Colliers
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2021 - Potable Water System Asset Management Plan Report

June 6, 2022

Township of Verona
Water Supply Treatment and Distribution Department
Essex County, New Jersey

Prepared for:

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Document Control

Revision No.	Year	Description	Date Issued
1	2022	Draft Asset Management Plan for review	
2			
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TOWNSHIP COUNCIL

Alex Roman..... Mayor

Christine McGrath..... Deputy Mayor

Jack McEvoy..... Councilman

Cynthia Holland..... Councilwoman

Christopher Tamburro..... Councilman

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Jeff Sonntag.....Backup Licensed Water Distribution and Treatment Operator

1.0 INTRODUCTION

1.1 Water System Background

The Verona Water Department maintains a service area of approximately 2.82 square miles within Verona Township serving approximately 14,000 customers. The Verona Water Department distribution system consists of approximately 49.89 miles of water main with two pressure zones. The high-pressure zone is located in the southwest section of the Town with the remainder of the town in the low-pressure zone. An overall Water Distribution Map highlighting water main size and locations of water mains, meter chambers, production wells, pump stations, storage tanks, treatment plants, interconnections, valve chambers, and fire hydrants is contained in Appendix A. The Verona Water Department's water distribution system contains approximately 340 lead service lines, as reported in the Lead Service Line Replacement Report contained in Appendix B.

The Verona Water Department owns and operates two deep rock wells that draw water from the Feltville Aquifer, and three pump stations (one of which is also a water treatment plant - located on Fairview Avenue). The Fairview Avenue Treatment Plant employs VOC removal with an air stripper. Water drawn from both rock wells is treated with ortho polyphosphate as a corrosion inhibiter, and the water drawn from these wells is chlorinated for disinfection residual. The pump stations are located within buildings (at the Fairview Avenue and Linn Drive well locations). The Fairview Avenue pump station pumps the well water from the Fairway Avenue well into the distribution system. The Linn Drive pump station boosts water from the low-pressure system to the high-pressure system. The third pump station (a below grade structure on Fells Road) can be utilized to boost water to the high-pressure zone or into Essex Fells. Both the Fairview Avenue and Linn Drive wells are presently offline due to exceedances in the concentration of PFOA present within the well water. The Township is undergoing the design phase for the future installation of new treatment facilities for both the Fairview Avenue and Linn Drive wells.

The wells are supplemented by treated surface water purchased from the Passaic Valley Water Commission (PVWC), which is presently supplying all the Township's water (until the Township's wells are back in service). The water from PVWC comes from the Wanaque Reservoir, which is owned and operated by the North Jersey District Water Supply Commission (NJDWSC) and located in Wanaque, New Jersey. PVWC can also provide water from their Little Falls Treatment plant located in Totowa, New Jersey; this treatment plant utilizes water from the Passaic River and/or the Pompton River. Additionally, the Verona Water Department has emergency water connections with Essex Fells, Cedar Grove, and the New Jersey American Water Company (NJAW).

The Verona Water Department owns and operates three water storage tanks (White Rock, Fairway and Claridge), with an effective storage capacity of 2.55 million gallons (MG). The Township also shares twin 2 MG storage tanks (with PVWC) which function as one 4 MG storage tank when both are in service.

1.2 Purpose and Scope

Proper asset management is essential to promote responsible maintenance, investment, and rehabilitation of water supply / distribution systems to ensure water systems meet customer service expectations, as well as meet applicable permit conditions. This asset management report has been prepared to evaluate and document the current asset management program implemented by the Verona Water Department, as well as detail specific recommendations for enhancing the current program and outlining future capital improvements. Furthermore, the contents of this asset management plan have been set forth to satisfy current and future compliance with the Water Quality Accountability Act (WQAA) enacted by the New Jersey Department of Environmental Protection (NJDEP) on July 21, 2017, effective October 19, 2017. (A copy of the WQAA has been included with this report as Appendix C.) This report includes a background of the water system, description of asset management practices, a complete inventory of assets, condition, and criticality evaluations.

1.3 Overall Methodology

The Verona Water Department, with the assistance of Colliers Engineering & Design, Inc. has created an asset management program utilizing the five core components of asset management set forth by the United States Environmental Protection Agency (USEPA) and the New Jersey Department of Environmental Protection (NJDEP). The five core components of asset management are as follows:

1. Asset Inventory, Mapping and Condition Assessment
2. Defining Level of Service (LOS) Goals
3. Criticality and Prioritization (Risk Assessment)
4. Establishing Life Cycle Costs
5. Long Term Funding Strategy

The below descriptions outline a brief summary and methodology of how each core component was addressed in the Verona Water Department asset management program. Detailed methodologies of specific asset management components can be found in each relevant section of this report.

1. **Asset Inventory, Mapping and Condition Assessment** - An inventory of water distribution system assets, such as water mains, hydrants and valves, and the associated mapping was developed in 2005 by the Verona Water Department in the form of a comprehensive geodatabase. This information was compiled from as-builts, operational data, and global positioning system (GPS) hardware. The Verona Water Department provided this geographic information systems (GIS) data to Colliers Engineering & Design, Inc, for review and analysis. In order to assess the condition of distribution system assets, Colliers Engineering & Design, Inc. reviewed all relevant documentation and met with Verona Water Department personnel to discuss operational history and system performance. In addition, on March 11, 2022, Colliers Engineering & Design, Inc. performed an inspection of all above grade assets including the source wells, treatment facilities, and exterior of the storage facilities while soliciting input on performance and operations from Verona Water Department personnel.

2. **Defining Level of Service Goals** - Setting level of service goals is essential to measure the efficacy of the asset management plan and to adapt the plan over time. The level of service goals was developed and centered around public health and safety, customer service, system maintenance, water loss/drought and demand management, utility management, and internal goals. Colliers Engineering & Design, Inc. worked with Verona Water Department staff to outline and develop a clear listing of the current and desired level of service goals.

3. **Criticality and Prioritization (Risk Assessment)** - Determining the criticality of assets is essential to justify timely and prioritized investments. The Business Risk Exposure (BRE) rating is a metric utilized by the USEPA to describe the overall criticality of a given asset. The BRE criticality rating quantifies the nature and level of risk a utility is likely to confront through potential failure of said assets. The BRE criticality rating is defined as the following:

   Criticality Rating (BRE) = Probability of Failure (PoF) X Consequence of Failure (CoF)

   The PoF and the CoF are assigned numerical values through engineering analysis. The product of the two ratings represents an assets overall criticality and can be used to rank capital projects and gauge urgency. The PoF rating describes how likely an asset is to fail based on parameters such as asset age, work order history, and environmental conditions. The PoF rating not only takes into account assets that fail operationally, but also assets that perform below level or service goals and/or become financially inefficient. The CoF rating describes the severity of impact as a result of failure of an asset. The CoF rating is based on the resulting loss of service and impacts to the environment, public health, safety, and cost. Colliers Engineering & Design, Inc. worked with the Verona Water Department staff to develop these ratings.

4. **Establishing Life Cycle Costs** - Based on the criticality and prioritization analysis performed above, Colliers Engineering & Design, Inc. developed and prioritized a budget for maintenance, repair, replacement of assets as well as proposed capital improvements.

5. **Long Term Funding Strategy** - An appropriate long-term funding strategy is essential to ensure adequate funding is available for current and planned capital improvements that support the continued effort to meet or exceed level of service goals. Based on the projects in the Township's current capital improvement plan, a desired level of funding was established, and available funding sources were evaluated. Colliers Engineering & Design, Inc. reviewed the current Verona Water Department budget in conjunction with the projects recommended in this report to ensure the current funding sources are sufficient.

1.4 Scope

The asset management plan outlined in this report is limited to potable water assets owned and operated by the Verona Water Department. The water distribution system facilities owned or operated by NJAW and / or PVWC are not included in this report. The recommended capital improvement projects and maintenance schedules set forth in this report are based on operational history, condition assessments, and the analysis conducted herein. The recommended capital improvements and budgets should be re-evaluated and assessed annually, or at a minimum every three years prior to submission of the triannual report to NJDEP.

2.0 WQAA COMPLIANCE

2.1 WQAA Components

The WQAA is a broad-based environmental act that establishes new requirements for public water purveyors with the intent to improve safety, reliability, and oversight of water systems with greater than 500 service connections. (A copy of the full act is contained in Appendix C of this report.) The requirements of the WQAA are summarized as the following:

1. **The geographic location of every hydrant and valve in the distribution system is required to be identified, to the extent possible, utilizing a global positioning system (GPS)**. Based on satellite or other geographic location technology in accordance with NJDEP standards. Current NJDEP standards outlines a minimum accuracy requirement for GPS of 5 meters.

2. **Implementation of a valve inspection and exercising program.** Valves 12" or greater in size are required to be inspected at a minimum once every two years. All other valves are required to be inspected at a minimum once every four years. Valve inspections shall be in conformance with AWWA manual M44 (Distribution Valves: Selection, Installation, Field Testing & Maintenance) and shall include at a minimum the following:

    - Clearing of the area around the valve to ensure full access.
    - Cleaning the valve box.
    - Dynamic testing of the valve, by opening and closing the valve based on the following number of turns:
        - The number of turns recommended by the valve manufacturer to constitute a credible test; or
        - The number of turns that constitutes 15 percent of the total number of turns necessary to completely open or completely close the valve.
    - Repair or replace any valve found to be broken or not operational.

3. **Implementation of a hydrant flushing and inspection program**. All hydrants, dead-ends and blow-offs are required to be inspected for condition and operability annually, as well as flushed annually. Procedures are to be in accordance with AWWA manual M17 (Fire Hydrants: Installation, Field Testing & Maintenance). In addition, each hydrant is required to be marked in accordance with the following:

    - Initials of its name, abbreviation of its name, corporate symbol, or other distinguishing mark or code by which ownership may be readily ascertained.
    - Number or symbol, or both, by which the location of the hydrant may be determined on the existing records.

- The markings may be made with paint, brand, or with a soft metal plate, and shall be of size and so spaced as to be easily read.

4. **All records of inspection, testing, and flushing are required to be kept for a minimum duration of six years.**

5. **Development of a cybersecurity program in accordance with NJDEP guidance documents.**

6. **Following three consecutive violations, submission of a mitigation plan within 60 days after receipt of the third violation.** The plan shall be prepared by the licensed operator or professional engineer and explain the technical approach to remedy the problem along with any associated capital expenditures required.

7. **Implementation of an Asset Management Plan prior to April 19, 2019**. All asset management plans are required to be certified by the licensed operator or professional engineer of the public water system and the Executive Director. The asset management plan is to be prepared with the aim to inspect, maintain, repair, renew, and upgrade the distribution system. In addition, the asset management plan is required to create a water main renewal program with a 150-year replacement cycle and include a water loss audit.

   Following implementation of the asset management plan, a report is required to be generated detailing the status of the asset management plan and should include updates about capital improvements completed in the last three years and planned capital improvements for the upcoming three years. The report is to be submitted before April 19, 2022, and every three years thereafter to the NJDEP and the Board of Public Utilities (BPU) or the Department of Community Affairs (DCA), whichever is applicable.

8. **Annual Certification** – The highest ranking official (e.g. Executive Director, Mayor) must certify in writing to the NJDEP that the water purveyor complies with all Federal and State drinking water regulations and the relevant sections of the WQAA.

2.2 GPS/GIS Program

Water mains, valves and hydrants throughout the distribution system have been GPS located and post processed into the GIS data used in the analysis contained herein. This information has largely been compiled from developer as-builts and manual collection using GPS hardware. As GPS hardware continues to improve, Colliers Engineering & Design, Inc. recommends that the Verona Water Department recollect the geographic location of any assets that the accuracy may be in question (if required).

2.3 Current Valve Program

The WQAA now requires all valves to be inspected every two or four years based on size, beginning October 19, 2017. Based on the GIS inventory 58 valves greater or equal to 12" throughout the distribution system. Based on the 2-year inspection cycle for valves 12" or larger set forth in the WQAA, this equates to roughly 29 valves per year or approximately 2.4 valves per month. Based on the GIS inventory, there are 996 valves smaller than 12". Given the 4-year inspection cycle set forth in the

WQAA, this equates to 249 valves per year or approximately 1 valve per workday (based on 250 workday per year). This yields a total valve testing requirement for both size intervals of roughly 1.1 valves per workday. It should be noted, there are currently 3 valves in the GIS with a diameter of 9999 which were included in the 12" or larger category.

The Verona Water Department currently does not have a valve inspection program in place and inspects valves on an as-needed basis. It is unclear if the Verona Water Department is on track to complete the required valve testing in accordance with the schedule set forth in the WQAA.

2.4 Current Hydrant Program

According to the Verona Water Department's GIS database, there are currently 403 active hydrants throughout the water distribution system. The WQAA requires all hydrants be inspected and flushed annually. The Township Department of Public Works is responsible to inspect and flush all hydrants.

All hydrants have ID tags installed.

2.5 Asset Management Requirements

This report constitutes the written documentation of the Verona Water Department asset management program and is to be submitted to the NJDEP and/or Board of Public Utilities (BPU) as the triannual asset management report beginning April 19, 2022.

3.0 FACILITY DESCRIPTIONS

3.1 Fairview Avenue Water Treatment Plant

The Fairview Avenue Water Treatment Plant is located on Hillwood Terrace off Fairview Avenue within the municipal boundary. The treatment plant treats water from the Fairview Avenue Well with a peak capacity of 500 gallons per minute (GPM). The water treatment plant utilizes an air stripper for VOC removal along with ortho polyphosphate injection and chlorination. An inventory of assets at the Fairview Avenue Water Treatment Plant can be found in Appendix D.

3.2 Wells

The Verona Water Department potable treatment facilities and distribution system is typically fed up to 1.12 MGD by two source wells (Fairview Avenue Well and the Linn Drive Well). The current effective Water Allocation Permit (WAP) - Permit No. 5832, has been included as Appendix E. The current WAP renewal was submitted to the NJDEP in August of 2021; the Verona Water Department is currently waiting to receive the renewal.

An inventory of assets at each well facility can be found in Appendix D and Appendix F. Well pump information can be found in Appendix G.

A summary of the allocation from each well is contained in Table 3.1 below.

Table 3.1 - Well and Water Allocation Summary

	Fairview Avenue	Linn Drive
Year Constructed	1997	1997
Depth	520'	690'
Pump Capacity (gpm)	500	275
Critical Area Aquifer	Feltville Aquifer Brunswick Group	
Critical Area Max Allocation (mgy)	N/A	
Max Allocation Total (gpm)	778	
Max Allocation Total (gpy)	9336	

Fairview Avenue Well - This Fairway Avenue Well is located in the northwestern section of Verona Township off Fairview Avenue. The Fairview Avenue Well site consists of a down well pump with pitless adaptor, an air stripper for VOC removal along with ortho polyphosphate injection and chlorination. The well is typically continuously operated and maintains a diesel generator for emergency power. Water withdrawn from this well is treated at the Fairview Avenue Well Treatment Facility before being distributed. The well treatment plant has a sodium hypochlorite feed system on-site for disinfection. Currently, this well is not being utilized due to exceedances in the concentration of PFOA within the well water.

Linn Drive Well - The Linn Drive Well is located off Linn Drive within a Verona Township Municipal Complex. The Linn Drive Well site consists of the well with a down well pump with pitless adaptor, chlorination and ortho polyphosphate injection. Sodium hypochlorite is used for on-site for disinfection. There is a generator on-site to provide emergency power for the Municipal Complex, including the well facility. Water withdrawn from this well goes directly into the distribution system. The well is typically used continuously. Currently, this well is not being utilized due to exceedances in the concentration of PFOA within the water.

3.3 Tanks

Currently, there are five (5) water storage tanks connected to the Verona System. The tanks have a total effective storage capacity of 6.55 million gallons but only three of these are owned and operated by the Verona Water Department. The Claridge Tank is located on Claridge Drive (within a private residential community known as The Claridge's Private Residences) and is a painted steel reservoir with a total storage volume of 1.0 MG. The Fairway Avenue Tank is located off Fairway Avenue and is a painted steel standpipe with a total storage volume of 0.8 MG. The White Rock Tank is located off White Rock Road and is a painted steel reservoir with a total storage volume of 0.75 MG. In addition

to these tanks, the Verona Water Department has an agreement with the PVWC to share twin 2.0 MG painted steel reservoirs, these tanks essentially function as one 4.0 MG tank (when they are both in service). The agreement calls for sharing the costs to maintain both tanks, however, the Township owns the property whereas PVWC owns and operates the tanks. These ground tanks are known as the PVWC Supply Tanks and are located off White Rock Road (on near the Highlands at Hilltop development).

An inventory of assets at the tanks can be found in Appendix H.

3.4 Interconnections

The Verona Water Department distribution system currently maintains emergency interconnections with the adjacent New Jersey American Water (NJAW), Cedar Grove and Essex Fells systems.

These interconnections are utilized to provide drinking water to the Township in the event of an interruption in the Verona Water Department's normal water services. The Verona Water Department also maintains a bulk interconnection with the Passaic Valley Water Commission (PVWC) from which water is purchased.

The 8" emergency interconnection with the NJAW system is located at the intersection of Forest Drive and Cunningham Drive. The Township does not have an agreement with PVWC concerning the transfer capacity of this interconnection, usage is on a case-by-case (emergency) basis.

The two 6" emergency interconnections with the adjacent Essex Fells system are located on Fellswood Drive and on Upland Road.

The 6" and 8" emergency interconnections with the adjacent Cedar Grove system are located on Ozone Avenue and Bently Road and Woodland Ave.

The 18" interconnection with PVWC is located on Fairview Avenue. Due to the exceedances in the levels of PFOA within the Verona Water Department's well water, as a temporary solution, the Township currently purchases all of the water for the Township from this interconnection. The purchase agreement states that the Township guarantees the purchase of water during each service year in the aggregate of 280 MG. In 2021, bulk sales from PVWC were 462.75 MG.

4.0 INVENTORY AND CONDITION ASSESSMENT

4.1 System Inventory

The Verona Water Department geodatabase contains an inventory and geographic location for all major potable water assets throughout the distribution system. All assets are classified by type and broken into separate data layers. Beyond spatial data, each data layer contains ancillary attribute information which is linked to each asset. Maps of existing water mains, hydrants, and valves can be found in Appendix A. A summary of the attribute information that was collected and digitized for major assets can be found below:

Water Mains: Owner, Lifecycle Status, Object ID, Water Type, Diameter, Material, Watermain Type, Install Date, Data Source Type, Data Source Reference, Length, and UID.

Hydrants: Owner, Lifecycle Status, Object ID, Water Type, Barrel Diameter, Nozzle Diameter, Notes, Installation Date, and Data Source Type.

Valves: Owner, Lifecycle Status, Water Type, Diameter, Valve Type, Installation Date, Data Source Type, Data Source Reference, Object, and ID.

The quantities of all major potable water distribution system assets contained in Verona Water Department's GIS data are summarized in Table 4.1 below. The GIS data has not been updated since its inception in 2006. The Verona Water Department is in the process of securing a contract with a professional firm in order to revise and update the GIS database to reflect current conditions within its system. Going forward, the database will be revised and updated as new information becomes available and as new infrastructure projects are completed.

Table 4.1 - GIS Asset Inventory Summary

Asset Type	Quantity
Water Main	49.89 miles
Hydrants	403
Valves	1,054

Colliers Engineering & Design, Inc. also inventoried all above grade assets within the water treatment and distribution facilities, such as treatment plants, storage tanks, and wells. The inventory of assets from the Fairview Avenue Treatment Plant and Well Linn Drive Well, Water Storage Tanks, and Fells Road Pump Station can be found in Appendix D, Appendix F, Appendix H and Appendix I respectively. Tank Inspection Reports can be found in Appendix K. More information on all the above ground assets can be found in Section 4.0.

A more detailed description of the distribution system is shown below in Figures 4.1 through 4.3. These quantities are based on the mapping of water main installation year, material, and diameter from the Water Distribution Maps contained in Appendix A.

Figure 4.1 - Water Mains - Year of Installation Distribution

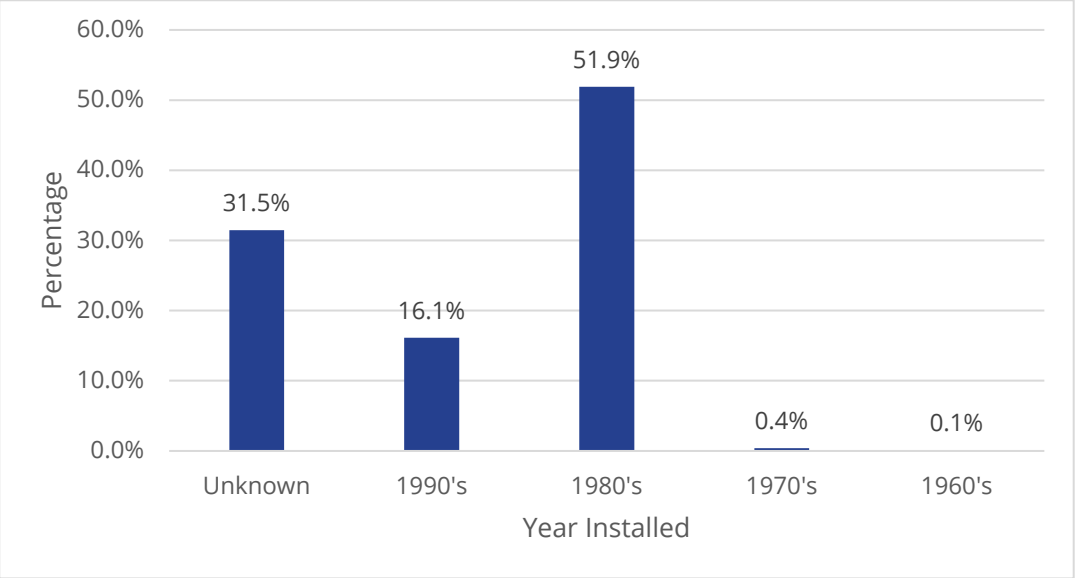


Figure 4.2 - Water Mains - Material Distribution

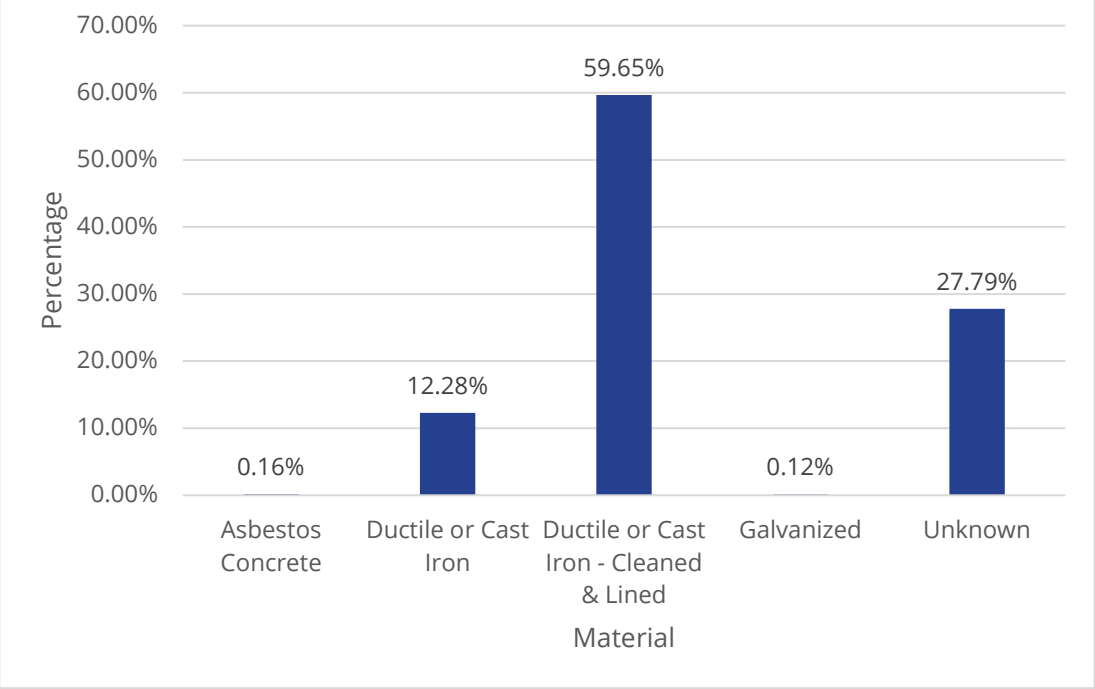
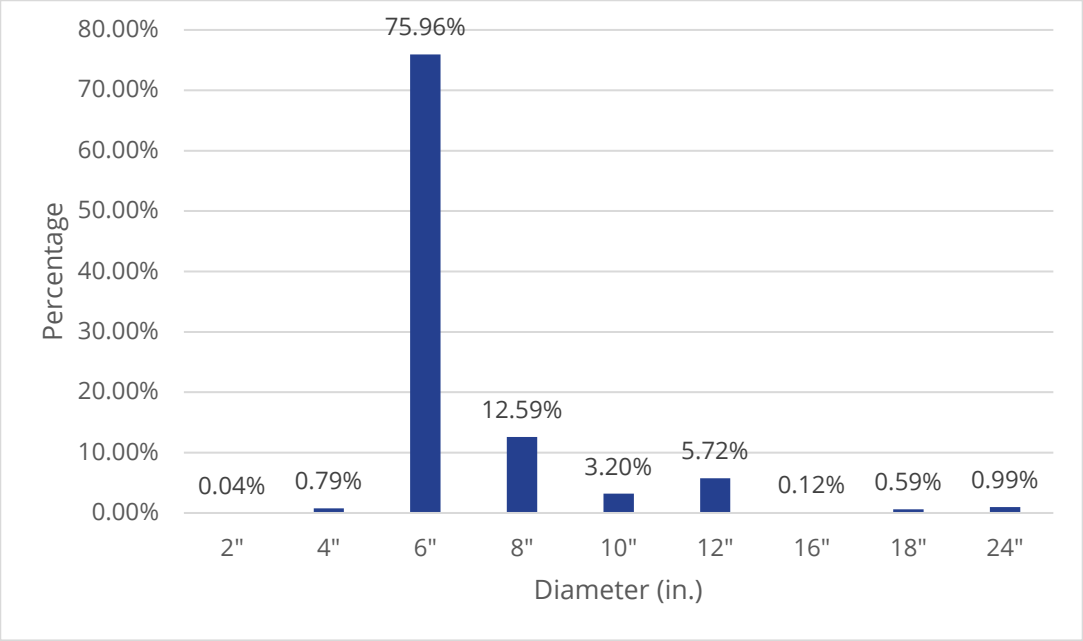


Figure 4.3 - Water Mains - Size Distribution



4.2 Condition Assessment Methodology

The above grade assets, including treatment plants, tanks, and wells, were assigned qualitative ratings (i.e.: excellent, good, fair, poor, and failure) based on visual inspection and discussions with Verona Water Department staff. The 'excellent' rating was reserved for assets that are new and/or like new. 'Good', 'fair', and 'poor' ratings were assigned based on visual inspection, operational history, required maintenance, and the estimated remaining useful lifespan. The 'failure' rating was utilized for assets that not only fail operationally, but any assets that may compromise the level of service below the thresholds set forth in Section 5.2. These qualitative ratings are translated into numerical scores (1 to 5 respectively), for use in the overall criticality calculation.

Due to the fact that the distribution system is under ground and does not lend itself available to perform visual inspections, the condition of the distribution system was evaluated based upon the available GIS attribute data and operational history. Items such as pipe age, material, soil conditions, and work order history were considered when assigning condition ratings. A new attribute field can be added to the current GIS data within the GIS database; this new attribute field can be populated with the numerical condition rating for use in the overall criticality evaluation. The GIS layer can be amended with condition ratings over time to reflect deterioration over time and / or the eventual replacement of said asset.

The exterior of the storage tanks were visually inspected during Colliers Engineering & Design, Inc. 's March 11, 2022, site visit; however, a more detailed condition assessment was not performed. Colliers Engineering & Design, Inc. also reviewed the available tank inspection reports prepared by outside consultants and / or contractors to determine the appropriate condition rating. It is recommended

that the Verona Water Department continue to have a consultant inspect all storage tanks at regular intervals dictated by their condition. Each time a condition assessment is performed, the condition rating assigned to the tank should be updated within the GIS database to reflect the results of the assessment.

4.3 Condition Rating Results

Water Mains - As discussed in the previous section, visual inspection was not conducted for any of the water distribution mains. The condition of the mains was therefore determined by the following factors: the age and the material of the pipe, environmental conditions of the pipe, and input on performance and operations from Verona Water Department personnel. Given the oldest mains in the distribution system were installed in the 1960's, the vast majority of the mains have just reached the third quartile of their estimated useful life (100 years). The factors listed herein were used to develop an overall probability of failure (PoF) score for each main (1 being least likely to fail and 5 being the most likely). A map showing the overall distribution system ranked from 1 to 5 can be found in Appendix L.

Water Treatment Plant - The Fairview Avenue Water Treatment Plant was constructed in 2004. The VWD's preventative maintenance routine has maintained many of these assets in new or like new condition. With many of these structures relatively new or upgraded, the overall general condition of the Fairview Avenue Water Treatment Plant ranges from good to excellent. Individual condition ratings for the Fairview Avenue Well Treatment Plant assets can be found with the asset inventory contained in Appendix D.

Wells - Table 4.2 below lists the general condition rating of each well facility as a whole. The condition rating and inventory for all the assets within each facility can be found in Appendix D and Appendix F.

Table 4.2 - Well Condition Rating

Fairview Avenue Well	Good
Linn Drive Well	Good

Storage Tanks - Based on visual inspection and the tank inspection reports provided by Verona Water Department, the general condition of each storage tank is summarized in Table 4.3 below. More detailed assessment regarding the state of specific tank components (such as year installed, tank coatings, metal loss, structural components, foundation and cathodic protection systems) are needed. The condition rating and inventory for all the assets within each tank can be found in Appendix H.

Table 4.3 - Tank Condition Rating

Claridge Tank	Good
White Rock Tank	Good
Fairway Avenue Tank	Good

4.4 Water Loss Audit Results

The most recent water loss audit was completed by the Verona Water Department in 2021, as a part of the Water Supply, Drought, and Emergency Plan Report to NJDEP (contained in Appendix J). In 2020, approximately 461.4 million gallons (MG) was metered as entering the distribution system. Approximately 391.6 MG was recorded as billed to customers, yielding approximately 69.8 MG (15.1%) of Unaccounted-for Water (UFW). This is an increase from 2019, which recorded approximately 3.6% UFW. In 2020, the Verona Water Department conducted a Leak Detection Survey of the entire water distribution system, and only a total of 12 leaks were discovered (with an estimated total flow of 900,000 gallons). These leaks were repaired by the Township's Department of Public Works. It is estimated that 0.750 MGY is used for firefighting and using in unmetered municipal buildings. The hydrant on Ozone Avenue is not metered and is commonly used by outside contractors. To reduce unaccounted-for water, the Township plans to have 25% of the system surveyed annually. It is recommended that connections to municipal buildings be metered to eliminate this flow from the total UFW to provide a more accurate assessment of the UFW within the Verona Water Department's distribution system.

5.0 LEVEL OF SERVICE (LOS) GOALS

5.1 Purpose and Determination of Level of Service (LOS) Goals

Setting level of service (LOS) goals is essential to measure the efficacy of the asset management plan and to adapt the plan over time. Colliers Engineering & Design, Inc. provided several possible goals for the Verona Water Department. Specific emphasis was placed on making the goals measurable and time sensitive. The level of service goals were developed and organized into the following categories: public health and safety, customer service, system maintenance, water loss/drought and demand management, utility management, and internal goals. Progress toward each goal should be evaluated annually, at which time goals will be added or removed as applicable.

5.2 Current Level of Service LOS Goals

The specific level of service goals for the 2021 asset management plan iteration are listed below.

Public Health and Safety

1. Provide customers with finished water that meets or exceeds all Maximum Contaminant Level Goals (MCLGs).
2. Secure and expand water sources while maintaining treatment and distribution systems to ensure that future demands are reliably met with no impact to finished water quality.
3. Develop systems to accurately convey public health information to impacted customers and operators within 8 hours of discovery of water quality event.
4. Design and install appropriate treatment systems to address the current PFOS issue.
5. Develop a sampling plan for lead and copper testing.

6. Per NJDEP requirements, update lead service line inventories and replacement plan on an annual basis and submit to the Department.

7. Per NJDEP requirements, beginning December 31, 2022, prepare annual progress reports detailing the Verona Water Department's progress in replacing lead service lines. The report will be made publicly available online and submitted to the Department.

Customer Service and Response Time

1. Fewer than 30 water service disruptions per 1,000 customer accounts per year.

2. Main breaks will be fixed within 8 hours of discovery 90% of the time. Service line breaks will be fixed within 16 hours of discovery 90% of the time.

System Maintenance

1. The planned maintenance ratio will be greater than 50% by 2023. The planned maintenance ratio is equal to the number of planned maintenance hours, divided by the sum of the planned maintenance hours and the corrective maintenance hours.

2. Investigate the feasibility of metering the irrigation water connections located municipal buildings to reduce UFW and encourage conservation.

Water Loss / Drought & Demand Management

1. Perform an annual water loss audit utilizing the AWWA M36 Manual Water Audit Software. Audit will be used to assess all categories of non-revenue water and develop strategies to reduce non-revenue water.

Utility Management

1. Maintain compliance with the requirements set forth in the Water Quality Accountability Act and update the asset management plan annually. Develop a capital improvement plan that meets the level of service goals at a sustainable life cycle cost.

2. Update and maintain the GIS Database and continue to update the database when new assets are added to the system or when repairs take place.

6.0 CRITICALITY ANALYSIS

6.1 Criticality Analysis Methodology

Determining the criticality of assets is essential to justify timely and prioritized investments. The Business Risk Exposure (BRE) rating is a metric utilized by USEPA and describes the overall criticality of a given asset. The method of determining BRE describes the nature and level of risk a utility is likely to confront through potential failure of assets. The BRE rating is defined as the following:

Criticality (BRE) Rating = Probability of Failure (PoF) X Consequence of Failure (CoF)

The PoF and the CoF are assigned numerical values through detailed engineering analysis. The product of the two ratings represents an assets overall criticality and can be used to rank capital projects and gauge urgency. The PoF rating describes how likely an asset is to fail based on parameters such as asset age, work order history, and environmental conditions. The PoF rating takes into account assets that fail operationally, as well as assets that perform below level or service goals and/or become financially inefficient.

The CoF rating describes the severity of impact as a result of failure of an asset. The CoF rating is based on the resulting loss of service and impacts to the environment, public health, safety and cost. Each asset was assigned a value and evaluated on the below matrix.

Figure 6.1 **- Risk Matrix**

Consequence of Failure (CoF)--						
	5	5	10	15	20	25
	4	4	8	12	16	20
	3	3	6	9	12	15
	2	2	4	6	8	10
	1	1	2	3	4	5
		1	2	3	4	5
	Probability of Failure (PoF)					

7.2 Probability of Failure Methodology

The Probability of Failure (PoF) rating describes the likelihood an asset will fail due to a variety of factors. The primary considerations when assigning PoF ratings to above grade assets were the current condition, operational history, and estimated remaining useful life. The PoF ratings for mains throughout the distribution system were based upon estimated remaining life. Each main was assigned an approximate lifespan based on material. Given the approximate install years present within the GIS data, an estimated remaining useful life was calculated and translated into an overall condition score. This methodology was utilized for all mains where the install year and material were known. The PoF ratings were assigned directly in GIS. A new attribute field was created and populated with the PoF score. The estimated useful life span for each material of install can be seen in table 6.1 below.

Table 6.1 - Pipe Life Expectancy

	Material				
	Ductile Iron – Cleaned and Lined	Ductile Iron	Asbestos Cement	Galvanized	HDPE
Average Life Expectancy	100	83	93	70	100

The estimated useful life listed above are not meant to dictate the exact year of replacement. The life spans are intended to ensure replacement of mains enters the planning and budgeting horizon prior to complete failure and/or compromise of level of service goals. Additionally, the rough lifespans listed above are well within the minimum 150-year replacement cycle stipulated by the WQAA.

6.3 Consequence of Failure Methodology

The Consequence of Failure (CoF) rating describes the magnitude of impact the Verona Water Department is likely to confront through the potential failure of an asset. For above grade assets, the rating was assigned largely based on how essential the asset was to normal operation, redundancy, cost, as well as potential social, environmental, and public health impacts of failure.

The CoF for the distribution system was evaluated directly within the GIS data. A new attribute field was created and populated with the assigned CoF rating. The water main CoF was primarily based on main size, given that failure of larger mains presents greater water loss, impacts to pressure, and potential service outages. When assigning CoF ratings, proximity to critical customers such as schools, hospitals, and municipal buildings was also considered. An outline of the criteria for assigning the CoF ratings is contained in Table 6.2 below.

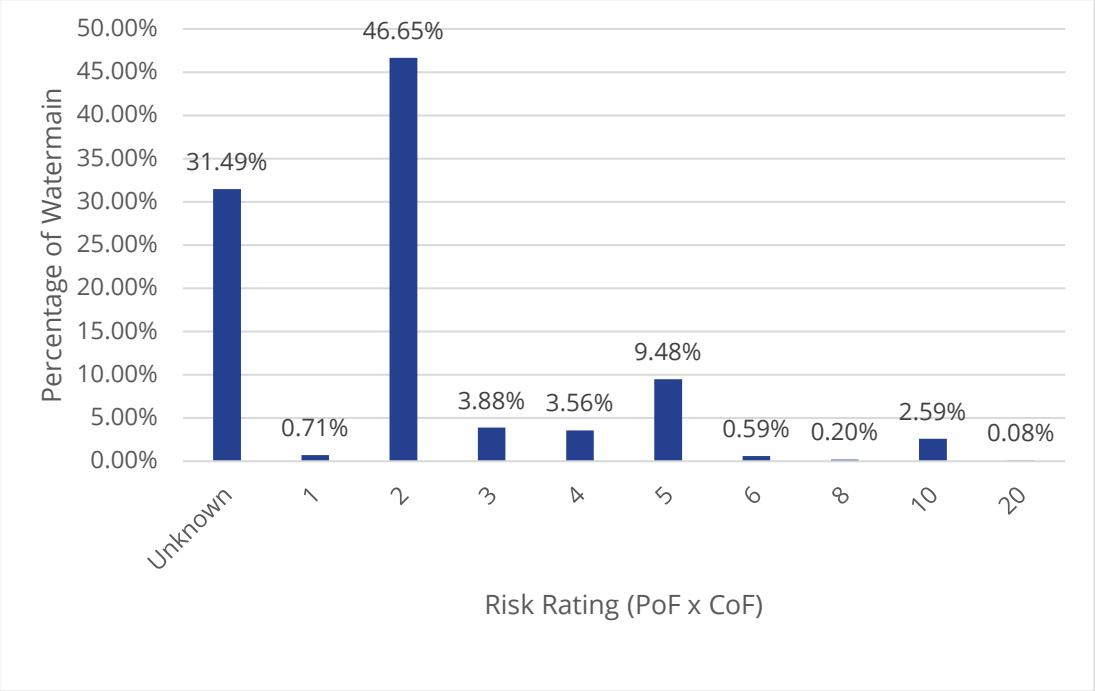
Table 6.2 - Water Main Consequence of Failure Form

Consequence of Failure Rating	Asset/Critical Customers
1	Pipe Diameter <6"
2	Pipe Diameter 6"
3	Pipe Diameter 8"; Pipes service Schools, County and Municipal Buildings, and Fire Stations
4	Pipes service Hospitals, Police Stations, Schools, Nursing Homes, and Day Cares
5	Pipe Diameter > 10", Pipes in/out of wells, WTP, Interconnections, Tanks, Transmission Mains, Highway or river crossings

6.4 Criticality Statistics and Results

Based on the methodology outlined in Section 6.2 and 6.3, PoF ratings and CoF ratings were assigned for all water mains and the criticality (BRE) was calculated. The distribution results of the criticality/risk analysis for water mains are summarized in Figure 6.2 below. Maps showing PoF, CoF, and BRE ratings throughout the distribution system are contained in Appendix J.

Figure 6.2 - Water Main Criticality/Risk Distribution



Treatment plant assets were assessed individually. The PoF, CoF, and risk or each individual asset can be found in Appendix D.

For summary of results, the average PoF, CoF and risk of each well facility, treatment facility, and pump station is contained in Table 6.3 below. The ratings for each individual asset can be found in Appendices D, F, I, and K.

Table 6.3 - Overall Well Asset Ratings

Well	PoF Average	CoF Average	BRE Average
Fairview Ave Well / Treatment Facility	2.07	1.76	3.76
Linn Drive Well	2.31	2.10	4.87
Fells Road Pump Station	2.38	1	2.38

The storage tank BRE results are summarized in Table 6.4 below.

Table 6.4 - Tank Asset Ratings

Water Storage Tank	PoF	CoF	BRE
Claridge Tank	2.33	4.67	11.17
White Rock Tank	1.83	4.5	8.5
Fairway Avenue Tank	2.33	4.33	10.67

7.0 LIFE CYCLE ASSESSMENT

7.1 Current O&M Program

Based on Colliers Engineering & Design, Inc. 's facility inspections, Verona Water Department has demonstrated an exemplary level of preventative maintenance and excellent housekeeping was evident. Verona Water Department keeps records of tank inspections, leak locating service calls, and upgrades to their facilities. Watermains, valves, and hydrants are inspected and maintained on an as-needed basis.

