

Metropolitan Sewerage District of Buncombe County

Asheville, North Carolina



**Presentation to:
Madison County Economic
Development Board**



April 23, 2020



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1. MSD Organization



MSD HISTORY

- MSD was formed in 1962 by State Statute as a special District with the sole purpose to collect and treat wastewater and to eliminate the direct discharges to the surrounding rivers and streams.
 - Between 1962 and 1989 MSD built over 100 miles of large interceptor lines and a 25 MGD treatment plant.
 - In 1968 the Treatment Plant was completed and we began treating the wastewater from the various local governments in the region. The Treatment Plant was later upgraded to a 40 MGD Plant in the mid 1990's.
 - In 1990 all the local governments and special districts gave all of their collection lines to MSD for ownership and maintenance in agreements we call "Sewer Consolidation."
 - MSD assumed over 720 miles of these small local collection lines which were in poor condition, many of which were installed in the 1920's.
-



Consolidation of Fifteen Separate Sewer Systems in 1990

Five Municipalities

- City of Asheville
- Town of Biltmore Forest
- Town of Black Mountain
- Town of Montreat
- Town Of Weaverville



Over 170,000 people

Ten Special Districts

- Beaverdam Water and Sewer District
- Busbee Sanitary Sewer District
- Caney Valley Sanitary Sewer District
- Crescent Hill Sanitary Sewer District
- Enka-Candler Water and Sewer District
- Fairview Sanitary Sewer District
- Venable Sanitary District
- Skyland Sanitary Sewer District
- Swannanoa Water and Sewer District
- Woodfin Sanitary Water and Sewer District



MSD Board of Directors

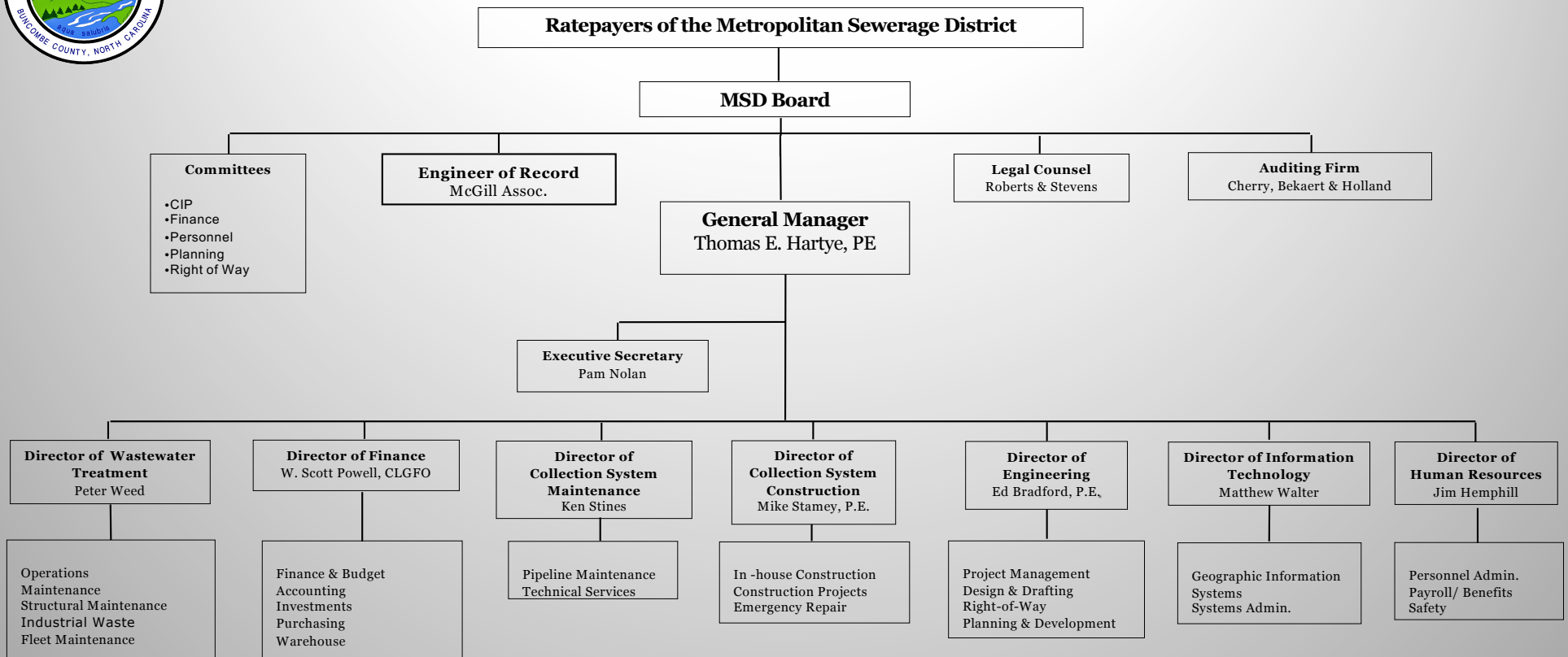
- Governed by a twelve-member Board appointed by the following entities:

| | |
|-----------------------|---|
| City of Asheville (3) | Montreat |
| Buncombe County (3) | Weaverville |
| Biltmore Forest | Woodfin Sanitary Water and Sewer District |
| Black Mountain | Town of Woodfin |
 - Board solely responsible for setting rates and fees for service.
 - Chairman, Vice-chairman and Secretary-Treasurer are elected annually by the Board.
 - Members serve staggered three-year terms and may be re-appointed.
 - Active subcommittees:

| | |
|-----------------------------|-----------|
| Capital Improvement Program | Personnel |
| Planning | Finance |
| Right of Way | |
 - The Board employs a General Manager, P.E., who is responsible for managing all District operations.
-



