

|    | Recommendation (2020 Report)  | 2021 Action Taken   | 2022 - Second Quarter  | 2022 - Third Quarter   |
|----|---|---|--|--|
|    | <b>FULL WATER SYSTEM</b>  | <b>FULL WATER SYSTEM</b>  | <b>FULL WATER SYSTEM</b>   | <b>FULL WATER SYSTEM</b>   |
| 1  | Continue Water Capital Projects Renovations and/or replacement of key water system infrastructures as described in the <b>2020 Water Capital Project Detail</b> .   | Projects Completed in 2021 include:<br>1. Mountaintop Pump Station Rehabilitation<br>2. Water Filtration Plant Emergency Generator and Chemical Storage Tank Replacement<br>3. East Allen Emergency Generator Replacement, Hecktown US 22 Bridge Bypass | Major projects planned 2022: 1. Water main extensions/replacements (see 11 below); 2. Lead service lines - \$2.9 million; 3. Convert East Allen Gardens to City water (bid pending receipt of DEP permit); 4. Install Mn treatment at Shady Lane well (contract awarded; construction pending) | 1. Water main extensions/replacements (see 11 below); 2. Lead service lines - 88 replaced to date; 3. Convert East Allen Gardens to City water (DEP permit issued; contract awarded; construction 4th qtr); 4. Install Mn treatment at Shady Lane well (construction complete; startup pending DEP operating permit) |
| 13 | We recommend the Authority and City work toward completion of its <b>GIS model for the entire water system and watershed assets</b> . This continues to be a long-term goal as funding permits investment.  | CED Renewed GIS Water and Sewer Evaluation 2021, New proposed in 2022   | City to hire GIS consultant to upgrade GIS platform for all underground utilities; GIS consultant selected; project on hold pending hiring of City GIS coordinator   | GIS consultant under contract; project on hold pending hiring of City GIS coordinator (continue in 2023)   |
| 14 | City continue to implement full Asset Management based upon the EPA guidelines. This continues to be a long-term goal as funding permits investment and may be mandated by the PA Senate Bill 597 – Water Quality Accountability Act, if it is voted into law.  | Long Range Goal after GIS update  | This effort will follow upgrade to the GIS platform noted above  | This effort will follow upgrade to the GIS platform noted above  |
|    | <b>WATERSHED</b>  | <b>WATERSHED</b>  | <b>WATERSHED</b>   | <b>WATERSHED</b>   |
| 2  | Continue to explore alternative energy sources including wind energy, hydropower, and solar power.  | Wind Farm at PA Court of Appeals  | Partially Positive Outcome; City's climate action plan will provide framework for pursuit of alternative energy sources  | PA Supreme Court decided not to hear the Twp. appeal. Noise issue remanded back to County Court and Twp. ZHB   |
| 5  | Improve regular maintenance and repair of all facilities in the watershed system, specifically: better maintain access roads and fire lanes, rusted access gates, and replace posted signage.   | The Authority hired a contractor to clear fire lanes in 2021.   | TBD  | Clearing of Fire Lanes in Tunk. Twp. postponed until 2023  |
| 6  | Repair and/or restoration of historic structures of the Watershed Campus including old masonry stone walls and buildings.   | Repairs to old masonry walls completed in 2021.   | Minor additional repairs TBD   | Complete   |
| 12 | Continue efforts to maximize the potential of all of its assets through the Watershed Management Program. The Authority continues its annual sale of green energy credits, strategic sale of timber program and the development of alternative energy.  | Authority continues Watershed Management Program, Timber Sales and Green Energy Credits   |  | Carbon Marketing Agreement with ANEW under review.   |
|    | <b>TREATMENT</b>  | <b>TREATMENT</b>  | <b>TREATMENT</b>   | <b>TREATMENT</b>   |