7.2 Recommended O&M Procedures

Based on the criticality evaluations contained herein, a more precise schedule for maintenance and replacement can be detailed. Based on the PoF ratings and subsequent risk ratings, specific thresholds for evaluation, maintenance and replacement can be set. Below is a brief summary of the recommended standard operating procedure (SOP) for repair and replacement relative to the assigned PoF ratings and subsequent risk scores.

Water Mains - Water mains with a BRE of 15 or higher or a PoF rating of 4 or higher are to be evaluated for inclusion into the CIP.

Valve and Hydrants - Valves and hydrants were not evaluated by Colliers Engineering & Design, Inc. utilizing the BRE system. It is recommended the repair and replacement be prioritized by the inspections performed by Verona Water Department staff in accordance with the WQAA or replace when water mains are replaced.

Well Facility Assets - Well facility assets with a BRE rating of 15 or higher or a probability of failure of 4 or higher should be prioritized for routine and preventative maintenance as well as, evaluated for inclusion into the CIP.

Water Treatment Plant – Water treatment plant assets with a BRE of 15 or higher or a probability of failure of 4 or higher should be prioritized for routine and preventative maintenance as well as, be evaluated for inclusion into the CIP.

Tanks - It is recommended detailed tank inspections be performed by an outside consultant at regular intervals and that the PoF ratings be updated at the time of each inspection. Inspections should include at a minimum, evaluation of the current state of the coating systems, foundation, structures, and cathodic protection. A baseline for tank inspections is roughly every 10 years for new or like new tanks. As condition deteriorates, inspections frequency can be increased to every 5- or 3-year intervals as applicable.

7.3 CIP Review and Recommendations

Overall, the Verona Water Department's assets were observed to be in good working condition, and preventative maintenance was evident throughout. The distribution system and the majority of the treatment systems are in good condition. The Verona Water Department does not maintain a capital improvement plan currently.

It is recommended that the Verona Water Department prepare a 5-year capital improvement plan which can be updated on an annual basis. Below are recommendations for inclusion in the 5-year capital improvement plan.

- Water storage tank inspections by a licensed tank inspector by 2023
- Power-wash Claridge Tank and White Rock Tank
- Approximately 455 feet of water main (high priority) main replacement, which had a risk rating of 20
- Hydrant inspection and flushing in accordance with the WQAA
- Inspect all valves 12" or greater by December 31, 2022, and all valves less than 12" by December 31, 2024, in accordance with the WQAA
- Maintain a conclusive GIS program which includes details such as size, material, install date, etc. of all assets by 2025, and continue to update as needed
- Have test pits done to investigate pipes within the system with unknown material and install date. This will allow the Township to have a better understanding of which mains are high risk and should be replaced
- Keep records of main breaks within the system
- When a main break occurs, take a coupon of the main to evaluate the condition and remaining useful life
- Replace all lead services by 2032
- Fix clearwell pump at Fairview Avenue Treatment Plant
- The VWD may also want to consider development of additional well facilities and increasing allocations in order to offset the cost of purchasing water. It is suggested that the VWD invest in a study to look at the feasibility and overall costs

The most recent tank inspection reports shown in Appendix K include only reports for the Fairway Tank (dated November 1, 2017). Tank inspections for all tanks should be completed again by 2023. In the past Colliers Engineering & Design, Inc. has utilized Mumford Bjorkman Associates (MBA) to complete this work. An amount of $5,000 for each tank is estimated for budgetary purposes. Considering that the tanks were constructed before 1991, lead testing would be included for an additional $1,000 per tank. A total of $20,000 would be estimated to inspect all water storage tanks including administrative costs.

The recommended 455LF of water main replacement represents one distinct section as seen below. This main currently has the highest BRE (criticality) rating.

- Pompton Ave 455 ft of 12" DIP

This main represents some of the oldest main within the distribution system with install date approximated circa 1960's. Based on the estimated remaining useful life, it is not absolutely necessary to include these mains in the 5-year capital improvement plan, but the main should be evaluated in future iterations based on operational history. For budgetary purposes, the cost of replacement for a 12" pipe was estimated at $300 per foot, for a total $136,500.00. A watermain priority map can be found in Appendix M. In addition to recommended watermain replacement, the map shows all the watermain within the Township with an unknown risk score. These mains either have an unknown install date or material type, therefore the probability of failure for these mains could not be evaluated. For that reason, it is recommended that these mains be investigated and rehabilitated or replaced as necessary. The mains with unknown risk scores account for approximately 87,046 LF of the total watermain. The watermain made of Asbestos Concrete material is also considered a priority for replacement, although most of it has an unknown install date and therefore falls into the unknown risk category. Lastly, the mains crossing Peckman River should be evaluated and rehabilitated as necessary. The annual budget noted in the Capital Plan is based on a 150-year replacement cycle for the 50-miles of water main in the township.

8.0 LONG TERM FUNDING STRATEGY

8.1 Operating Budget

An appropriate long-term funding strategy is essential to ensure adequate funding is available for current and planned capital improvements that support the continued effort to meet or exceed level or service goals. Based on the budgetary cost estimates prepared for the highest priority projects, a desired level of funding was established, and available funding sources were evaluated.

8.2 Available Funding Source Review

A cursory review of the available funding sources is summarized below:

Internal Funding - Internal funding consists of funds allocated for capital improvement projects directly from billing rates and service charges collected by the Township. A complete breakdown of the Verona Water Department's estimated expenditures for the 2022/2023 fiscal year can be found in Appendix N.

New Jersey Infrastructure Bank (NJIB) – NJIB is divided into the New Jersey Environmental Infrastructure Trust (NJEIT) and the New Jersey Transportation Infrastructure Bank (NJTIB). NJEIT provides low-interest loans to finance a broad array of infrastructure aimed at meeting or maintaining compliance with the Safe Drinking Water Act (SDWA). NJEIT maintains a partnership with NJDEP to administer the New Jersey Drinking Water State Revolving Fund (SRF) to combine market rate financing with zero interest loans. The result is low-cost financing for the design, engineering during construction, legal, bond counsel, and construction of projects that maintain and improve water quality. There is no deadline; applications are accepted on a rolling basis. Funding is available for any publicly or privately-owned community water system in New Jersey. In addition, the Township may wish to peruse the potential for principal forgiveness associated with lead service removals being offered by the State.

Purpose of Funding – To provide low-interest loans for the construction of a variety of water quality protection measures. The financing program also provides loans for activities such as open space land purchase and conservation, remedial action activities (including brownfields) and well sealing.

Total Loan Funding Available – Approximately 100-200 million distributed annually. There is no minimum or maximum for applicable projects. Base long-term financing is currently available for the project's useful life, or up to 30 years at a combination of 0% interest from NJDEP and AAA market rate from the Water Bank.

Eligible Borrowers:

a) Municipalities & Counties
b) Sewerage or Utility Authorities
c) Joint meetings
d) Improvement Authorities
e) Local Governments
f) Private Water Utilities

Qualifications and Procedures

Eligibility is determined according to ranking criteria of the Federal Priority System developed by the NJDEP each year. The ranking system methodology considers the type of project proposed, the existing water uses and the receiving waterbody, and public health impacts. Applicants must submit a letter of interest and project planning documentation.

Information Contact:

Municipal Finance and Construction Element
New Jersey Department of Environmental Protection
Division of Water Quality
Municipal Finance and Construction Element
401 E. State Street, 3rd Floor
PO Box 420
Trenton, NJ 08625
Phone: 609-292-8961

Email: waterbankinfo@dep.nj.gov

Water Infrastructure Finance and Innovation Act (WIFIA) – The WIFI Act of 2014 established the WIFIA program. The program is a federal credit program administered by the USEPA for both water and wastewater infrastructure projects. Eligible costs included project design, feasibility studies, and consulting fees. The program provides low, fixed interest rates and flexible financing terms. Repayment can be deferred up to 5 years. Beyond that, EPA has flexibility to structure repayment to best match the cashflow of the project in question. EPA and prospective borrowers will negotiate the repayment schedule for each project, and it will be included in the credit agreement. A complete summary of the program is listed below.

Total Loan Funding Available - $55 million. EPA will provide federal credit assistance in the form of secured (direct) loans or loan guarantees for eligible water infrastructure projects.

a. Loan terms up to 35 years with no repayment obligation for up to five years.

b. Loan interest rates match weighted average of current U.S. Treasury rates.

Award Amount – Minimum project size for large communities is $20 million while the minimum project size for small communities (25,000 or less) is $5 million. WIFIA funding limited to 49% of a project's eligible costs (up to 25% of the appropriated budget authority) may be used for up to 80% of a project's cost.

Eligible Borrowers:

a) Local, state, tribal, and federal government entities
b) Partnerships and joint ventures
c) Corporations and trusts
d) Clean Water and Drinking Water State Revolving Fund (SRF) programs
*Municipal governments can come together under one application with a common security pledge.

Eligible Projects:

a) Projects that are eligible for the Clean Water SRF, notwithstanding the public ownership clause
b) Projects that are eligible for the Drinking Water SRF
c) Enhanced energy efficiency projects at drinking water and wastewater facilities
d) Brackish or seawater desalination, aquifer recharge, alternative water supply, and water recycling projects
e) Drought prevention, reduction, or mitigation projects
f) Acquisition of property if it is integral to the project or will mitigate the environmental impact of a project
g) A combination of projects secured by a common security pledge or submitted under one application by an SRF program

Eligible Development and Implementation Activities:

a) Development phase activities, including planning, preliminary engineering, design, environmental review, revenue forecasting, and other pre-construction activities
b) Construction, reconstruction, rehabilitation, and replacement activities
c) Acquisition of real property or an interest in real property, environmental mitigation, construction contingencies, and acquisition of equipment
d) Capitalized interest necessary to meet market requirements, reasonably required reserve funds, capital issuance expenses and other carrying costs during construction

Information Contact:

Karen Fligger
1200 Pennsylvania Avenue, Northwest
Mail Code 4201T
Washington, District of Columbia 20460
wifia@epa.gov
202-564-2992

Other sources of funding were evaluated for the Verona Water Department including, but not limited to, the USDA Rural Development Program and the Small Cities Community Development Block Grant (CDBG). Verona Water Department may qualify for the Small Cities Community Development Block Grant, but eligibility should be evaluated further. Verona Water Department is not eligible for the USDA Rural Development Program largely due to the Township's population and/or income restrictions.

8.3 Long Term Funding Strategy

Based on the available funding sources and desired level of funding 's set forth in the Verona Water Department CIP, it is recommended that the Verona Water Department utilize a combination of internal funding and financing through NJEIT. Funding through the WIFIA is a potential source but is not recommended to be pursued at this time (due to the fact that the minimum project size eligible for funding is $5 million). In an event where large quantities of main replacement are anticipated or required in the future, the potential for WIFIA funding can be considered at such time.

Colliers Engineering & Design

Appendix

Appendix A | Water Distribution Map

Township of Verona
Essex County
Water Distribution System

Map Revision October 2005

NORTH CALDWELL BOROUGH

CEDAR GROVE TOWNSHIP

MONTCLAIR TOWNSHIP

WEST ORANGE TOWNSHIP

Cedar Grove Emergency Interconnection

24 " PVWC Supply Main

Fairview Ave Treatment Plant

Fairview Ave Well

PVWC Meter

Fairview Avenue Tank HWL: ± 673 2 MG

White Rock Tank 0.8 MG

Linn Drive Well & Pump Station

Fells Road Pump Station

Essex Fells Emergency Interconnection

Essex Fells Emergency Interconnection

Fairway Ave. Storage Tank HWL: ± 720 0.8 MG

NJAW Emergency Interconnection

Claridge Tank HWL: ± 665 1 MG

Hoffman-La Roche Meter Chamber

Verona Lake

PECKMAN RIVER

OZONE AVE
LAUREL CT
HEMLOCK DR
VALLEYVIEW RD
DURRELL ST
OLD FARM RD
GROVE AVE
COMMERCE CT
LYNWOOD RD
CLOVER LN
STEVEN AVE
ANN ST
CYPRESS AVE
WILLOW TER
BIRCH LN
DODD TER
SAMPSON DR
BROOKSIDE TER
OAK LN
PECKMAN CT
CRANE TER
WESTLAND RD
SPRUCE LN
FRANKLIN ST
WOODLAND AVE
KENWOOD AVE
MIDWOOD RD
WOODLAND PL
LINDEN AVE
ARNOLD WAY
PERSONETTE AVE
E REID PL
REID PL
BRENTWOOD DR
EDGEMERE RD
WELLWOOD TER
NEWMAN AVE
ROSE TER
DOCK TER
OTSEGO RD
LAWOOD RD
CLIFF ST
ELK RD
BEACH RD
HIGHLAND TER
MARTIN RD
LANNING RD
OVERHILL RD
WEDGEWOOD DR
FLOYD RD
FLOYD TER
HAMILTON RD
WALDEN TER
CLAREMONT AVE
BLOOMFIELD AVE
CHURCH ST
MALVERN PL
HILLCREST TER
ELMWOOD RD
WESTVIEW RD
MONTCLAIR AVE
GREEN ACRES DR
PARK AVE
LAKEVIEW PL
SERONA PL
LAKESIDE AVE
COOK LN
BROOKDALE CT
BROOKDALE AVE
DOUGLAS PL
SUNSET AVE
MOUNT PROSPECT AVE
STONEWOOD PKWY
OVERLOOK PARK
PARKHURST RD
HOCKSLEY RD
PL
AFTERGLOW AVE
AFTERGLOW WAY
CLIFTO RD
BELLECLARE PL
COLE RD
GORDON PL
SUMMIT RD
RAVINE RD
ROBERTS CT
MOUNT VERNON SQ
LOUISBURG SQ
CLAREMONT AVE STUB PL
CRESTMONT PL
CRESTMONT RD
WESTOVER RD
KIPS RDG
WHITTEMORE RD
HASSAU RD
CAMBRIDGE RD
LANT CT
VINCENT PL
CLARIDGE DR
POMPTON AVE
MANOR RD
RANDOLPH PL
MOUNTAINVIEW RD
RIDING WAY
SUTTON PL
WAYLAND DR
SYLVAN RD
VALHALLA WAY
BIROSEYE GLN
HATHAWAY LN
WHITNEY TER
WINDEMERE RD
BALSTON DR
MARION RD
MAPLE TER
MORNINGSIDE RD
HILLSIDE AVE
GERDES AVE
HOWELL DR
GEORGIAN RD
FAIRWAY AVE
FOREST AVE
HOWARD ST
PEASE AVE
HALLSTED ST
STOCKER RD
FELLSWOOD DR
MOUNTAIN RD
CHESTNUT RD
HARRISON ST
BEECHWOOD RD
FELLS RD
OAKRIDGE RD
LINCOLN WAY
PINE ST
PARSONS CT
HILL ST
WILSON LN
MONTROSE AVE
WILLOW AVE
WILKINSON ST
E LINCOLN ST
ROCKLAND TER
GROVE AVE
GOULD ST
PARK PL
ORCHARD ST
DEPOT ST
LINN DR
PARKHURST PL
SUNNYSIDE PL
NJAW 24"
PVWC 24"
PVWC 12"
NJAW 12"
NJAW 8"
NJAW 6"

Legend

- Meter Chamber
- Production Well
- Pump Station
- Storage Tank
- Treatment Plant
- Interconnection
- Valve Chamber
- Fire Hydrant

Water Main Owner

- Municipal
- Water Company

N W E S

0 300 600 Feet

Hatch Mott MacDonald

Map Document: (P:\21431\4\GIS\Projects\Plates\Water\WaterDistributionOverall.mxd)
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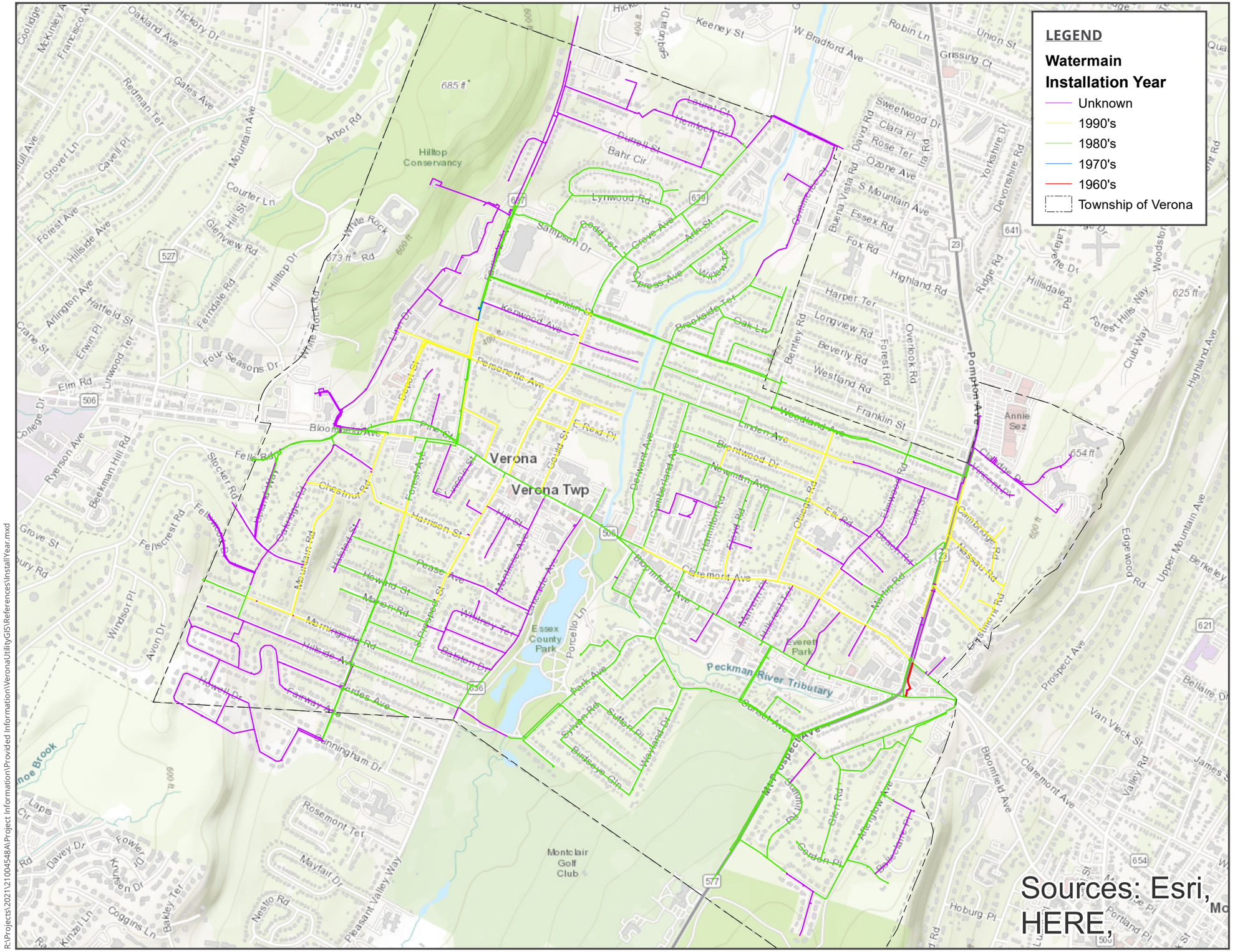
WATER MAIN INSTALL YEAR

TOWNSHIP OF VERONA

Essex County
New Jersey



N

0 300 600 900 1,200
Feet

1 inch = 1,200 feet

MARCH 2022

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

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WATER MAIN MATERIAL

TOWNSHIP OF VERONA

Essex County
New Jersey

LEGEND

Watermain Material

- Asbestos Concrete
- Brick
- Cast Iron
- Clay
- Ductile Iron
- Ductile Iron - Cleaned & Lined
- Galvanized
- High Density Poly Ethylene
- Other
- Poly Vinyl Chloride
- RCP
- Unknown
- Vitrified Clay Pipe
- Wood
- Township of Verona

N

0 300 600 900 1,200
Feet

1 inch = 1,200 feet

MARCH 2022

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Colliers Engineering & Design

Sources: Esri, HERE,

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WATER MAIN DIAMETER

TOWNSHIP OF VERONA

Essex County
New Jersey

LEGEND

Watermain Diameter

- 2
- 4
- 6
- 8
- 10
- 12
- 16
- 18
- 24
- Township of Verona

N

0 300 600 900 1,200
Feet

1 inch = 1,200 feet

MARCH 2022

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Colliers Engineering & Design

Sources: Esri, HERE,

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Colliers Engineering & Design

Appendix

Appendix B | Lead Service Line Replacement Report

Department of Environmental Protection
Mail Code 401-04Q
Bureau of Water System Engineering
401 East State Street - P.O. Box #420
Trenton, New Jersey 08625
Tel # 609-292-2957 – Fax # 609-633-1495
Email: watersupply@dep.nj.gov

Lead Service Line Replacement (LSLR) Report

Requirements Pursuant to 40 CFR 141.84 & 141.90

Sections I through III are required to be completed and submitted electronically to the above email address **within 60 days of becoming aware of a trigger to commence Lead Service Line Replacement Requirements or upon request by the Department.** In accordance with 40 CFR 141.84(a) LSLR is triggered when a system fails to meet the lead action level in tap samples after installing corrosion control and/or source water treatment. The State may also require a system to commence LSLR for failure to install corrosion control treatment and/or source water treatment.

For water systems conducting LSLR, as required or voluntarily, all Sections are required to be completed and submitted electronically to the above email address **within 12 months following the end of the monitoring period that triggered LSLR (if applicable) and annually thereafter.**

I. System Information	
Water System Name	Township of Verona
PWSID Number	0720001

II. Contact Information		
Licensed Operator and/or Owner Name:	Stephen P. Lyons Paul Jeff Sonntag	
Licensed Operator and/or Owner Phone and Email Address:	Phone: Steve # 732-566-0038 Paul Jeff # 973-857-4643	Email Address: slyons@lyonsenvironmental.com jsonntag@veronanj.org

III. Inventory Information			
Owner of the LSL:	System ☐	Property Owner ☑	Both ☐

Initial number of LSL[1] in the system, regardless of ownership: _____

A. Select one of the two options below:

☐ Number of sites with LSL[2]: _____

☑ Total number of LSL unknown, but number of known LSL: 0

Approximate number of "unknown" LSL: 290

[1] If the system is resuming LSLR after cessation of its LSLR program, the initial inventory of LSLs must include any LSL site that was not replaced previously due to sampling conducted under 40 CFR 141.86(b)(3).

[2] Include sites with service lines made from lead installed from main to curb and/or curb to home.

B. Select one of the two options below:

☐ Number of lines that are lead-lined or dipped: _____

☑ Total number of lines that are lead-lined or dipped is unknown, but number of known lines that are lead-lined or dipped: 0

Approximate number of "unknown" lines that are lead-lined or dipped: 0

C. Select one of the two options below:

☐ Number of sites with lead goosenecks only[3]: _____

☑ Total number of lead goosenecks unknown, but number of known lead goosenecks: 0

Approximate number of "unknown" lead goosenecks: 50

Lead goosenecks are defined as LSLs in accordance with 40 CFR 141.2

D. Total number of Initial LSL Inventory[4]: 340 as of Date: March 1, 2019

[Number from Part A.] + [Number from Part B] + [Number from Part C] = [Total Number for Initial LSLR Inventory][5]

IV. Required Number of LSL to Replace annually

Required number of LSLs to replace annually: _____ as of Date: _____

Calculation for Initial LSLR Program:

[Total Number for LSLR Initial Inventory] x 0.07 = [7% LSL to replace annually]

Calculation for Resuming LSLR Program:

[Total Number for LSLR Initial Inventory[5]] / [Remaining Years[6]] = [Number of LSLs to replace annually]

V. Replacement Information as of Date: _____

Reason for LSLR:	ALE ☐		Voluntary ☐
Date range of replacement:	☐ Jan. 1, 20_ Dec. 31, 20_	☐ July 1, 20_ June 30, 20_	☐ Oct. 1, 20_ Sept. 30, 20_
No. of LSLR annually:	Partial LSLR[7] #:	Full LSLR[8] #:	Total #:
Were ≥7% of the initial LSLs replaced this year:	Yes ☐		No ☐
The percentage of the initial LSLs replaced: (If less than 7% replaced, attach justification with			

[3] Do not include sites that also have other lead service line materials and are already counted within item A or B of this Section.

[4] The total number if initial LSL include the known and approximate numbers identified in items A – C of this Section.

[5] If the system is resuming LSLR after cessation of its LSLR program, the initial inventory of LSLs must include any LSL site that was not replaced previously due to sampling conducted under 40 CFR 141.86(b)(3).

[6] LSLR is based on a 15-year program; therefore, if previously completed two years before ceasing LSLR then the number of years remaining will be 13.

[7] Partial LSLR means the utility-owned LSL portion was replaced but the customer owned lead service line is still in place.

[8] Full LSLR means that after replacement the home/building is no longer served by any utility owned and/or customer owned LSL.

any supporting documentation.)		
No. of property owners who approved full LSLR: (if applicable)		
No. of LSLs replaced under an emergency response:		
No. of previously known LSLs discovered to not be lead[9]:		
No. of LSLs remaining that are **ONLY** lead on the property-owner side (no lead on the system side):		
Has the Lead and Copper Sampling Plan been updated to reflect LSLR and maintained onsite?	Yes ☐	No ☐
Has the BWSE-18 form been updated and sent to NJDEP to reflect LSLR?	Yes ☐	No ☐
☐ **Attached Required Map of LSLR locations** The map must identify partial LSLR sites, full LSLR sites, sites that were not physically replaced but deemed not required due to sampling of the LSL [per 40 CFR 141.84(c)], the remaining known LSL sites, and areas of suspected but unknown LSL sites.		

V. LSL Sampling (if applicable)		N/A ☐
☐ **The water system is maintaining all LSL sampling documentation required under 40 CFR 141.90(e)(3) including, the water lead concentration and location of each lead service line sample, the sampling method, and date of sampling.**		
Was lead sampling conducted at LSL sites to determine if physical replacement of the LSL was necessary?	Yes ☐	No ☐
Was lead sampling conducted at full LSLR sites?	Yes ☐	No ☐
Was lead sampling conducted at partial LSL replacement sites?	Yes ☐	No ☐

VI. Partial LSLR (if applicable)		N/A ☐
☐ **The water system is maintaining all partial LSLR documentation required under 40 CFR 141.90(e)(3) including, but not limited to, copies of the public notice, and the number and locations of each LSLR.**		
Was Public Notice distributed 45 days prior to LSLR in accordance with 141.84 (d)(i)?	Yes ☐	No ☐
Were follow-up lead samples collected within 72 hours of partial LSLR from customers willing to participate?	Yes ☐	No ☐
Were results provided to the customer within 3 business days of receipt?	Yes ☐	No ☐

[9] Only to identify sites that have no known lead on both utility and/or customer owned portions.

If the answer to any of the questions above are "No", provide details and justification in the comment box below (attach additional documentation as necessary).
Comments:

☐ ***I certify*** *that all LSLs that have been replaced (no longer containing any lead), have been made inactive in the water system's lead and copper sampling pool and will no longer be used for future lead and copper sampling under Tier 1 category I and/or Tier 2 category iv or x. A Revised PbCu Sample Location Spreadsheet (Form BWSE-18) has been submitted electronically to watersupply@dep.nj.gov.*

☐ *(If applicable)* ***I certify*** *that all LSL sample results have been reported on the Non-Compliance Lead and Copper Tap Monitoring Form (Form BWSE -16) and submitted electronically to watersupply@dep.nj.gov.*

☑ ***I have verified and certify*** *the information listed in this form is true and accurate to the best of my knowledge and belief:*

Signatures

Water System Name: Township of Verona

PWSID: 0720001

Paul J Sonntag
Water System Owner Signature

April 1, 2019
Date

Paul Jeff Sonntag
Water System Owner Name (Please Print)

Assistant Water Operator
Title

Licensed Operator Signature

April 1, 2019
Date

Stephen P. Lyons
Licensed Operator Name (Please Print)

563899
License Number

Colliers Engineering & Design

Appendix

Appendix C | NJDEP Water Quality Accountability Act (WQAA)

CHAPTER 133

AN ACT concerning the operation and management of public water systems, and supplementing Title 58 of the Revised Statutes.

BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey:*

C.58:31-1 Short title.

1. This act shall be known and may be cited as the "Water Quality Accountability Act."

C.58:31-2 Definitions relative to operation, management of public water systems.

2. As used in this act:

"Board" means the Board of Public Utilities.

"Department" means the Department of Environmental Protection.

"Public water system" means the same as the term is defined in section 3 of P.L.1977, c.224 (C.58:12A-3).

"Water purveyor" means any person that owns a public water system with more than 500 service connections.

C.58:31-3 Inspections, testing by water purveyor.

3. a. Each water purveyor shall inspect each valve in its public water system in accordance with the provisions of subsection b. of this section in order to determine (1) accessibility of the valve for operational purposes, and (2) the valve's operating condition. A water purveyor shall repair or replace any valve found to be broken or otherwise not operational.

b. Each water purveyor shall inspect each valve that is 12 or more inches in diameter at least once every two years, and shall inspect all other valves at least once every four years , except that the requirements of this subsection shall not apply to any service connection valve or customer shut-off valve . At a minimum, each valve inspection conducted pursuant to this subsection shall include:

(1) clearing of the area around the valve to ensure full access to the valve for operating purposes;

(2) cleaning out of the valve box;

(3) dynamic testing of the valve, by opening and then closing the valve for either of the following number of turns:

(a) the number of turns recommended by the valve manufacturer to constitute a credible test; or

(b) the number of turns which constitutes 15 percent of the total number of turns necessary to completely open or completely close the valve ; and

(4) complying with any other criteria as may be required by the department pursuant to rules and regulations adopted pursuant to the "Administrative Procedure Act," P.L.1968, c.410 (C.52:14B-1 et seq.).

c. (1) Each water purveyor shall, once a year, test every fire hydrant in its system in order to determine the hydrant's working condition.

(2) Each water purveyor shall formulate and implement a plan for flushing every fire hydrant in the public water system, and every dead end of a main in the public water system. This plan for flushing may be combined with the periodic testing of fire hydrants required pursuant to paragraph (1) of this subsection.

d. Each water purveyor shall keep a record of all inspections, tests, and flushings conducted pursuant to this section for a period of at least six years.

e. Each water purveyor that owns, solely or jointly, a fire hydrant shall mark each hydrant with the initials of its name, abbreviation of its name, corporate symbol, or other distinguishing mark or code by which ownership may be readily and definitely ascertained. Each fire hydrant shall be marked with a number or symbol, or both, by which the location of the hydrant may be determined on the water purveyor's office records. The markings may be made with paint, brand, or with a soft metal plate, and shall be of such size and so spaced and maintained as to be easily read.

f. Each water purveyor shall identify, to the extent possible, the geographic location of each valve and fire hydrant in its public water system using a global positioning system based on satellite or other location technology.

C.58:31-4 Development of cybersecurity system; exemptions.

4. a. Within 120 days after the effective date of this act, each water purveyor shall develop a cybersecurity program, in accordance with requirements established by the board, that defines and implements organization accountabilities and responsibilities for cyber risk management activities, and establishes policies, plans, processes, and procedures for identifying and mitigating cyber risk to its public water system. As part of the program, a water purveyor shall conduct risk assessments and implement appropriate controls to mitigate identified risks to the public water system, maintain situational awareness of cyber threats and vulnerabilities to the public water system, and create and exercise incident response and recovery plans.

A copy of the program developed pursuant to this subsection shall be provided to the New Jersey Cybersecurity and Communications Integration Cell, established pursuant to Executive Order No. 178 (2015) in the New Jersey Office of Homeland Security and Preparedness.

b. Within 60 days after developing the program required pursuant to subsection a. of this section, each water purveyor shall join the New Jersey Cybersecurity and Communications Integration Cell, established pursuant to Executive Order No. 178 (2015), and create a cybersecurity incident reporting process.

c. A water purveyor that does not have an internet-connected control system shall be exempt from the requirements of this section.

C.58:31-5 Violations; mitigation.

5. In addition to any other requirements in law, or any rule or regulation adopted pursuant thereto, whenever a water purveyor is issued , pursuant to section 10 of P.L.1977, c.224 (C.58:12A-10) , three notices of violation for any reason or two notices of violation related to an exceedance of a maximum contaminant level within any 12-month period, the water purveyor, within 60 days after receipt of the third or second notice, as applicable, shall submit to the department a mitigation plan specifying whether the notice of violation will be addressed through operational changes or require a capital expenditure and providing a schedule for implementation of the mitigation plan. The mitigation plan shall include a report prepared by the licensed operator of the public water system and a professional engineer licensed pursuant to P.L.1938, c.342 (C.45:8-27 et seq.) that includes a technical analysis of the notices of violation and an explanation of how the mitigation plan submitted pursuant to this section is intended to prevent a recurrence of the issue that resulted in the notice of violation. Any capital expenditures required pursuant to this section shall be incorporated into the asset management plan required pursuant to section 7 of this act.

C.58:31-6 Additional certifications.

6. In addition to any other certifications required pursuant to law, rule, or regulation, the responsible corporate officer of the public water system, if privately held, executive director, if an authority, or mayor or chief executive officer of the municipality, if municipally owned, as applicable, shall be required to certify in writing each year to the Department of Environmental Protection and, if applicable, the Board of Public Utilities that the water purveyor complies with: all federal and State drinking water regulations, including water quality sampling, testing, and reporting requirements; the hydrant and valve requirements set forth in section 3 of this act; the notice of violation mitigation plan requirements set forth in section 5 of this act, if applicable; and the infrastructure improvement investment required pursuant to section 7 of this act.

C.58:31-7 Asset management plan; report.

7. a. Beginning no later than 18 months after the effective date of this act, every water purveyor shall implement an asset management plan designed to inspect, maintain, repair, and renew its infrastructure consistent with standards established by the American Water Works Association. The asset management plan shall include:

(1) a water main renewal program designed to achieve a 150-year replacement cycle, or other appropriate replacement cycle as determined by a detailed engineering analysis of the asset condition and estimated service lives of the water mains serving the public water system;

(2) a water supply and treatment program designed to inspect, maintain, repair, renew, and upgrade wells, intakes, pumps, and treatment facilities in accordance with all federal and State regulations, standards established by the American Water Works Association, and any mitigation plan required pursuant to section 5 of this act ; and

(3) any other programs, plans, or provisions as may be required by the department pursuant to rules and regulations adopted pursuant to the "Administrative Procedure Act," P.L.1968, c.410 (C.52:14B-1 et seq.).

Each water purveyor shall dedicate funds on an annual basis to address and remediate the highest priority projects as determined by its asset management plan.

All asset management plans and system condition reports shall be certified to by the licensed operator or professional engineer of the public water system and the responsible corporate officer of the public water system, if privately held, executive director, if an authority, or mayor or chief executive officer of the municipality, if municipally owned, as applicable. The replacement cycle shall be determined by dividing the miles of water main located in the public water system by 150 or other appropriate demonstration set forth in the certified asset management plan prepared pursuant to this section.

b. At least once every three years, each water purveyor shall provide to the department and the board, if applicable, a report based on its asset management plan prepared pursuant to subsection a. of this section identifying the infrastructure improvements to be undertaken in the coming year and the cost of those improvements, as well as identifying the infrastructure improvements completed in the past year and the cost of those improvements. A municipal water department or municipal water authority shall also submit the report required pursuant to this subsection to the Division of Local Government Services in the Department of Community Affairs.

c. The department, the board, and the Department of Community Affairs shall create a centralized portal allowing for electronic submittal of the report required pursuant to subsection b. of this section. The lack of a centralized portal pursuant to this subsection shall

not negate the requirement for a water purveyor to submit a report pursuant to subsection b. of this section.

8. This act shall take effect on the 90th day after the date of enactment.

Approved July 21, 2017.

Colliers Engineering & Design

Appendix

Appendix D | Above Ground Asset – Fairview Avenue Water Treatment Plant and Well

Asset Management Plan
FAIRVIEW AVENUE TREATMENT PLANT AND WELL ASSET INVENTORY
For
Verona Water Department
Essex County, New Jersey

Asset Inventory					Condition Assessment				Risk Assessment		
Asset Type	Asset Description	Asset Facility	Make	Model	Approx. Year Installed	Estimated Useful Life	Remaining Life Span	Condition Rating	Probability of Failure Rating	Consequence of Failure Rating	BRE / Criticality Rating
Building	Aeration/Treatment Facility	Fairview Treatment Facility	N/A	N/A	2004	60	42	Excellent	1	2	2
Building Roof	Aeration/Treatment Facility	Fairview Treatment Facility	N/A	N/A	2004	30	12	Good	2	2	4
Generator	Generator	Fairview Treatment Facility	Catapillar		2018	20	16	Excellent	1	2	2
Controls	Automatic Transfer Switch	Fairview Treatment Facility			2018	20	16	Excellent	1	2	2
Pump	Submersible Well Pump and Downwell Piping	Fairview Avenue Well			2018	15	11	Fair	3	2	6
Motor	Submersible Well Pump Motor	Fairview Avenue Well	Mid-America	9-9RCHC-GP	2019	15	12	Excellent	1	2	2
Control Panel	Pump Control Panel	Fairview Treatment Facility	Panalarm		2004	20	2	Good	2	2	4
Well Casing	Exterior Well Casing	Fairview Avenue Well			2004	35	17	Excellent	1	2	2
Control Box	Well Control Box	Fairview Avenue Well			2004	20	2	Good	2	2	4
Control Valve	Well Pump Control Valve	Fairview Avenue Well			2004	25	7	Good	2	2	4
Pump	Vertical Turbine Clearwell Pump	Fairview Treatment Facility	Flowserve	10EMM-7	2004	20	2	Good	2	2	4
Motor	Vertical Turbine Clearwell Pump Motor 60 Hp	Fairview Treatment Facility	Emerson Motor Company	7220-BEM	2004	20	2	Good	2	2	4
Pipe	8" Tower Influent	Fairview Treatment Facility	Layne Christensen		2004	35	17	Excellent	1	2	2
Air Stripper	Air Stripper	Fairview Treatment Facility	Layne Christensen	PCS.61.16.CA	2004	40	22	Excellent	1	2	2
Packing	Air Stripper Packing	Fairview Treatment Facility	Layne Christensen		2004	20	2	Good	2	2	4
Pipe	Air Stripper 12_inch Aluminum Tower Effluent	Fairview Treatment Facility	Layne Christensen	PCS.61.16.CA	2004	40	22	Excellent	1	2	2
Air Filters	Air Filters	Fairview Treatment Facility			2004	15	-3	Fair	3	2	6
Motor	Air Stripper Blower Motor / Fan	Fairview Treatment Facility	American Fan Company	BCS-165	2004	20	2	Fair	3	2	6
Blower	Blower for Air Stripper	Fairview Treatment Facility	American Fan Company	BCS-165	2004	20	2	Fair	3	2	6
Ductwork	Blower Ductwork 18"	Fairview Treatment Facility	AirTechnologies	T-VT2130-2X2-1	2004	25	7	Fair	3	2	6
Flexible Coupling	Duct Work Flexible Couplings	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Meter	Loop Powered Digital Panel Meter	Fairview Treatment Facility	Percision Digital	PD685	2004	20	2	Fair	3	2	6
Control Panel	Clearwell Pump Control Panel	Fairview Treatment Facility	Flowserve	10EMM-7	2004	20	2	Fair	3	2	6
Control Panel	Sodium Hypochlorite Control Panel	Fairview Treatment Facility		CP-500	2004	20	2	Fair	3	2	6

Asset Management Plan
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For
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Asset Inventory					Condition Assessment				Risk Assessment		
Asset Type	Asset Description	Asset Facility	Make	Model	Approx. Year Installed	Estimated Useful Life	Remaining Life Span	Condition Rating	Probability of Failure Rating	Consequence of Failure Rating	BRE / Criticality Rating
Storage Tank	Sodium Hypochlorite Storage Tank	Fairview Treatment Facility	PolyProcessing	V 13 01441	2004	30	12	Good	2	2	4
Metering Pump	Sodium Hypochlorite Metering Pump No. 1	Fairview Treatment Facility			2004	15	-3	Fair	3	1	3
Metering Pump	Sodium Hypochlorite Metering Pump No. 2	Fairview Treatment Facility			2004	15	-3	Fair	3	1	3
Metering Pump	Sodium Hypochlorite Metering Pump No. 3	Fairview Treatment Facility			2004	15	-3	Fair	3	1	3
Storage Tank	Polyphosphate Storage Tank	Fairview Treatment Facility			2004	30	12	Good	2	2	4
Metering Pump	Ortho Polyphosphate Pump	Fairview Treatment Facility			2004	15	-3	Fair	3	2	6
Meter	Ortho Polyphosphate Meter	Fairview Treatment Facility			2004	15	-3	Fair	3	2	6
Pipe	Ortho Polyphosphate Feed Line	Fairview Treatment Facility			2004	50	32	Good	2	2	4
Recorder	Chlorine Residual Recorder	Fairview Treatment Facility	Chessell	392	2004	15	-3	Fair	3	2	6
Analyzer	Chlorine Residual Analyzer	Fairview Treatment Facility	Hach	CL17	2004	15	-3	Fair	3	2	6
Meter	Flow Meter	Fairview Treatment Facility			2004	15	-3	Fair	3	2	6
Pipe	Analyzer Drain Pipe	Fairview Treatment Facility			2004	50	32	Good	2	1	2
Pressure Sensing Line	Pressure Sensing Line	Fairview Treatment Facility			2004	15	-3	Fair	3	2	6
Pressure Gauge	Pressure Gauge	Fairview Treatment Facility	Winters	PFQ Series	2004	15	-3	Fair	3	2	6
Pressure Regulator	Pressure Regulator	Fairview Treatment Facility			2004	15	-3	Fair	3	2	6
Motor Control Center	Motor Control Center	Fairview Treatment Facility	General Electric	E9000	2004	25	7	Good	2	2	4
Pipe	Copper Water Service	Fairview Treatment Facility			2004	50	32	Good	2	1	2
Valve	2" Combination Air & Vacuum Valve	Fairview Treatment Facility	GA Industries	Figure No. 945	2004	25	7	Fair	3	2	6
Valve	Process Piping: 8" Swing Check Valve	Fairview Treatment Facility			2004	25	7	Fair	3	2	6
Valve	Process Piping: 8" Butterfly Valve	Fairview Treatment Facility			2004	40	22	Good	2	2	4
Valve	Process Piping: 3" Butterfly Valve	Fairview Treatment Facility			2004	40	22	Good	2	2	4
Valve	Process Piping: 3" Surge Relief Valve	Fairview Treatment Facility			2004	25	7	Fair	3	2	6
Valve	12" Inline Rubber Check Valve	Fairview Treatment Facility			2004	25	7	Fair	3	2	6
Pipe	Process Piping: 8" Blind Flange	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Coupling	Dresser Couplings	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1

Asset Management Plan
FAIRVIEW AVENUE TREATMENT PLANT AND WELL ASSET INVENTORY
For
Verona Water Department
Essex County, New Jersey

Asset Inventory					Condition Assessment				Risk Assessment		
Asset Type	Asset Description	Asset Facility	Make	Model	Approx. Year Installed	Estimated Useful Life	Remaining Life Span	Condition Rating	Probability of Failure Rating	Consequence of Failure Rating	BRE / Criticality Rating
Pipe	Victaulic Coupling	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Pipe	12" Overflow Piping to Chamber	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Pipe	Distribution Piping: 8" Distribution System	Fairview Treatment Facility			2004	40	22	Excellent	1	2	2
Pipe	Overflow Piping: 12" 90-Degree Bend	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Pipe	Process Piping: 3" 90-Degree Bend	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Pipe	4"x3" Eccentric Reducer	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Backflow Preventer	3/4" Backflow Preventor	Fairview Treatment Facility			2004	25	7	Good	2	2	4
Pipe	D.I. Spool Piece	Fairview Treatment Facility			2004	40	22	Excellent	1	1	1
Buried Pipe	Buried Pipe	Fairview Avenue Well			2004	40	22	Excellent	1	2	2
Heater	Electric Unit Heater	Fairview Treatment Facility			2004	25	7	Good	2	2	4

Colliers Engineering & Design

Appendix

Appendix E | NJDEP Water Allocation Permit (WAP)

BWA-001 B
Revised 11/2015

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
MAIL CODE 401-04Q
DIVISION OF WATER SUPPLY & GEOSCIENCE
BUREAU OF WATER ALLOCATION & WELL PERMITTING
P.O. BOX 420
TRENTON, NEW JERSEY 08625-0420
(609) 984-6831

WATER ALLOCATION PERMIT APPLICATION

RENEWALS

PLEASE READ THE INSTRUCTIONS BEFORE COMPLETING THIS APPLICATION FORM.
Provide all requested information, as applicable.