Management Structure



Employees FY 2001 -- 167
Employees FY 2020 -- 150



2. System Overview



Collection System Overview

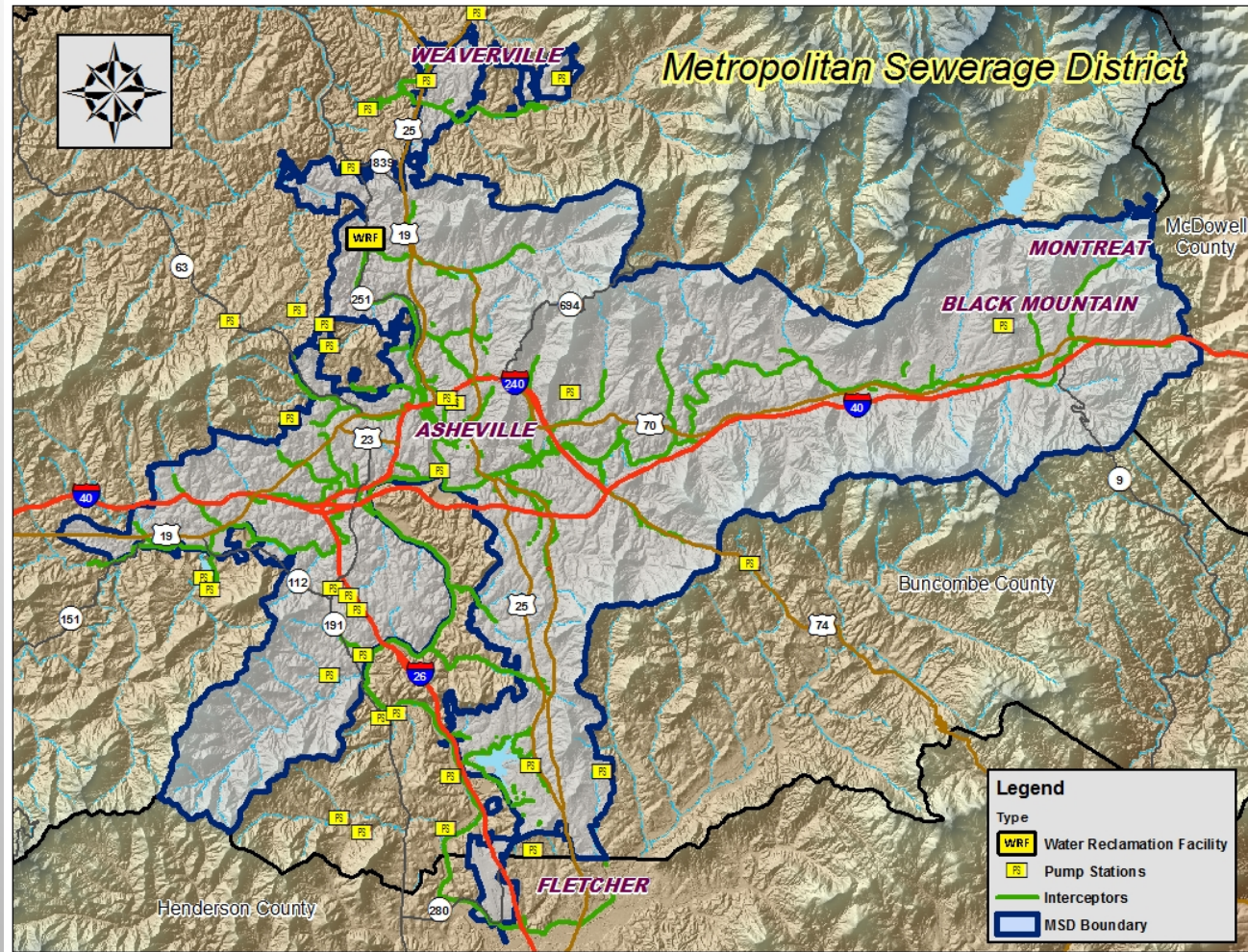
- The MSD service area includes Asheville, Biltmore Forest, Black Mountain, Montreat, Woodfin, Weaverville, the unincorporated parts of Buncombe County. The northern portion of Henderson County (CCWSD) will consolidate with MSD this July 1st.
 - The MSD service area is over 180 square miles.
 - Over 55,000 Customer Accounts.
 - Since taking over the member agency collection systems in 1990, MSD has reinvested over \$395 Million in replacing more than 1,118,000 feet of sewer mains (over 25% of Original System).
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How much system does MSD maintain?



MSD maintains over 1,015 miles of sewer line - well past these locations.





