62	\$0.00	\$0.00
PUMP HOUSE EQUIPMENT		Equipment inside the pump house	\$266,408					
Filtration; Current project		Filtration plant in pumphouse	\$121,455					
	Mid life	Engineering, Filter tanks, piping	\$108,985	2	0.05	\$54,492.74	\$56,672.45	\$58,939.35
	short life	Injectors, preassure valve	\$12,469	2	0.05	\$6,234.65	\$6,484.03	\$6,743.39
Filtration; Next Generation		Filtration plant in pumphouse	\$143,016					
	Mid life	Engineering, Filter tanks, piping	\$130,547	30	0.03	\$4,351.57	\$0.00	\$0.00
	short life	Injectors, preassure valve	\$12,469	15	0.03	\$831.29	\$0.00	\$0.00
Distribution		Distribute from reservoir to Piping	\$116,256					
	Long Life	Preassure tanks, valves, & Piping	\$102,724	37	0.03	\$2,776.34	\$0.00	\$0.00
	Mid Life	Pressure tank controls	\$4,188	10	0.03	\$418.82	\$0.00	\$0.00
	Short Life	Booster Pumps	\$9,343	5	0.05	\$1,868.62	\$0.00	\$0.00
PUMP HOUSE BUILDING			\$54,870					
	Long life	Building, less roof	\$49,668	37	0.03	\$1,342.39	\$0.00	\$0.00
	Mid Life	roof	\$5,201	7	0.05	\$743.04	\$0.00	\$0.00
WELL			\$20,116					
	Long life	well drilling & casing	\$13,315	17	0.03	\$783.25	\$0.00	\$0.00
Near term pump replacement	Short Life	pump & wiring	\$6,801	2	0.05	\$3,400.48	\$3,536.49	\$3,677.95
Long term replacement	Short Life	pump & wiring	\$6,801	15	0.03	\$453.40	\$0.00	\$0.00
GENERATOR			\$14,937					
	Mid Life	Generator set, wiring & fuel storage	\$14,937	21	0.03	\$711.28	\$0.00	\$0.00
DISTRIBUTION PIPING		~4800' of underground piping	\$1,104,295					
	Long Life	pipes & installation	\$982,393	52	0.03	\$18,892.16	\$0.00	\$0.00
	Mid Life	valves, Hydrants, meters	\$71,971	30	0.03	\$2,399.02	\$0.00	\$0.00
	Short Life	meters	\$49,932	20	0.03	\$2,496.60	\$0.00	\$0.00
		Total Amount needed Annually					\$66,692.97	\$69,360.69
		Less available funds (\$26,000 total)					-\$13,000.00	-\$13,000.00
		short term capital needed				\$110,053.67	\$53,692.97	\$56,360.69
		Per connection (22)					\$2,440.59	\$2,561.85