A. LOCATION AND PROPERTY INFORMATION

The Department is now maintaining a single database of regulated sites. The following information will prevent unnecessary duplication of data.

1. ACTUAL DIVERSION LOCATION

Name of Facility Application is for (For facilities pending or under construction, please use the proposed facility name)
TOWNSHIP OF VERONA

Street Address/Location (or nearest cross streets if no address is available; P.O. Boxes are not acceptable)
600 BLOOMFIELD AVE

City or Town VERONA State NJ Zip Code 07044+

Municipality VERONA Does the Facility span multiple municipalities? Yes ☒ No ☐

County ESSEX Does the Facility span multiple counties? Yes ☐ No ☒

2. PROPERTY/LAND OWNERS(S) INFORMATION

Name TOWNSHIP OF VERONA Telephone (973) 857-4767

Mailing Address 600 BLOOMFIELD AVE

City or Town VERONA State NJ Zip Code 07044+

Organization Type: (Check one)
☐ Authority/District/Commission ☒ Municipal ☐ County ☐ State
☐ Commercial/Industry ☐ Individually Owned ☐ Utility ☐ Corporation
☐ Investor (Non-BPU) ☐ Investor (BPU) ☐ Other

3. APPLICANT/OPERATING ENTITY(IES)

Name TOWNSHIP OF VERONA Telephone (973) 857-4843

Mailing Address 10 COMMERCE CT.

City or Town VERONA State NJ Zip Code 07044+

Fax (973) 239-7837 E-Mail address JSONTAG@VERONANJ.ORG

CONTACT INFORMATION

Application Contact (contact at the above address for all application matters):

If an agent has been authorized under the certification section of the application to act as the agent/representative in all matters pertaining to the application, please check here: ☐

If an agent has not been authorized, provide an Application Contact:

Name PAUL J. SONTAG Telephone (973) 857-4843

Report Form Recipient/Permit Contact (contact at the above address for permit information and monitoring reports):

Name PAUL J. SONTAG Telephone (973) 857-4843

Title BACK UP OPERATOR Department WATER DEPT.

4. Responsible Entity/Organization

If the responsible organization is the Applicant located in No. 3 above, check here: ☑

If the responsible organization is different from the Applicant in No. 3 above, complete the following:

Organization Name _____ Telephone ( ) _____

Mailing Address _____

City or Town _____ State _____ Zip Code _____+_____

Fax ( ) _____ E-Mail _____

Organization Type (Check one): ☐ Authority/District/Commission ☐ Municipal ☐ County ☐ State ☐ Commercial/Industry ☐ Individually Owned ☐ Utility ☐ Corporation ☐ Investor (Non-BPU) ☐ Investor (BPU) ☐ Other _____

5. Billing Contact

Billing should go to mailing address of:

☐ Responsible Entity/Organization address in No. 4 ☑ Applicant/Operating Entities address in No. 3

Name PAUL J. SONTAG Telephone (973) 857-4843

6. Other Permits/Agencies

Provide the following for any other state, local or federal permit that has been applied for in relation to this project.

Permit Type	Application No./ Permit No./Relevant DEP No.	Application Date	Application Status
• Water Quality Management Plan Amendment	APPLIED FOR THROUGH LEAD AGENCY - ESSEX COUNTY		
• Safe Drinking Water System/Potable Water Supply Well or Intake	264693 + 264694	12/2000	APPROVED
• Hazardous Waste Management Program	N/A		
• Land Use Permits (Freshwater Wetlands, etc.)	N/A		
• Relevant Environmental Permits – Including Federal, State, & Local Approvals – Specify:	N/A		

Is the project located within the New Jersey Pinelands Area? ___ Yes ✓ No

If this application includes a new source of supply, which is located in the New Jersey Pinelands Area, or is for an increase in allocation, then a Certificate of Filing from the New Jersey Pinelands Commission must be submitted with the application. The Pinelands Commission can be contacted at (609) 894-7300.

Is the project located in the Delaware River Basin? ___Yes X No

If Yes, has a docket been issued for this project by the Delaware River Basin Commission?

___Yes Docket No. _____

___No Docket applied for on _____ (Date)

The Delaware River Basin Commission can be contacted at (609) 883-9500.

B. CERTIFICATIONS

In cases where the official required to sign Certification 1 below is the same person as the official required to sign the Certification 2 below, only Certification 1 need be signed. In all other cases, both certifications shall be completed.

1. HIGHEST RANKING INDIVIDUAL OF FACILITY

This certification is to be signed by the highest-ranking individual at the facility with overall responsibility for that facility.

I certify under penalty of law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties for submitting false, inaccurate or incomplete information, including fines and/or imprisonment.

8/19/21
Date

Signature

Charles Mulligan Jr
Name (please print)

Supervisor DPW
Title

2. HIGHEST RANKING INDIVIDUAL

This certification shall be signed as follows:

(a) For a corporation, by a principal executive officer of at least the level of vice president; or
(b) For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or
(c) For a municipality, State, Federal or other public agency, by either the principal executive officer ranking elected official.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information. I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil and criminal penalties for submitting false, inaccurate or incomplete information, including the possibility of fines and/or imprisonment.

8/19/2021
Date

Matthew Cavallo
Signature

Matthew Cavallo
Name (please print)

Township Manager
Title

3. Applicant's Agent (if applicable)

I, the Applicant/~~Owner~~ PAUL J. SONTAG *or Applicant/Operator (when the owner of the facility and the operator of the facility are distinct parties)* _____

or Co-permittee (if applicable) _____ *authorize to act as my agent/representative in all matters pertaining to my application the following person:*

Name MICHAEL J. LYONS Phone 732-566-0038

Company/Employer LYONS ENVIRONMENTAL SERVICES, LLC

Address 1105 GREEN GROVE RD. County MONMOUTH

City or Town NEPTUNE State NJ Zip Code 07753

Occupation/Profession LEO

Paul A Sontag
(Signature of Applicant/Owner)

(Signature of Applicant/Owner)

(Signature of Co-permittee)

AGENT'S CERTIFICATION

Sworn before me
this _____ day of
_____ 20 ____

_____
Notary Public

I agree to serve as agent for the above mentioned applicant

Michael J. Lyons
(Signature of Agent)

MICHAEL C. DeCARLO
NOTARY PUBLIC OF NEW JERSEY
Commission ID: 50147445
My Commission Expires Jan. 6, 2026

4. Statement of Preparer of Plans, Specifications, Surveyors or Technical Report (if applicable)

I hereby certify that the engineering plans, specifications and engineer's report applicable to this project comply with the current rules and regulations of the State Department of Environmental Protection with the exceptions as noted.

(Signature of Engineer)

Type: Name and Date

Position, Name of Firm

PROFESSIONAL ENGINEER'S
EMBOSSED SEAL

C. Required Submittals/ Application Attachments

Check to ensure the following are included with the application:

Included		
☑	1.	Proof of Meter Calibration for each source
☑	2.	Water conservation and Drought Management Plan *If not required, please indicate why:* _____
☐	3.	Information supporting Future Demands Projections listed in Section E.1.
☐	4.	**Send a PDF version of this application and attachments to: wateralloca tion@dep.nj.gov**

D. Diversion Request and Diversion Source Information

This application is for:

☑ Renewal of existing Permit No. 5832 Activity No. (if known) N/A

1. Present Allocation:
   a. Groundwater: 34.6 million gallons of water per month at a maximum rate of 775 gallons per minute.

   Please note the present Aquifer Specific Allocation:

Aquifer/Formation Name	Present Allocation (million gallons)	
	Per Month (mgm)	Per Year (mgy)
FELTVILLE FORMATION/BRUNSWICK GROUP	34.6	365

   b. Surface water: 0 million gallons of water per month at a maximum rate of 0 gallons per minute.

   c. All sources: 34.6 million gallons of water per month at a maximum rate of 775 gallons per minute.

   d. All sources: 365 million gallons of water per year.

   Note: Monthly allocations are established based upon the maximum withdrawal expected during any one month (31 days) of the calendar year.

2. Diversion to be used for PUBLIC WATER SUPPLY.

3. Complete the following for each diversion source:

a. Groundwater (wells)

State Well Permit No. (mandatory)	Well Local Name	Location Description	Existing (E) Proposed (P)	Proposed Maximum Withdrawal Rate (million gallons)	
				Per Month	Per Year
2646493	FAIRVIEW WELL A	FAIRVIEW	E	22.3	286
2646494	LINN DR. WELL B	LINN DRIVE	E	12.3	147

[1] *If source specific surface water allocations are requested, please attach requests as necessary.*

b. Groundwater (continued from previous page)

State Well Permit No. (mandatory[1])	Well Local Name	Location Description	Existing (E) Proposed (P)	Proposed Maximum Withdrawal Rate (million gallons)	
				Per Month	Per Year

b. Surface water (streams, reservoirs, ponds) N/A

Intake Subject Item Identification No. [2]	Intake Local Name	Location Description	Existing (E) Proposed (P)	Proposed Maximum Withdrawal Rate (million gallons)	
				Per Month	Per Year

4. Complete Addendum A and B for each diversion source.

E. WATER USE

1. The current and projected average and peak water demands in million of gallons for 5 year intervals are as follows:

WATER DEMAND	AVERAGE DEMAND			PEAK DEMAND	
	Daily	Monthly	Annual	Daily	Monthly
Current Demand	1.264	38.451	461.409	1.780	55.165
5 Year Projections	1.35	40.0	480.0	1.850	57.0
10 Year Projections	1.38	41.0	485.0	1.900	58.0
15 Year Projections	1.40	42.0	490.0	1.950	59.0

[1] *State Well Permit No. is mandatory for existing wells (see instructions).*
[2] *Intake Subject Item Identification No. is the identification number assigned to the intake by the DEP. For existing, approved sources, this number can be found on the Pre-Printed Monitoring Report Forms or the existing permit.*

2. Present annual average water use:

WATER USE	Self Supplied		Other Sources (mgd)	Total (mgd)	Estimated Consumptive Use[1] (%)
	Ground (mgd)	Surface (mgd)			
Domestic Supply	0.742	0	0.593	1.335	92.7
Industrial Process	0	0	0	0	0
Industrial Cooling	0	0	0	0	0
Irrigation	0	0	0	0	0
Commercial	0.058	0	0.047	0.105	7.3%
Remediation	0	0	0	0	0
Other	0	0	0	0	0
Total Water Use	0.800	0	0.640	1.440	100%

[1] Consumptive use is water withdrawn that is not returned to the surface or ground waters at or near the point from which it was taken without substantial dimunition in quantity or substantial impairment of quality.

3. The water, after use for above purposes stated in D.2., will discharge into VERONA WASTEWATER FACILITY (Name of Stream, Sewage System, or Subsurface Disposal System). For wastewater discharged directly by the facility or via a sewerage system to treatment plant, provide the location of the plant and its NJPDES Permit Number.
   Location: 10 COMMERCE CT. VERONA, NJ 07044
   NJPDES Permit No. NJ0024490

4. For non-potable diversions, what is the source of water for sanitary use? N/A

F. IRRIGATION

Complete if water is to be used for irrigation purposes. N/A

1. Check to ensure the following is included:

Included	
☐	Attach a diagram of the irrigation system piping between the diversion sources, any storage ponds and wet wells, up to the irrigation system distribution piping. Include the position of all water meters.

2. Irrigation is to be used for (e.g. golf course, landscape, grounds maintenance)

3. Describe the types of grasses, acreage and maximum need for each in extreme dry weather, in gallons per week.

4. Describe the irrigation system (type, capacity of nozzles in gpm, maximum number of nozzles operating at one time, average and maximum irrigation time in hours per day, how diversion is metered, how the ponds are fed.)

5. Is there any treated wastewater used for irrigation? ___Yes ___No

G. PUBLIC WATER/SUPPLY SYSTEMS

Complete only if diversion is for public water supply.

1. Population
   a. Population supplied at the time of application: 13,822
   b. Provide source or basis as to how figure in 1a. was determined: CENSUS
   c. The population supplied is projected to be 13,950 by the year 2021. The method used to calculate the population is (or include in attached report): ON GOING

2. Estimated Consumption (average day of maximum month (MGD)):
   a. Immediate 1.264
   b. Future (1.350 years) 2025

3. Quantity or percentage of water supplied during the last calendar year for the following:

	Annual	Maximum Month	
Total	461.409 MG	55.165 MG	
Domestic	373.741	44.684	
Commercial	50.755	6.068	
Industrial	0	0	
Other	36.913	4.413	MUNICIPAL

4. Quantity or percentage of unaccounted-for water (as defined by N.J.A.C. 7:19-6.2): _____ for 2020 (Year), of a total water production of 461.409 million gallons.

5. Number of Service Taps: Domestic 3966 Commercial and Industrial 279
   Number of Meters: Domestic 3966 Commercial and Industrial 279

6. Capacity of Plant (gallons daily) 1,120,000

7. Total System Storage (million gallons) 6.55

8. The following is required for all Public Water Supply Applications:

Included		
☐	a.	Provide a list of **all contracts** with other municipalities or water companies to supply or purchase water. Provide copies of the all contracts not previously approved by the Bureau.
☐	b.	List of **municipalities to be supplied**. Submit a map of the service area when not restricted by established municipal limits. (If not submitted previously.)
☐	c.	List of **all interconnections**, size of each interconnection, and the water system serviced.
☐	d.	Other drawings and information deemed pertinent.

ADDENDUM A
SOURCE DATA FOR GROUNDWATER (WELLS)

Complete Well information for all existing and proposed sources. This information is mandatory. Refer to instructions for acceptable values. Please reference the same State Well Permit Numbers and Well Names as referenced in Section D of the application. Attach additional copies of addendum as needed.

State Well Permit No.	2646493
Well Local Name	FAIRVIEW AVE WELL A
Date Drilled	5/12/1997
Total Finished Depth (feet) (include tailpiece if any)	520'
Depth to Top of Open Hole Interval or Screen (feet)	95'
Depth to Bottom of Open Hole Interval or Screen (feet)	520'
Rated Pump Capacity (gpm)	500
Yield (gpm)	500
Aquifer/Geological Formation	FELTSVILLE BRUNSWICK GROUP
Elevation Information:	
Site Elevation	470.5
Elevation System Description	FEET ABOVE SEA LEVEL
Elevation Method Description	PLOT PLAN
Absolute Elevation Accuracy	+/- 0.5'
Absolute Elevation Accuracy Units (feet or meters)	FEET
Locational Information:	
X coordinate (e.g. Longitude) of well center	561417
Y coordinate (e.g. Latitude) of well center	731864
Coordinate System Code and Description	01
Coordinate Method Description	EXACT ADDRESS MATCH
Absolute Location Accuracy	10'
Accuracy Units (feet or meters)	FEET

State Well Permit No.	2646494
Well Local Name	LINN DRIVE WELL B
Date Drilled	5/12/1997
Total Finished Depth (feet) (include tailpiece if any)	690'
Depth to Top of Open Hole Interval or Screen (feet)	50'
Depth to Bottom of Open Hole Interval or Screen (feet)	690'
Rated Pump Capacity (gpm)	275
Yield (gpm)	275
Aquifer/Geological Formation	FELTSVILLE BRUNSWICK GROUP
Elevation Information:	
Site Elevation	487.0
Elevation System Description	FEET ABOVE SEA LEVEL
Elevation Method Description	PLOT PLAN
Absolute Elevation Accuracy	+/- 0.5'
Absolute Elevation Accuracy Units (feet or meters)	FEET
Locational Information:	
X coordinate (e.g. Longitude) of well center	559307
Y coordinate (e.g. Latitude) of well center	729476
Coordinate System Code and Description	01
Coordinate Method Description	EXACT ADDRESS MATCH
Absolute Location Accuracy	10'
Accuracy Units (feet or meters)	FEET

ADDENDUM B

SOURCE DATA FOR SURFACE WATER (STREAMS, RESERVOIRS, PONDS)

Complete Intake information for all existing and proposed sources. This information is mandatory. Refer to instructions for acceptable values. Please reference the same Source Intake ID and Intake Local Name as referenced in Section D of the application. Attach additional copies of addendum as needed:

Source Intake SI ID (if already permitted)	
Intake Local Name	
Rated Pump Capacity (gpm)	
MA7CD10 (cfs) at intake opening	
Requested Passing Flow (cfs)	
Surface Water Quality Classification	
Drainage Area Above Intake (square miles)	
Locational Information:	
X coordinate (e.g. Longitude) of intake opening	
Y coordinate (e.g. Latitude) of intake opening	
Coordinate System Code and Description	
Coordinate Method Description	
Absolute Location Accuracy	
Accuracy Units (feet or meters)	

Source Intake SI ID (if already permitted)	
Intake Local Name	
Rated Pump Capacity (gpm)	
MA7CD10 (cfs) at intake opening	
Requested Passing Flow (cfs)	
Surface Water Quality Classification	
Drainage Area Above Intake (square miles)	
Locational Information:	
X coordinate (e.g. Longitude) of intake opening	
Y coordinate (e.g. Latitude) of intake opening	
Coordinate System Code and Description	
Coordinate Method Description	
Absolute Location Accuracy	
Accuracy Units (feet or meters)	

Addendum B Page ___ of ___

INSTRUCTIONS FOR COMPLETING BWA-001B

1. GENERAL INSTRUCTIONS

This form includes eight sections, A through H, and Addenda A and B. Section F applies to irrigation water users (other than Agricultural/Horticultural water users certified by the County Agricultural Agent under N.J.A.C. 7:20A-1 et seq.). Section G applies to Public Water Suppliers. Addenda A and B apply to each individual diversion source for all applicants. **All applicable sections must be completed or the application will be returned.**

Applications must reference valid State Well Permit Numbers and wells must be permitted for their intended use. A well search can be scheduled by the applicant or performed by the Department for a fee. **Applications without valid State Well Permit Numbers for existing wells will be returned.**

All information required by the regulations under N.J.A.C. 7:19-2.2 must be addressed in this application.

A. Site Location Information

1. Actual Diversion Location - Provide the Name of the Facility of which the application is for, the physical street address or nearest cross streets of the diversion location. Attach additional sheets if more than one physical location applies.
2. Property/Land Owners – Provide the legal name for the owner of the property/land on which the diversion is located.
3. Applicant/Operating Entity(ies) – Provide the name, as it is legally referred to, of the operating entity of the subject facility. The operating entity is the firm, public agency, individual, or other entity which has the primary management and decision making authority over any part of the facility/site.

   The Application Contact is the individual responsible for all aspects/inquiries regarding the application. Check the Agent box if an Agent has been designated in Section B3 of the Application. The Report Form Recipient/Permit Contact is the designated individual responsible for completing Quarterly Monitoring Report Forms. All Monitoring Report Forms will be mailed to the Report Form Recipient/Permit Contact designated at the Operating Entities address.
4. Responsible Entity/Organization – The person, company, or corporation financially responsible for the activity relating to the diversion and has overall legal responsibility of the activities occurring at the site. The organization liable or accountable for overall facility operations. The responsible entity may be the same as the Applicant/Operating Entity noted in Section A3. If so, check the appropriate box provided. If not, provide the requested information for the Responsible Entity
5. Billing Contact – Check the box of the appropriate address (either the Responsible Entity/Organization or the Applicant/Operating Entity) and indicate the individual contact for all billing inquiries.
6. Other Permits – Provide information for all other permits applied to in relation to the project and diversion activities, as indicated.

B. Certifications – Provide Certifications as indicated in Section B.

C. Required Submittals/Application Attachments

1. All diversion sources must be metered prior to treatment. Submit evidence to demonstrate that the flow meter for each source has been calibrated within the past five years. Also include the type of meter for each source. Evidence of meter calibration is not required for new sources (meters must be installed on all approved new sources, however). If the diversion is not metered at each source prior to treatment, please indicate why.
2. A completed Water Conservation and Drought Management Plan. Separate instructions and worksheets for completing the plan should be obtained by contacting the Bureau of Water Allocation & Well Permitting. A Conservation Plan is not required if the application is for ground water remediation, sand and gravel mining, or where diverted water is returned in undiminished quantity to its source.
3. Supporting information that shows how the future demands were determined in Section E.1. of the application.

For Sections D through G, please provide all information as requested in the section.

2. Instructions for Completing Addenda A and B

The following tables provide the acceptable values for completing Addenda A and B.

Elevation Information

Elevation System Description
Feet above sea level
Meters above sea level

Elevation Method Description
Approximate address match
DEP program database
Digital image
Exact address match
GPS
Hard copy match
Licensed Surveyor
Topographic Map
Plot Plan
Proposed Elevation-Digital Image
Proposed Elevation-Hard Copy Map

Absolute elevation accuracy is the uncertainty in feet or meters of the elevation measurement.

Locational Information

USGS quadrangle maps have the coordinate system printed on the map. GPS units can usually be set to display a variety of coordinate systems. New Jersey State Plane 83 – USFEET is the State standard.

Coordinate System Code	Coordinate System Description*
22	Lat/Long (NAD27) – Decimal Degrees
27	Lat/Long (NAD27) – DMS
21	Lat/Long (NAD83) – Decimal Degrees
20	Lat/Long (NAD83) – DMS
09	New Jersey State Plane 27 – USFEET
02	New Jersey State Plane 83 – Meters
01	New Jersey State Plane 83 – USFEET
26	UTM (NAD27) – Meters
08	UTM Zone 18N – Meters
03	UTM Zone 18N (78 W to 72 W) – Kilometers

Coordinate Method Description
GPS
DEP Program Database
Exact Address Match
Digital Image (such as i-Map)
Hard Copy Map
Other (Describe)
Approximate Address Match
Proposed Location - Digital Image (such as i-Map)
Proposed Location - Hard Copy Map

*Coordinates obtained historically from BWA are likely to be Lat/Long (NAD27) – DMS

Absolute location accuracy is the uncertainty in feet or meters of the location from actual ground truth. Modern GPS units can provide this number.

2020

2010 Water Allocation Permit Renewal Application
Permit Number 5382
Township of Verona
600 Bloomfield Avenue
Verona, New Jersey 07044
Essex County

Section G.

1) Municipal / Water Purveyor Water Contracts: (previously submitted)

Passaic Valley Water Commission – Little Falls, NJ (purchase)
New Jersey – American Water Company (purchase)
Essex Fells, NJ (purchase – sell)
Cedar Grove, NJ (purchase – sell)
West Orange, NJ (sell)

2) List of municipalities to be supplied: (previously submitted)

Essex Fells, NJ
West Orange, NJ
Cedar Grove, NJ

3) Interconnections:

Passaic Valley Water Commission, Little Falls, NJ – 18 inch
New Jersey – American Water Company – 6 inch
Essex Fells, NJ – 8 inch
Cedar Grove, NJ – 6 inch + 8"

ADVANTECH CORPORATION
20 Just Road, Fairfield. New Jersey 07004

INSTRUMENT CALIBRATION FORM

TAG NO. FIT-600

SERIAL NO. 03-96768-4

DESCRIPTION TOWNSHIP OF VERONA NJ- LINN DRIVE WELL STATION
WELL FLOW TRANSMITTER

MFR./MODEL NO. TELETRANS 350830C-141-111-100-110-111-0

CALIBRATED RANGE 0-140.69 Inches of Water/ 0-600 GPM

REMARKS VERIFIED INSTRUMENT OPERATION AND RANGE BY APPLYING PRESSURE USING A HANDHELD PRESSURE PUMP AND DIGITAL PRESSURE GAUGE/CALIBRATOR.

PROCESS INPUT	ENGINEERING UNITS	% OF RANGE	OUTPUT SIGNAL (Ma)
0 INCHES OF WATER	0 GPM	0	4mA
70.35 INCHES OF WATER	300 GPM	50	12mA
140.69 INCHES OF WATER	600 GPM	100	20mA

REPRESENTATIVE	SIGNATURE	PRINTED NAME	DATE
Contractor Instrument Technician		JOE FRITCH	4/10/18
Witnessing Engineer			

PCS

System Integrators & Contractors
41 Plymouth St, Fairfield NJ 07004,
(9735) 575-7464 FAX: (973) 575-5938

On site Calibration Certificate

Job n° **2674**
Certificate n° **267419001**
Verification date **3/4/2019**

Customer information
Company name **Township of Verona**
Address **10 Commerce Ct**
Verona, NJ 07044
Contact **Jeff Sonntag**

Place of verification
Company name **Township of Verona**
Location **10 Commerce Ct**
Address **Verona, NJ 07044**

Instrument information (UUT) UUT : Unit Under Test
Manufacturer **ABB**
Description **Diferential Pressure Transmiter**
Model **264DSFSSA1A1L1N2**
Serial n° **6208001982**
Tag n°

Measuring range	0.00	to	136.80	InH2O
Input	4.00	to	20.00	mA
Calibrated range	0.00	to	136.80	InH2O
Max perm. error (MPE)		1.0		% FS

Standards used

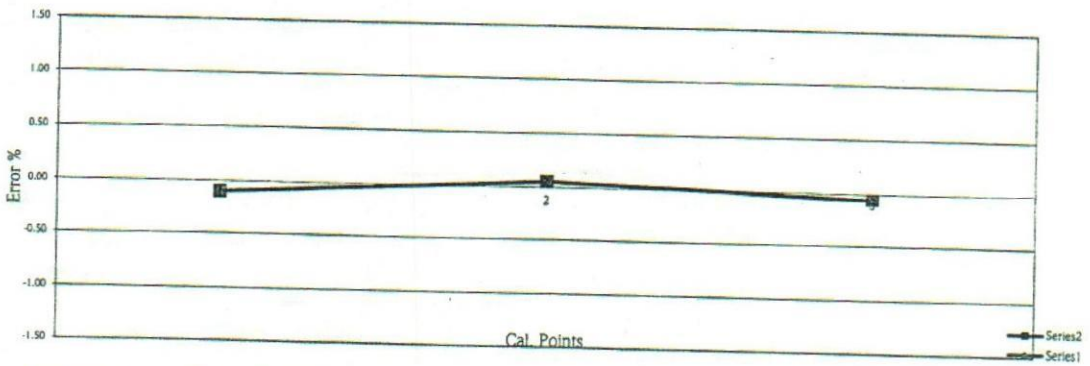
Type	Description	Serial n°	ID	Certificate	Due date
DWYER PHP-1	PNEUMATIC HAND PUMP	N/A	N/A	N/A	N/A
FLUKE 721	PRESSURE CALIBRATOR	4180127	N/A	3000118741	03/28/19

Calibration Method
Description **Onsite calibration Using Pneumatic Pump to simulate pressure and Pressure calibrator to record**

Number of test points **3**

Verification value(s) ☑ as found ☑ as left

Cal. point(s)	Measurand Reference value	Measured value display UUT	Reference value output calculated	Measured value output UUT	Display percent error	Full scale relative error	MPE +/-
Units*	InH2O	InH2O	mA	mA	mA	% FS	% FS
1	0.000	2.60	6.21	6.200	-0.09	-0.04	1.00
3	68.400	69.59	15.41	15.421	0.06	0.06	1.00
5	136.800	134.16	19.84	19.834	-0.05	-0.07	1.00



Conformity ☑ **UUT conforms** ☑ **UUT does not conform**

Remarks
Unit passed Calibration. As found same as as left.

Service Engineer **Edgar R. Reyes**
Printing date **4 March 2019**

Signature

Endress+Hauser GmbH+Co.
2340 Endress Place
Greenwood. In. 46143-9772

Final Inspection Report /Endprüfprotokoll

The manufacturer confirms that all measuring equipment used to assure the quality of the products has been calibrated and is traceable to national (e.g. DKD/DAkkS, NIST, NABL...) or international standards.

Der Hersteller bestätigt, dass die zu Qualitätsprüfungen des Erzeugnisses eingesetzten Messmittel gültig kalibriert waren und auf nationale (z.B. DKD/DAkkS, NIST, NABL...) bzw. internationale Normale rückführbar sind.

Cerabar S

TAG number	Messstellen-Nummer	
Order code	Bestellcode	PMP71-4AVU2/115
Serial number	Seriennummer	M101CC1509C
Extended order code	Erweiterter Bestellcode	PMP71-ABC1HF1RAAMU
Sensor range	Sensor-Messbereich	-400...400 inH2O
Adjusted measuring range	Eingestellter Messbereich	10...300 inH2O
Maximum permissible error	Max. zulässige Messabweichung	± 0.05 %
Output type	Ausgang	4...20 mA, HART
Software version	Softwareversion	02.20.04
Output mode	Ausgangsmodus	linear

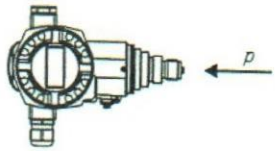
PCS SYSTEMS INTEGRATORS

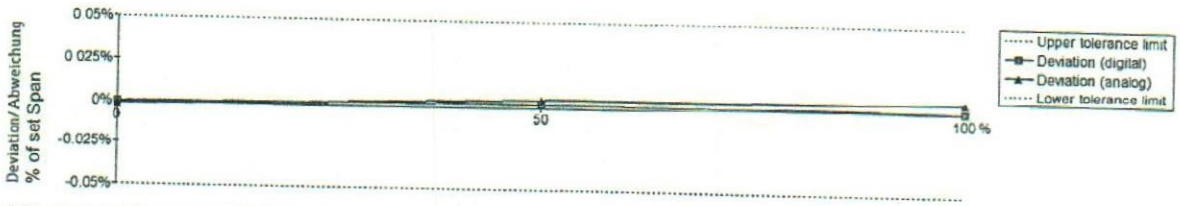
Customer order number	Auftragsnummer des Kunden	2196-01EH
E+H sales order number	E+H Auftragsnummer	3018705169000010
Internal order number	Interne Auftragsnummer	3800272312/0010
Ambient temperature	Umgebungs-Temperatur	22.4 °C (± 1 °C)
Ambient humidity	Umgebungs-Luftfeuchte	24.9 %rel.F (± 10 %rel.F)
Ambient pressure	Umgebungs-Luftdruck	988.7 mbar (± 0.2 mbar)
Calibrated according to fix point method IEC 60770.	Prüfung nach Grenzpunktmethode gemäß IEC 60770.	

Measuring results /Messergebnisse

Calibration point / Kalibrierpunkt	Nominal value ($p_{Ref.}$) Sollwert	Measured value (digital readout) Istwert (Digitaler Wert)	Deviation (digital) Abweichung (digital)	Nominal value (I_{Out} calculated) Sollwert (I_{Out} berechnet)	Current output (analog) Istwert Stromausgang (analog)	Rel. deviation (analog) Rel. Abweichung (analog)
%	inH2O	inH2O	% of Span	mA	mA	%
0	9.62300	9.62429	0.00045	3.97920	3.97898	-0.00136
50	154.113	154.120	0.00244	11.95104	11.95169	0.00409
100	298.063	298.063	-0.00002	19.89312	19.89395	0.00518

Calibration orientation
Kalibrierlage





Calibration carried out in output mode linear/
Kalibration erfolgte im Ausgangsmodus linear.

Measuring point in % of adjusted measuring range/
Messpunkt in % vom eingestellten Messbereich

We confirm that all tests, according to the Quality Plan (QP), have been performed successfully. At the time of verification, the measuring points of the device indicated above were in compliance to the published valid technical specification (TI).

TI 383P

Wir bestätigen, dass alle Tests aus dem Qualitätsplan (QP) erfolgreich durchgeführt wurden. Das Gerät entsprach zum Zeitpunkt der Prüfung an den aufgeführten Messpunkten den gültigen technischen Spezifikationen (TI).

This document was generated electronically and is valid without signature.

Dieses Dokument wurde elektronisch erzeugt und ist ohne Unterschrift gültig.

Date of inspection/ Prüfdatum 19. Jan 2017

71089244/250002797-G

- End of document -
- Ende des Dokumentes -

Endress+Hauser
People for Process Automation

Colliers Engineering & Design

Appendix

Appendix F | Above Ground Assets – Linn Drive Well

Asset Management Plan
LINN DRIVE WELL AND PUMP STATION ASSET INVENTORY
For
Verona Water Department
Essex County, New Jersey

Colliers Engineering & Design

Asset Inventory					Condition Assessment				Risk Assessment		
Asset Type	Asset Description	Asset Facility	Make	Model	Approx. Year Installed	Estimated Useful Life	Remaining Life Span	Condition Rating	Probability of Failure Rating	Consequence of Failure Rating	BRE / Criticality Rating
Building	Linn Drive Pump Station Building	Linn Drive Facility	NA	NA	2002	60	40	Excellent	1	2	2
Building Roof	Building Roof	Linn Drive Facility	NA	NA	2002	30	10	Good	2	2	4
Water Meter	Building Service Metering Equipment	Linn Drive Well			2002	15	-5	Fair	3	2	6
Pump	Submersible Well Pump and Downwell Piping	Linn Drive Well			2021	15	14	Excellent	1	2	2
Motor	Submersible Well Motor	Linn Drive Well			2021	15	14	Excellent	1	2	2
Well Casing	Exterior Well Casing	Linn Drive Well			2002	35	15	Good	2	2	4
Buried Pipe	Buried Pipe	Linn Drive Well			2002	40	20	Good	2	2	4
Control Panel	Well Control Box	Linn Drive Well			2002	20	0	Fair	3	2	6
Transducer	Water Level Transducer to Well Station on Well	Linn Drive Well			2002	10	-10	Fair	3	2	6
Valve	Process Piping: Pump Control Valve	Linn Drive Well			2002	40	20	Good	2	2	4
Control Panel	Control Panel CP600	Linn Drive Facility			2002	10	-10	Fair	3	2	6
Flow Meter	Process Piping: Flow Meter	Linn Drive Facility			2002	15	-5	Good	2	2	4
Pump	Horizontal Split Case Pump #1	Linn Drive Facility	Paco		2002	20	0	Fair	3	3	9
Motor	Horizontal Split Case Pump #1 Motor 25Hp	Linn Drive Facility	Marathon	JVN284TTDN16063AA	2002	20	0	Fair	3	3	9
Pump	Horizontal Split Case Pump #2	Linn Drive Facility	Paco		2002	20	0	Fair	3	3	9
Motor	Horizontal Split Case Pump #2 Motor 25Hp	Linn Drive Facility	Marathon	AVJ284TTDR16035ANL	2002	20	0	Fair	3	3	9
Gage	Process Piping: Pressure Gage on Pump (4)	Linn Drive Facility			2002	15	-5	Fair	3	2	6
Gage	Process Piping: Pressure Gage	Linn Drive Facility			2002	15	-5	Fair	3	2	6
Metering Pump	Chemical Feed Pump no. 1	Linn Drive Facility			2002	15	-5	Fair	3	2	6
Metering Pump	Chemical Feed Pump no. 2	Linn Drive Facility			2002	15	-5	Fair	3	2	6
Storage Tank	55 Gallon Tank used for Sodium Hypochlorite storage	Linn Drive Facility	PolyProcessing	V 13 01439	2002	30	10	Good	2	2	4
Control Panel	Sodium Hypochlorite Control Panel	Linn Drive Facility	Panalarm	CP-600	2002	10	-10	Fair	3	2	6
Residual Recorder	Chlorine Residual Recorder	Linn Drive Facility	Chessell	392	2002	15	-5	Fair	3	2	6
Residual Analyzer	Chlorine Residual Analyzer	Linn Drive Facility	Hach	CL17	2002	15	-5	Fair	3	2	6
Pipe	Process Piping: 1" Copper Chlorine Residual Line	Linn Drive Facility			2002	50	30	Good	2	2	4
Pipe	Discharge Piping: 8" High Service Discharge Line	Linn Drive Facility			2002	50	30	Good	2	3	6
Flow Meter	Process Piping: 6" Venturi Flow Meter	Linn Drive Facility			2002	20	0	Fair	3	2	6
Flow Meter	Process Piping: 4" Venturi Flow Meter	Linn Drive Facility			2002	20	0	Fair	3	2	6
Pipe	Dischareg Piping: 16" Detention Main	Linn Drive Facility			2021	40	39	Excellent	1	3	3

Concrete Pipe Supports	Concrete Pipe Supports	Linn Drive Facility			2002	50	30	Good	2	2	4
Saddle Type Pipe Support	Process Piping: Saddle Type Pipe Support	Linn Drive Facility			2002	50	30	Good	2	2	4
Valve	Process Piping: Motor Operated Butterfly Valve	Linn Drive Facility			2002	40	20	Good	2	2	4
Valve	Process Piping: 6" Swing Check Valve	Linn Drive Facility	CLA-VAL	384 FLEX CHECK	2015	25	18	Excellent	1	2	2
Valve	2"Air Release/Vacuum Valve	Linn Drive Facility			2002	25	5	Fair	3	2	6
Valve	Motor Operator By-Pass Valve	Linn Drive Facility			2002	40	20	Good	2	2	4
Valve	Process Piping: Two 8" Swing Check Valves	Linn Drive Facility	GA Industries		2002	25	5	Fair	3	2	6
Valve	Process Piping: 8" Pressure Reducing Valve	Linn Drive Facility			2002	25	5	Fair	3	2	6
Valve	Process Piping: 6"Butterfly Valve With Handwheel	Linn Drive Facility			2002	40	20	Fair	3	2	6
Valve	Process Piping: 8"Butterfly Valve With Handwheel	Linn Drive Facility			2002	40	20	Fair	3	2	6
Pipe	Process Piping: 6"x4" Reducer	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 8"x5" Reducer	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 8"x4" Reducer	Linn Drive Facility			2002	40	20	Good	2	2	4
Coupling	Process Piping: Two 8" Dresser Coupling	Linn Drive Facility			2002	40	20	Good	2	2	4
Coupling	Process Piping: 6" Dresser Coupling	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 6" 90-Degree Vertical Bends	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 8" 90-Degree Vertical Bends	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 8" 90-Degree Horizontal Bends	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 6" 90-Degree Horizontal Bends	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 8" Spools	Linn Drive Facility			2002	40	20	Good	2	2	4
Pipe	Process Piping: 8"x 8" Flg. Tees	Linn Drive Facility			2002	40	20	Good	2	2	4
Metering Pump	Ortho Polyphosphate Pump	Linn Drive Facility			2002	15	-5	Fair	3	2	6
Meter	Ortho Polyphosphate Meter	Linn Drive Facility			2002	15	-5	Fair	3	2	6
Pipe	Ortho Polyphosphate Feed Line	Linn Drive Facility			2002	50	30	Good	2	2	4
Spill Containment Area	Spill Containment Area near 55 Gallon Sodium H	Linn Drive Facility			2002	60	40	Good	2	2	4
Motor Control Center	Motor Control Center	Linn Drive Facility	General Electric	E9000	2002	25	5	Good	2	2	4
Back Flow Preventer	Back Flow Preventer	Linn Drive Facility			2002	25	5	Good	2	2	4
Pipe	Building Copper Water Piping	Linn Drive Facility			2002	50	30	Good	2	2	4
Heater	Electric Unit Heater	Linn Drive Facility			2002	25	5	Good	2	2	4
Fan	Exhaust Fan	Linn Drive Facility			2002	25	5	Good	2	2	4
Pipe	Building Copper Water Piping	Linn Drive Facility			2002	50	30	Good	2	2	4

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Appendix

Appendix G | Well Pump Information

Submersible Motor Installation Record

RMA No. _____

INSTALLER'S NAME Uni-Tech Drilling . OWNER'S NAME VERONA

ADDRESS PO Box 407 ADDRESS OF WELL - 100 HILLWOOD TERR.