| 4  | Continue to improve/replace critical equipment at the water filtration plant. Continue towards the planned chlorination system replacement with safer modern disinfection systems. The 2021 Capital Plan includes increased funding for the Water Filtration Plant; the replacement chlorination system is planned for design in 2023 and construction in 2024. | 1. 10 Year Plan Major Project at WFP each year includes \$250,000 for 2022 for Chemical Storage Tanks, Service Pumps, and other miscellaneous equipment.<br>2. Chlorination system replacement to be implemented in 2030                                | 2022 Projects: 1. Complete lagoon baffle replacement (complete); 2. Roof repairs (additional repairs planned for 2022); 3. Rebuild service water pump (complete)   | 2022 Projects: 1. Complete lagoon baffle replacement (complete); 2. Roof repairs (complete); 3. Rebuild service water pump (complete)  |
|    | <b>TRANSMISSION LINES</b>   | <b>TRANSMISSION LINES</b>   | <b>TRANSMISSION LINES</b>  | <b>TRANSMISSION LINES</b>  |
| 9  | Explore technologies for in-situ inspection of water transmission lines and rock bore tunnels   | Nothing New 2021  | TBD  | TBD  |
|    | <b>DISTRIBUTION SYSTEM</b>  | <b>DISTRIBUTION SYSTEM</b>  | <b>DISTRIBUTION SYSTEM</b>   | <b>DISTRIBUTION SYSTEM</b>   |
| 3  | The shortfall of working emergency sources detailed in the Emergency Water Supply Feasibility Study (October 2018) is a significant concern. In July of 2020, the Bethlehem Authority commissioned an Emergency Interconnection Evaluation Study. Plan additional long-term funding with the City to further invest in improved emergency water supplies.       | Emergency Interconnection Study Dated 12/9/21 Completed   | Study Accepted by BA Board; next step is to share report with neighboring water suppliers and begin discussions on shared responsibilities/opportunities   | Initial discussion held with LCA; scheduling discussion with ESWA  |
| 7  | Replace the 2 MG concrete Southwest High Service Reservoir and accelerate the refurbishment and maintenance contract for the remaining finished water storage tanks. The City completed a replacement feasibility study in 2020. The Capital Plan includes funding for design in 2022 and construction in 2023.   | 1. 2 MG Tank design planned for 2024 and construction in 2025.<br>2. South Mountain Park 0.5 MG Southeast High Tank painted.  | 2022 Tank projects: 1. complete rehab of 5 MG SE tank (paint inside/outside) (in progress); 2. inspect 5 MG NE tank (deferred to 2023); 3. Repaint 1/2 MG south exterior (complete)  | 2022 Tank projects: 1. complete rehab of 5 MG SE tank (paint inside/outside) (in progress; estimated completion 4th qtr); 2. inspect 5 MG NE tank (deferred to 2023); 3. Repaint 1/2 MG south exterior (complete)  |
| 8  | Continue implementation of program to systematically exercise valves throughout the entire water system every five years and annually exercise fire hydrants through flushing. Continue to improve regular maintenance and repair of all facilities in the distribution system.   | On-Going Annual Maintenance Report completed annually.  | 1,580 valves exercised in 2021; fire hydrant flushing and maintenance is on a 2 to 3 year cycle  | 2022 to date: 730 valves exercised; 610 fire hydrants flushed.   |
| 10 | Continue program of customer water meter replacement. Investigate meter accuracy, increase leak detection efforts and track unaccounted for water on a monthly basis to reduce percent unaccounted-for-water which has significantly increased above industry standards, as reported in years 2018, 2019 and 2020.  | 1. The 2022 Budget includes \$600,000 for meter replacement, this will increase each year to be \$1.9 Million in 2028<br>2. RFP Unaccounted for water study 2/8/22  | 2022 Meter schedule:<br>1. 1400 meters<br>1500 RF units<br>UFW Contract awarded to AECOM   | 2022 Meter replacement to date:<br>2. 1. 1367 meters<br>2. 940 RF units<br>UFW Contract awarded to AECOM; data gathering phase   |