3. MSD Operations



Collection System

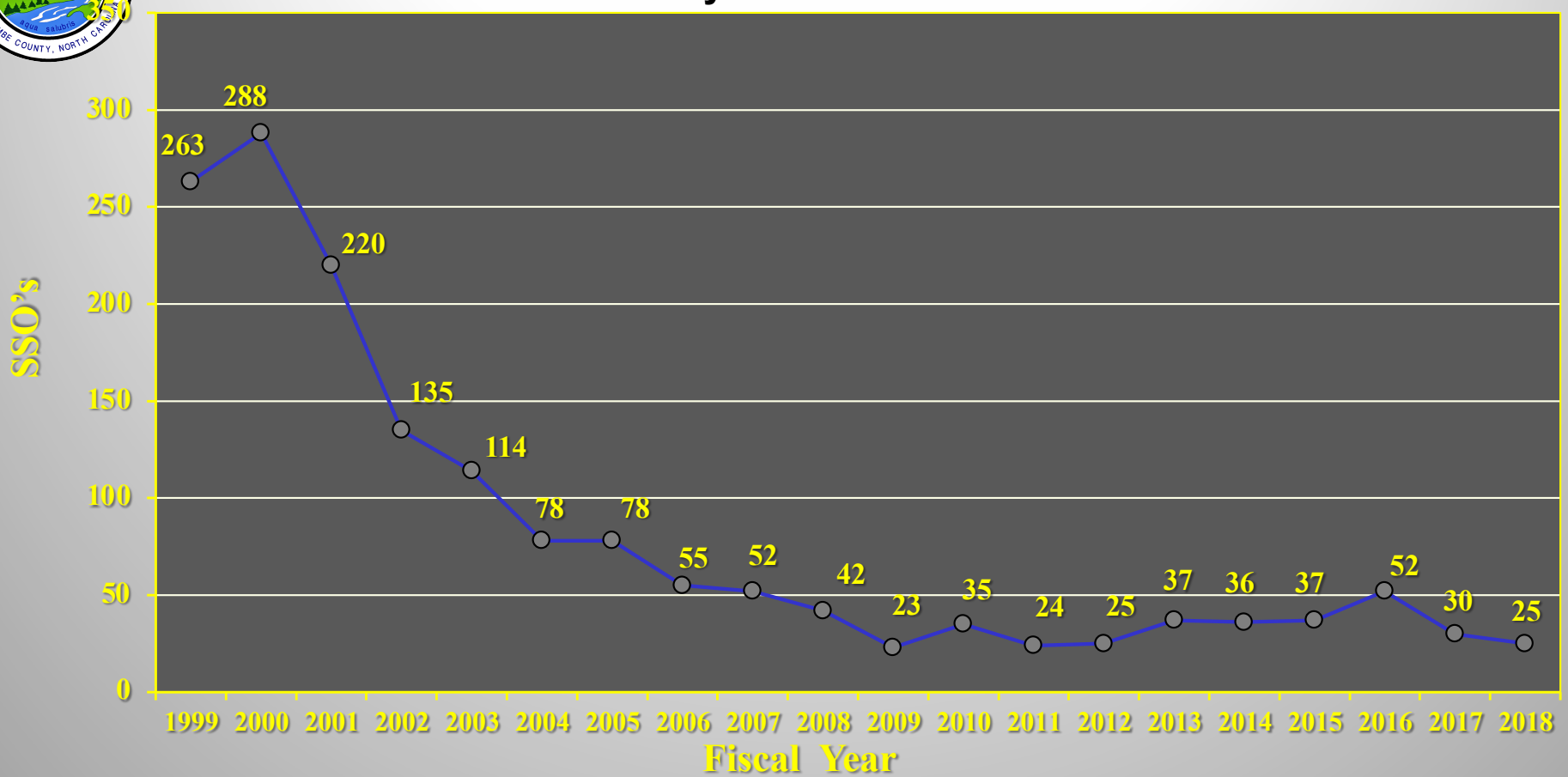


- Over 1,120 miles of sewer mains
- 40 pump stations
- Over 33,000 manholes
- 264 square mile service area (Includes CCWSD in Northern Henderson County)
- Preventative maintenance cleaning and CCTV 15% - 20% of system per year
- More than 1,118,000 feet of sewer line replaced since 1990. Additional 250,000 feet in the next five years.



Significant Progress over Past Nineteen Years

Sanitary Sewer Overflows





Customer Service Response

The MSD service area is over 180 square miles.

- MSD created a First Response Team to cut down in response time to customer calls and system emergencies.
- MSD tracks both response times and the time spent on each job.
- In FY 2016 the average response time of 31 minutes to customer service requests during regular working hours.
- During this same time period the average response time was 38 minutes to customer service requests after hours with the Night First Responder and Night Crew.