CITY Franklinville STATE NJ ZIP 08322 CITY VERONA STATE NJ ZIP 07044

PHONE (856) 694-4200 FAX (856) 694-4242 PHONE (973) 857-4843 FAX (___) _____

CONTACT NAME Eugene Stichler CONTACT NAME JEFF SONNTAG

WELL NAME/ID Fairview Ave DATE INSTALLED 1-16-19 DATE FAILED _____

WATER TEMPERATURE _____ °F or _____ °C

MOTOR:

Motor No. G2773803H Date Code K18 HP 75 Voltage 460 Phase 3

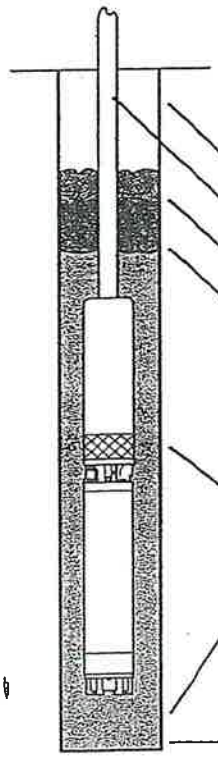
PUMP: #A-253584-18

Manufacturer MID-AMERICA Model No. 9-9RCHC-GP Curve No. _____ Rating: _____ GPM@_____ft. TDH

NPSH Required _____ ft. NPSH Available_____ ft. Actual Pump Delivery_____GPM@ _____ PSI

Operating Cycle _____ON (Min./Hr.) _____ OFF (Min./Hr.) (Circle Min. or Hr. as appropriate)

YOUR NAME STICHLER, Eugene DATE 2 / 6 / 19



WELL DATA:

Total Dynamic Head _____ ft.

Casing Diameter 12 in.

Drop Pipe Diameter 6 in.

Static Water Level 97.91' ft.

Drawdown (pumping) Water Level_____ ft.

Checkvalves at 100' & _____ &

385' & _____ ft.

☐ Solid ☐ Drilled

Pump Inlet Setting 395' ft.

Flow Sleeve: X No ___ Yes, Dia. _____ in.

Casing Depth 95' ft.

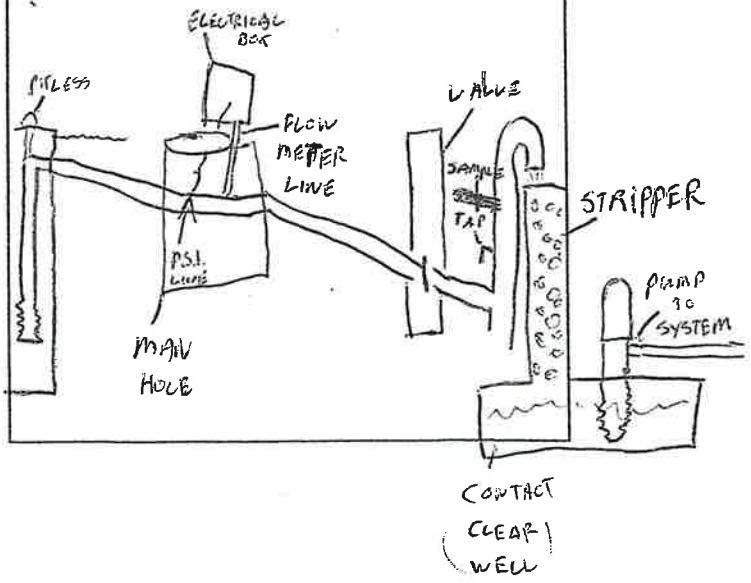
~~☐ Well Screen~~ ~~☐ Perforated Casing~~

From _____ to _____ ft. & _____ to _____ ft.

Well Depth 490' → FILLED IN TO 476' ft.

ROCK WELL

TOP PLUMBING:
Please sketch the plumbing after the well head (check valves, throttling valves, pressure tank, etc.) and indicate the setting of each device.



Form No. 2207 8/00

INVOICE 524977

Customer No. **TOV480**

Samuel STOTHOFF Co., Inc.

PO Box 306
Flemington, N.J. 08822

Telephone 908/782-2116
Fax 908/782-9528

RECEIVED

JUL 06 2021

Bill To:

Township of Verona
Dept. of Public Works
10 Commerce Street
Verona, NJ 07044

Ship To: TOWNSHIP OF VERONA
DEPT. OF PUBLIC WORKS

880 Bloomfield Ave.
Well Pump Service

Date	Ship Via	F.O.B	Terms
04/26/21			Net 30 Days

Purchase Order Number	Order Date	Salesperson	Our Order Number
21-00738	/ /		44390

Quantity Used	Item Number	Description	Tax	Unit Price	Discount	Amount
		880 Bloomfield Ave. Verona, NJ				
1.00	LABOR/EQUIP/MAT	Work to Include: Conduct electrical check (ohm/meg) out motor and pump cable. Remove 60HP submersible pump from well. Pump is set at 500' on 5" Sch 40 steel coated T&C pipe with 3/4" and 1" M-Scope line. Inspect condition of 5" drop pipe, 5" Check valve, pump cable, pump end, motor. Provide condition summary with price quote for repair/replace and re-installation of pump. Work completed on 4/19/21, 4/20/21	N	4400.00		4400.00

(Continued)

Work Complete

OK To PAY 7/6/21 D

0.00
0.00

"Customer Original (Reprinted)"

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Appendix

Appendix H | Water Storage Tanks Asset Inventory

Asset Management Plan
WATER STORAGE TANKS ASSET INVENTORY
For
Verona Water Department
Essex County, New Jersey

Asset Inventory					Condition Assessment				Risk Assessment		
Asset Type	Asset Description	Asset Facility	Make	Model	Approx. Year Installed	Estimated Useful Life	Remaining Life Span	Condition Rating	Probability of Failure Rating	Consequence of Failure Rating	BRE / Criticality Rating
Reservoir	1 MG Welded Steel Water Storage Tank	Claridge Road	Pitts-Des Mones, Inc.		1960	60	-2	Good	2	5	10
Underground Vault	Vault	Claridge Road			1960	60	-2	Good	2	4	8
Paint	Exterior and Interior Paint	Claridge Road			2015	20	13	Good	1	4	4
Valve	Altitude Valve	Claridge Road			2009	30	17	Fair	3	5	15
Valve	Butterfly Valves	Claridge Road			2009	30	17	Fair	3	5	15
Valve	Check Valve	Claridge Road			2009	30	17	Fair	3	5	15
Reservoir	0.75 MG Welded Steel Water Storage Tank	White Rock Road	Pitts-Des Mones, Inc.		1986	60	24	Good	2	5	10
Transimission Main	White Rock Transmission Main	White Rock Road			1986	100	64	Excellent	1	5	5
Paint	Exterior and Interior Paint	White Rock Road			2015	20	13	Good	1	3	3
Underground Vault	Vault	White Rock Road			1986	60	24	Good	2	4	8
Valve	Altitude Valve	White Rock Road			2019	30	27	Good	2	5	10
Valve	Gate Valves	White Rock Road			1986	30	-6	Fair	3	5	15
Standpipe	0.8 MG Welded Steel Water Storage Tank	Fairway Avenue	Pitts-Des Mones, Inc.		1970	60	8	Good	2	5	10
Paint	Exterior and Interior Paint	Fairway Avenue			2019	20	17	Excellent	1	3	3
Underground Vault	Vault	Fairway Avenue			1970	60	8	Good	2	3	6
Valve	Altitude Valve	Fairway Avenue			2009	30	17	Fair	3	5	15
Valve	Gate Valves	Fairway Avenue			2009	30	17	Fair	3	5	15
Valve	Check Valve	Fairway Avenue			2009	30	17	Fair	3	5	15

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Appendix

Appendix I | Fells Road Pump Station Asset Inventory

Asset Management Plan
FELLS ROAD PUMP STATION ASSET INVENTORY
For
Verona Water Department
Essex County, New Jersey

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Asset Inventory					Condition Assessment				Risk Assessment		
Asset Type	Asset Description	Asset Facility	Make	Model	Approx. Year Installed	Estimated Useful Life	Remaining Life Span	Condition Rating	Probability of Failure Rating	Consequence of Failure Rating	BRE / Criticality Rating
Underground Vault	Structure	Fells Road Pump Station			Unknown	60	Unknown	Good	2	1	2
Ladder	Ships Ladder Access	Fells Road Pump Station			Unknown	20	Unknown	Poor	4	1	4
Control Valve	Control Valve	Fells Road Pump Station			2004	20	2	Fair	3	1	3
Pump	Horizontal Centrifugal Pump	Fells Road Pump Station			2004	20	2	Fair	3	1	3
Control Panel	Control Panel	Fells Road Pump Station			2004	20	2	Fair	3	1	3
Check Vlave	Check Vlave	Fells Road Pump Station			2004	25	7	Good	2	1	2
Butterfly Valve	Three 8-inch and one 4-inch Butterfly Valve	Fells Road Pump Station			2004	40	22	Good	2	1	2
Pipe	Reducer	Fells Road Pump Station			2004	40	22	Good	2	1	2
Flexible Coupling	Dresser Couplings	Fells Road Pump Station			2004	40	22	Good	2	1	2
Pipe	90-Degree Horizontal Bends	Fells Road Pump Station			2004	40	22	Good	2	1	2
Pipe	Spools	Fells Road Pump Station			2004	40	22	Good	2	1	2
Pipe	Tees	Fells Road Pump Station			2004	40	22	Good	2	1	2
Heater	Electric Unit Heater	Fells Road Pump Station			2004	25	7	Good	2	1	2

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Appendix

Appendix J | Water Supply Drought and Emergency Management Plan (without plan appendices)

WATER CONSERVATION AND DROUGHT OR WATER SUPPLY EMERGENCY MANAGEMENT PLAN REPORT FOR PUBLIC WATER SUPPLY SYSTEMS

PERMITTEE: TOWNSHIP OF VERONA PROGRAM INTEREST NO.: 5382

CONTACT NAME: PAUL J. SONTAG DATE: AUGUST 2021

ADDRESS: 10 COMMERCE CT., VERONA, NJ 07044

EMAIL ADDRESS: JSONTAG@VERONANJ.ORG

TELEPHONE NO.: 973-857-4843

Submit to: Mail Code 401-04Q
Bureau of Water Allocation & Well Permitting
P.O. Box 420
Trenton, New Jersey 08625-0420

See your Water Allocation Permit for your submittal schedule

NOTE: You must read and complete all sections of the worksheet. Your Water Allocation Permit requires water conservation and water management activities that you may not usually consider in this context but no section may be omitted.

Please discard your file copies of the previous worksheets and/or delete or update computerized forms. Your report must be submitted on an exact replica of this worksheet, either a photocopy or a computerized version, with the original kept on file for future reference. An incomplete worksheet will be returned to you. If there is not enough space provided for your information, additional pages should be used.

I. WATER CONSERVATION COMPONENTS

A. WATER SYSTEM

1. Allocation: 34.6 mgm, 775 gpm, 365 mgy

2. Sources of water:

   number of wells 2

   number of surface intakes 0

   bulk purchase 2 mgd, 65 mgm, 630 mgy

3. Metering:

	(circle one)	
raw water source	Yes	(No)
finished water	(Yes)	No
delivered water	(Yes)	No

4. Date of last source meter calibration: 3/4/2019 + 4/10/18

5. System Capacity:

treatment	1.12 mgd
delivery	3.62 mgd
storage	6.55 mg

6. Customer Base:

	# of Connections	# of Meters	% of overall use
Residential	3966	3966	81%
Commercial	224	224	11%
Industrial	0	0	0
Municipal	35	35	8%
Total	4225	4225	100%

7. Interconnections:

	PVWC	ESSEX FELLS	CEDAR GROVE	NJAW
existing/size	18"	6"	8"+6"	8"
under construction	0	0	0	0
planned (5 year)	0	0	0	0

Interconnection Use (circle one) (Bulk + Emergency) Other (describe)

Agreements for use (circle one) (Yes (give details) ATTACHED) No

8. Map or diagram of the system (submit only once unless there are changes).
PREVIOUSLY SUBMITTED

B. ANALYSIS OF WATER USE

1. Demand: Report demand from the most recent year for which you have complete data as the "Base Year". Note the years the data refers to where indicated.

USAGE	PEAK MONTH (mgm)	ANNUAL (mgy)
Base Year 2020	49.069	424.266
Previous Year 2019	41.290	355.001
Peak Year (of last 5) 2018	54.978	493.605
Peak Year (of last 10) 2018	54.978	493.605

PROJECTED USAGE	PEAK MONTH (mgm)	ANNUAL (mgy)
Next Year 2021	60.00	500.00
5 Year 20___	62.00	520.00

2. Customers:

Estimated population 13,640 (2020 year)

Names of municipalities served VERONA + SMALL PORTIONS OF CEDAR GROVE + ESSEX FELLS

3. Per Capita Use

To produce standardized data, please use the following calculations, using data from the years identified under B.1 - Demand.

$$Average\ Use = \frac{(Total\ annual\ usage^{*}\ in\ gallons \times \%\ Residential\ Use) \div 365}{Number\ of\ People\ Served}$$

$$Minimum\ Use = \frac{(Minimum\ month\ usage\ in\ gallons \times \%\ Residential\ Use) \div 31^{*}}{Number\ of\ People\ Served}$$

$$Maximum\ Use = \frac{(Maximum\ month\ usage\ in\ gallons \times \%\ Residential\ Use) \div 31^{*}}{Number\ of\ People\ Served}$$

**Usage = Total Diversion + Total Purchased − Bulk Sales. Divide by 28,30 or 31, depending on number of days in minimum/maximum month*

	Current Year 20 20	Last Year 20 19
Average	69.0	57.8
Minimum	47.3	33.1
Maximum	94.0	71.8

Calculation based on (circle one) (total pumpage) or residential use only

4. Management of Peaks (describe approach):

VERONA'S SUPPLY IS SUPPLEMENTED BY PVWC AS NEEDED + BY EMERGENCY AGREEMENTS THROUGH AVAILABLE INTERCONNECTIONS.

5. Projections of Growth:

	Service Connections
new in past year	0
expected this year	0
projected 5 year	12

C. UNACCOUNTED-FOR WATER

1. Leak Detection & Repair Program

   a. frequency of surveys (performed on a regular schedule, as conditions require, etc.)
   AS REQUIRED - NO FORMAL SCHEDULE

   b. miles of mains surveyed per year ~ 1 MILE
   valves tested 50
   hydrants tested ALL

   c. methods employed BOROUGH EMPLOYEES + CONTRACTORS
   LFSC LEAK DETECTION

   d. equipment used CONTRACTOR SUPPLIED

   e. equipment owned/rented/borrowed/consultant employed
   MINIMAL

2. Leak Repair Activities (for last calendar year)

   a. Leaks detected

	Number	Size	Repaired
Mains	12	6" + 8"	12
Valves	0	—	0
Hydrants	0	—	0

   b. estimate of water saved 900,000 GALLONS

   c. manpower/equipment available to make repairs BOROUGH EMPLOYEES
   + CONTRACTORS - BACKHOES + FRONTEND LOADERS

3. Long-range plans to reduce unaccounted-for water (for example, over the next three years) FSC SHOULD SURVEY 25% OF SYSTEM YEARLY

4. Service Meter Repair/Replacement Procedures

   a. regular schedule or as needed basis AS NEEDED

   b. average age of meters in use 7 YRS

   c. approximate number of direct read 0

   d. approximate number remote read 4,225

5. Calculate Unaccounted-for Water (UFW) for past *two years*
(DO NOT INCLUDE ANY ESTIMATED WATER USE)

$$100 - \left(\frac{gallons\ of\ water\ billed\ *}{gallons\ of\ water\ entering\ distribution\ system} \times 100\right) = UFW\%$$

$$100 - \left(\frac{391,645,000\ gallons}{461,409,000\ gallons} \times 100\right) = \underline{15.1}\ \%\ (20\underline{20})$$

$$100 - \left(\frac{369,853,000\ gallons}{383,515,000\ gallons} \times 100\right) = \underline{3.6}\ \%\ (20\underline{19})$$

*Water billed may include unbilled metered water and/or unbilled authorized consumption (e.g. fire fighting)

6. Estimate water supply used for fire fighting and unmetered municipal buildings.
0.750 mgy

7. Water Loss Audit (optional) /Water Loss Control

"Water loss control represents the efforts of water utilities to provide accountability in their operation by reliably auditing their water supplies and implementing controls to minimize system losses."

The following is a link to the American Water Works Associations' free water audit software: http://www.awwa.org/resources-tools/water-knowledge/water-loss-control.aspx

Software outputs meaningful indicators:

gpd / connection _____

gpd / mile mains _____

ILI (infrastructure leakage index) _____

Questions? Contact **AWWA's Water Loss Control Committee** directly.

D. WATER RATES

1. Attach a copy of your rate schedule or a summary of schedule. ATTACHMENT C.
2. Note any planned or proposed changes in rates. NONE AT THIS TIME
3. Meter reading and billing schedule METERS ARE READ & BILLED QUARTERLY IN FEB., MAY, AUGUST & NOV.

E. PUBLIC EDUCATION/AWARENESS

List efforts undertaken to date and those planned

1. Assess public awareness of local and regional water supply problems.

NONE CURRENTLY

2. Describe and/or include samples of information distributed to water users.

RESIDENTS ARE NOTIFIED OF WATER RESTRICTIONS + REMINDED TO CONSERVE VIA POST CARDS, CCR's + ON INTERNET + ON PUBLIC BULLETIN BOARDS + VERONA-CEDAR GROVE TIMES

3. Describe activities undertaken in the past 3 years to meet with environmental committees and watershed associations to explore the concept of water conservation education.

NONE AT THIS TIME

4. Describe the assistance given to schools and civic organizations to promote the best use of local water resources.

NONE AT THIS TIME

II. DROUGHT OR WATER SUPPLY EMERGENCY MANAGEMENT COMPONENTS

A. Management of Localized Water Supply Problems

1. Storage, backup supplies, equipment and interconnections on standby status:

5 WATER STORAGE TANKS (6.55 MG STORAGE)
BULK INTERCONNECTIONS WITH PVWC + EMERGENCY INTERCONNECTS WITH NJAU, CEDAR GROVE + ESSEX FELLS

NOTE: The following section refers to local restrictions, which may be voluntary or mandatory, as decided by local officials when necessary, to manage local shortages only. The restrictions that apply when a drought emergency is declared by the Governor are not to be included here.

2. List ordinances that have been adopted to promote water conservation and provisions for their enforcement: 146-25 THROUGH 146-30. ATTACHED

3. Indicate which of the above ordinances are implemented during the following local conditions:
   a. Drought warning 146-25 THROUGH 146-30
   b. Drought emergency " " "
   c. Precipitation deficits " " "
   d. Reservoir storage deficits " " "

4. Distribution of water conservation devices/retrofit program/rebate program:

   N/A

5. Regulations requiring reuse or recycling of water:

   NONE AT THIS TIME

B. Voluntary Transfers Via Interconnections

1. Describe conditions under which voluntary transfers of water into your system are made via existing interconnections: THERE IS A MIN. PURCHASE AGREEMENT WITH PUSC. TRANSFERS ARE MADE IF TANK LEVELS FALL BELOW 65% OR PRESSURE DROPS

2. Describe existing interconnections and agreements for their use during temporary emergencies and during localized drought emergencies:

   PVWC 18" BULK PURCHASE INTERCONECT (ATTACHMENT B)
   6" EM. INTERCONNECT WITH ESSEX FELLS. - 8" WITH NJAW + 8" + 6" WITH CEDAR GROVE

3. Give schedule for exercising interconnections: ANNUAL

C. Purveyors with Water Supply Reservoirs with Capacity over 2.0 Billion Gallons ONLY;

1. Attach a rule curve that can be used to establish storage level thresholds for your reservoir or note that there is one on file with the Bureau of Water Allocation & Well Permitting.

2. Explain the management steps to be taken as drought conditions progress approaching drought warning or drought emergency levels of the rule curve.

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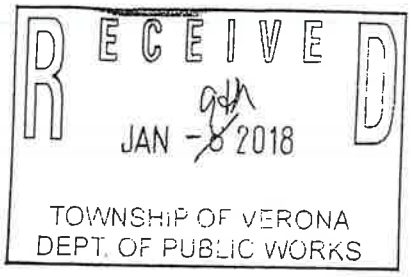
Appendix

Appendix K | Tank Inspection Reports

Item 7: Tank Inspection
Fairway Tank 2018

MOTT MACDONALD

Mr. James M. Helb, PE, PLS
Township of Verona
10 Commerce Court
Verona, NJ 07044



Your Reference
PO 17-02180

Our Reference
390100

111 Wood Avenue South
Iselin NJ 08830-4112
United States of America

T +1 (800) 832 3272
F +1 (973 376 1072
mottmac.com

Rehabilitation of the Fairway Avenue Water Tank
Evaluation Report

January 2, 2018

Dear Mr. Helb:

Enclosed please find a copy of the Evaluation Report prepared by Mumford-Bjorkman Associates, Inc. (MBA) for the Fairway Tank including a DVD copy of the ROV inspection. We are proceeding with preparing our design to rehabilitate the tank in accordance with the recommendations included in the report.

Please contact us if you have any questions or wish to discuss the project in further detail.

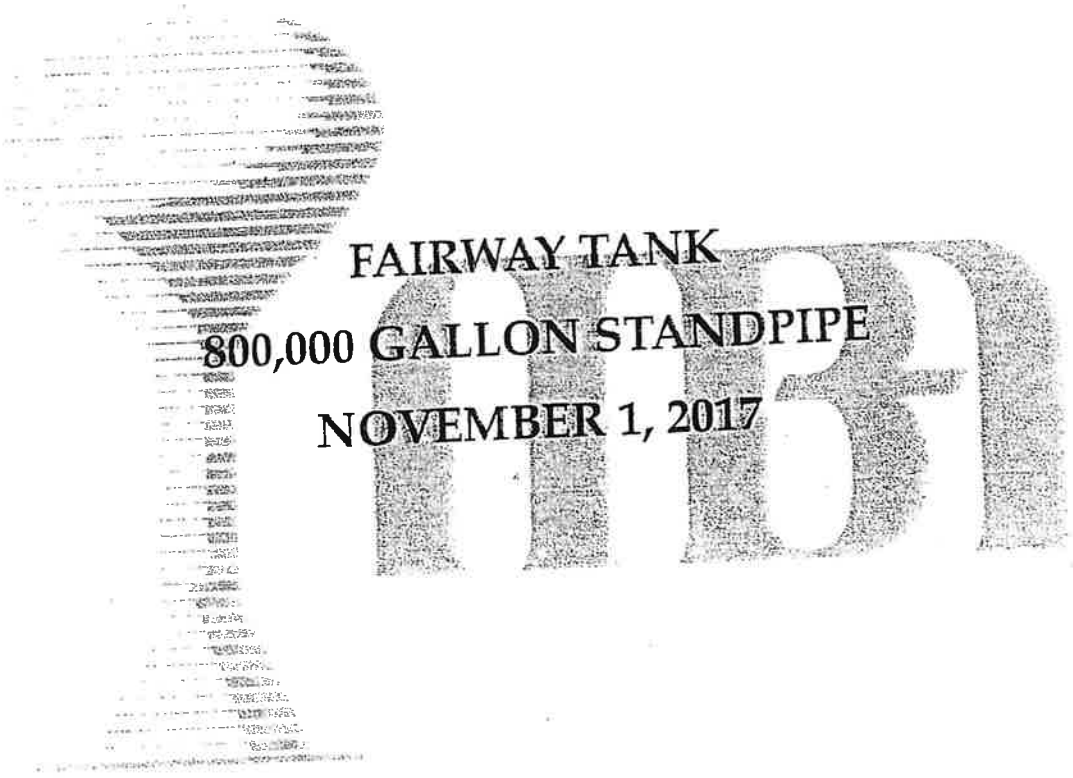
Very truly yours,

Mott MacDonald

Robert E. Wells, PE
Senior Project Engineer
T 973.912.2591
robert.wells@mottmac.com

Cc: M. Tompeck

ROV EVALUATION:



PREPARED FOR:

MOTT MACDONALD

P.O. Box 733, New Castle, DE 19720 • telephone: 1.800.486.4841 • fax: 302.655.8260 • www.mbatanks.com

Mumford-Bjorkman Associates, Inc.
P.O. Box 733
New Castle, DE 19720
1-800-486-4841
www.mbatanks.com

Subject

The subject of this report is the external and internal evaluation of the following:

Engineer:	Mott MacDonald
Owner:	Verona Township, NJ
Location:	119 Fairway Avenue, Verona, NJ
Tank Name:	Fairway Tank
Capacity:	800,000 Gal. Standpipe
Size:	Approximately 46' Diameter x 65' High
Erected By:	PDM
Year Built:	1970

The exterior was evaluated visually and digital photographs were taken. The digital photographs accompany this report.

The interior was evaluated utilizing our Remotely Operated Vehicle (ROV). Prior to the ROV entering the water, it was disinfected in accordance with AWWA C652. The internal evaluation was recorded and a DVD of this inspection accompanies this report.

This evaluation was performed on November 1, 2017, under MBA Contract No. 173032R.

Objectives

The purpose of this inspection was to determine the condition of the tank's interior, exterior, foundation, and accessories. We will make recommendations for the painting, repair, corrosion protection, and maintenance. However, our inspection for this structure is made visually, using only a PosiTest gauge for film thickness. The

dimensions of the structure and its appurtenances were retrieved during this evaluation and should be verified prior to receiving quotes for maintenance and repairs. Our recommendation for a paint system on the interior and exterior are for convenience, using a system we feel is satisfactory, having limited knowledge of the environment and water content. Structural repairs listed in this report are given for consideration by the Owner's Engineers.

Summary

A. Lead Testing

MBA was not authorized to remove coating samples for total lead analysis.

B. Security

The tank is located in a residential area of Verona Township in Verona, NJ. The tank site is surrounded by a 8' high chainlink fence topped with barbed wire. The barbed wire is damaged or missing at the rear of the site. A lock is present on the fence gate and the valve vault door is locked. A locked ladder gate is present on the shell ladder and the roof manhole is locked. See photographs #6, #8, #12, #43, #46, #75, and #76.

C. Exterior

1. **Site** - The tank is located at the top of a hill. Access to the tank site is provided by a paved driveway. The distance between the tank and site fence is 8'. The grounds outside the tank site are comprised of residential homes on the front of the site and woods on the back of the site. There are houses immediately to the left and the right of the tank site. There is very limited lay down inside the fence for the contractor's equipment during the tank rehabilitation, and it may be difficult to get large, heavy equipment to the tank site. See photographs #1, #2, #6, #12, #22, #37, #43, and #44.

2. **Foundation** - The concrete foundation was found to be in good condition, with only minor chipping, bug holes, and exposed aggregate noted. The sealant was in fair condition with minor breakdown occurring. See photographs #23-#27.

3. **Protective Coating** - The exterior coating appeared to be an epoxy / urethane overcoat. The coating measured from 12-18 mils dry film thickness. Coating

adhesion testing was performed in accordance with ASTM D3359, Method A (X-cut). The ASTM adhesion rating for Method A range from 0A-5A, with a 0A rating being the worst, and a 5A rating being the best. The exterior coating met the criteria of a 1A rating, indicating removal from most of the area of the X under the tape. See photograph #42.

Weathering with pinhole corrosion was present on the shell rings with sporadic coating breakdown down to prime coat occurring. Generalized mildew growth was present on throughout the bottom shell rings. Corrosion was affecting approximately 20% of the shell surfaces. Areas of checked coating were resulting in coating delamination down to prime coat. Corrosion was present on irregular surfaces such as the manhole lips, fasteners, overflow pipe, roof platform, ladder components, and base plate. Minor holidays were noted on the overflow pipe, ladder components, and rest platforms. See photographs #3-#5, #13-#42, and #44-#53.

The coating on the roof was found to be heavily weathered, with generalized pinhole corrosion occurring. Approximately 60% of the flat roof plate surfaces were exhibiting pinhole corrosion. Other areas of corrosion were noted on irregular surfaces such as the roof handrails, platform, steps, vent neck flange, and manhole. See photographs #54-#76.

We recommend that the exterior surfaces are fully abrasive blasted to an SSPC-SP6, "Commercial Blast," and recoated within one (1) to three (3) years. During abrasive blasting operations, it will be necessary to utilize a Class 1A containment in accordance with SSPC Guide 6. We have attached our Cleaning and Painting Recommendation Sheet, as well as our Cost Estimate Sheet, for your review and consideration.

4. **Structural -** This tank appeared to be in good structural condition. Minor distortion on the shell ring near the overflow pipe was observed. See photograph #31.

5. **Components -**

a. **Valve Vault -** A small building with locked door is located inside the fence in front of the tank, and contains the valve vault. There are two (2) pipes in the vault. The coating on the pipes appeared to be a vinyl coating that was found to be in poor condition with generalized corrosion occurring. We recommend that the valve

vault piping is abrasive blasted and recoated during the next rehabilitation. See photographs #6-#11.

b. **Base Plate** - The base plate was exhibiting generalized corrosion along the exposed edge, with evidence of minor metal loss noted. The base plate appeared to be in good condition. See photographs #23, #24, and #27.

c. **Overflow Pipe** - This tank is equipped with a 6" diameter external overflow pipe, and appeared to be adequately supported. Corrosion was observed throughout the overflow pipe. The overflow pipe travels down the shell and discharges 8" above a concrete splash pad that directs any flow of water down the drive way. The overflow pipe screen is in good condition with minor corrosion on the washers and flange. See photographs #30-#37.

d. **Shell Manholes** - This tank is equipped with two (2) shell manholes. One 18" x 24" manhole with double clamps is located 41" above grade and one (1) 24" diameter manhole with single cross-clamp is located 18" above grade. Neither have external davit arms or hinges. Corrosion was noted on the 18" x 24" shell manhole lip and on the nuts and bolts of both shell manholes. Current AWWA recommendations call for at least one (1) shell manhole to measure no less than 30" diameter. See photographs #38-#40.

e. **Shell Ladder** - The 15" inner diameter ladder is located 9' above grade and is equipped with a full cage with an 28" cage back. The ladder possesses an 8" standoff. The shell ladder is not equipped with a safety climb device. Sporadic corrosion was occurring on the ladder and cage. Minor corrosion was present on the rungs. Under OSHA's 29 CFR 1910.23, the ladder is undersized, as a 16" inner diameter is required. See photographs #44-#48.

f. **Roof Platforms and Handrails** - A 29" x 26" diamond plate platform is present at the top of the shell ladder, and provides access to the roof. Attached to the diamond plated platform is a 42" x 25" expansion steel platform. Corrosion was observed on the top and underside of the expansion steel platform. The handrails on the roof platform measure 42" high, with a 4" kick plate and a midrail. The roof handrails extend to the left and the right of the shell ladder and extend approximately 4' from the edge of the roof to the center of the roof. Corrosion was observed on the roof handrails. See photographs #50-#57.

g. **Roof Manhole -** This tank is equipped with one (1) hinged 24" x 24" roof manhole with a 5" rain lip. The roof manhole was not locked at the time of our inspection, but one was installed by MBA upon completion of the inspection. Corrosion was observed on the 5" rain lip and the lid. When the roof manhole lid is opened it rests on the roof handrail vertical post. Damage can occur to the coating on the roof handrail vertical post when the roof manhole lid is opened. The rain lip on the manhole does not comply with current N.J.A.C. requirements, which requires a minimum 6" high rain lip. See photographs #74-#76.

h. **Roof Vent -** This tank is equipped with a 18" diameter pressure vacuum (PV) vent that is mounted on a 18" diameter flanged vent neck. The screen and pressure pallet were found to be intact and in good condition. Corrosion was observed on underside of the vent neck flange and vent. A partially torn plastic sheet was present in between the vent pressure pallet and vent. See photographs #62-#67.

i. **Antennas -** Two (2) whip antennas are located on the roof handrails, and one (1) is located on the overflow pipe. The conduits for the handrail antennas travel up the shell ladder cage, and should be relocated. See photographs #30-#32, #44, #46, #48, #54, and #68.

6. **Repairs and Modifications -**

a. Repair site fence and barbed wire.

b. Abrasive blast and recoat valve vault piping.

c. Remove all sealant and re-apply an elastomeric sealant at the base plate. See attached drawing.

d. Install a screened overflow discharge flap gate. See attached drawing.

e. Replace the 18" x 24" shell manhole with a new bolted 30" diameter shell manhole with an external davit arm or hinge. See attached drawing.

f. Replace the shell ladder with and OSHA compliant shell ladder, cut off 16' above grade.

g. Install a galvanized flexible safety climb device on the new shell ladder. See attached drawing.

h. Install locked 8' aluminum ladder guard at base of new shell ladder. See attached drawing.

i. Install self-closing swing gate at the shell ladder to roof platform transition.

j. Increase roof manhole rain lip height to no less than 6" to comply with current N.J.A.C. requirements.

k. Remove existing 18" diameter roof vent and replace with a new 24" diameter flanged vent neck and new 18" diameter vent. See attached drawing.

l. Install welded clips on the shell to the right (counter-clockwise) of the new shell ladder and relocate all antenna conduits to these clips, away from the shell ladder.

D. Interior

1. **Protective Coating -** The interior coating is an epoxy system that was found to be in good condition. The coating measured 6-11 mils dry film thickness.

The coating above the waterline was exhibiting minor isolated pinhole corrosion. Rust staining was emanating from the lap seams on the roof and knuckle. Moderate staining was noted in the water level fluctuation zone. See photographs #77-#81 and DVD containing ROV footage.

The coating below the waterline was exhibiting isolated pinhole corrosion. Isolated areas of coating failure were observed. Isolated blistering was present, with some found to be fractured, and others intact. See DVD containing ROV footage.

We recommend that the interior surfaces are fully abrasive blasted to an SSPC-SP10, "Near White Metal Blast," and recoated during the next tank rehabilitation. We have attached our Cleaning and Painting Recommendation Sheet and Cost Estimate Sheet for your review and consideration.

2. **Components -**

a. **Overflow -** The interior overflow elbows up 90 degrees from its shell penetration. The intake appeared to be in good condition and unobstructed. See photograph #81 and DVD containing ROV video footage.

b. **Painters Angle -** This tank is equipped with one (1) shell painters angle at the top of the shell. The angle is detaching from the shell and found to be split in one (1) location. This could be a result of ice damage. We recommend that the angle is repaired and re-welded to secure it. Corrosion and minor debris were present on and around the angle ring, particularly inside the lip. The angle should not be used for rigging in its current condition. See photograph #77 and DVD containing ROV footage.

c. **Inlet/Distribution Line -** The inlet/distribution line is equipped with a removable silt stop. No sediment encroachment was noted, and the silt stop appeared to be in good condition, with minor tubulars noted on the lip and silt stop. See DVD containing ROV footage.

d. **Shell Manholes -** The two (2) shell manholes and their gaskets were intact with no evidence of leakage detected. Corrosion were present on the interior flanges. An internal davit arm is present on the 24" diameter shell manhole. See DVD containing ROV video footage.

3. **Structural -** This tank appeared to be in good structural condition.

4. **Sediment -** Approximately 1/2" of sediment was observed on the floor. See DVD containing ROV video footage.

5. **Repairs and Modifications -**

a. Repair the existing painters angle.

b. Perform metal repairs as necessary. Areas exhibiting 50% or greater metal loss should be pit welded or patch plated.

Conclusion

We recommend that the tank is rehabilitated within in one (1) to three (3) years. All repairs listed should be performed during the next rehabilitation. We have attached a copy of our Cleaning and Painting Recommendations Sheet, as well as our Cost Estimate Sheet, for your review and consideration.

MBA'S TANK DATA SHEET

Customer: Mott MacDonald
Location: 119 Fairway Ave.
City: Verona State: NJ
Tank Name: Fairway Tank

Inspection Date: 11/1/2017
Contract No.: 173032R
Builder: PDM
Year: 1970

Type of Tank: Standpipe Capacity: 800,000 Gal. Size: ~45' Dia. x 65' High
Type of Roof: Ellipsoidal No. of Shell Rings: 8 Weld / Rivet: Weld

Shell Manhole
Quantity: 2
Size: 18" x 24"
24"

Roof Manhole
Quantity: 1
Size: 24" x 24"
N/A

Locked: Yes
Rain Lip: 5"

Vent
Vent Size: 18"
Vent Type: PV
Screen: Good

Overflow
Size: 8"
Screen: Good
Splash Pad: Yes

Riser
Size: N/A
Manhole Size: N/A
N/A

Piping
Inlet Size: Unknown
Dist. Size: Unknown
No. of Pipes: 1

Accessories
Painter's Attachment: No
CP System: No Type: N/A

Ladders
Exterior
Ladder: Yes
Safety Climb: No Locked: Yes
Cage: Yes Off Grade: 9'
Width: 15" Ladder Gate: Yes
Standoff: 8"

	Roof	Dry	Access Tube	Wet	Riser
Ladder	No	N/A	N/A	No	N/A
Safety Climb	N/A	N/A	N/A	N/A	N/A
Cage	N/A	N/A	N/A	N/A	N/A
Width	N/A	N/A	N/A	N/A	N/A
Standoff	N/A	N/A	N/A	N/A	N/A

Legs Number of Legs: N/A Type of Legs: N/A Number of Tiers: N/A
Leg Anchor Bolts: N/A
Riser Anchor Bolts: N/A

Coating

		Mils
Int. Coating	Epoxy	6-10
Dry Coating	N/A	N/A
Ext. Coating	Overcoat	12-18
Last Painted	Unknown	
Contractor	Unknown	

Total Lead Content

	mg/kg	Year
Int. Wet Total Pb	Unknown	N/A
Int. Dry Total Pb	N/A	N/A
Exterior Total Pb	Unknown	N/A

Estimated Area (sq.ft.)
Interior Wet: 12,525
Interior Dry: N/A
Exterior: 10,925

Repairs
Repair fence and barbed wire.
Blast and recoat valve vault piping.
Perform sealant repairs.
Install screen overflow flap gate.
Replace one shell manhole with 30" manhole.
Replace shell ladder with OSHA compliant shell ladder.
Install galvanized flexible cable safety climb.
Install 8' aluminum ladder guard.
Install self-closing swing gate.
Increase roof manhole rain lip height.
Replace roof vent with new 24" vent neck and 18" PV vent.
Install welded clips for antenna cables.
Repair existing painters angle.
Perform metal repairs as necessary.

P.O. Box 733
New Castle, DE 19720
Phone: (800) 486-4841
Fax: (302) 655-8260
www.mbatanks.com

Rehab Estimate Sheet

By Qualified Tank Painter*

Customer	Mott MacDonald	**Location**	Verona	**State**	NJ
Tank Name	Fairway Tank	**Total Lead Test**	Int. Wet: Unknown	Int. Dry: N/A	Exterior: Unknown
Type of Tank	Standpipe				
Capacity	800,000 Gal.				