Capital Replacement Costs, Long Term, Years 3 thru 10

Component	Category	Summary Description	Replacement Cost in 2023 \$	Remaining Lifetime	Inflation Factor	2023 replacement cost / remaining lifetime	2026	2027	2028	2029	2030	2031	2032	2033	8 Year Total	Average Annual Contribution	Annual Per connection (22 connections)
RESERVOIR			\$225,343														
	Long Life	Storage Tank	\$199,920	37	0.03	\$5,403.24	\$5,621.53	\$5,733.96	\$5,848.64	\$5,965.62	\$6,084.93	\$6,206.63	\$6,330.76	\$6,457.38	\$48,249.45	\$6,031.18	\$274.14
	Mid Life	Piping & Valves at base	\$25,423	12	0.03	\$2,118.62	\$2,204.21	\$2,292.38	\$2,384.07	\$2,479.43	\$2,578.61	\$2,681.76	\$2,789.03	\$2,900.59	\$20,310.07	\$2,538.76	\$115.40
PUMP HOUSE EQUIPMENT		Equipment inside the pump house	\$266,408														
		Filtration plant in pumphouse	\$121,455														
	Mid life	Engineering, Filter tanks, piping	\$108,985	2	0.05	\$54,492.74	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
	short life	Injectors, preassure valve	\$12,469	2	0.05	\$6,234.65	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
		Filtration plant in pumphouse	\$143,016														
	Mid Life	Engineering, Filter tanks, piping	\$130,547	30	0.03	\$4,351.57	\$4,527.37	\$4,617.92	\$4,710.28	\$4,804.48	\$4,900.57	\$4,998.58	\$5,098.56	\$5,200.53	\$38,858.29	\$4,857.29	\$231.30
	short life	Injectors, preassure valve	\$12,469	15	0.03	\$831.29	\$864.87	\$882.17	\$899.81	\$917.81	\$936.16	\$954.89	\$973.98	\$993.46	\$7,423.15	\$927.89	\$44.19
		Distribute from reservoir to Piping	\$116,256														
	Long Life	Preassure tanks, valves, & Piping	\$102,724	37	0.03	\$2,776.34	\$2,888.50	\$2,946.27	\$3,005.20	\$3,065.30	\$3,126.61	\$3,189.14	\$3,252.92	\$3,317.98	\$24,791.92	\$3,098.99	\$140.86
	Mid Life	Pressure tank controls	\$4,188	10	0.03	\$418.82	\$435.74	\$444.45	\$462.23	\$480.72	\$499.95	\$519.95	\$540.74	\$562.37	\$3,946.15	\$493.27	\$22.42
	Short Life	Booster Pumps	\$9,343	5	0.05	\$1,868.62	\$1,944.11	\$1,982.99	\$2,062.31	\$2,144.80	\$2,230.59	\$2,319.82	\$2,412.61	\$2,509.11	\$17,606.34	\$2,200.79	\$100.04
PUMP HOUSE BUILDING			\$54,870														
	Long life	Building, less roof	\$49,668	37	0.03	\$1,342.39	\$1,396.62	\$1,424.56	\$1,453.05	\$1,482.11	\$1,511.75	\$1,541.99	\$1,572.83	\$1,604.28	\$11,987.18	\$1,498.40	\$68.11
	Mid Life	roof	\$5,201	7	0.05	\$743.04	\$773.05	\$788.52	\$820.06	\$852.86	\$886.97	\$922.45	\$959.35	\$997.72	\$7,000.98	\$875.12	\$39.78
WELL			\$20,116														
	Long life	well drilling & casing	\$13,315	17	0.03	\$783.25	\$814.89	\$831.19	\$847.81	\$864.77	\$882.06	\$899.70	\$917.70	\$936.05	\$6,994.18	\$874.27	\$39.74
Near term pump replacement	Short Life	pump & wiring	\$6,801	2	0.05	\$3,400.48	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Long term replacement	Short Life	pump & wiring	\$6,801	15	0.03	\$453.40	\$471.71	\$481.15	\$500.39	\$520.41	\$541.23	\$562.88	\$585.39	\$608.81	\$4,271.96	\$534.00	\$24.27
GENERATOR			\$14,937														
	Mid Life	Generator set, wiring & fuel storage	\$14,937	21	0.03	\$711.28	\$740.01	\$754.81	\$769.91	\$785.31	\$801.01	\$817.03	\$833.38	\$850.04	\$6,351.51	\$793.94	\$36.09
DISTRIBUTION PIPING		~4800' of underground piping	\$1,104,295														
	Long Life	pipes & installation	\$982,393	52	0.03	\$18,892.16	\$19,655.41	\$20,048.52	\$20,449.49	\$20,858.48	\$21,275.64	\$21,701.16	\$22,135.18	\$22,577.88	\$168,701.75	\$21,087.72	\$958.53
	Mid Life	valves, Hydrants, meters	\$71,971	30	0.03	\$2,399.02	\$2,495.94	\$2,545.86	\$2,596.78	\$2,648.72	\$2,701.69	\$2,755.72	\$2,810.84	\$2,867.06	\$21,422.61	\$2,677.83	\$121.72
	Short Life	meters	\$49,932	20	0.03	\$2,496.60	\$2,597.46	\$2,649.41	\$2,702.40	\$2,756.45	\$2,811.58	\$2,867.81	\$2,925.16	\$2,983.67	\$22,293.94	\$2,786.74	\$126.67
		Total Amount needed Annually					\$47,431.44	\$48,424.15	\$49,512.42	\$50,627.25	\$51,769.36	\$52,939.50	\$54,138.42	\$55,366.94	\$410,209.49	\$51,276.19	\$2,330.74

Long Term, years 3 through 10 and beyond

- Generate sufficient reserves to replace the entire system based on depreciation and expected lifetime. Items would be replaced as they break or wear out.
- Average annual capital needed for 100% replacement: \$51,276
- Annual cost per household: 2330.
- The state and Whidbey Island Water Systems Association (WIWSA) recommend a 10 year forward projection and an update every five years.

Other Comments

- This analysis is based on the assumption that any replacement elements would provide the same level of service as those in the current system.
- Replacement components would be of the same quality and material as the present system. No attempt was made to “re-engineer” the system using different materials.
- The association may wish to consider additional projects and improvements. The following are suggestions, but have not been incorporated into the calculations:
 - Remote monitoring of the reservoir.
 - Remote monitoring of filtration system operation
 - Remote sensing of the well levels. Note: The state may require this in the future.
 - Increase reservoir capacity

Appendices

References & Files

This summarizes the files used in the preparation of this report. They should be considered a part of this study.

Event Chronology

This provides historical perspective as to the events leading up to this point in time.