MSD Treatment Plant



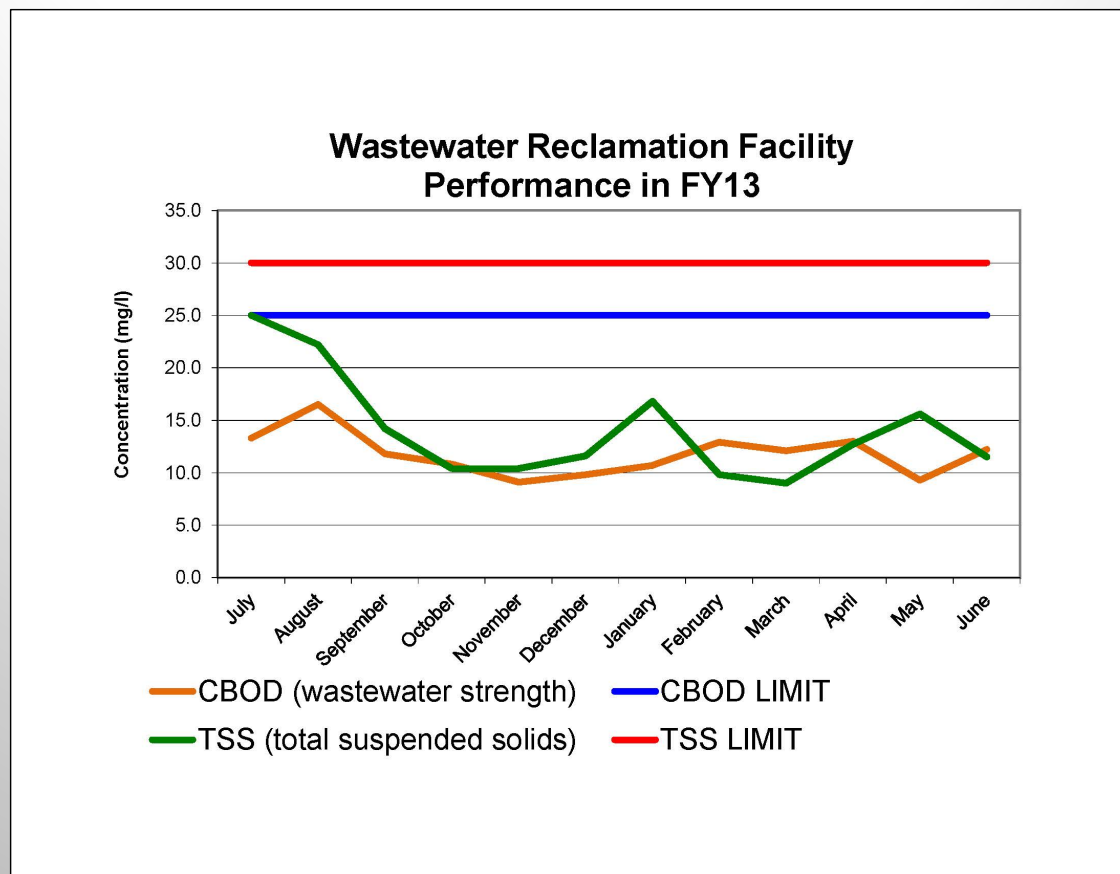


Treatment Plant

- 1987 Plant expansion to 40 MGD completed (65 MGD Peak)
 - Current Average Daily Flow 19 MGD
 - 152 Rotating Biological Contactors (RBC)—largest in world
 - 2880 KW Hydroelectric Generation Facility
 - 4 MW Diesel Generator Back-up
 - New \$10 million Aqua Disk Polishing Filters
 - \$ 7.4 Million Upgrade to incinerator and air emissions system
-



Regulatory Compliance at the Treatment Plant



FY 2014 TSS average = 9.8 mg/l and FY 2015 TSS average = 8.7 mg/l



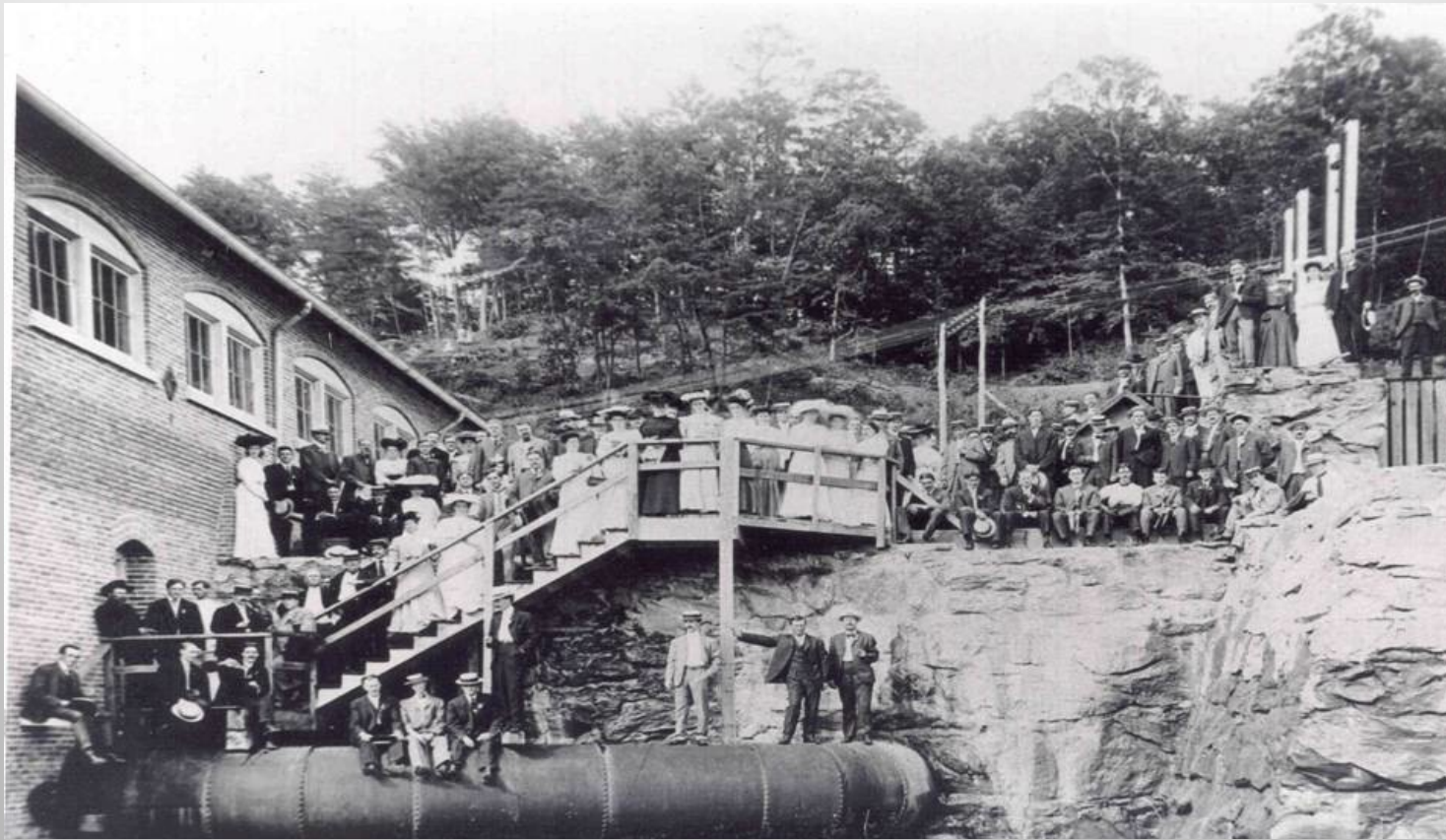
Treatment Plant Receives NACWA Platinum 7 Award