Estimated Coating Repair Cost

	Square Foot	$ / sq.ft.	Coating Repairs		
Int. Wet	12,525	20.00	Full SSPC-SP10	Int. Wet Cost	$250,500.00
Int. Dry	N/A	N/A	N/A	Int. Dry Cost	$0.00
Exterior	10,925	35.00	Full SP6 w/ 1A Contain	Exterior Cost	$382,375.00
				Total Coating Cost	**$632,875.00**

Estimated Metal Repair Cost

Repair fence and barbed wire.	$7,500.00
Blast and recoat valve vault piping.	$7,500.00
Perform sealant repairs.	$2,000.00
Install screen overflow flap gate.	$9,000.00
Replace one shell manhole with 30" manhole.	$12,000.00
Replace shell ladder with OSHA compliant shell ladder.	$2,000.00
Install galvanized flexible cable safety climb.	$2,000.00
Install 8' aluminum ladder guard.	$2,000.00
Install self-closing swing gate.	$4,500.00
Increase roof manhole rain lip height.	$9,000.00
Replace roof vent with new 24" vent neck and 18" PV vent.	$7,500.00
Install welded clips for antenna cables.	$4,000.00
Repair existing painters angle.	$10,000.00
Perform metal repairs as necessary.	
Total Metal Repairs Cost	$79,000.00

TOTAL BUDGET $711,875.00

Costs are based on past bid results. Contractor's actual bid could be higher or lower.
*MBA can assist with Project Specifications and list of qualified Tank Painters.

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Rehab Estimate Sheet

By Qualified Tank Painter*

Customer Mott MacDonald
Tank Name Fairway Tank
Type of Tank Standpipe
Capacity 800,000 Gal.

Location Verona
State NJ

Total Lead Test

Int. Wet	Int. Dry	Exterior
Unknown	N/A	Unknown

Estimated Coating Repair Cost

	Square Foot	$ / sq.ft.	Coating Repairs	
Int. Wet	12,525	20.00	Full SSPC-SP10	Int. Wet Cost $250,500.00
Int. Dry	N/A	N/A	N/A	Int. Dry Cost $0.00
Exterior	10,925	35.00	Full SP6 w/ 1A Contain	Exterior Cost $382,375.00

Total Coating Cost $632,875.00

Estimated Metal Repair Cost

Repair fence and barbed wire.	$7,500.00
Blast and recoat valve vault piping.	$7,500.00
Perform sealant repairs.	$2,000.00
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Replace shell ladder with OSHA compliant shell ladder.	$2,000.00
Install galvanized flexible cable safety climb.	$2,000.00
Install 8' aluminum ladder guard.	$2,000.00
Install self-closing swing gate.	$4,500.00
Increase roof manhole rain lip height.	$9,000.00
Replace roof vent with new 24" vent neck and 18" PV vent.	$7,500.00
Install welded clips for antenna cables.	$4,000.00
Repair existing painters angle.	$10,000.00
Perform metal repairs as necessary.	

Total Metal Repairs Cost $79,000.00

TOTAL BUDGET $711,875.00

Costs are based on past bid results. Contractor's actual bid could be higher or lower.
*MBA can assist with Project Specifications and list of qualified Tank Painters.

MBA New Castle, De. 19720 302-655-8234

SEALANT INSTALLATION

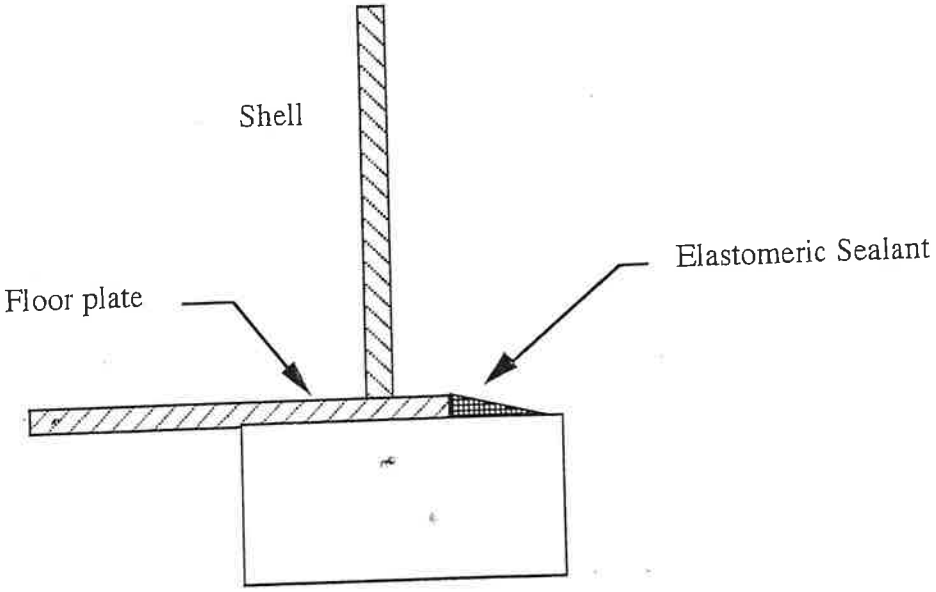
A) Procedure

All broken and loose sealant between the floor plate and foundation shall be removed. The floor plate shall be cleaned and coated using the system specified in the specification. After the coating is completed and properly cured, an elastomeric sealant shall be applied to the floor plate and slightly tapered to the foundation.

B) Material (Elastomeric sealant)

1) Pecora Dynatrol 1 or 2, polyurethane sealant, First State Dist. New Castle, De.

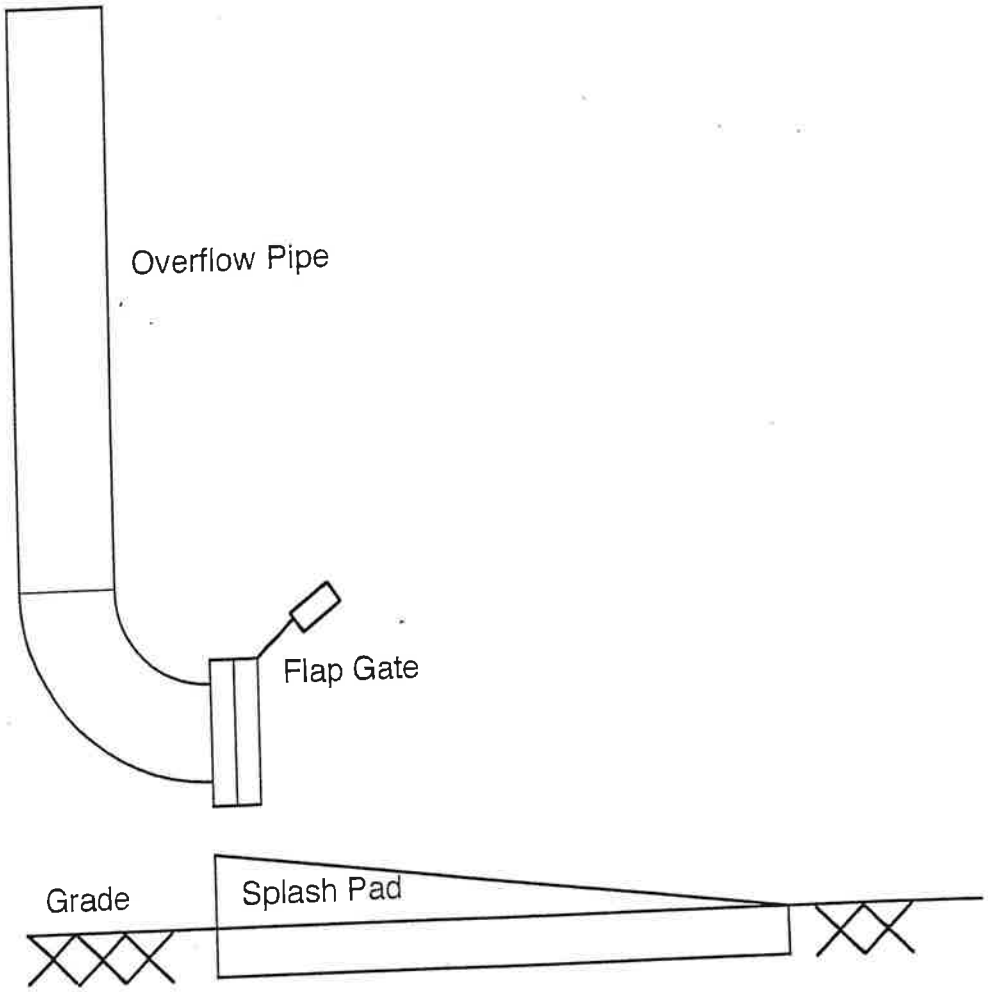
2) Sikaflex-1a



This drawing is only to be used as an illustration for recommended repairs.

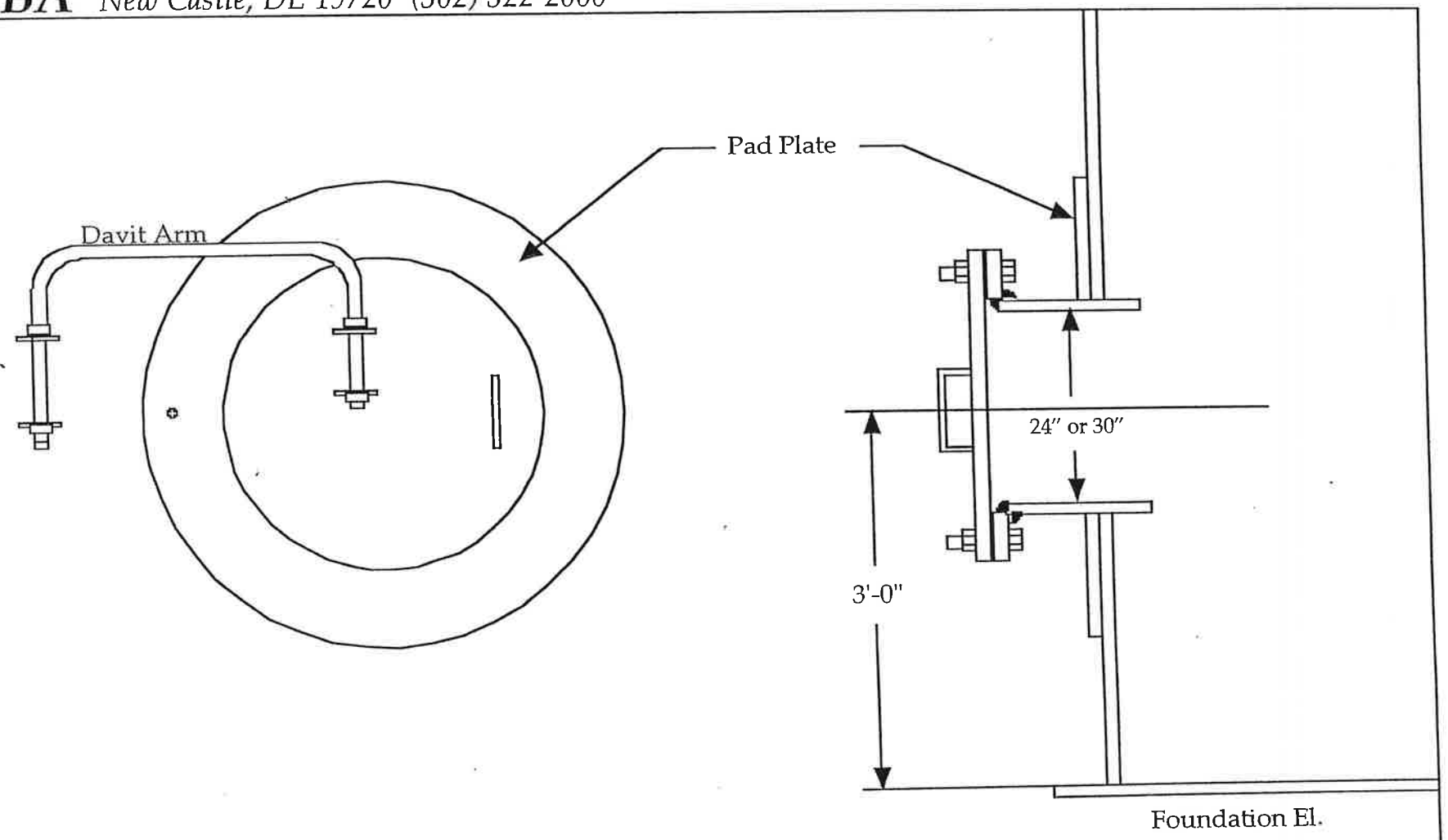
MBA New Castle, DE 19720 (302) 322-2000

OVERFLOW SPLASH PAD AND FLAP GATE



This drawing is not to be used for fabrication. It is intended for illustration purposes only.

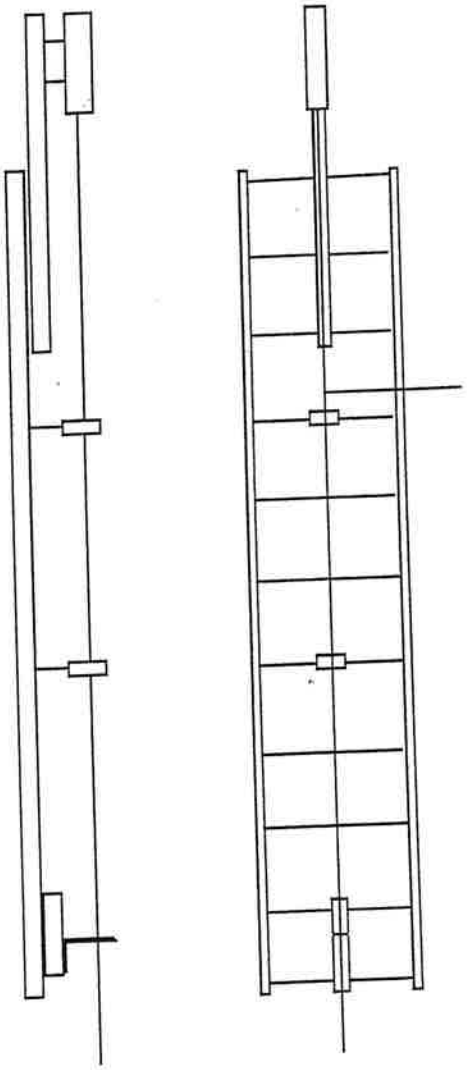
MBA *New Castle, DE 19720 (302) 322-2000*



24" OR 30" DIAMETER SHELL MANHOLE

MBA New Castle, DE 19720 (302) 322-2000

Flexible Cable Safety Climb System



Galvanized:
3/8" cable 1X7 strand extra st. 15,400 lbs. min. tensile

Stainless:
3/8" cable 1X7 strand 302 SS, 18,000 lbs. min. tensile

Straight Ladder

OSHA 29 CFR 1910.27 requires a safety climb system on all ladders over 20' in height.

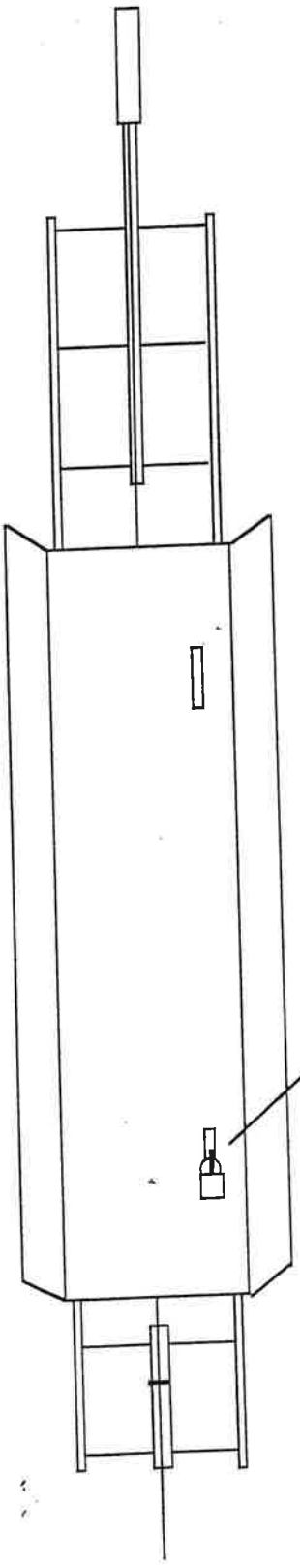
Accessories:
Safety Harness: #1103270
Lanyard: #1244412
Sleeve w/ Carabiner: #6160030

The manufacturer is DBI/SALA. The distributor is First State Distributors, Wilmington, DE (302) 655-8234.

This drawing is not to be used for fabrication. It is intended for illustration purposes only.

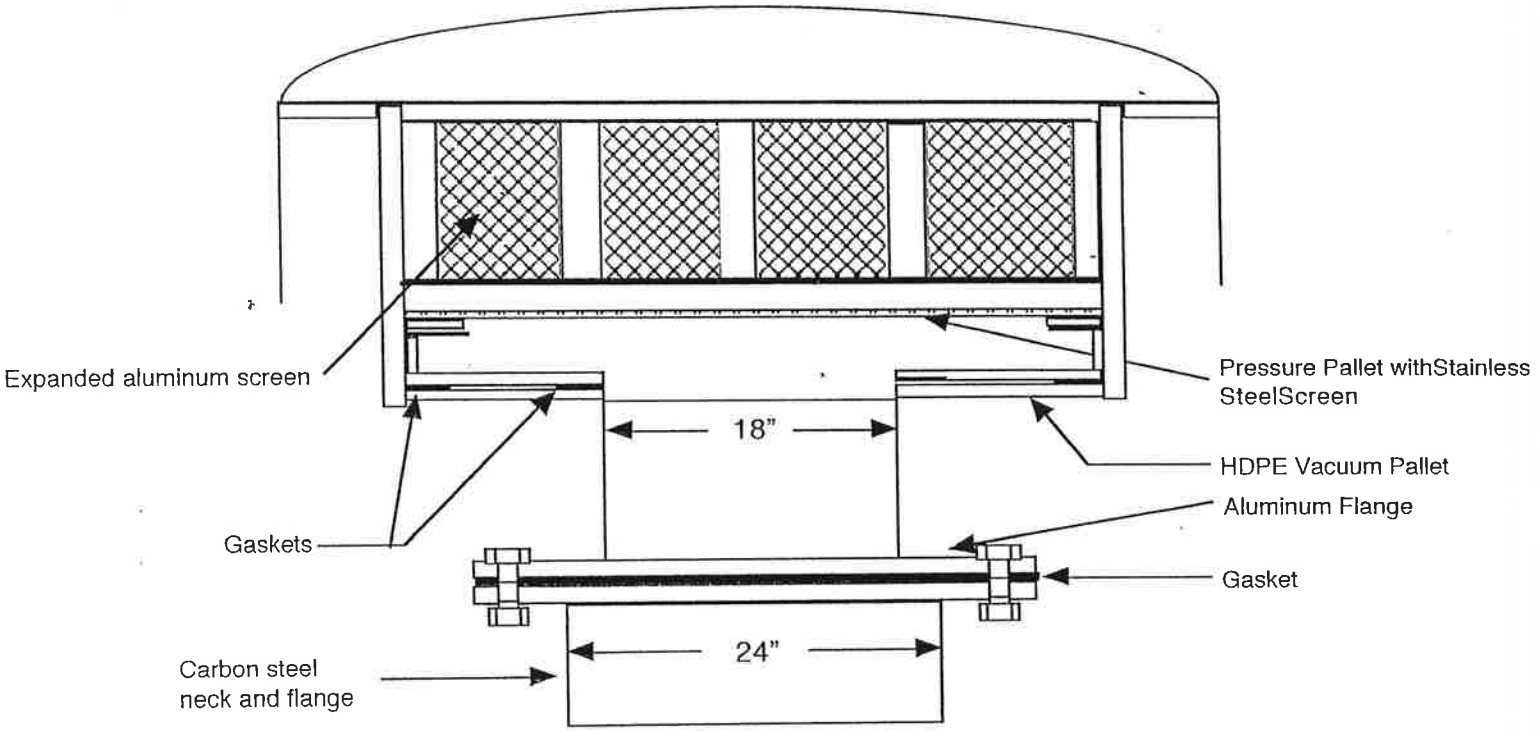
MBA, New Castle, De. 302-322-2000

8 Ft. Aluminum Ladder Gate



The manufacturer is DBI/SALA. The distributor is First State Distributors, Wilmington, DE. (302) 655-8266.

ALUMINUM PRESSURE VACUUM VENT



This drawing is not to be used as a fabrication drawing. Its only intent is to illustrate the recommended roof vent.

MBA Wilmington, DE 302-322-2000

TBA Photo Log

TBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

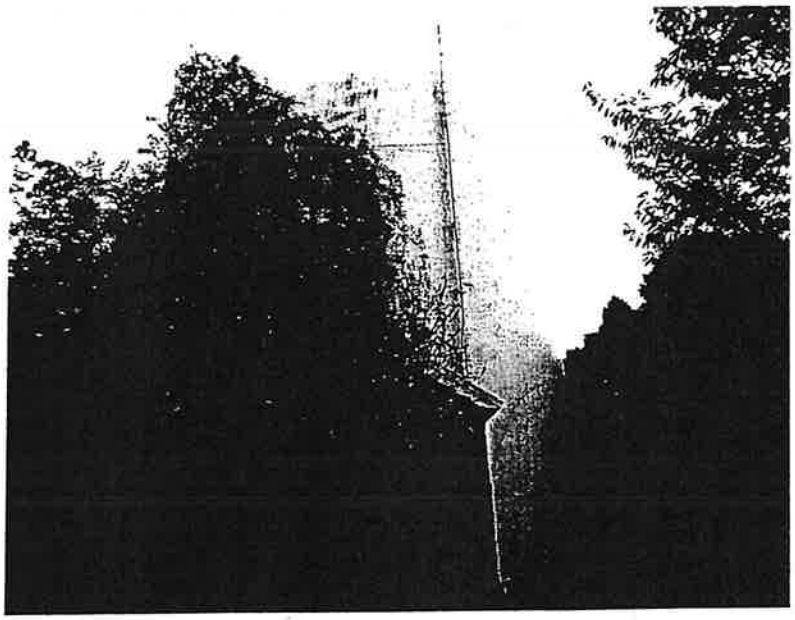


Photo # 1

Date

11/1/2017

Location

Exterior

Notes

Overall of tank.

Photo # 2

Date

11/1/2017

Location

Exterior

Notes

Entrance to site.

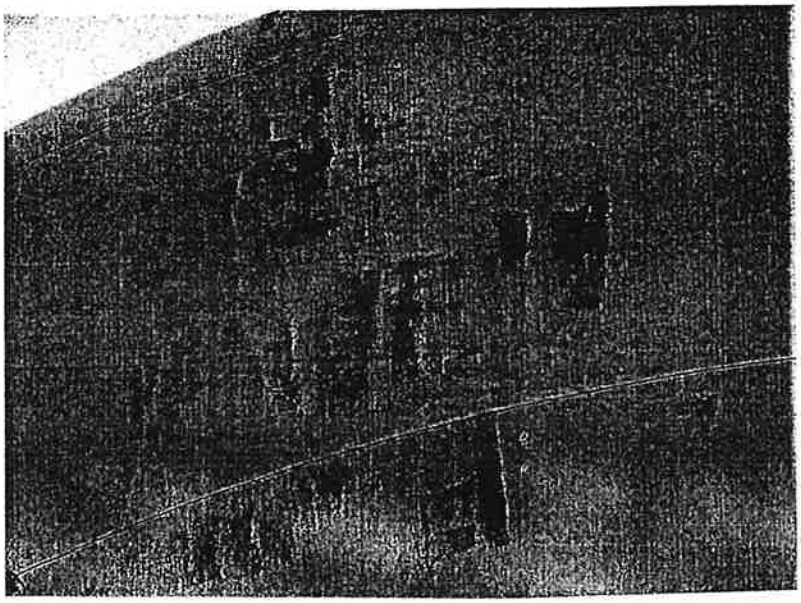


Photo # 3

Date

11/1/2017

Location

Exterior

Notes

Pinhole corrosion on shell.

MBA Photo Log

MBA Contract No. 173032R

Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

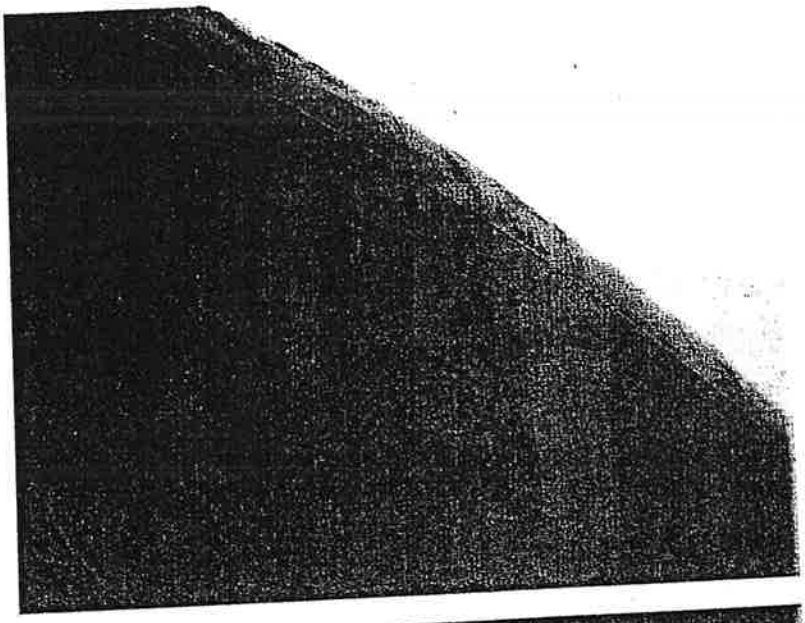


Photo # 4

Date
11/1/2017

Location
Exterior

Notes
Pinhole corrosion on shell.

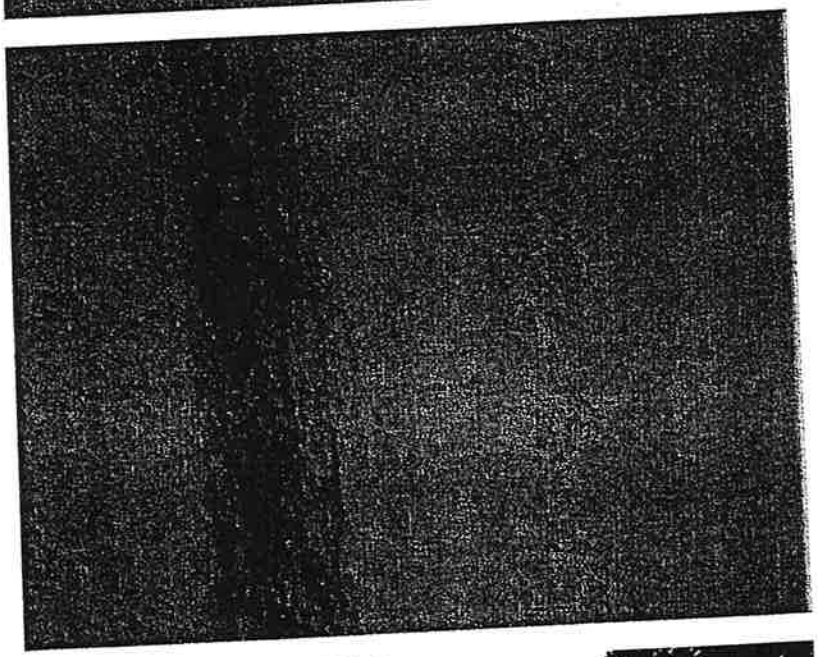


Photo # 5

Date
11/1/2017

Location
Exterior

Notes
Pinhole corrosion on shell.

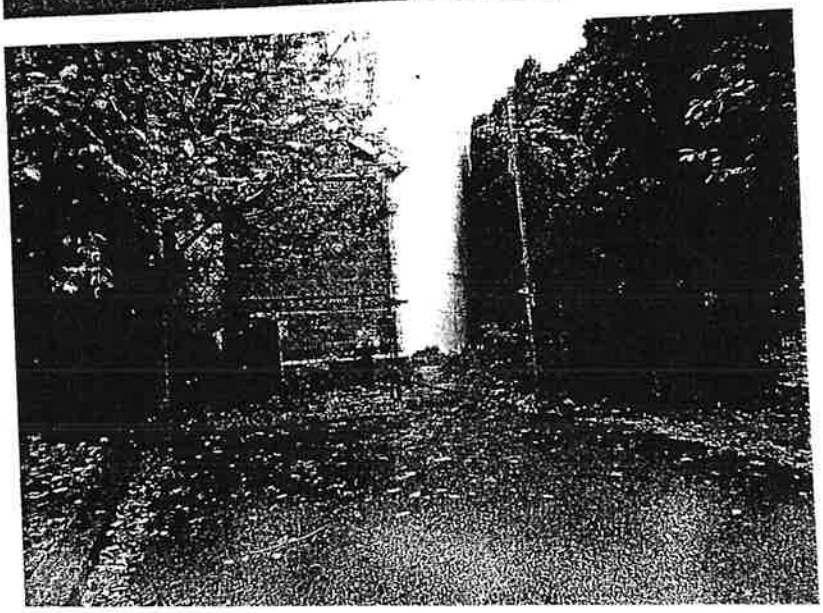


Photo # 6

Date
11/1/2017

Location
Exterior

Notes
Site gate.

Photo Log

Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

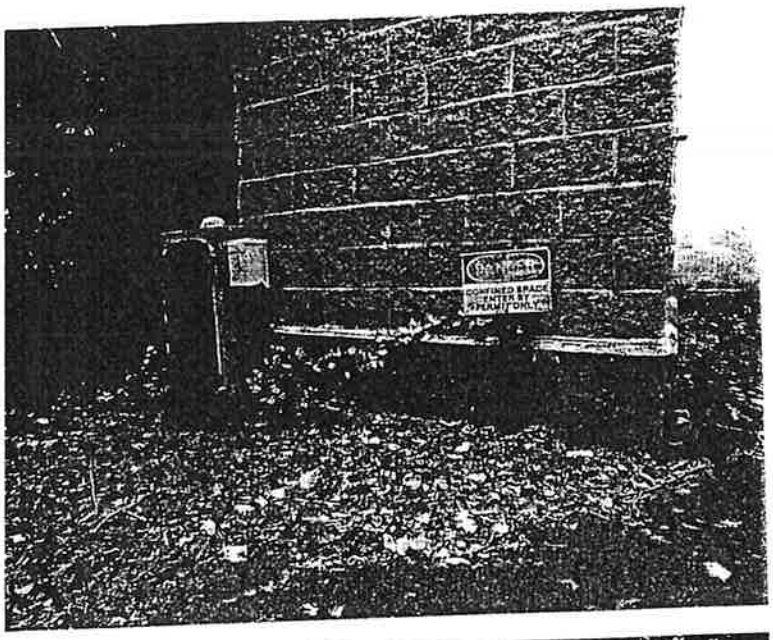


Photo #7

Date
11/1/2017

Location
Valve Vault

Notes
Signage at valve vault.

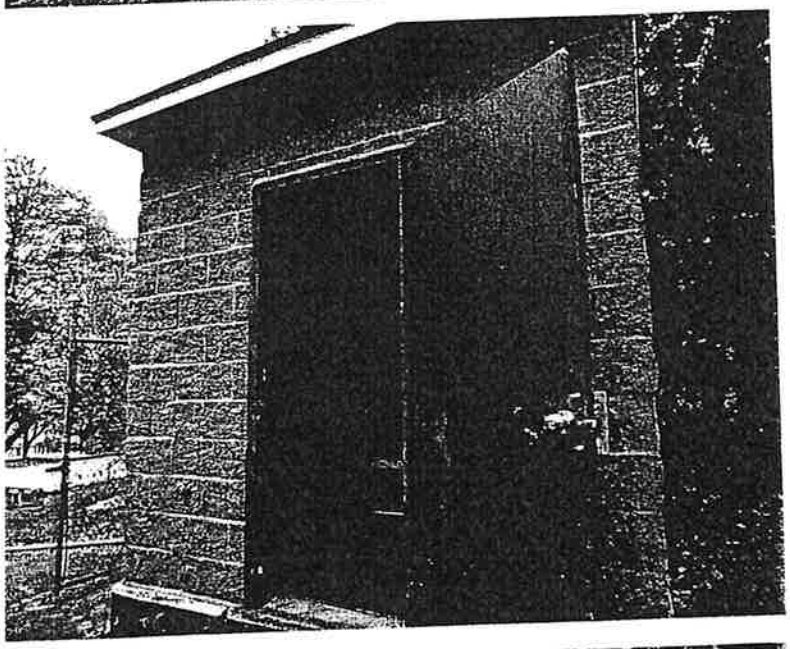


Photo #8

Date
11/1/2017

Location
Valve Vault

Notes
Valve vault entrance.

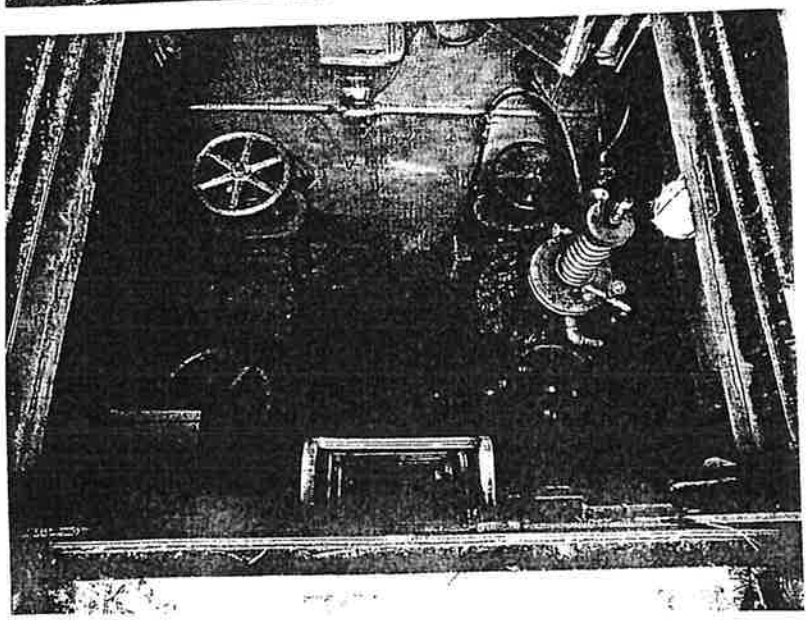


Photo #9

Date
11/1/2017

Location
Valve Vault

Notes
Coating on pipes.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

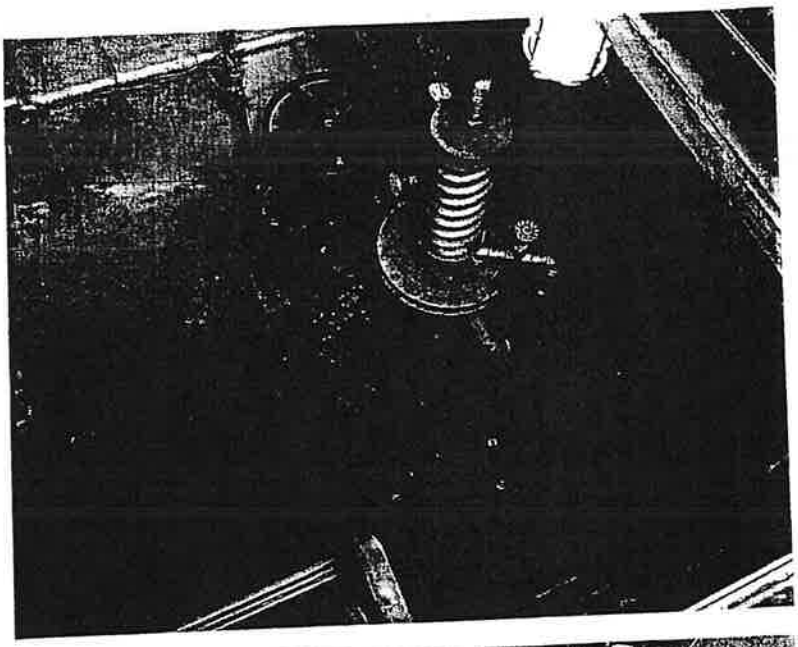


Photo # 10

Date
11/1/2017

Location
Valve Vault

Notes
Corrosion on pipes.

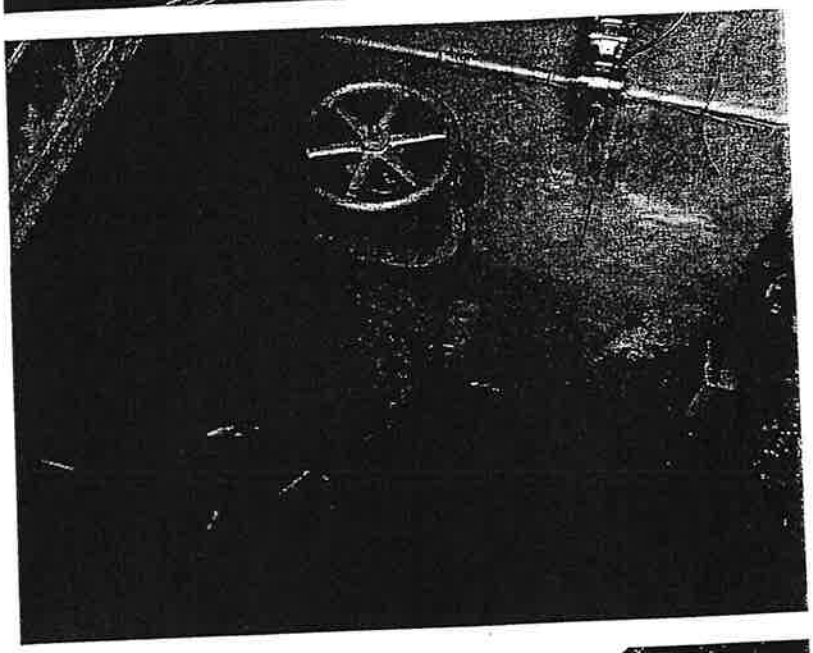


Photo # 11

Date
11/1/2017

Location
Valve Vault

Notes
Corrosion on pipes.

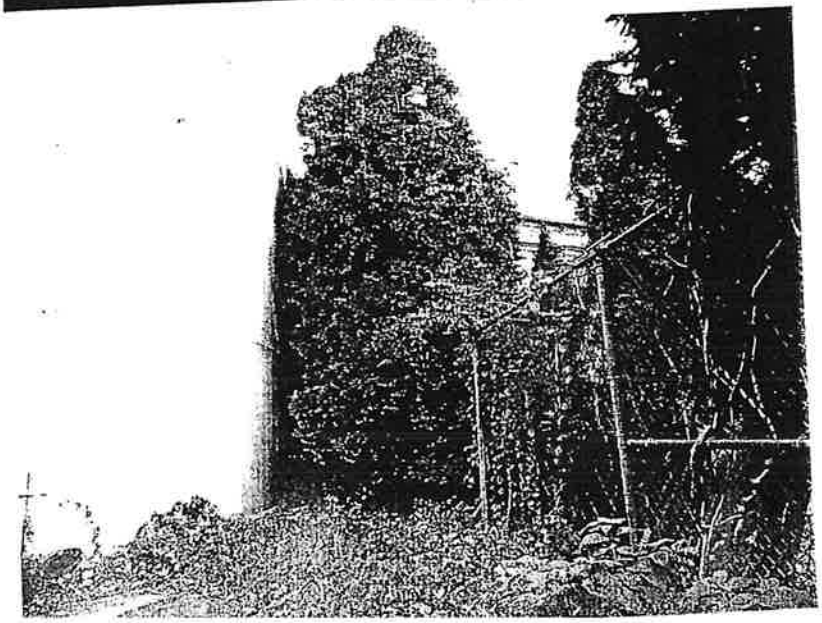


Photo # 12

Date
11/1/2017

Location
Exterior

Notes
Tree growth adjacent to tank.

Photo Log

A Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

Photo # 13

Date

11/1/2017

Location

Exterior

Notes

Coating on shell.

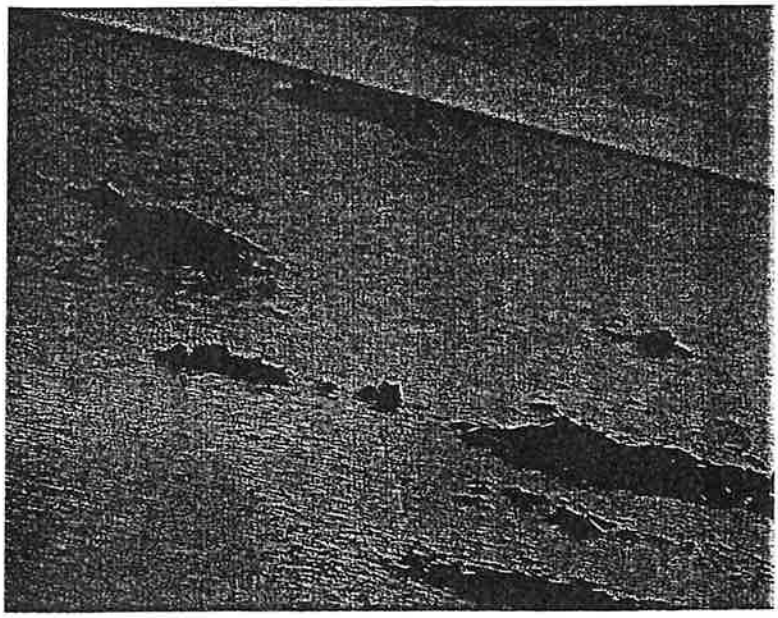


Photo # 14

Date

11/1/2017

Location

Exterior

Notes

Coating delamination on shell.

