

Lewes Board of Public Works  
Special Meeting: Watermain Assessment  
June 22, 2023  
BPW Conference Room  
9:00am

**1. Welcome, Call the meeting to order.**

President Panetta called the meeting to order at 9:05am.

**2. Roll Call.**

**Board Members**

*Thomas Panetta, President*  
*Earl Webb, Vice President*  
*D. Preston Lee, P.E., Secretary*  
*Richard Nichols, Treasurer*  
*Barbara Curtis, Assistant Treasurer*

**Ex-Officio Members**

*Austin Calaman, BPW General Manager*  
*Robin Davis, BPW Assistant General Manager*  
*Michael Hoffman, Legal Counsel*  
*Andrew Williams, Mayor*

**Others**

*Kimberley Bellere, BPW*  
*Kristina Keller, BPW*  
*Sharon Sexton, BPW*

*Vince Luciani, GMB*  
*Benjamin Hearn, GMB*  
*Elliott Hurdle, GMB*  
*Charlie O'Donnell, GMB*

**3. GMB presentation on the water main assessment study.**

Mr. Luciani, GMB, presented:

- Elliott Hurdle, GMB, performed sample acquisition, organization, and rankings assessment. Benjamin Hearn did the modeling work.

Introduction

- The study focuses on the iron pipe in the Lewes water system, with specific emphasis on water quality as opposed to structural integrity.
- Work started in 2021.
- Tuberculation, which is a bacterial-based oxygen-driven form of corrosion that results in iron oxide precipitation, is a common problem associated with iron pipe. This results in reddish-brown discoloration of water coming out of pipes. The “dirty” has no health issues associated.
- Water main is an asset, and this study can be considered a tool for the management program for the water main maintenance and prioritize future projects.

Background

- Cast Iron pipe began being used in the early 1800's.
- In the 1950's ductile iron pipe was introduced as an improvement on cast iron and introduced in AWWA standards in 1965. Most ductile iron is standard cement lined.
- In the last 50 years, there have been significant improvements and changes in water pipe types. The greatest change has been PVC (polyvinyl chloride) and HDPE (high density polyethylene).

#### Breakdown By Length

- Cast Iron: 27% of the system, 16.82 miles.
- Ductile Iron: 15.8%, 9.53 miles
- HDPE: 3%, 1.79 miles
- PVC: 53.2%, 32.05 miles
- Total: 60.19 miles
- Pilottown Road was about a mile of replaced pipe and was a three-year project.

#### Data Collection

- Collected 27 samples around the city.
- 2 photographs from previous projects and 25 physical samples.
- Through modelling, GMB can determine the average and maximum flow through the pipes.
- Refer to Pipe Sample Data table.

#### Ranking of Samples

- Photos of each sample were grouped together and combined into a randomized condition ranking survey.
- 12 GMB employees ranked samples independently.
- The ranking of the 27 samples was extrapolated to the entire system by examining various characteristics of the samples against trendlines and correlation factors of how closely the characteristics related to actual condition.
- The age of the pipe provided the best correlation to visually ranked samples meaning that older pipes are in worse condition.
- Average velocity and flow had loose correlations to the sample rankings.
- The ranking was broken into 5 percentiles.

Mr. Nichols questioned what is "water age". Mr. Hurdle stated that it is how long water will sit in the pipe. Water age correlates to chlorine residual. GMB uses a water model to determine how water moves through the system. Mr. Luciani stated that they did not see the trend of tuberculation and water sitting in pipes. Complicated to predict where sediment will go at any given time. A pipe that has low flow now may not have always had low flow.

Mr. Nichols questioned what the impact of the new water tower will be. Mr. Hearn stated that the water tower will not change the system but will change the characteristics of flow. The new tower will not change in terms of tuberculation and velocity.

Mr. Hurdle stated that after collecting all the data and rankings, GMB was able to extrapolate trend lines to all pipes in the system. There are 881 iron pipes in the system, both cast and

ductile. Age was the biggest factor (80%). Mr. Webb questioned if the size of pipes and growth to area was considered. Mr. Hearn stated that these parameters were not part of the study, but would relate to priorities of projects, other than just based off condition.