- **Platinum Peak Performance**
 - Seven consecutive years for excellence in wastewater treatment

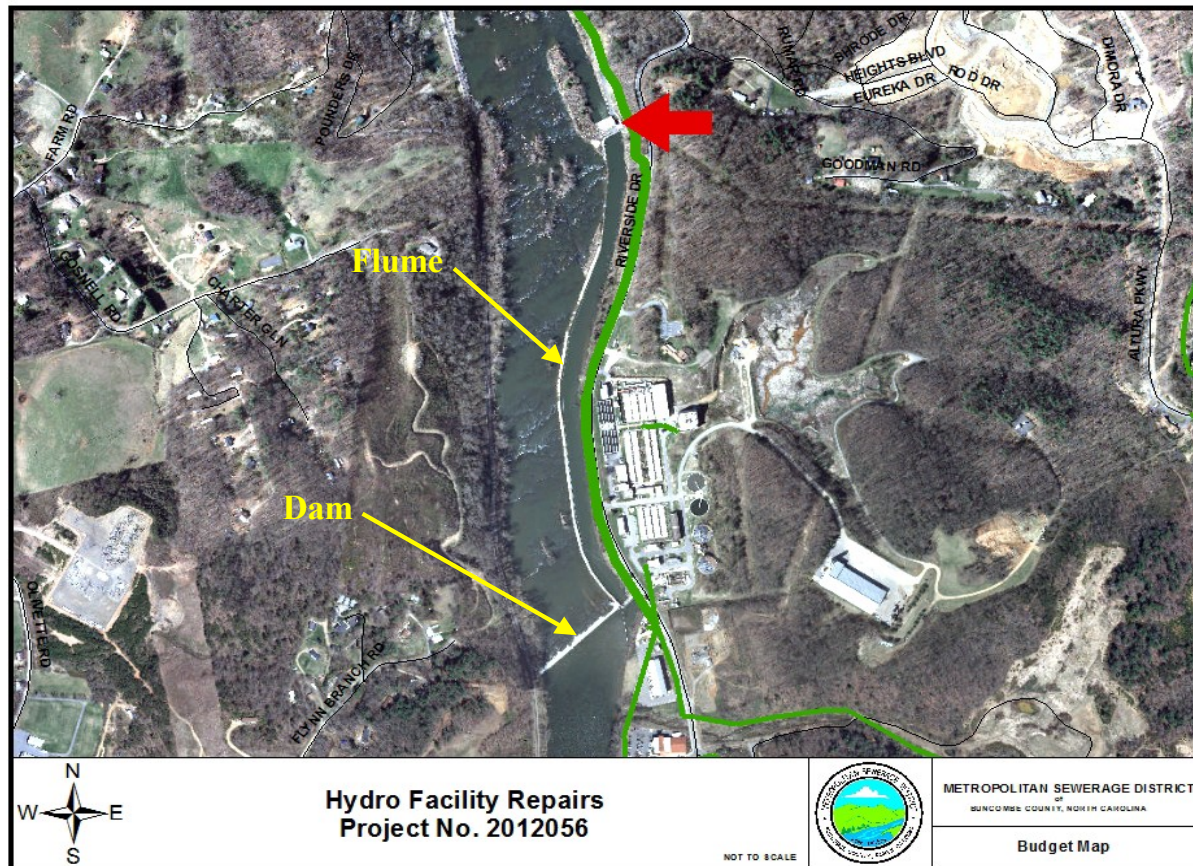




Hydroelectric Generation Facility



1986 Reconstructed Craggy Dam Hydro Plant (Originally Built 1903)



Hydro Facility Repairs
Project No. 2012056

NOT TO SCALE



METROPOLITAN SEWERAGE DISTRICT
BUNCOMBE COUNTY, NORTH CAROLINA
Budget Map



Current Hydroelectric Production



- Can Generate 2880 KW
- FY 2015 Avoided Power Cost \$435,000



One of three turbine blades - variable pitch.