References & Files 1

- **MajorAssets_revA.xlsx**: EXCELI™ spreadsheet containing the asset inventory, estimates & calculations for the capital replacement figures. It contains the following tabs:
 - **Summary**. This tab summarizes the cost of the components sorted by category as well as their expected lifetime
 - **Filter Plant Estimates**. This tab contains the cost estimates for the filter plant replacement project. They are based on data provided by DCG in August of 2021. They have been escalated for inflation.
 - **Detailed Inventory**: This is a detailed inventory of all the pieces & parts for each component and category. It contains cost of each individual item and labor estimates. The last two columns are the basis of estimate as well as reference links to internet pages containing pricing data.
 - **CaptlRplc1**: This tab contains the calculations for the capital replacement costs of each category & component.
 - **Main Lengths**: This tab was used to calculate the replacement costs of the water mains. It is based on a price of \$200 per foot. Some adjustment was made for pipe size, but this was not very significant.

References & Files 2

- **AM Webinar 2020PWB.pdf.** These are presentation materials from a WA DOH webinar on asset management of water systems. It was intended for systems with several hundred connections. I used it for information concerning lifetimes of major components. See the chart on page 25. Note: They refer to a spreadsheet for calculating replacement costs. This was too complicated for our system.
- **MtgNotes_2023_09_21.** These are notes from the quarterly meeting of the Whidby Island Water Systems Associations. The meeting covered such topics as rate setting, financial reserves & a quick and simple method for capital replacement cost estimation. The latter was the basis for the method used. The highlight of the meeting was a presentation by Karyn Johnson of KLJ Consulting which addressed these topics. Her presentation, **RateSetting_Capital_2023_09_21**, is included in the folder. Discussions at this meeting were the origin of the lower price, \$150 per foot, for water main replacement.

Events Leading Up to Our Present Situation 1

2019

- Complaints received about Black Stuff in water. At the time, our manager, Whidbey Water Services(WWS) said this was due to sediment in the pipes being disturbed by construction. There were several houses being built simultaneously. Note: WWS only recommended occasional flushing.
- After construction slowed, there was still stuff in the water. WWS said that the filter media in the tanks needed replacement. The tanks themselves probably needed replacement as water was coming to the surface by osmosis (brown streaks on tanks). In any case, the tanks would have to be completely removed since there were no cleanout ports.
- We asked them (WWS) for a quote. They did not respond. They were also unresponsive in other matters. They operated out of Freeland. Our system was far from their main customer base, south Island.
- We also asked a contractor, Dahlman Well & Pump, for a quote (see DahlmanQuote_2020_01.pdf). Their price was predicated on using some tanks they had left over from some other job and were not sure they would fit.
- We were not very happy with WWS. They were unresponsive.
- We were also getting promoted to a class A system due to connections for new houses.
- WWS suggested we maintain a capital reserve of \$50,000 for system repairs.

Events Leading Up to Our Present Situation 2

2020

- At the Jan 2020 board meeting, it was decided to dump WWS and go to King Water as we were in the primary area of operations. Another contractor was approached (affiliate of Scotty's plumbing?), but declined to bid.
- It was decided to delay the filtration plant project until we had gained some experience with King. Initially, King suggested a greensand & chlorine system.
- See the meeting minutes (200131boardminutes.pdf) as well as some comments & emails exchanged by myself & others, NotesMtg_01_27.pdf.
- It was planned to present this to the membership at a planned 2020 annual meeting. **THEN COVID HIT**, disrupting a lot of different activities.
- We transitioned to a Group A system about this time. This introduced multiple new requirements which include, but are not limited to:
 - Increased and more frequent testing.
 - Approval requirements and engineering studies for major work.
 - Increased reporting and inspection requirements.
- Water quality was better for a while, probably because King had cleaned the reservoir

Events Leading Up to Our Present Situation 3

2021

- Water quality was worsening again so the renovation project was brought forward.
- King was willing to do the job & give us a quote, but wanted an engineering study first.
- Two vendors were contacted. The first was an independent consultant who wanted an immediate contract just to come out and look at the pump house. He made a bad impression on Bill Walker and, indirectly me. He was rejected.
- DCG (Jeff Tasoff) was contacted. They were amenable to coming out to look at the job and giving us a Rough Order of Magnitude (ROM) cost with neither compensation nor contract.
- Received ROM costs from DCG in Aug. (see Probable ProjectCost... & email files.)
- Complaints about water quality were sparse around the time. Flushing seemed to be working.

Events Leading Up to Our Present Situation 4

2022

- More frequent & serious complaints were being received.
- Decided to go ahead with engineering work for the upgrade, DCG was placed under contract.
- Presented Plan to membership.
- Began a “Bottoms Up” Inventory of the system & its components.
- Learned that the state would require a capital replacement plan for all HOA’s, including water associations.

2023

- Frequent flushing and some near term “tweaking” by King water seems to have improved water quality.
- Engineering for filtration plant replacement continues.
- Does not negate the need for filter plant replacement.
- Higher operating cost incurred due to class A system designation.
- Northwest Natural water buys King Water.

2024

- Management contract cost increase from \$365 to \$500 per month.. This translates to an increase of \$40-\$50 per household, semi-annually.
- Costs keep increasing due to high overall inflation.