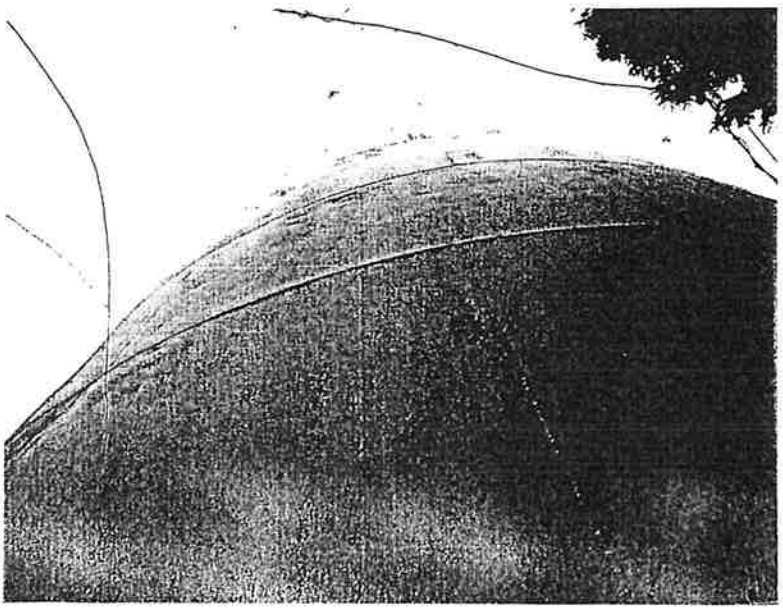


Photo # 15

Date

11/1/2017

Location

Exterior

Notes

Coating on shell.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

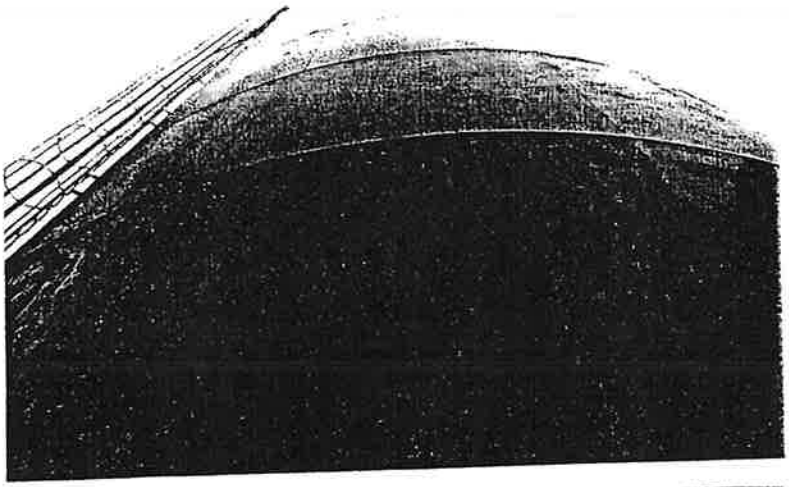


Photo # 16

Date
11/1/2017

Location
Exterior

Notes
Coating on shell.

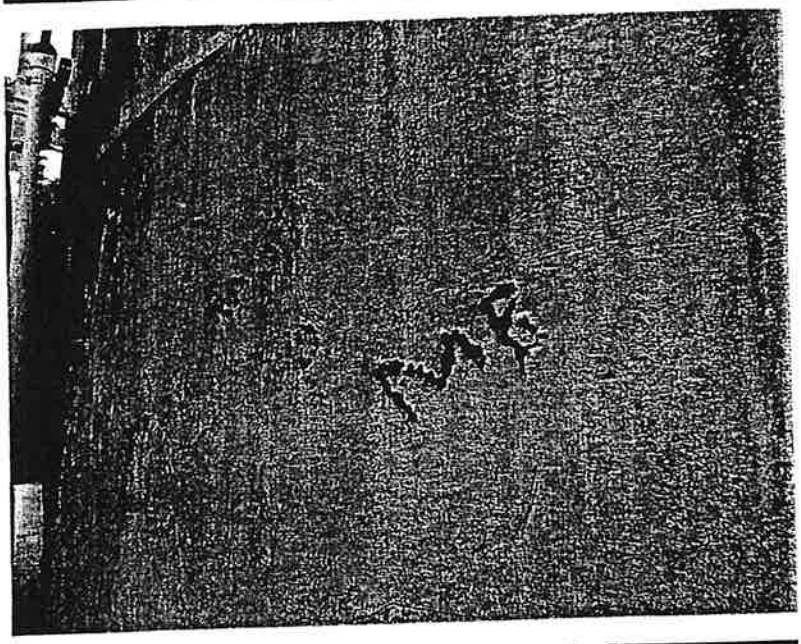


Photo # 17

Date
11/1/2017

Location
Exterior

Notes
Coating delamination on shell.

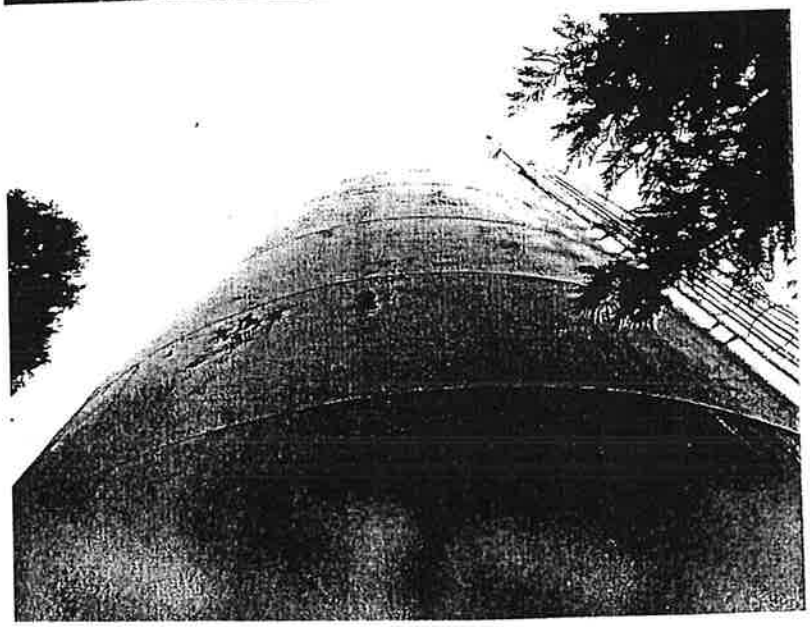


Photo # 18

Date
11/1/2017

Location
Exterior

Notes
Coating on shell.

Photo Log

Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

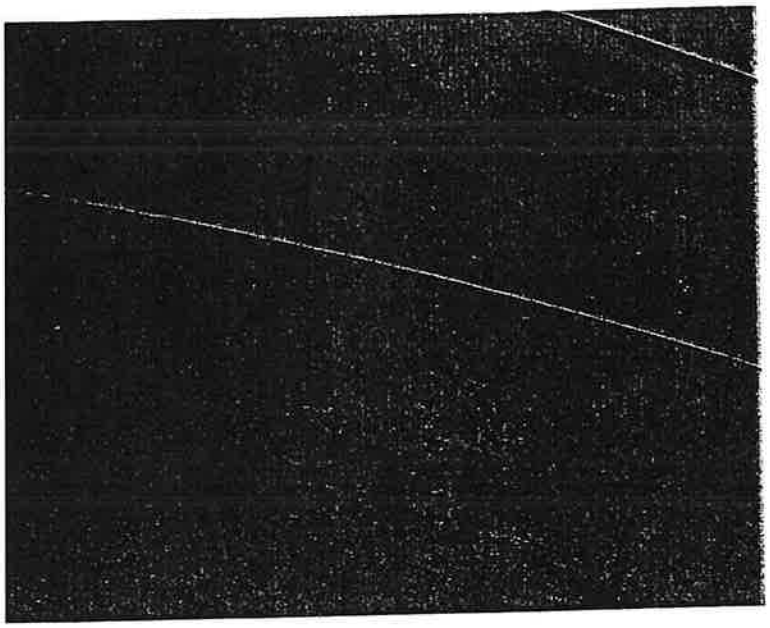


Photo # 19

Date

11/1/2017

Location

Exterior

Notes

Weathered coating on shell.

Photo # 20

Date

11/1/2017

Location

Exterior

Notes

Coating delamination on shell.

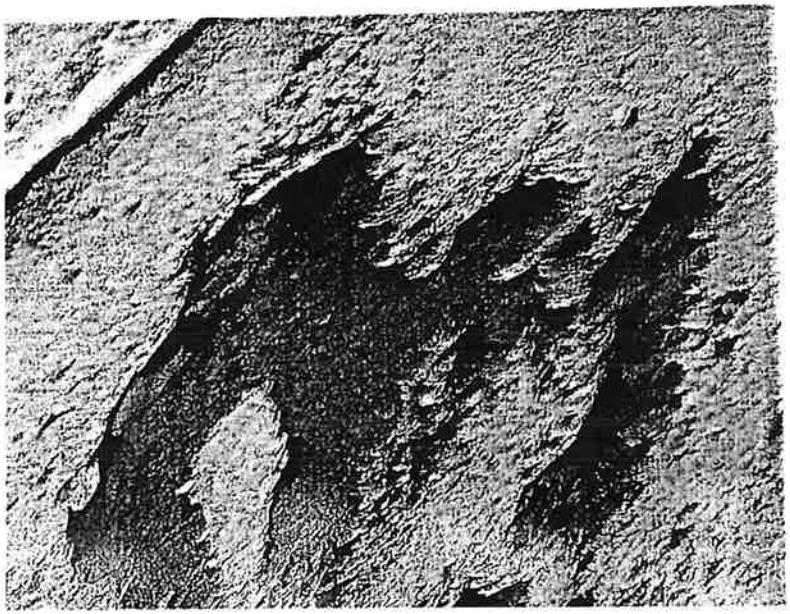


Photo # 21

Date

11/1/2017

Location

Exterior

Notes

Coating delamination on shell.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

Photo # 22

Date

11/1/2017

Location

Exterior

Notes

Grounds around tank.

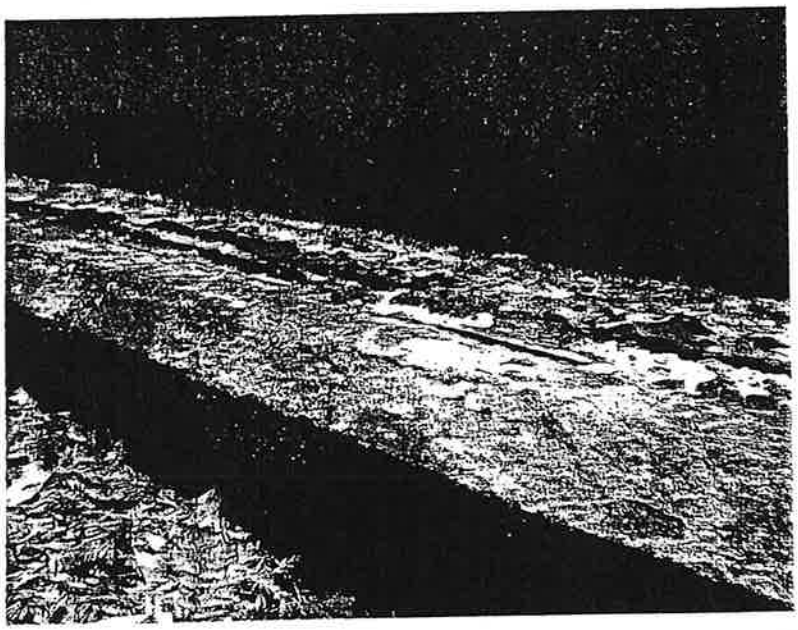


Photo # 23

Date

11/1/2017

Location

Exterior

Notes

Corrosion on base plate, sealant breakdown, and foundation.

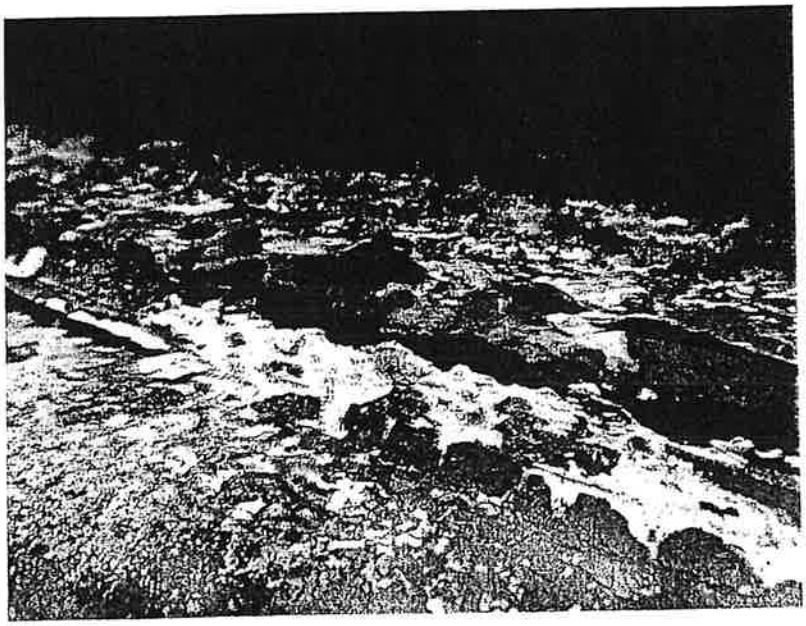


Photo # 24

Date

11/1/2017

Location

Exterior

Notes

Corrosion on base plate and sealant breakdown.

IBA Photo Log

IBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

Photo # 25

Date

11/1/2017

Location

Exterior

Notes

Grounds around tank.

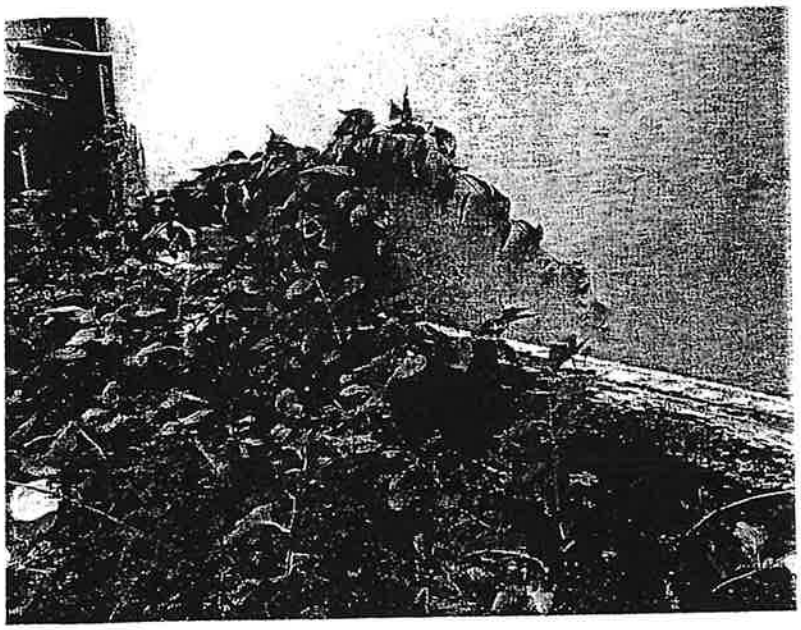


Photo # 26

Date

11/1/2017

Location

Exterior

Notes

Overgrowth around tank foundation.

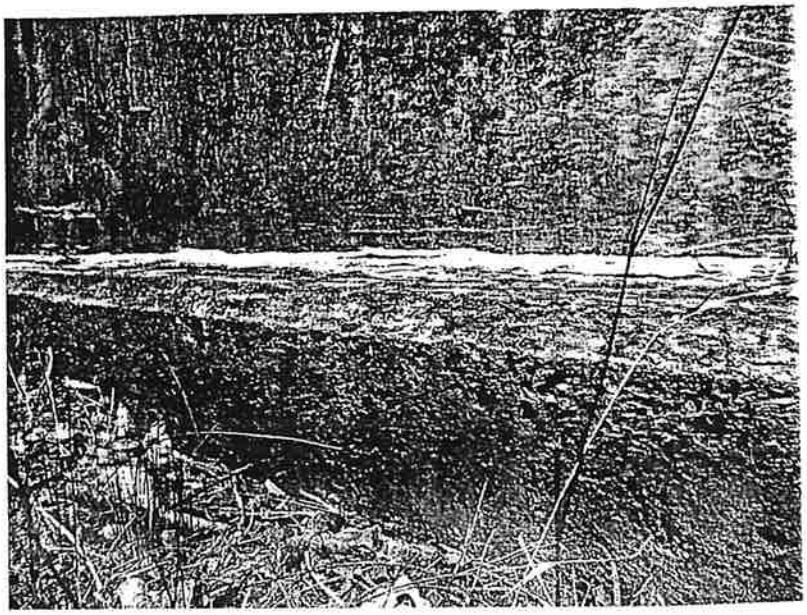


Photo # 27

Date

11/1/2017

Location

Exterior

Notes

Tank foundation.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

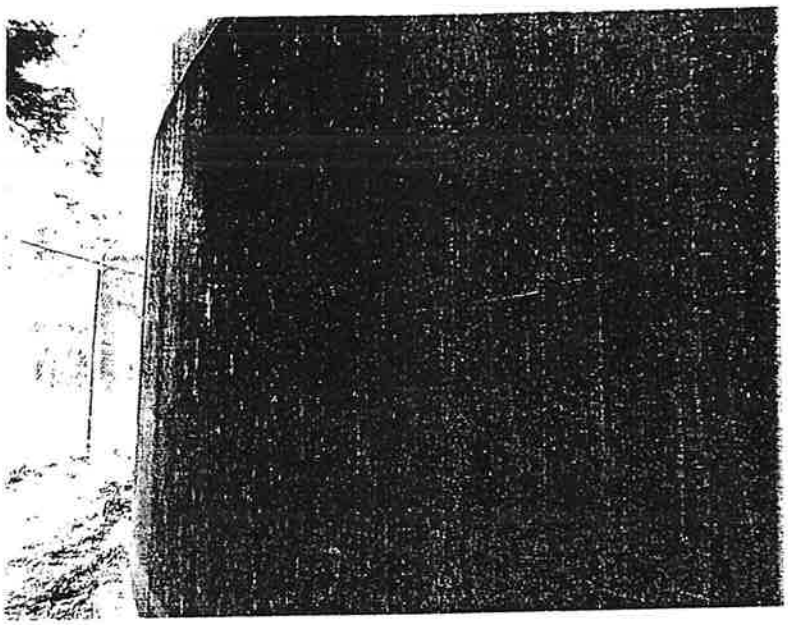


Photo # 28

Date

11/1/2017

Location

Exterior

Notes

Mildew growth at base of shell.

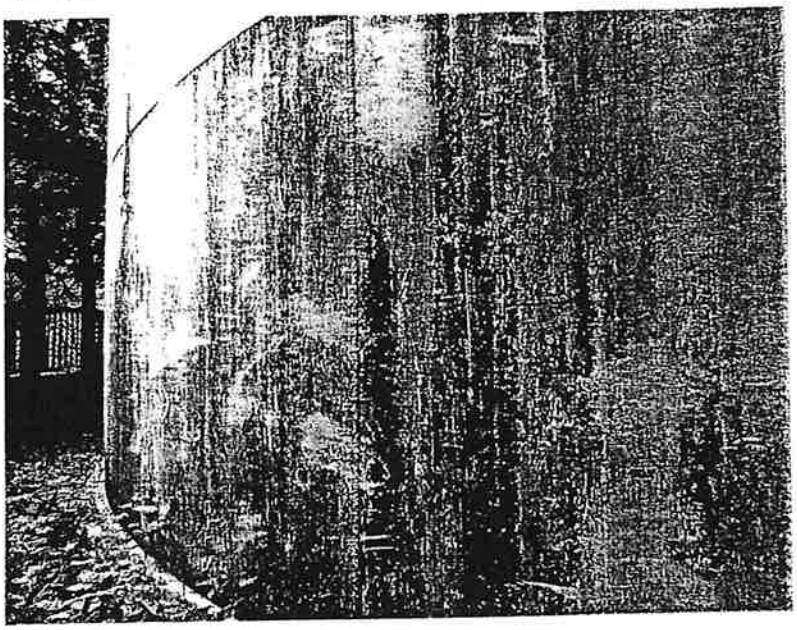


Photo # 29

Date

11/1/2017

Location

Exterior

Notes

Mildew growth at base of shell.

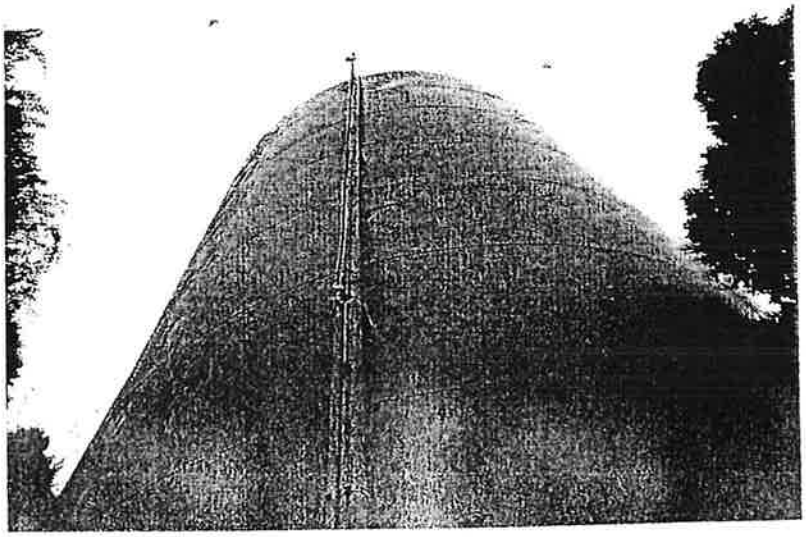


Photo # 30

Date

11/1/2017

Location

Exterior

Notes

Coating on shell and 6" dia. overflow pipe.

Photo Log

Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

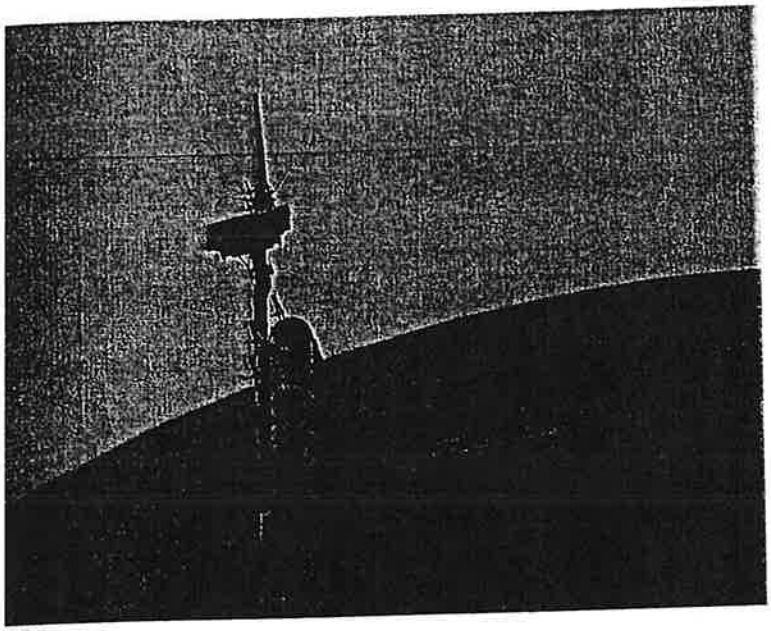


Photo # 31

Date

11/1/2017

Location

Exterior

Notes

Whip antenna mounted to 6" dia. overflow pipe and coating on shell.

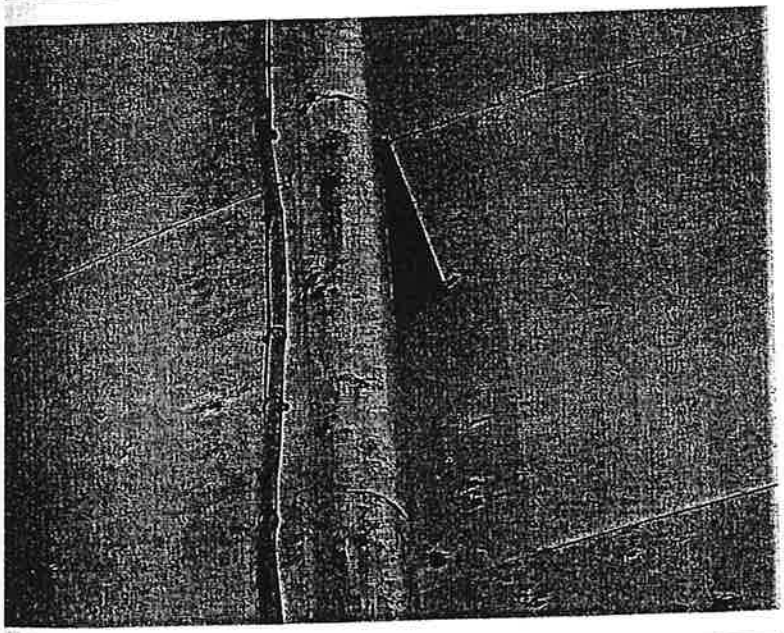


Photo # 32

Date

11/1/2017

Location

Exterior

Notes

Coating on shell and 6" dia. overflow pipe.

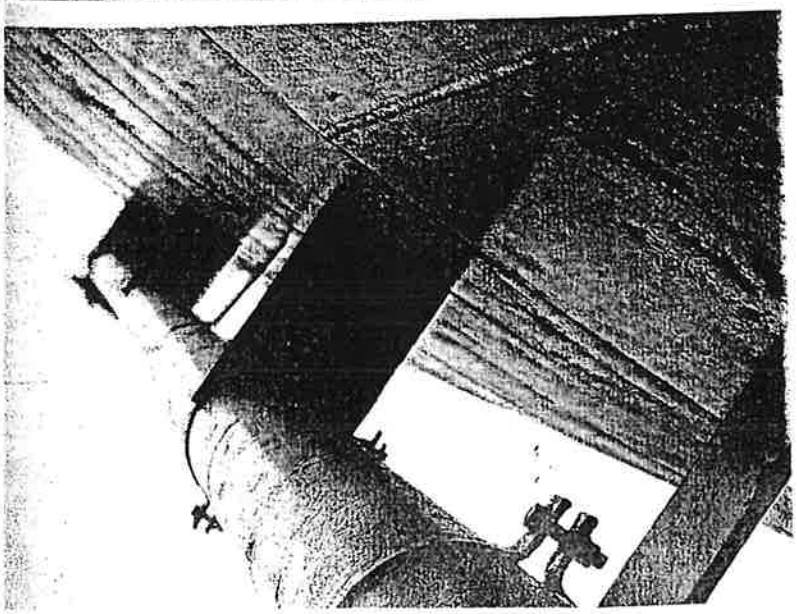


Photo # 33

Date

11/1/2017

Location

Exterior

Notes

Coating on shell and 6" dia. overflow pipe.

MBA Photo Log

MBA Contract No. 173032R

Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

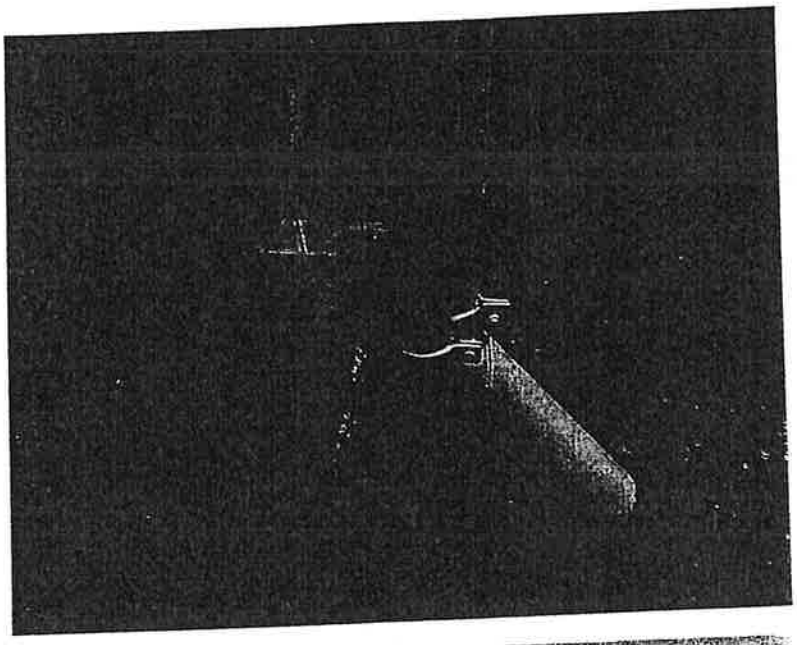


Photo # 34

Date

11/1/2017

Location

Exterior

Notes

Coating on shell, 6" dia. overflow pipe, and pipe mounted to overflow pipe.

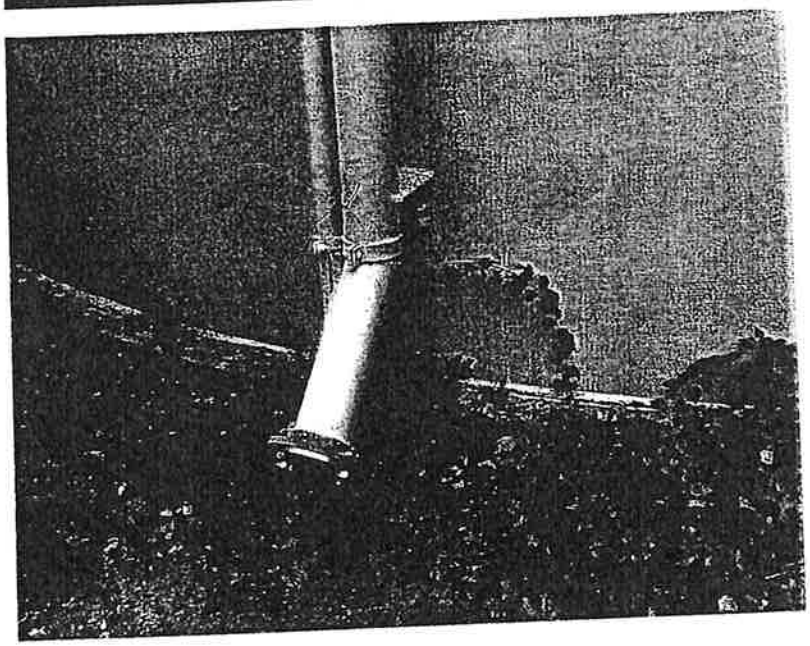


Photo # 35

Date

11/1/2017

Location

Exterior

Notes

Coating on shell and 6" dia. overflow pipe.

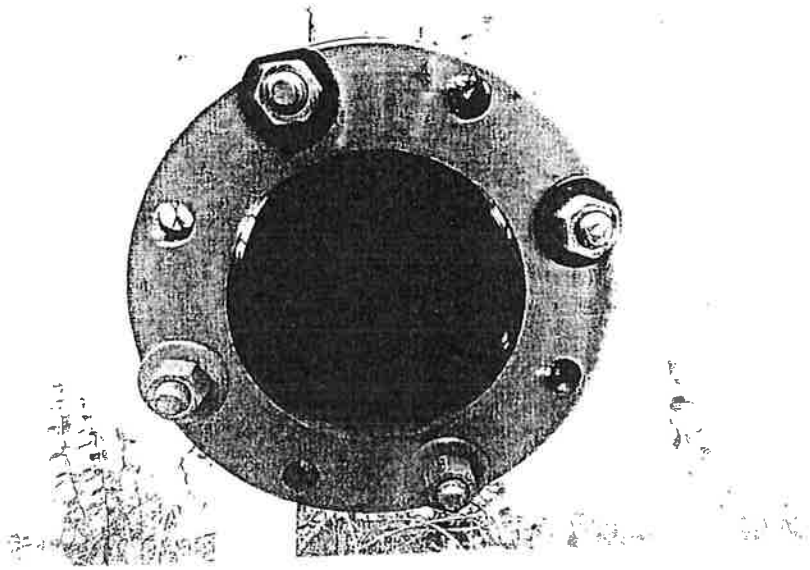


Photo # 36

Date

11/1/2017

Location

Exterior

Notes

6" dia. overflow pipe discharge screen.

Photo Log

A Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

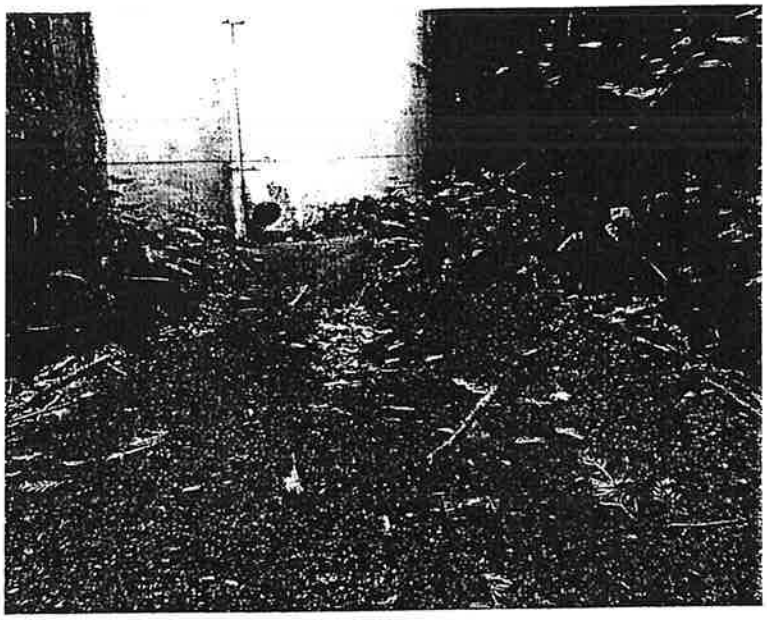


Photo # 37

Date

11/1/2017

Location

Exterior

Notes

Splash pad graded away from tank.

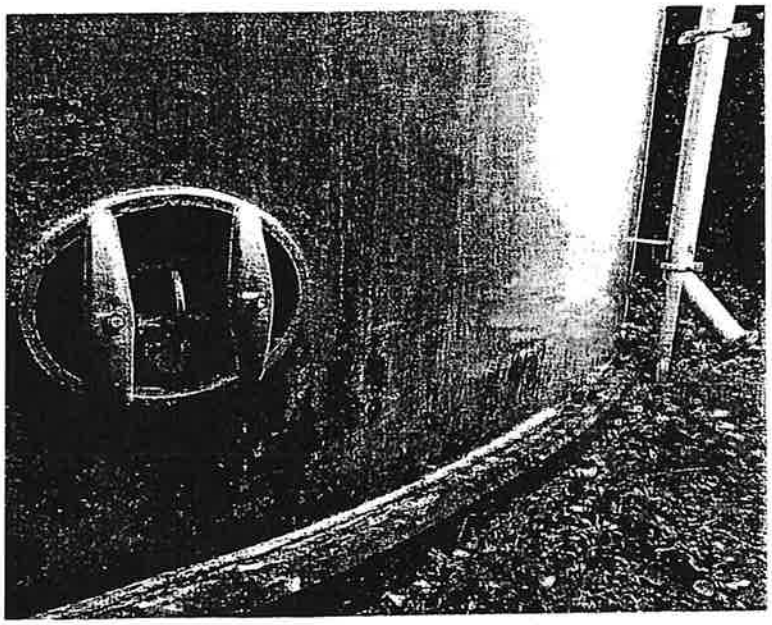


Photo # 38

Date

11/1/2017

Location

Exterior

Notes

Coating on shell and 18" x 24" shell manhole.

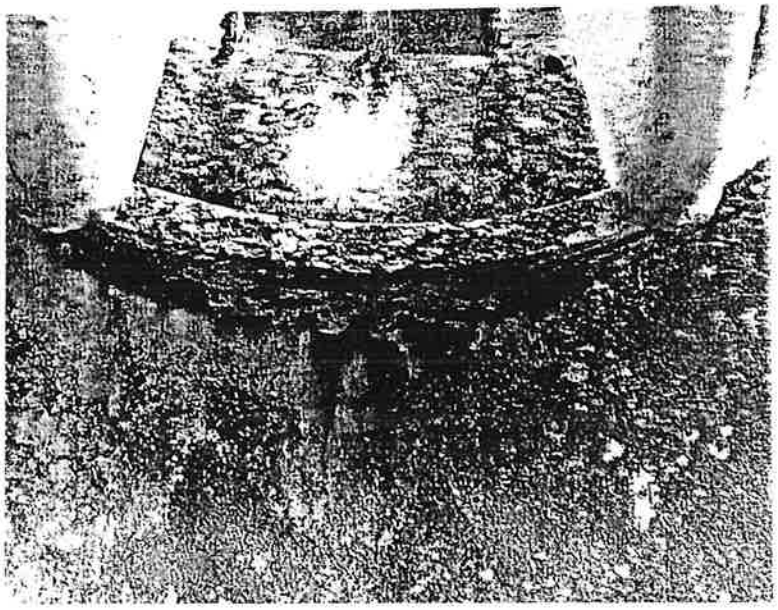


Photo # 39

Date

11/1/2017

Location

Exterior

Notes

Corrosion on 18" x 24" shell manhole lip.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

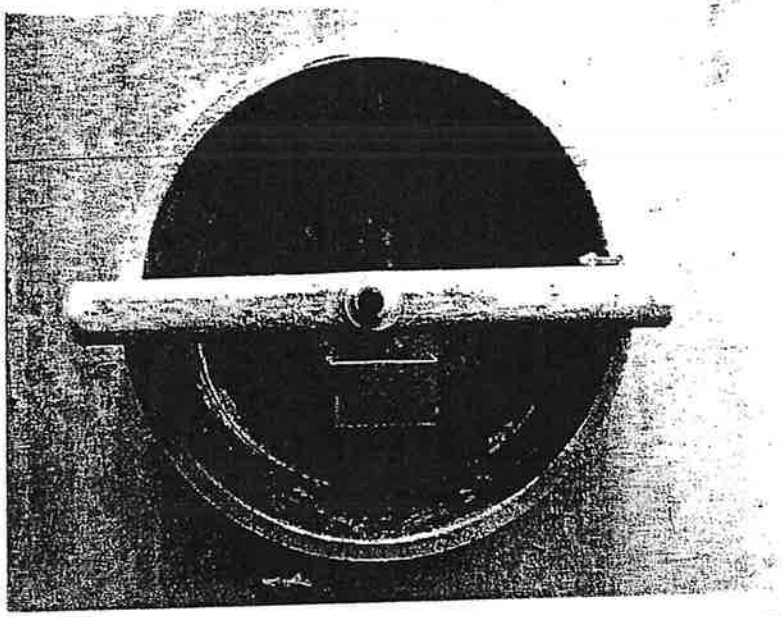


Photo # 40

Date

11/1/2017

Location

Exterior

Notes

Coating on 24" dia. shell manhole.

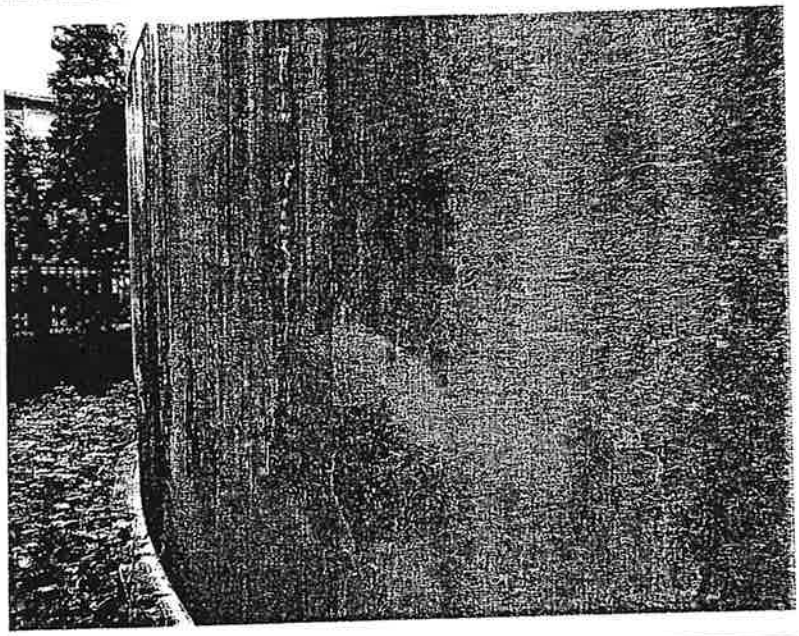


Photo # 41

Date

11/1/2017

Location

Exterior

Notes

Mildew growth on shell.