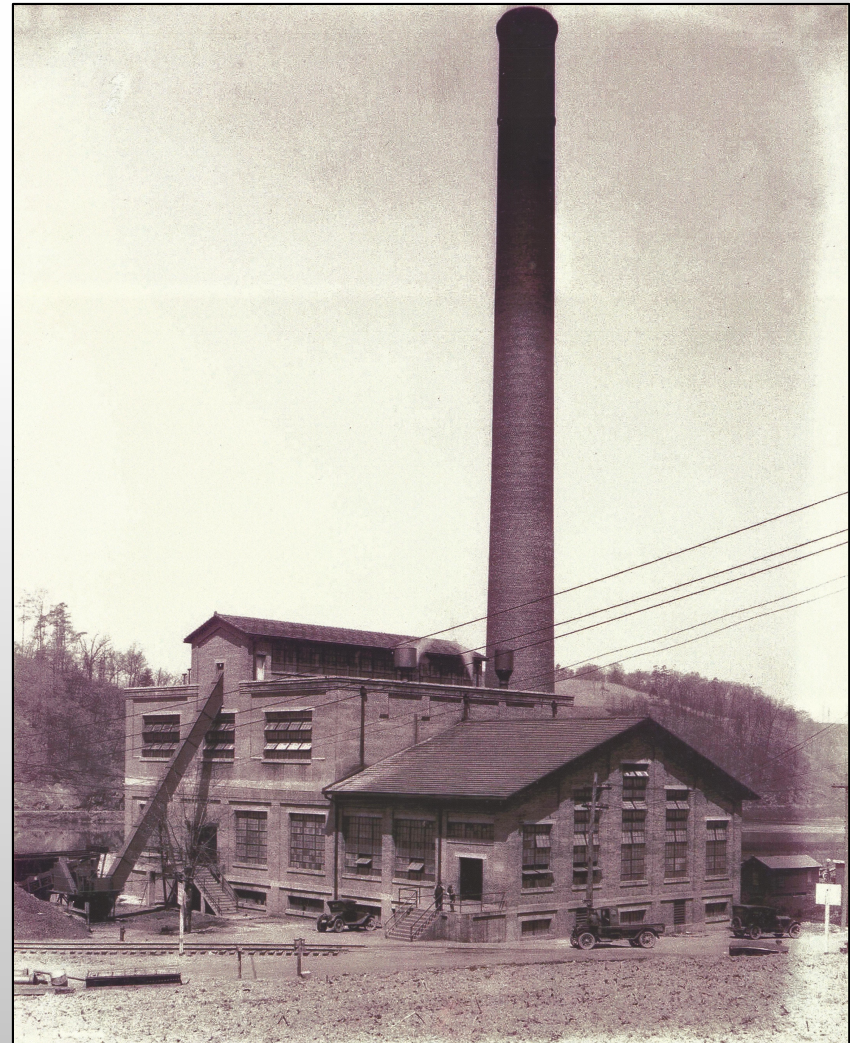
*The current
MSD Admin
Building once
housed the
power
generation
facility for the
trolley system
in Asheville.*

Downtown Asheville *ca* 1923





MSD Administration Bldg. ca 1923
Power Generation Facility





Interior of Facility – Showing Coal-fired Steam Generators





MSD Administration Building - Today





4. Capital Improvement Program



Capital Improvement Program Background

- A Capital Improvement Program Committee comprised of representatives of all of our member agencies makes annual recommendations to the Board regarding program priorities.
 - The District has replaced or rehabbed nearly 25% of the entire system and has implemented a long-term asset management plan to rehab or replace a little over 1% of the system per year which translates to a little over 50,000 feet each year.
 - Since Consolidation in 1990 the District has reinvested over \$397 Million on Capital Improvements for the system. This includes \$350 million for replacing and rehabbing sewer lines and \$47million on rehabilitation of the Treatment Plant and general infrastructure.
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Future Growth Potential System Capacity

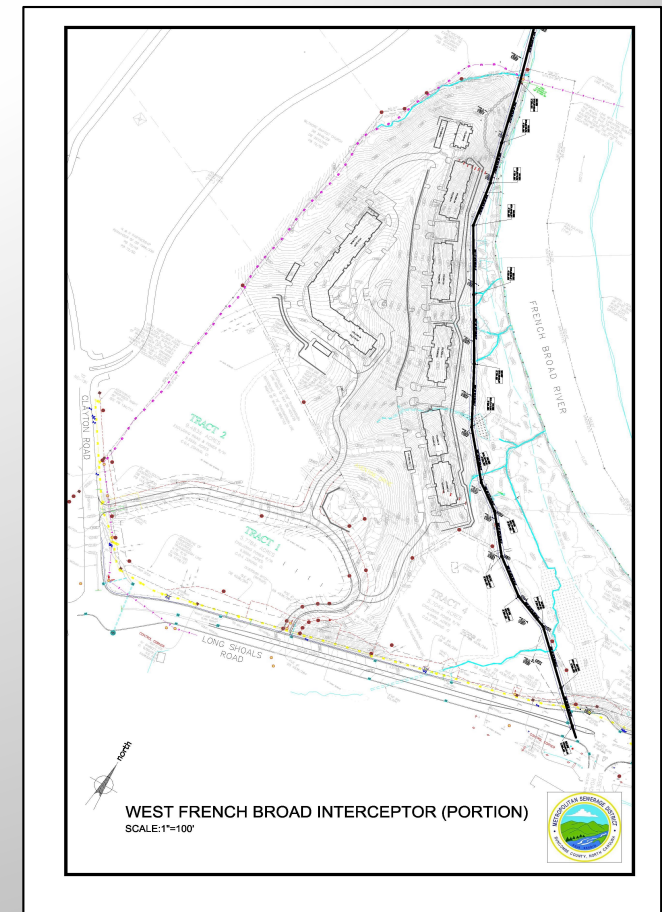
- Currently using about 20 MGD of 40 MGD capacity at the Treatment Plant.
- MSD's aggressive program of rehabilitation and replacement of existing lines include upgrades of lines sizes to provide for future growth.
- The MSD Collection System Master Plan has mapped out all the lines necessary to serve areas that are identified by our Member Agencies for future growth.