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| 11 | The City continues its <b>replacement program of water distribution lines</b> throughout the system. In a system with facilities well over 100 years old, it is important that a <b>systematic, annual replacement program</b> be implemented. Increase funding of this program over the next decade.   | In 2022, \$5.4 Million is budgeted for line replacement, and \$2.9 Million of this is lead service. <b>The Capital Plan includes doubling the annual funding of water main replacement from \$500,000 to \$1,000,000 in year 2023.</b>   | 1. <b>LSL project - \$2.9 million; target 300 +/- lead services (in progress - contractor mobilized June 2022)</b><br>2. <b>Water mains - \$1.3 million; approx 1 mile (8 locations) (contract awarded; construction pending)</b> | 1. <b>LSL project - 88 replaced to date</b> 2. <b>Water mains - HTNC roads complete; E. Market St (City) complete; Snowdrift Rd (East Allen) in progress; future - Highland Ave. (City)</b> |
|    | <b>SECURITY</b>   | <b>SECURITY</b>  | <b>SECURITY</b>   | <b>SECURITY</b>   |
| 17 | We recommend that the City and Authority budget for and Implement the security initiatives in the <b>DHS documents and our security recommendations found in Appendix 14</b> of 2020 Annual Engineer's Report (Confidential).   | We recommend that the City and Authority budget for and Implement the security initiatives in the <b>DHS documents and our security recommendations found in Appendix 14</b> of 2020 Annual Engineer's Report (Confidential).  | See Security Improvements Feasibility Study 2021-2022   | TBD   |
| 18 | <b>The Pohopoco Drive frontage should be secured with a 6-feet high fence across the entire frontage at the ultimate right-of-way, ideally the fence could be decorative. Low shrubbery could be added in front of the fence and "No Parking" signs posted on the fence. A mortorized slide gate should be installed at the main entrance behind the stone walls.</b> | <b>The Pohopoco Drive frontage should be secured with a 6-feet high fence across the entire frontage at the ultimate right-of-way, ideally the fence could be decorative. Low shrubbery could be added in front of the fence and "No Parking" signs posted on the fence. A mortorized slide gate should be installed at the main entrance behind the stone</b> | Security Improvements Feasibility Study to be completed in 2022   | <b>Pohopoco fence construction awarded; installation TBD</b>  |
| 19 | We recommend that a <b>separate detailed security improvements feasibility study</b> be authorized to develop a full program for implementation program of prioritization and assigned estimated costs for each particular water system facility. Anticipated budgetary range of <b>\$1.2M to \$2.0M.</b>   | We recommend that a <b>separate detailed security improvements feasibility study</b> be authorized to develop a full program for implementation program of prioritization and assigned estimated costs for each particular water system facility. Anticipated budgetary range of <b>\$1.2M to \$2.0M.</b>  | Security Improvements Feasibility Study to be completed in 2022   | TBD   |
| 20 | Implement Water System Risk and Resilience Assessment Study. Commission a specific <b>Cybersecurity Assessment evaluation</b> of the City's current IT systems.   | Implement Water System Risk and Resilience Assessment Study. Commission a specific <b>Cybersecurity Assessment evaluation</b> of the City's current IT systems.  | <b>City IT Dept maintains cybersecurity program; Assessment effort TBD</b>  | TBD   |
|    | <b>FUNDING</b>  | <b>FUNDING</b>   | <b>FUNDING</b>  | <b>FUNDING</b>  |
| 15 | Continue to implement <b>10-Year Capital Plan and Capital Improvement Program Funding Plan</b> and continue efforts to monitor the current Funding Plan and its implementation to balance capital project funding and debt management and to allow additional new capital funding of City water system improvement projects when needed.                              | Authority and City to Refinance Long Term Plan in Fall 2022  | <b>Council finance committee meeting March 8; Water bonds priced June 9; settlement scheduled August 17</b>   | <b>Water bond settlement completed August 17; \$10 million in new capital (\$3 million budgeted in 2023)</b>  |