Pigging is a common practice. Pigging is the mechanical removal of tuberculation, and the pipe is re-lined. To remove without lining is pointless. Mr. Luciani stated that re-lining versus replacement would be project specific.

#### Function Based Versus Risk Based Analysis

- Condition assessment may be defined as the likelihood that an asset will continue to perform its required function.
- A function-based assessment is a simpler approach that is based on specific prioritizations.
- Risk-based assessment considers the consequences of the failure in addition to the likelihood of failure. **RISK= Likelihood of Failure x Consequence of Failure.**
- The risk-based approach was difficult. Water modeling is very complex and is dependent on many variables such as system demands at the time of modeling, operating state of the system. Report focuses on a function-based analysis.
- Study leans towards function based.

#### Anecdotal Observations

- Lewes Waterfront Preserve

Ms. Curtis questioned the water main break at Lewes Waterfront Preserve. Mr. Hearn stated that this break was due to a contractor hitting the main. Valves were shut off, holding water. When water recirculated, customers saw “dirty” water. Mr. Calaman stated that that another valve was shut off from a previous project creating sediment to be stirred when valve was reopened.

- Angler’s Marina Water Main installation
  - Post-construction flushing of a newly installed dead end watermain had a duration of over 2 hours before clean water observed.
- SPI Pharma

Mr. Calaman stated that the BPW has requested that SPI Pharma notify the BPW of any issues. SPI Pharma is the biggest water user for Lewes BPW. SPI Pharma demands a lot of water (360 gallons per minute) and gives no water back because they discharge to the bay.

#### Conclusion

- Ranking Map
- Prioritizing the replacement solely based on condition is difficult as most of the time there are other factors which make up a decision.
- Replacement of all the iron pipes is the ultimate goal to eliminate the water quality issues related to iron pipe.
- The results of the study can be used as a guideline for a structured approach to the replacement of iron water main in the Lewes BPW service area.

Road assessment was not tied into this study.

## Current 5-year Capital Budget

- Includes 9 potential projects that require replacement of water mains. Projects were identified based on the following factors:
  - Lewes BPW knowledge of water quality issues through history of water main breaks, valve exercising, hydrant/valve opening and closing, etc.
  - Water quality issues reported by residents.
  - Age of water main
  - Coordination with other capital improvement projects by city or DelDot, etc.
  - Mr. O'Donnell stated that that larger diameter mains will impact more people. Mr. Webb questioned if a bigger pipe is installed, would this be an impact fee. Mr. O'Donnell feels that the Board should try to get reimbursed but will have pushback.

Mr. Calaman stated that it is not feasible to complete all projects on the capital improvements budget within the next 5 years. This is the need for ranking and prioritization. Rehoboth completes work block by block, regarding water repair and maintenance. BPW and the City of Lewes should coordinate capital projects, as there may be cost benefits to both sides.

Mr. Webb questioned the ranking. Some pipes from 1904 only ranked 1.9. Mr. Hurdle stated that the rankings from page 8 were based off visual inspection. Most likely an older pipe with low ranking was lined.

Mr. Webb was concerned that there were no updates during the study and rankings depended upon 12 people visually assessing pipes. Mr. Webb feels that the Board should have been involved throughout the study.

Mr. Calaman would like the Board to take information from the study to update the capital budget. Mr. Lee would like staff to put impressions on paper based on customer complaints, projects in conjunction with the City of Lewes or DelDot, etc. Mr. Lee recommends holding a workshop to review capital projects with water main assessment information.

### **4. Executive Session**

**Action:** *Mr. Nichols motioned to move to executive session. Mr. Webb seconded the motion, which passed unanimously.*

President Panetta adjourned to executive session at 10:54 am.

### **5. Return to open session.**

Returned to open session.

**ACTION:** *Mr. Lee motioned to return to open session. Mr. Nichols seconded the motion, which passed unanimously.*

### **6. Discussion and action on items from executive session if applicable.**

None.

## 7. Adjournment

**ACTION:** *Mr. Lee motioned to adjourn. Mr. Nichols seconded the motion, which passed unanimously.*

President Panetta adjourned the meeting at 11:58am.

Respectfully Submitted  
Sharon Sexton  
Executive Assistant