Economic Development Partner

- MSD provides incentives for the orderly growth of the sewer system into new areas as identified by Member Agencies and the Collection System Master Plan.
- MSD provides design services, ROW services, and financial contributions toward construction of new Master Plan lines.
- MSD also shares revenue with developers to help fund extensions.
- Economic development fee waiver
- Developer to developer reimbursements.





Master Planning Efforts Form Capital Improvement Program

- **2001 Master Plan** – Camp, Dresser & McKee (CDM): Collection, Treatment, and Operations.
 - ✓ Management, Operations and Maintenance
 - ✓ Sewer Rehabilitation Program
 - ✓ Capacity Improvements for wet and dry flows
 - **2008 Collection System Master Plan** – McGill & Assoc.:
 - ✓ Incorporated new Buncombe County Land Use Plan and Zoning Ordinance
 - ✓ Incorporated all member agency planning/zoning efforts
 - ✓ Plan for orderly growth of sewer system
 - ✓ Replacement of existing sewers sized for future growth
 - **2015 Facilities Plan** – CDM: Detailed look at the Treatment Plant
 - ✓ Grit and Grease replacement/upgrade
 - ✓ Upgrade bar screens and add Fine Screening process.
 - ✓ High rate ballasted flocculation primary treatment system
-



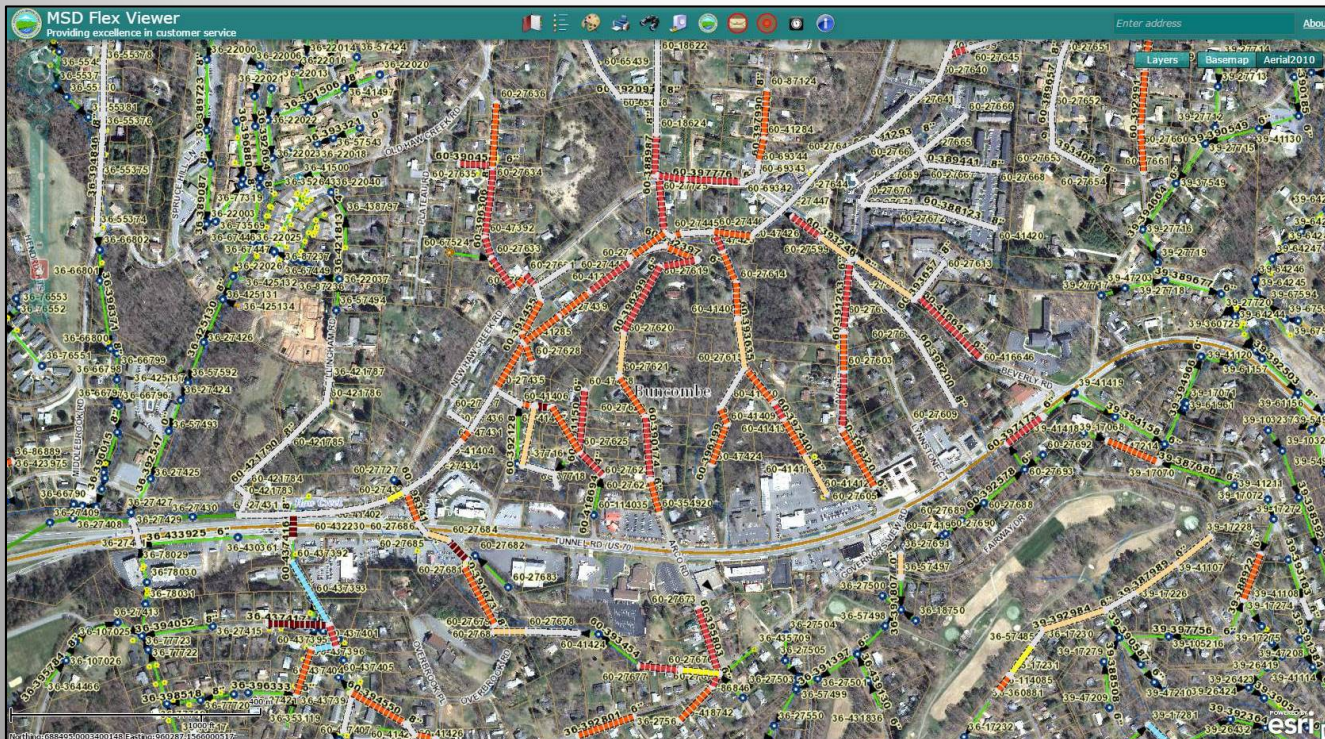
CAPITAL IMPROVEMENT PROGRAM **FY20 through FY29 (10 years)**

| | |
|---------------------------------|---------------------------------|
| Interceptors/Wet Weather Rehab. | \$ 86.8 Million (26%) |
| Collection Rehabilitation | \$ 126.3 Million (38%) |
| Treatment Plant / P.S. | \$ 117.7 Million (35%) |
| Reimbursements | <u>\$ 1.6 Million (< 1%)</u> |
| Total | \$ 332.4 Million |

Since Consolidation in 1990 the District has reinvested over \$397.4 million for Capital Improvements.