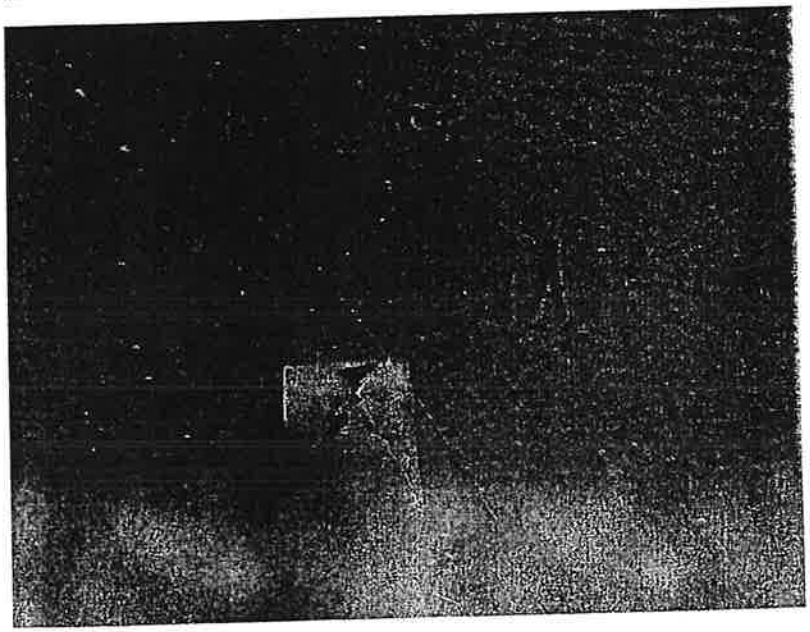


Photo # 42

Date

11/1/2017

Location

Exterior

Notes

Adhesion test performed on shell.

Photo Log

A Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

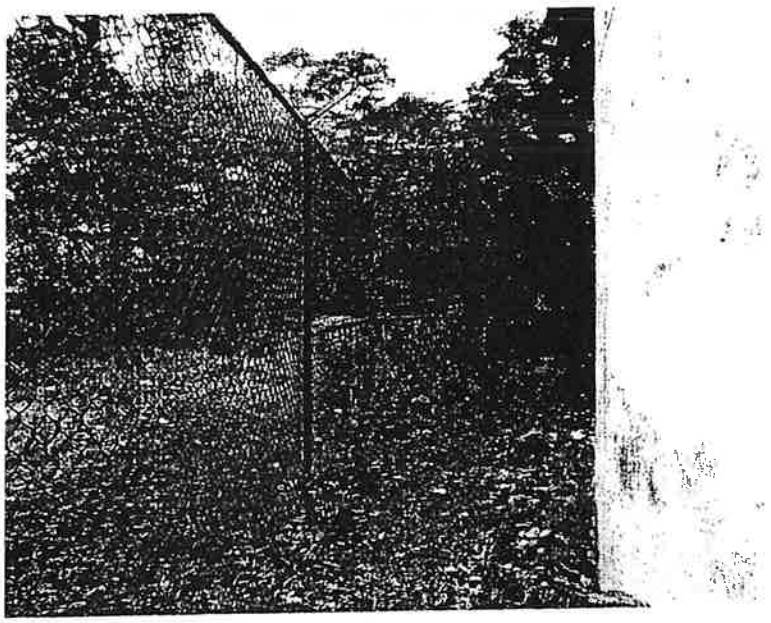


Photo # 43

Date

11/1/2017

Location

Exterior

Notes

Site fence and coating on shell.

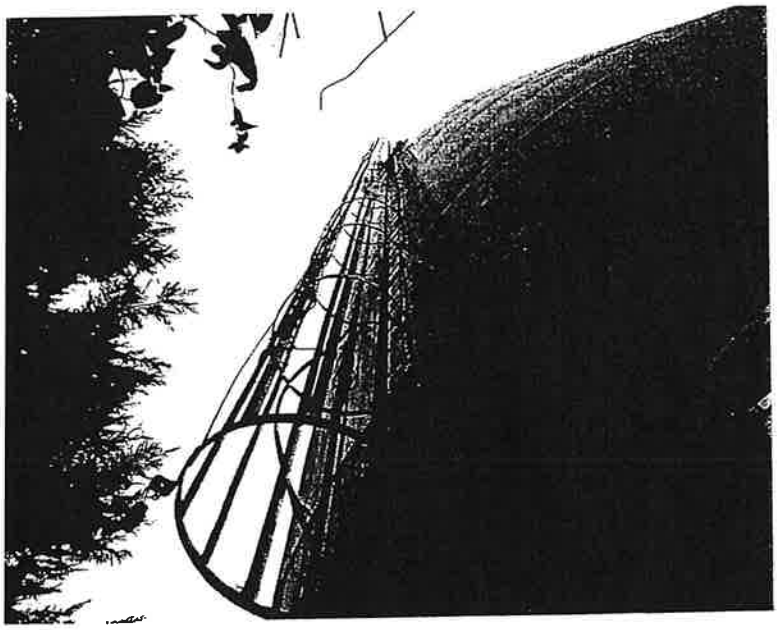


Photo # 44

Date

11/1/2017

Location

Exterior

Notes

Coating on shell ladder and ladder cage.

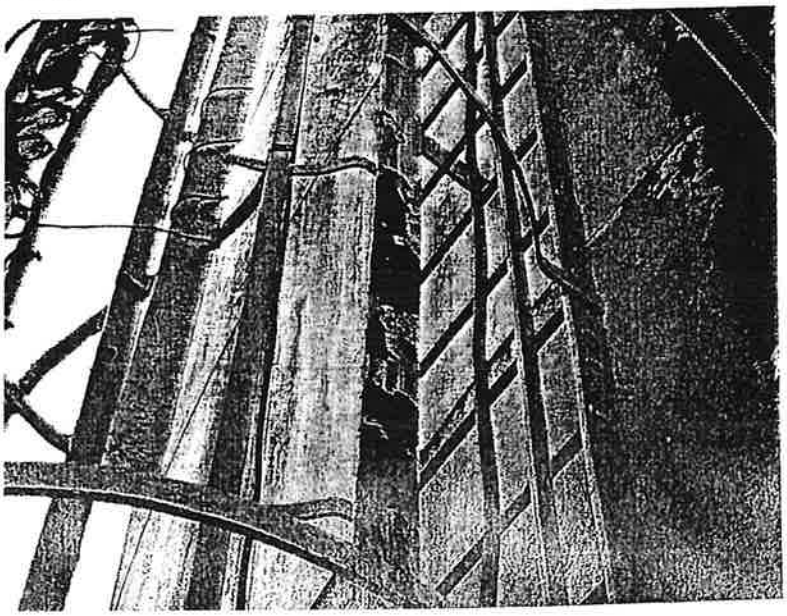


Photo # 45

Date

11/1/2017

Location

Exterior

Notes

Corrosion on shell ladder cage.

MBA Photo Log

MBA Contract No. 173032R

Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

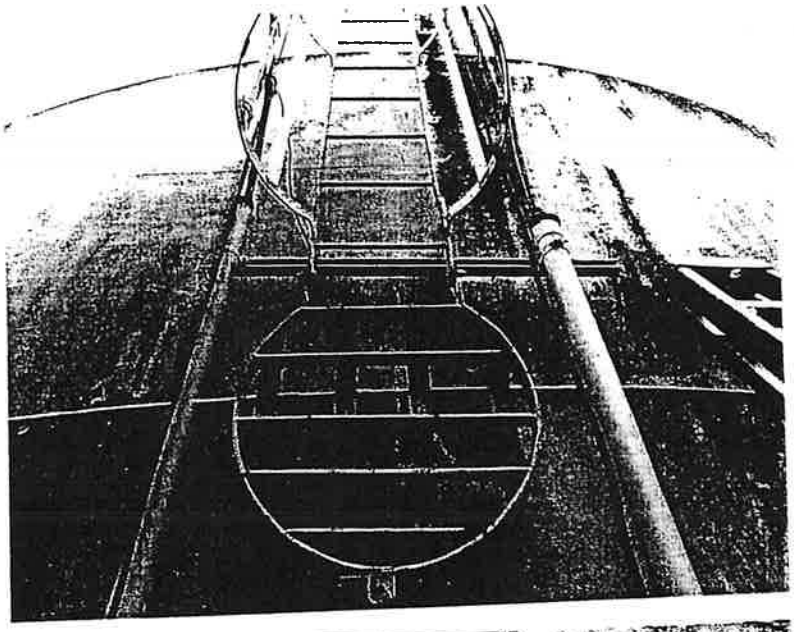


Photo # 46

Date
11/1/2017

Location
Exterior

Notes
Coating on shell ladder gate.

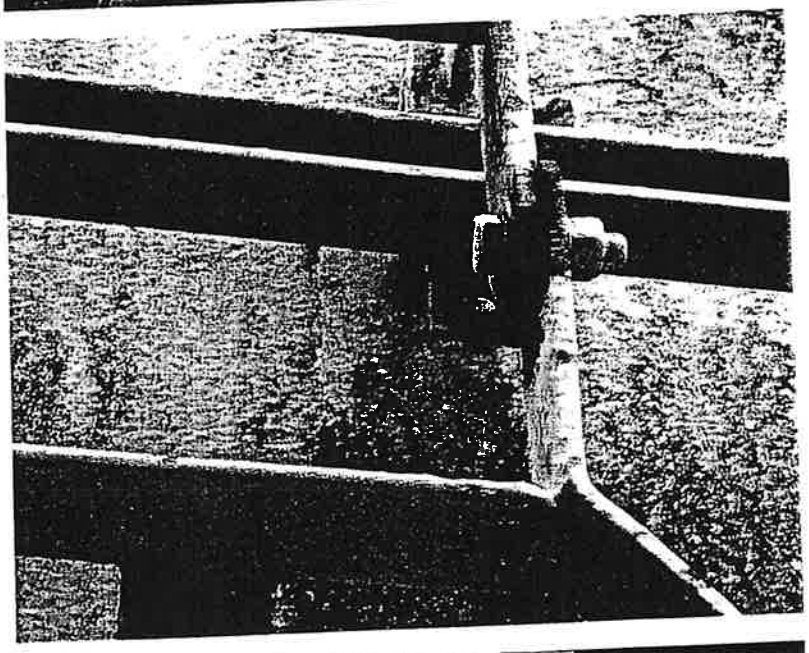


Photo # 47

Date
11/1/2017

Location
Exterior

Notes
Corrosion on shell ladder gate hinge.

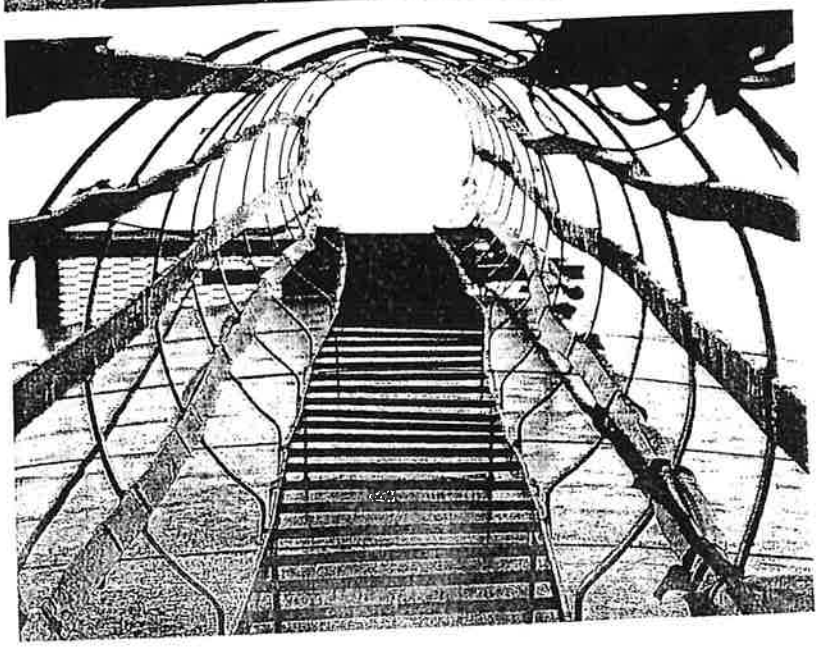


Photo # 48

Date
11/1/2017

Location
Exterior

Notes
Coating on shell ladder and ladder cage.

Photo Log

Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

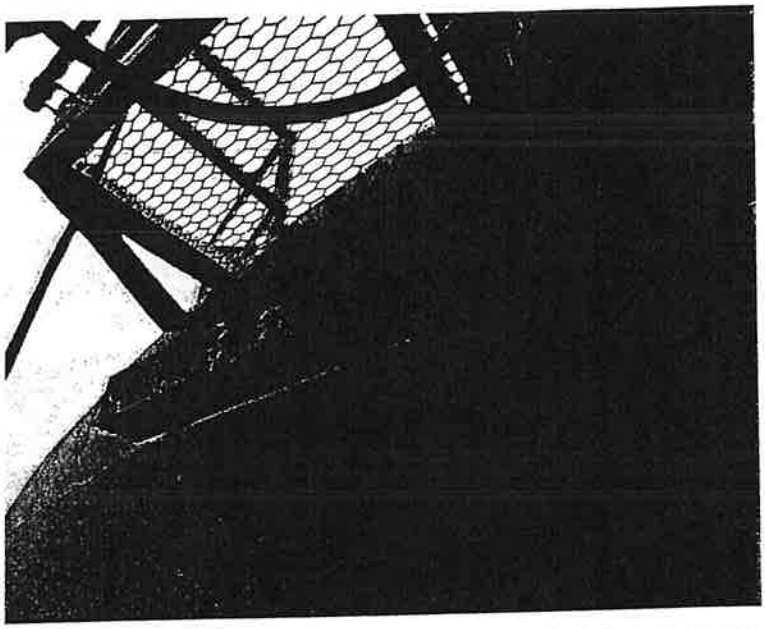


Photo # 49

Date

11/1/2017

Location

Exterior

Notes

Corrosion on angled steel and shell.

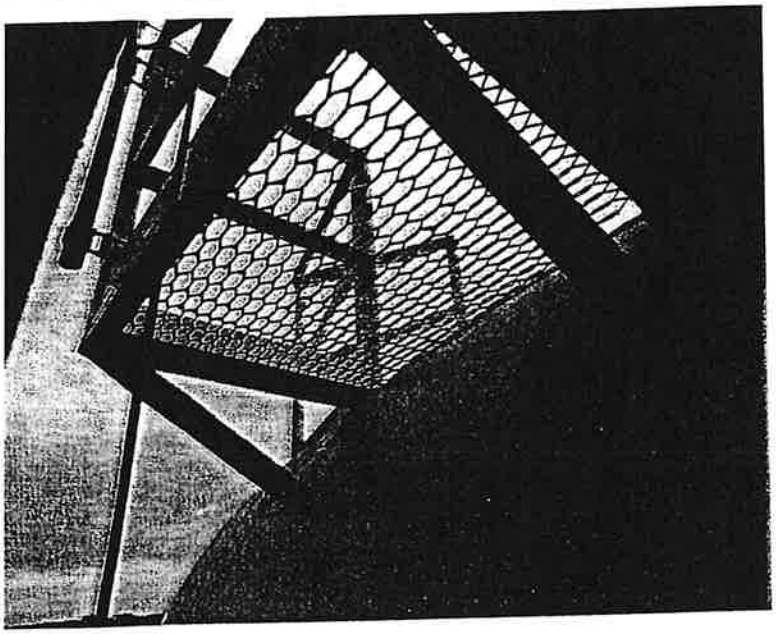


Photo # 50

Date

11/1/2017

Location

Exterior

Notes

Coating on underside of 42" x 35" roof platform.

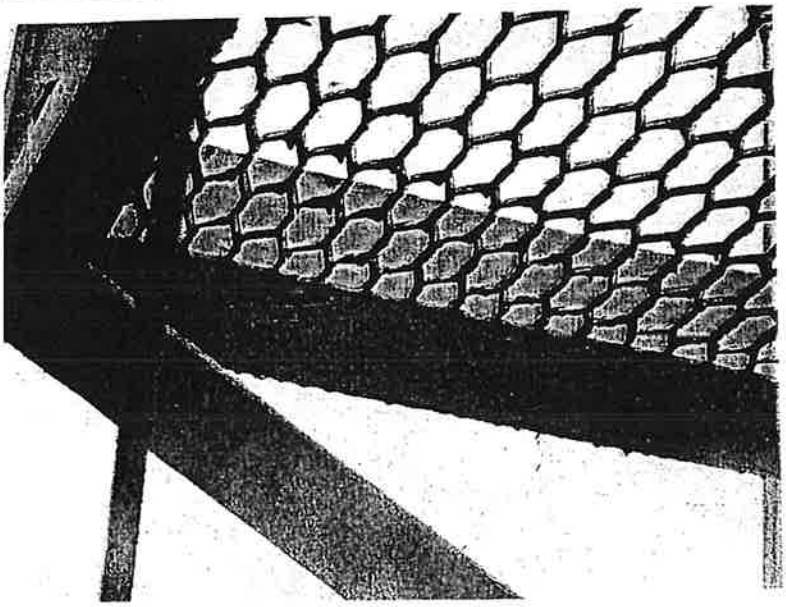


Photo # 51

Date

11/1/2017

Location

Exterior

Notes

Coating on underside of 42" x 35" roof platform.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

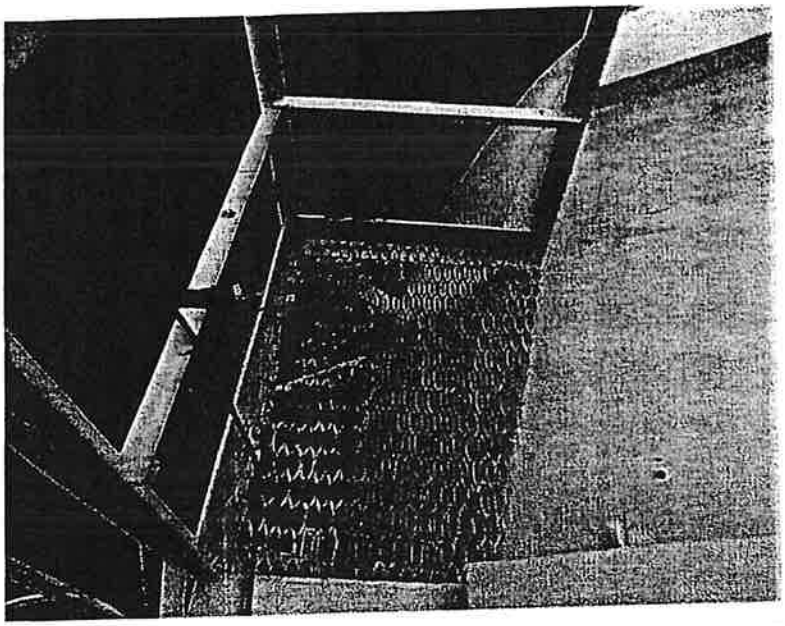


Photo # 52

Date

11/1/2017

Location

Exterior

Notes

Coating on 42" x 35" roof platform and handrails.

Photo # 53

Date

11/1/2017

Location

Exterior

Notes

Corrosion on shell ladder cage.

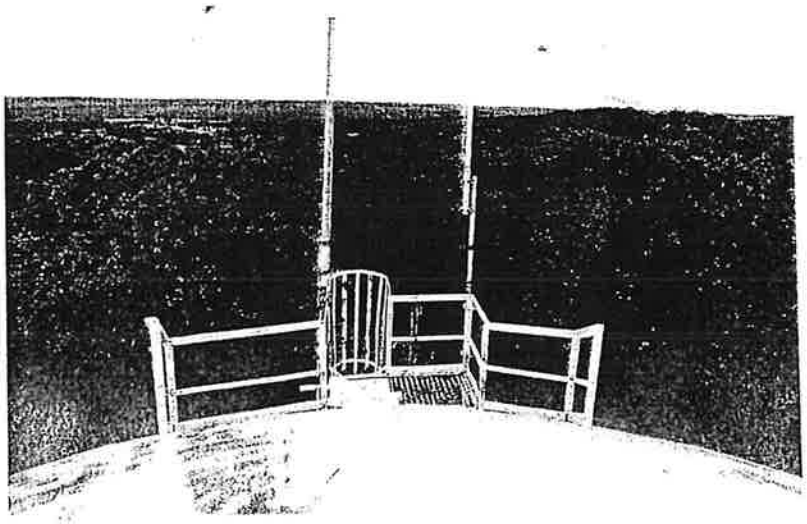


Photo # 54

Date

11/1/2017

Location

Exterior

Notes

Roof handrails and whip antennas mounted to roof handrails.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

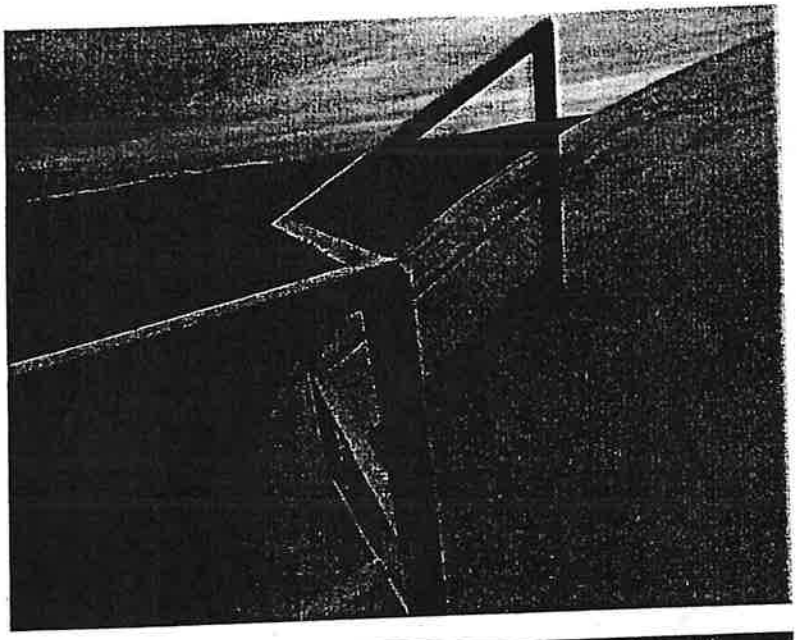


Photo # 55

Date

11/1/2017

Location

Exterior

Notes

Coating on roof handrails.

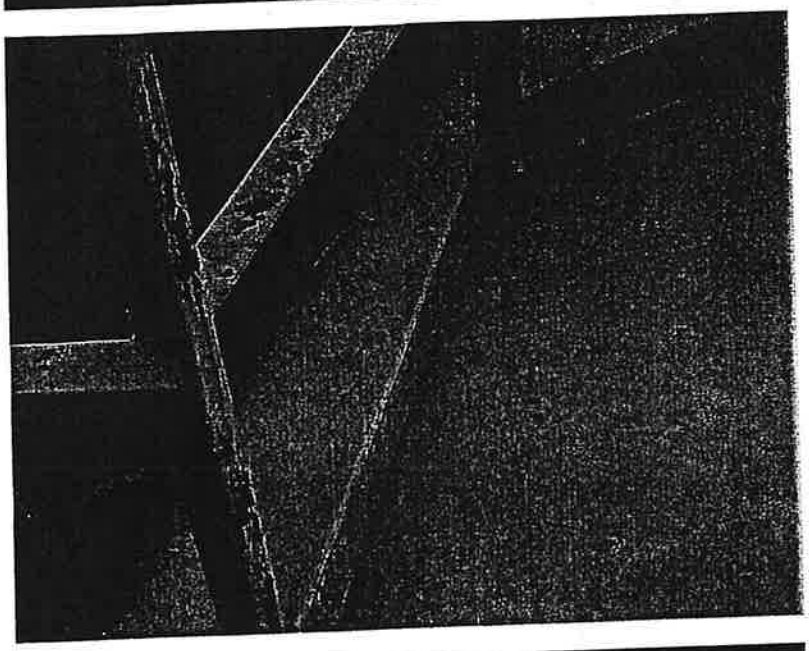


Photo # 56

Date

11/1/2017

Location

Exterior

Notes

Corrosion on roof handrails.

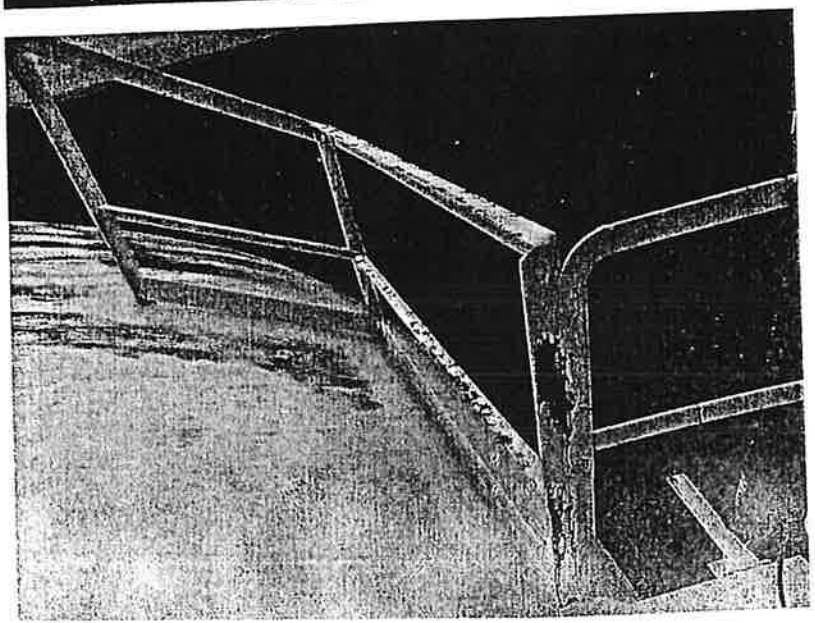


Photo # 57

Date

11/1/2017

Location

Exterior

Notes

Corrosion on roof handrails and pinhole corrosion on roof.

MBA Photo Log

MBA Contract No. 173032R

Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

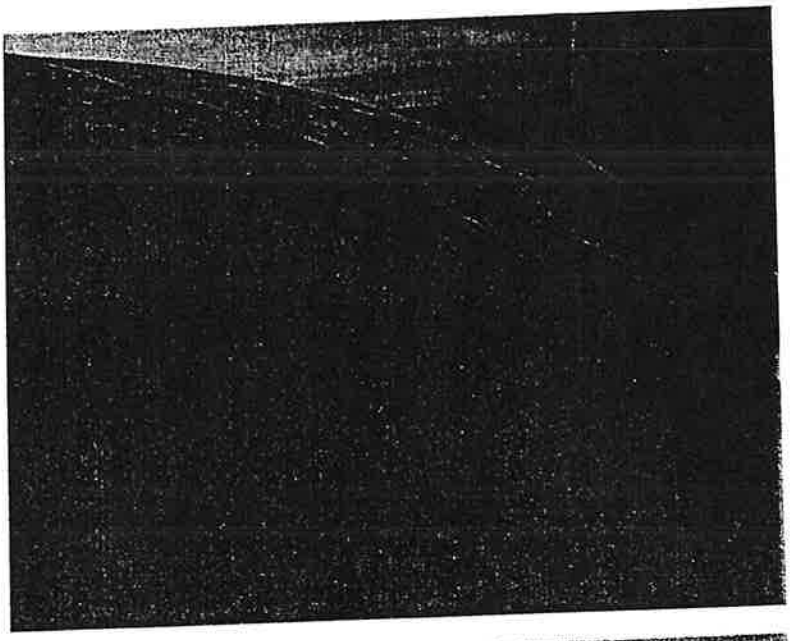


Photo # 58

Date

11/1/2017

Location

Exterior

Notes

Pinhole corrosion on roof.

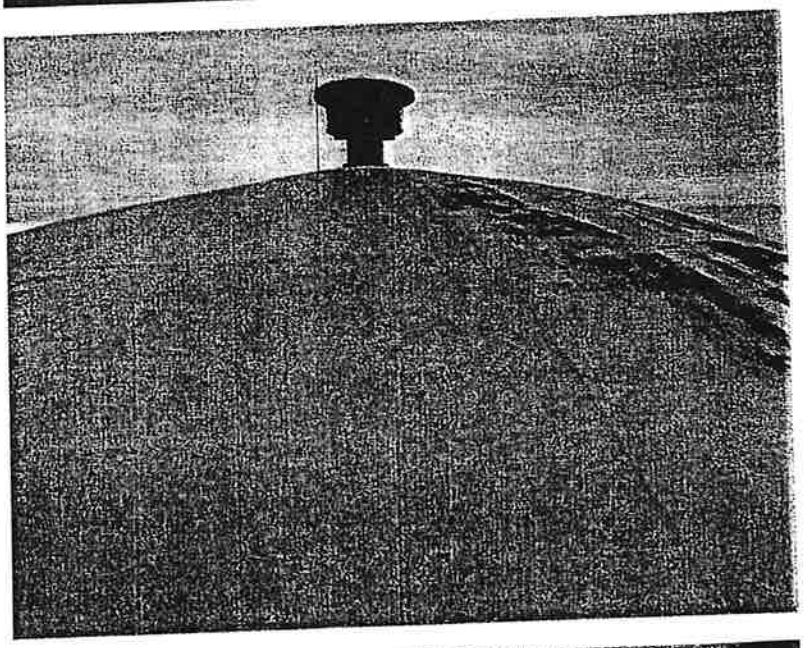


Photo # 59

Date

11/1/2017

Location

Exterior

Notes

Coating on roof.

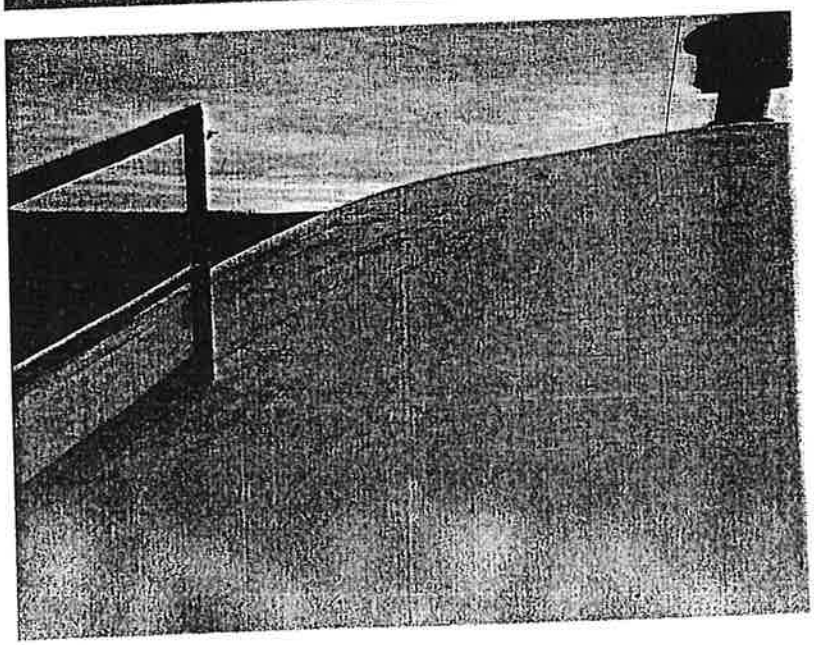


Photo # 60

Date

11/1/2017

Location

Exterior

Notes

Coating on roof.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

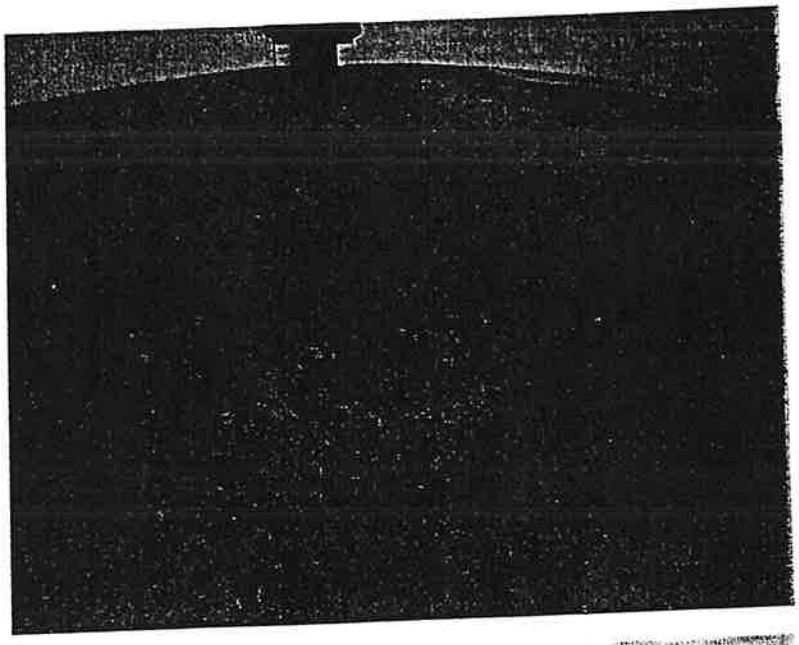


Photo # 61

Date

11/1/2017

Location

Exterior

Notes

Pinhole corrosion on roof.

Photo # 62

Date

11/1/2017

Location

Exterior

Notes

Coating on 18" dia. PV vent.

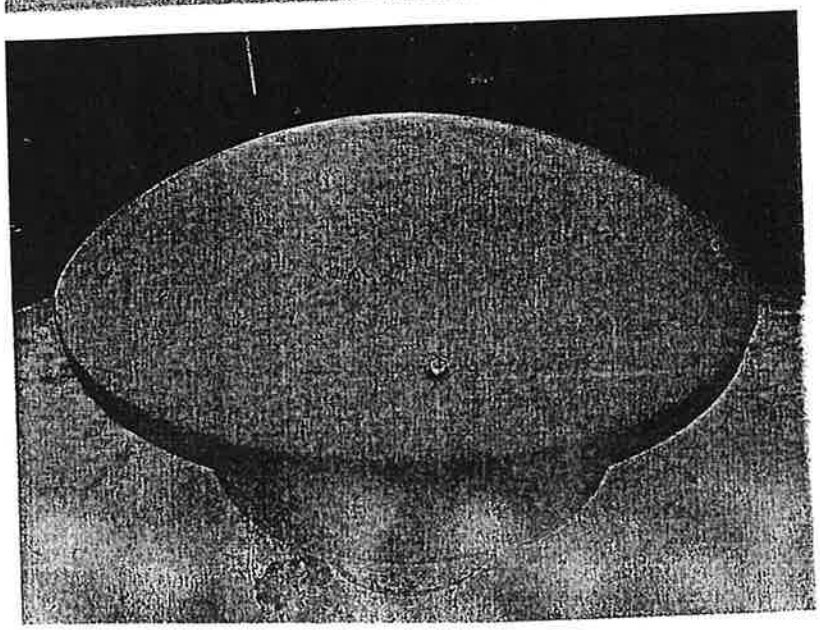


Photo # 63

Date

11/1/2017

Location

Exterior

Notes

Coating on 18" dia. PV vent.

MBA Photo Log

MBA Contract No. 173032R

Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

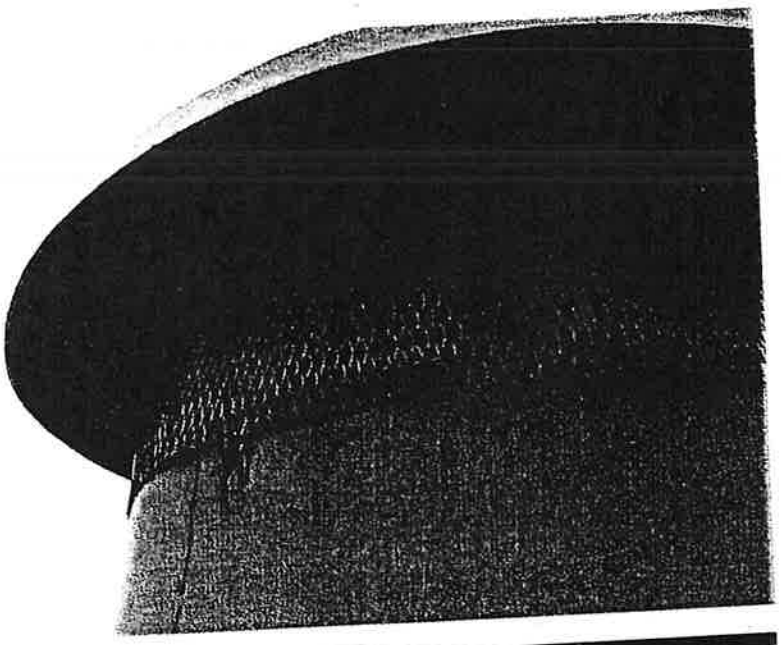


Photo # 64

Date
11/1/2017

Location
Exterior

Notes
18" dia. PV vent screen.

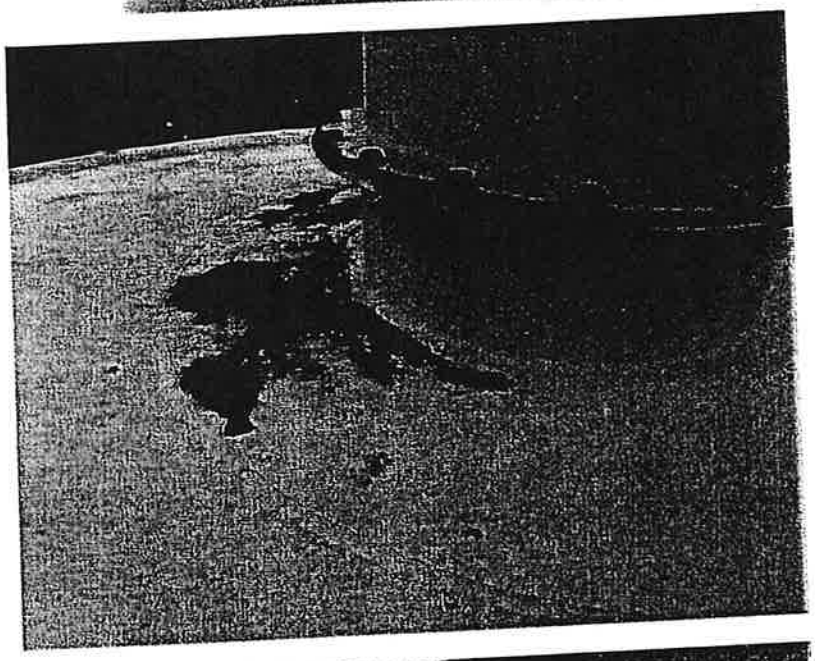


Photo # 65

Date
11/1/2017

Location
Exterior

Notes
Corrosion at base of 18" dia. PV vent.

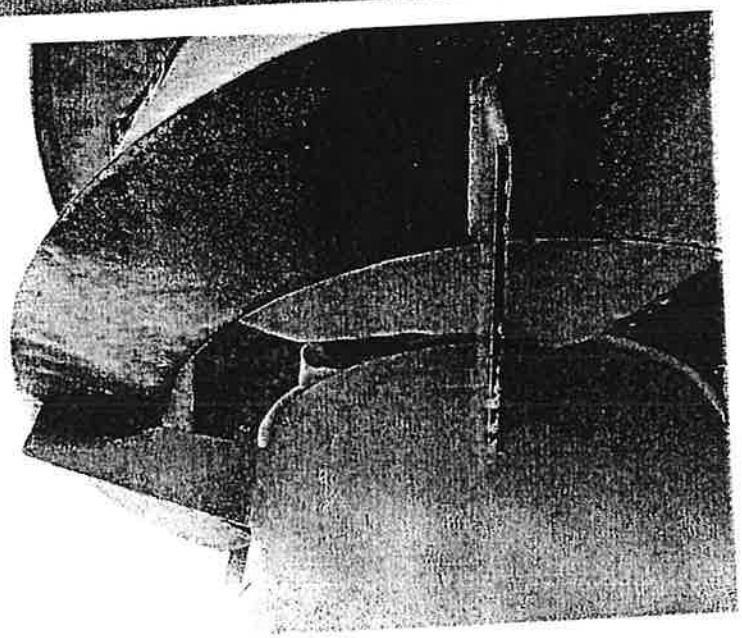


Photo # 66

Date
11/1/2017

Location
Exterior

Notes
Corrosion beneath 18" dia. PV vent.

MBA Photo Log

MBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

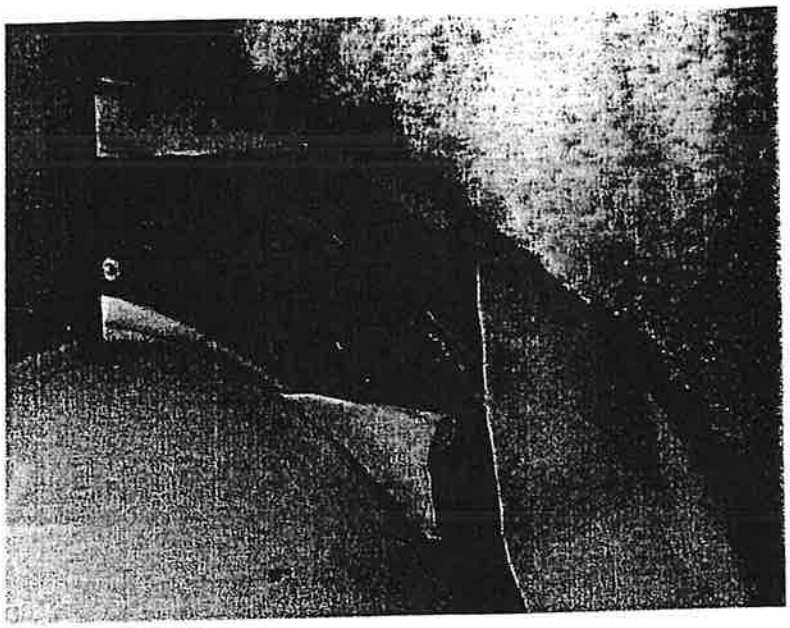


Photo # 67

Date

11/1/2017

Location

Exterior

Notes

Plastic sheeting stuffed between pressure pallet.

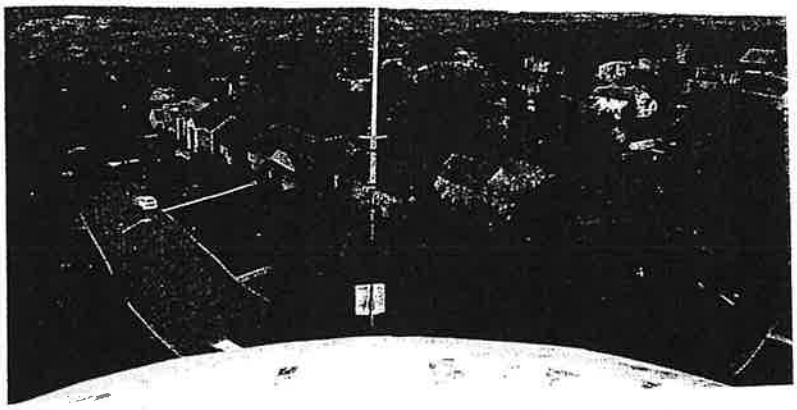


Photo # 68

Date

11/1/2017

Location

Exterior

Notes

Whip antenna mounted to 6" dia. overflow pipe.

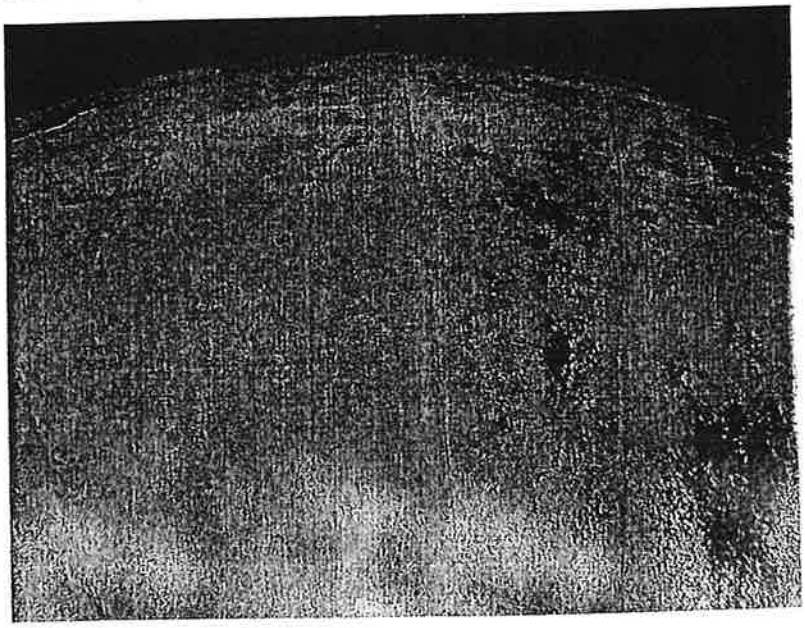


Photo # 69

Date

11/1/2017

Location

Exterior

Notes

Corrosion on roof.

MBA Photo Log

MBA Contract No. 173032R

Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

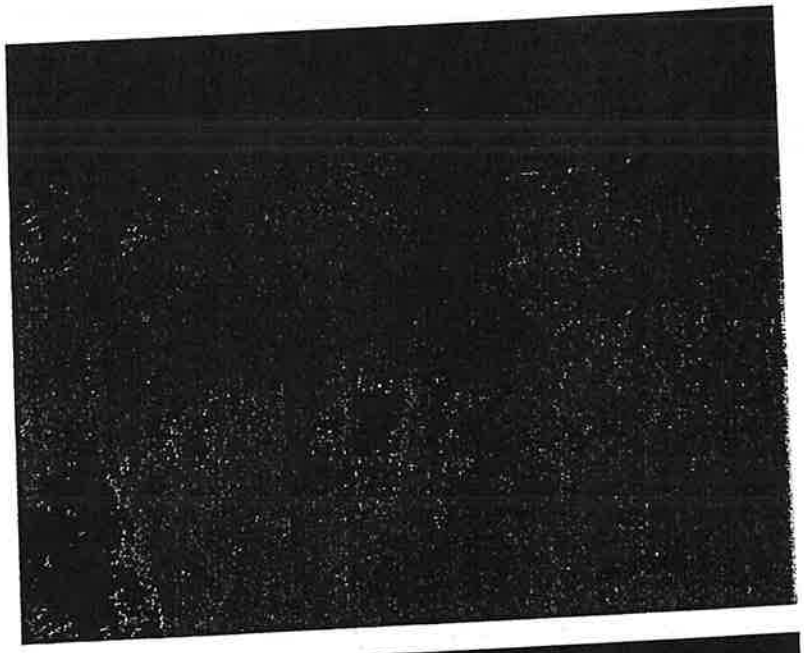


Photo #70

Date
11/1/2017

Location
Exterior

Notes
Corrosion on roof.

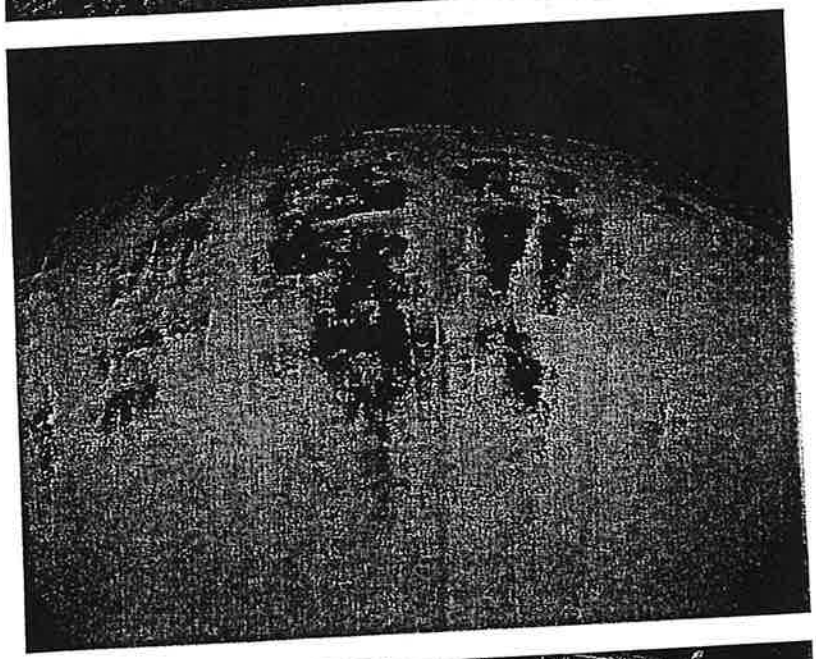


Photo #71

Date
11/1/2017

Location
Exterior

Notes
Corrosion on roof.

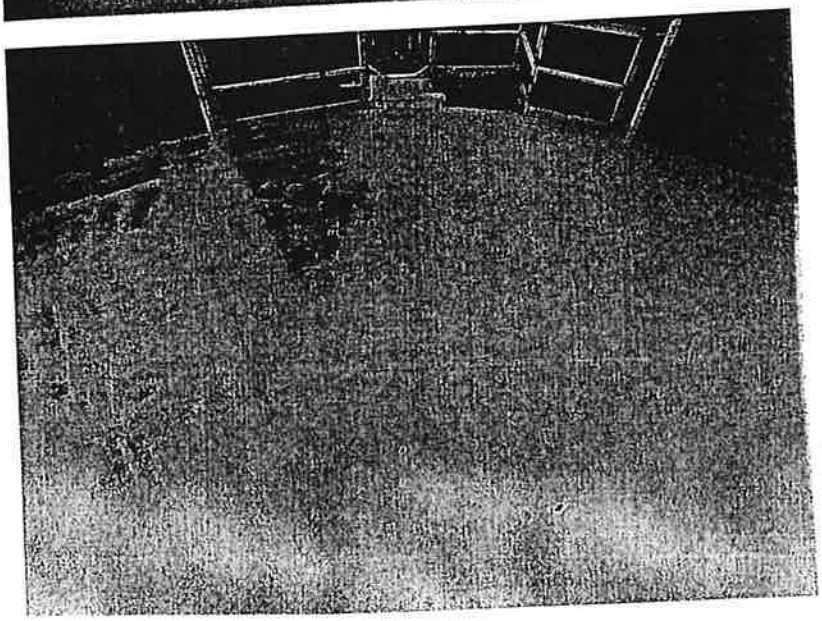


Photo #72

Date
11/1/2017

Location
Exterior

Notes
Corrosion on roof.

IBA Photo Log

IBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

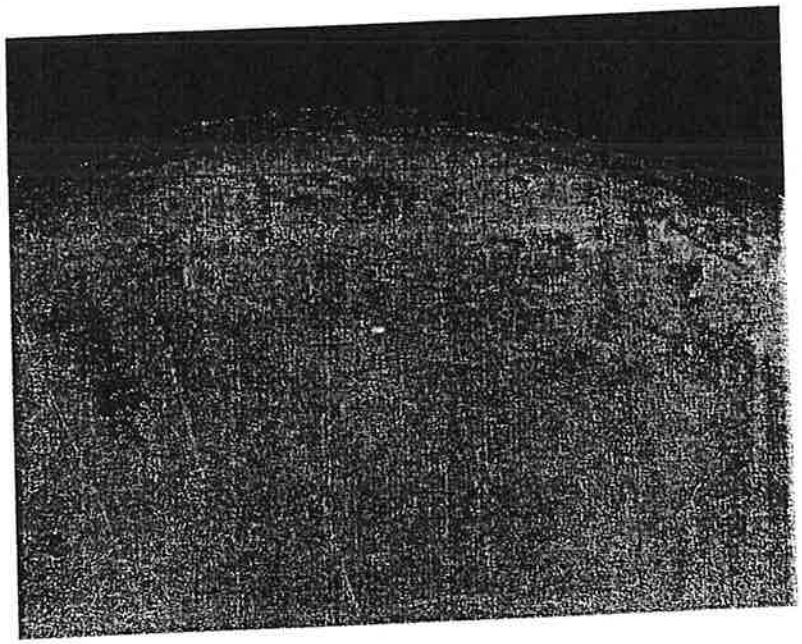


Photo # 73

Date

11/1/2017

Location

Exterior

Notes

Corrosion on roof.

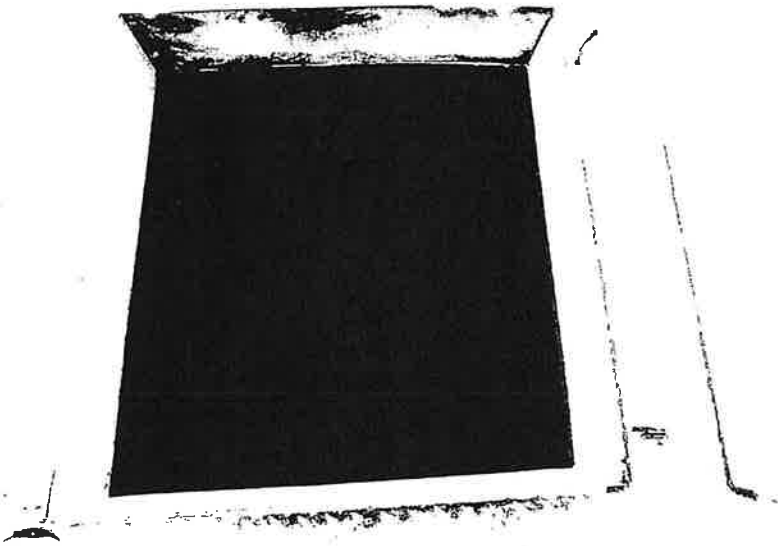


Photo # 74

Date

11/1/2017

Location

Exterior

Notes

Corrosion on 24" x 24" roof manhole rain lip.

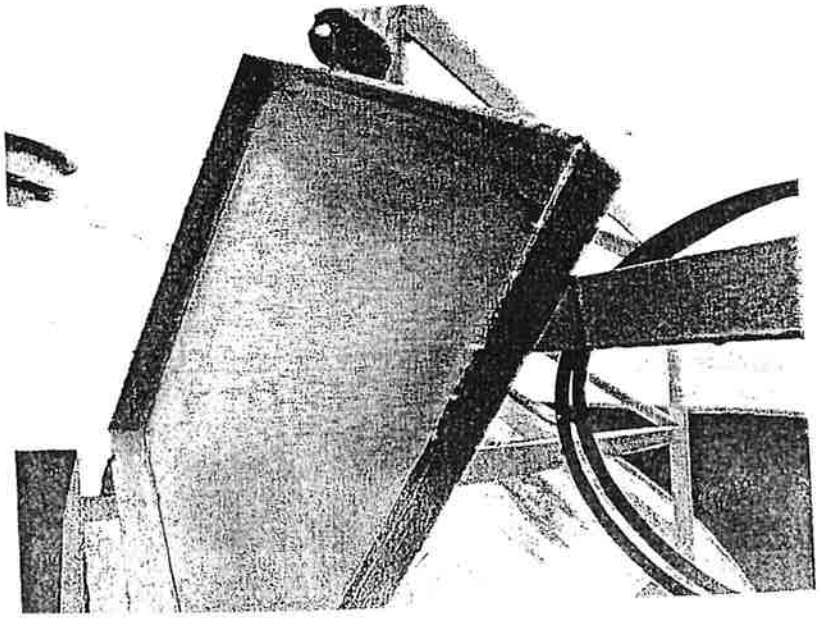


Photo # 75

Date

11/1/2017

Location

Exterior

Notes

Coating on 24" x 24" roof manhole lid.

MBA Photo Log

MBA Contract No. 173032R

Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

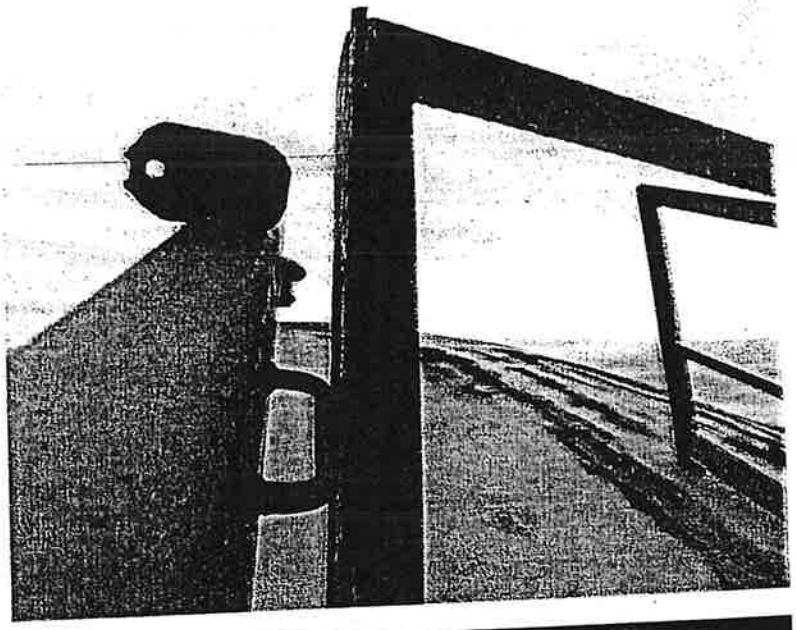


Photo # 76

Date

11/1/2017

Location

Exterior

Notes

24" x 24" roof manhole grab handle rests on roof handrail vertical post when opened.

Photo # 77

Date

11/1/2017

Location

Interior Wet

Notes

Coating on shell and corrosion on painters angle.

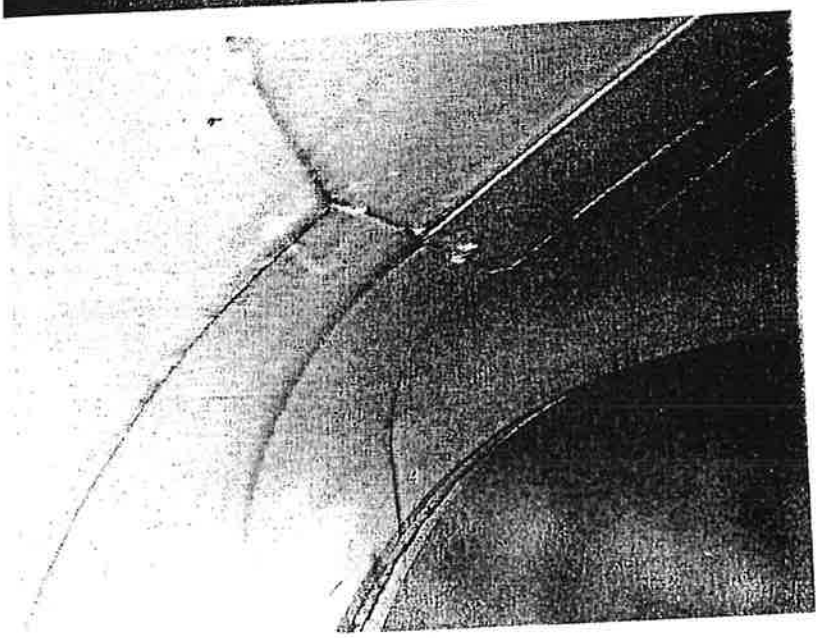


Photo # 78

Date

11/1/2017

Location

Interior Wet

Notes

Coating on shell and rust staining in lap seams.

TBA Photo Log

TBA Contract No. 173032R Jobsite: Fairway Ave. Verona, NJ **Tank:** 800,000 Gal. Standpipe

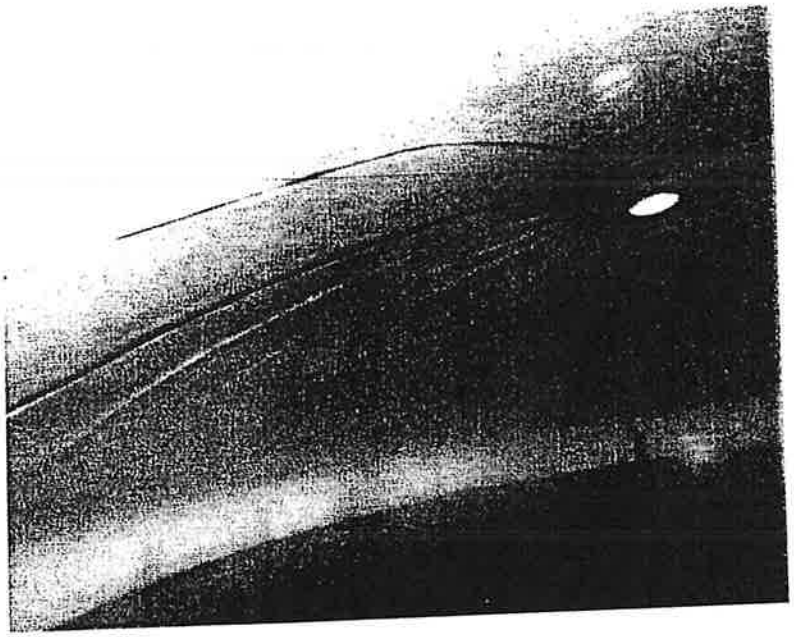


Photo # 79

Date

11/1/2017

Location

Interior Wet

Notes

Coating on roof and rust staining in lap seams.

Photo # 80

Date

11/1/2017

Location

Interior Wet

Notes

Coating on roof and knuckle.

Photo # 81

Date

11/1/2017

Location

Interior Wet

Notes

Coating on 6" dia. overflow pipe bell flange.

prepared a NJDEP permit application to allow the Township to drain the tank before the rehabilitation work began. HMM also provided engineering services during construction, including part-time on-site observation, shop drawing review, Contractor coordination and processing of Contractor pay applications.

The project was completed on schedule in December of 2009. The final construction cost of the project was $449,100. Change Order No. 1 resulted in a net additional cost of $4,000. Change Order No. 1 was executed to delete the proposed retaining wall, after excavation during construction revealed that existing natural rock formations at the site would serve the intended purpose of the retaining wall; and to extend the proposed fencing to the perimeter of the entire site at the Township's request, after evidence of illegal dumping was discovered at the site.

White Rock Road Tank No. 3

HMM prepared design documents for the rehabilitation of White Rock Road Tank No. 3, including contract drawings and specifications. HMM also provided assistance during the bid period, including response to inquiries from prospective bidders and preparation of the bid report. Bids were received for the project in August 2010 and the project was awarded to the lowest bidder, Valley Painting, for $248,850.

The scope of the White Rock Road Tank No. 3 rehabilitation project included surface preparation and painting of the tank interior, tank exterior, and valve vault piping; replacement and/or modification of the tank ladder, vents, overflow pipe, manways, handrails and other tank appurtenances to meet current codes and standards; and sitework to improve drainage and security at the site. HMM provided engineering services during construction, including part-time on-site observation, shop drawing review, Contractor coordination and processing of Contractor pay applications.

Change Order No. 1 has been executed at a net additional cost of $9,950 for additional work requested by the Township, including replacement of the tank altitude and gate valves; placement of a weed mat and stone around the tank perimeter; and installation of a second fence gate. The majority of the work under the original contract and Change Order No. 1 was completed in December 2010. The remaining items will be completed when weather conditions are appropriate. The Township must obtain NJDEP approval before placing the tank into service in the Verona system. HMM is assisting the Township with obtaining the required approvals.

Hatch Mott MacDonald

Item 7: Tank Inspection Claridge Tank 2009

To Mark Tompeck
From Carol Walczyk
Date February 22, 2011
Project # 257512
Page 1 of 2
CC
Subject Township of Verona
Water Storage Tank Rehabilitation Projects
Status Report

Hatch Mott MacDonald has been assisting the Township of Verona with rehabilitation of three of its water storage tanks. Below is a summary of the status of each project.

Water Storage Tank Inspection and Evaluation

In late 2008, HMM and its subconsultant, Mumford Bjorkman Associates, conducted internal and external inspections of the Fairview Avenue Tank, Claridge Tank and White Rock Road Tank No. 3 (formerly known as the Jail Annex Tank). At the Fairview Avenue and Claridge tanks, a remote observation vehicle (ROV) was used to perform the interior inspection to allow the tanks to remain in service. The tank coatings were also tested for lead content. A report summarizing the findings and recommendations resulting from the inspection was provided to the Township in January of 2009.

Fairview Avenue Tank

HMM prepared design documents for the rehabilitation of the Fairview Avenue Tank, including contract drawings and specifications. HMM also assisted the Township with its application for New Jersey Environmental Infrastructure Trust funding for the project, by preparing the application package and supporting documents. This project has not yet been advertised for bidding.

Claridge Tank

HMM prepared design documents for the rehabilitation of the Claridge Tank, including contract drawings and specifications. HMM also provided assistance during the bid period, including response to inquiries from prospective bidders and preparation of the bid report. Bids were received for the project in September 2009 and the project was awarded to the lowest bidder, U.S. Tank Painting, for $445,100.

The scope of the Claridge Tank rehabilitation project included surface preparation and painting of the tank interior, tank exterior, and valve vault piping; replacement and/or modification of the tank ladder, vents, overflow pipe, manways, handrails and other tank appurtenances to meet current codes and standards; and sitework to improve drainage and security at the site. HMM

prepared a NJDEP permit application to allow the Township to drain the tank before the rehabilitation work began. HMM also provided engineering services during construction, including part-time on-site observation, shop drawing review, Contractor coordination and processing of Contractor pay applications.

The project was completed on schedule in December of 2009. The final construction cost of the project was $449,100. Change Order No. 1 resulted in a net additional cost of $4,000. Change Order No. 1 was executed to delete the proposed retaining wall, after excavation during construction revealed that existing natural rock formations at the site would serve the intended purpose of the retaining wall; and to extend the proposed fencing to the perimeter of the entire site at the Township's request, after evidence of illegal dumping was discovered at the site.

White Rock Road Tank No. 3

HMM prepared design documents for the rehabilitation of White Rock Road Tank No. 3, including contract drawings and specifications. HMM also provided assistance during the bid period, including response to inquiries from prospective bidders and preparation of the bid report. Bids were received for the project in August 2010 and the project was awarded to the lowest bidder, Valley Painting, for $248,850.

The scope of the White Rock Road Tank No. 3 rehabilitation project included surface preparation and painting of the tank interior, tank exterior, and valve vault piping; replacement and/or modification of the tank ladder, vents, overflow pipe, manways, handrails and other tank appurtenances to meet current codes and standards; and sitework to improve drainage and security at the site. HMM provided engineering services during construction, including part-time on-site observation, shop drawing review, Contractor coordination and processing of Contractor pay applications.

Change Order No. 1 has been executed at a net additional cost of $9,950 for additional work requested by the Township, including replacement of the tank altitude and gate valves; placement of a weed mat and stone around the tank perimeter; and installation of a second fence gate. The majority of the work under the original contract and Change Order No. 1 was completed in December 2010. The remaining items will be completed when weather conditions are appropriate. The Township must obtain NJDEP approval before placing the tank into service in the Verona system. HMM is assisting the Township with obtaining the required approvals.

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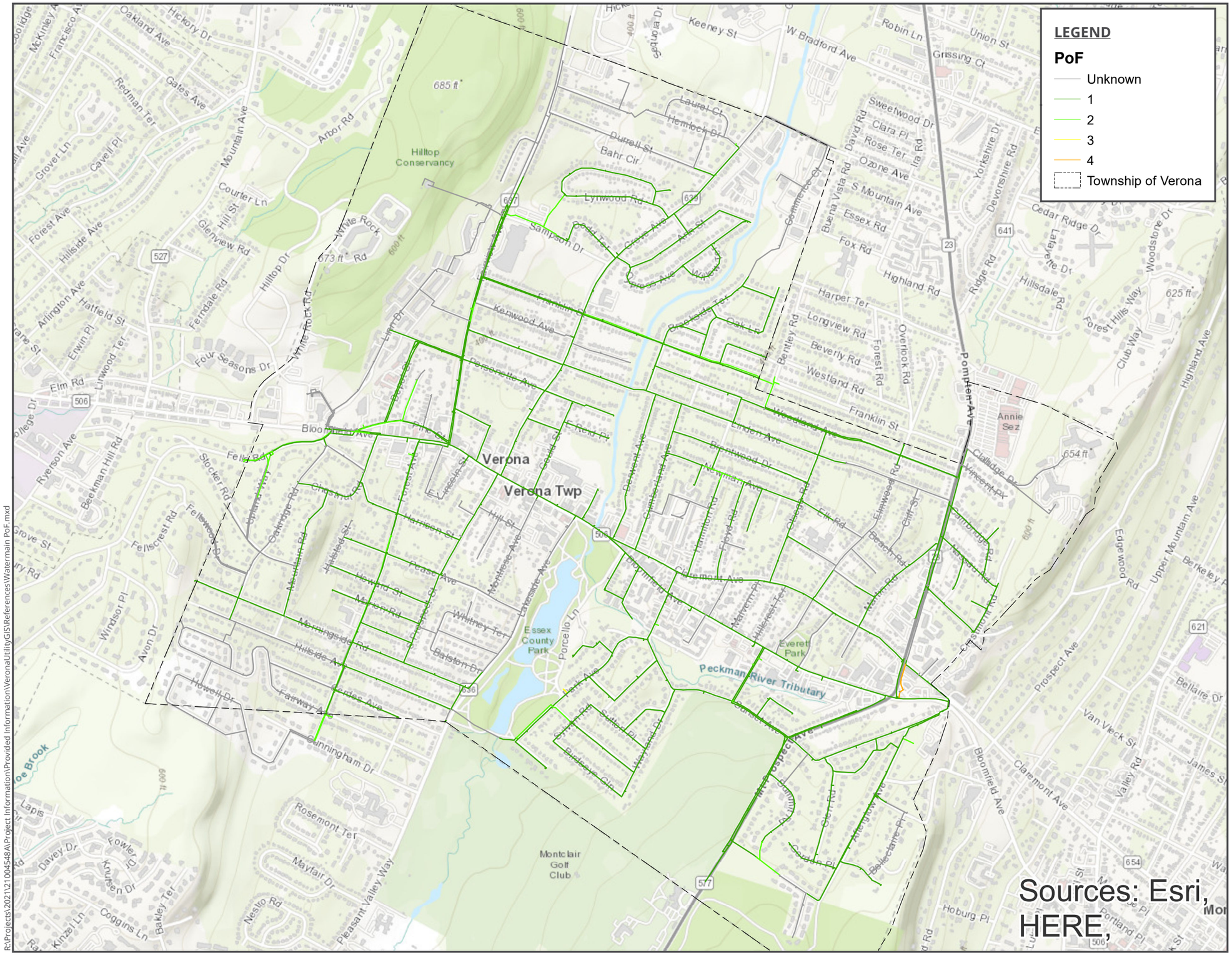
Appendix

Appendix L | PoF, CoF, and Risk Assessment Maps of Watermains

WATERMAIN PROBABILITY OF FAILURE

TOWNSHIP OF VERONA

Essex County
New Jersey



N

0 300 600 900 1,200 Feet

1 inch = 1,200 feet

MARCH 2022

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

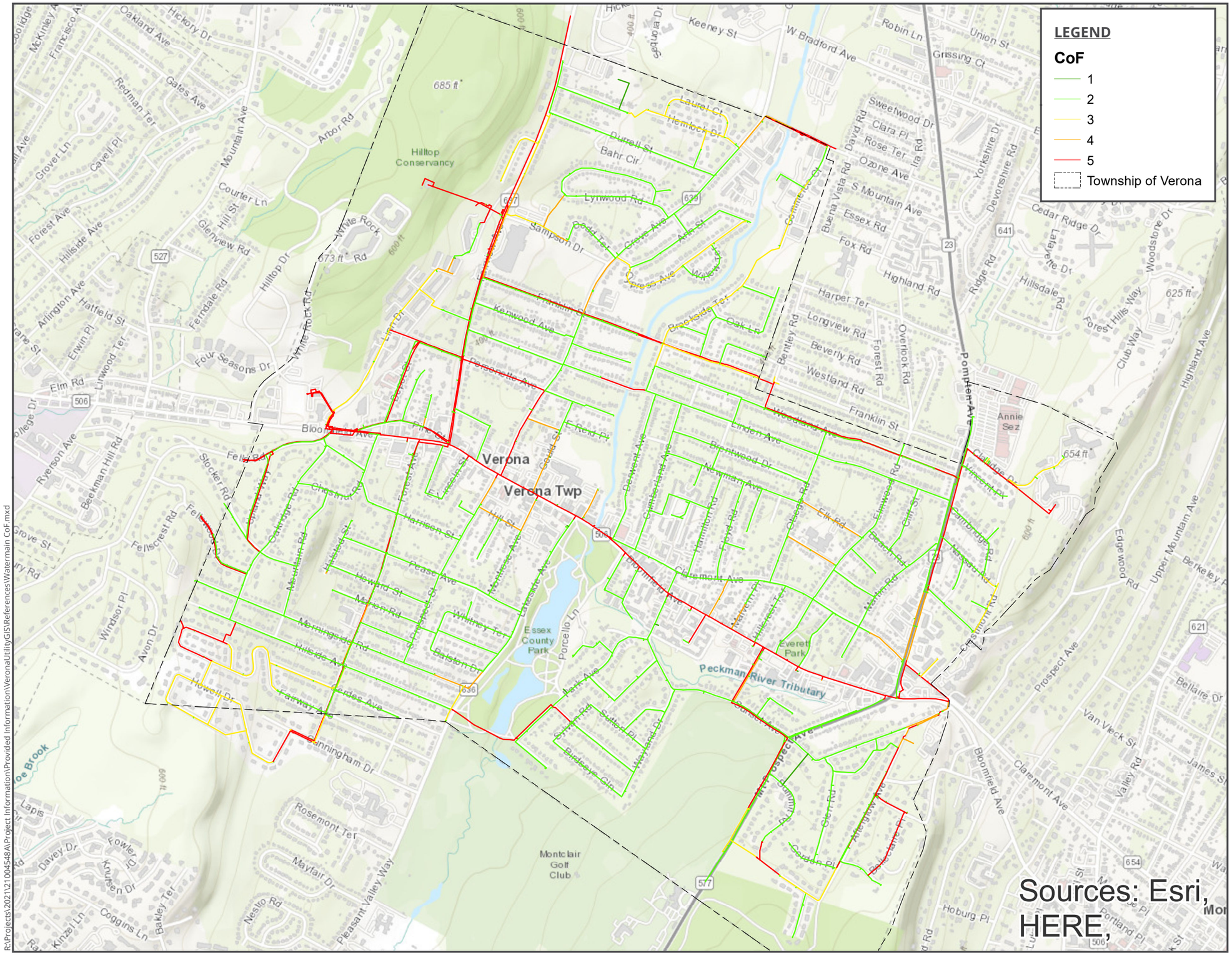
Colliers Engineering & Design

R:\Projects\2021\21004548A\Project Information\Provided Information\VeronaUtilityGIS\References\Watermain PoF.mxd

WATERMAIN CONSEQUENCE OF FAILURE

TOWNSHIP OF VERONA

Essex County
New Jersey



N

0 300 600 900 1,200 Feet

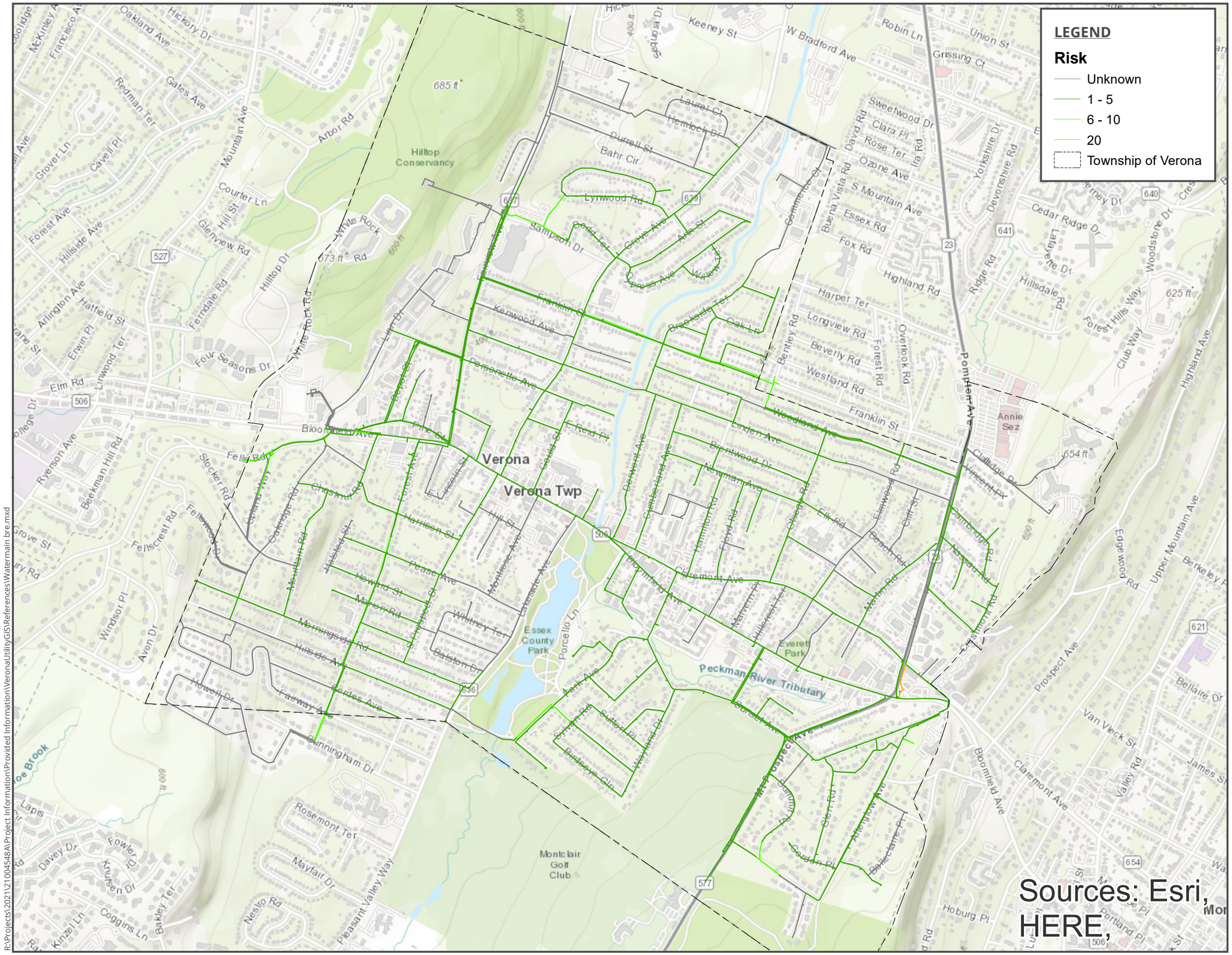
1 inch = 1,200 feet

MARCH 2022

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Colliers Engineering & Design

R:\Projects\2021\21004548A\Project Information\Provided Information\VeronaUtilityGIS\References\Watermain CoF.mxd



WATERMAIN RISK ASSESSMENT

TOWNSHIP OF VERONA

Essex County
New Jersey

N

0 300 600 900 1,200
Feet

1 inch = 1,200 feet

MARCH 2022

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

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R:\Projects\2021\21004548A\Project Information\Provided Information\VeronaUtilityGIS\References\Watermain bre.mxd

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Appendix

Appendix M | Watermain Priority Map

WATERMAIN PRIORITY MAP

TOWNSHIP OF VERONA

Essex County
New Jersey

LEGEND

- Watermain
- Proposed to be Replaced
- Unknown Risk Rating - to be Investigated
- Asbestos Concrete
- Township of Verona

Pompton Ave.
12" DIP - 455 ft

N

0 300 600 900 1,200 Feet

1 inch = 1,200 feet

MARCH 2022

This map was developed using NJDEP and County GIS digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Colliers Engineering & Design

Sources: Esri, HERE,

R:\Projects\2021\21004548A\Project Information\Provided Information\VeronaUtilityGIS\References\Watermain bre.mxd

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Appendix

Appendix N | Recommended Capital Plan

Asset Management Plan
Recommended Capital Plan
Verona Water Department
Township of Verona, Essex County, New Jersey

Colliers Engineering & Design

Capital Project Type	Project Title	Capital Plan 2021/2022	Capital Plan 2022/2023	Capital Plan 2023/2024	Capital Plan 2024/2025	Capital Plan 2025/2026	Capital Plan 2026/2027	Total 6 Year 2021/2027
Water								
Water	PFAS	$ 1,000,000	$ 1,000,000	$ -	$ -	$ -	$ -	$ 2,000,000
Water	WQAA - Implementation - Report	$ 40,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 2,000	$ 50,000
Water	WQAA - Implementation - Hydrant Flushing	$ -	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 50,000
Water	WQAA - Implementation - Valve Inspection	$ -	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 50,000
Water	Tank Inspections	$ -	$ -	$ 20,000.00	$ -	$ -	$ -	$ 20,000
Water	High Priority Main Replacement	$ -	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 2,000,000
Water	GIS System	$ -	$ 20,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 24,000
Water	Replace Lead Services	$ -	$ 340,000	$ 340,000	$ 340,000	$ 340,000	$ 340,000	$ 1,700,000
Water	Long Term Water Supply Plan	$ -	$ -	$ -	$ 40,000	$ -	$ -	$ 40,000

Asset Management Plan
Recommended Capital Plan
Verona Water Department
Township of Verona, Essex County, New Jersey

Colliers Engineering & Design

Capital Project Type	Project Title	Capital Plan 2021/2022	Capital Plan 2022/2023	Capital Plan 2023/2024	Capital Plan 2024/2025	Capital Plan 2025/2026	Capital Plan 2026/2027	Total 6 Year 2021/2027
Water								
Water	Downwell Pump Maintenance/ Replacement	$ -	$ -	$ 20,000	$ -	$ 20,000	$ -	$ 40,000
Water	Controls Improvements	$ -	$ 35,000	$ 35,000	$ 35,000	$ 35,000	$ 35,000	$ 175,000
Water	Fairview Blower Improvements	$ -	$ -	$ -	$ 40,000	$ -	$ -	$ 40,000
Water	Valve Repair/ Repalcement at Above Grade Faciliteies	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 150,000
Water	Buried Valve Replacement	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 300,000
Water	Chemical System Maintenance/ Repair	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 120,000
Water	Booster Pump Maintenance	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	$ 90,000
Water	Safety Equipment	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 3,000	$ 18,000
	Total Water Capital	**$ 1,153,000**	**$ 1,930,000**	**$ 951,000**	**$ 991,000**	**$ 931,000**	**$ 911,000**	**$ 6,867,000**

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Infrastructure • Geotechnical/Environmental • Telecommunications • Utilities/Energy