Pipe Rating Program



- Proactive program to focus rehabilitation dollars where most needed
- Featured in February 2004 issue of “Water Environment & Technology” magazine
- Developed by interdepartmental team using off-the-shelf software



Line cleaning and CCTV & Defect Coding





GIS Capabilities



Beaver Lake
Man Hole Inspection



Variety of Information
LINKED TO MAPPING

Video



CCTV, Defects, SSO's, Work Orders

Microsoft Access

File Edit View Insert Format Records Tools Window Help

pipe score 4in 97 format : Database

Tables Queries Forms Reports Macros Modules

select form view of pipe scoring

Open Design New

select form view of pipe scoring

| PipeID | Mean Pipeline score | Mean Defect score | Peak Defect |
|--------|---------------------|-------------------|-------------|
| 24820 | 9.2647 | 45 | 45 |

Length 34 Slope 0.076616 UPMHNO 26507 DSMHNO 26506

Pipe Video hyperlink
\\Video_server\Video\Basin47\26507 to 26506.mpg


Drain_B Royal Pines

Basin #: 47

Record: 1 of 798

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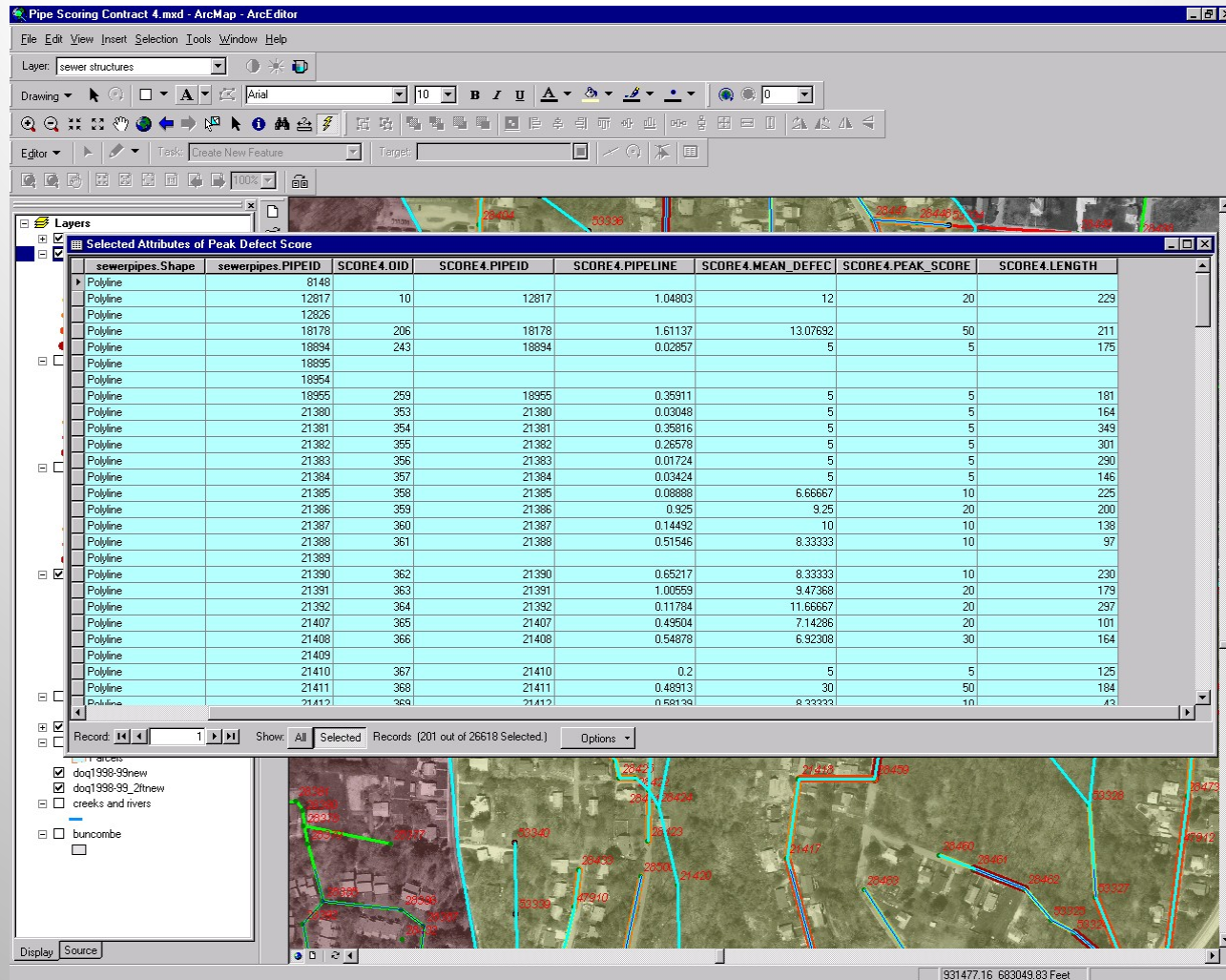
NUM



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Integrated Data





Pipe Rating Program



Proactive program to focus rehabilitation dollars where most needed



AMSA Award for Pipe Rating Project

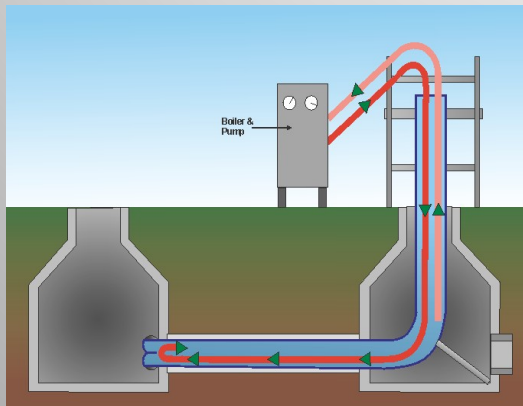
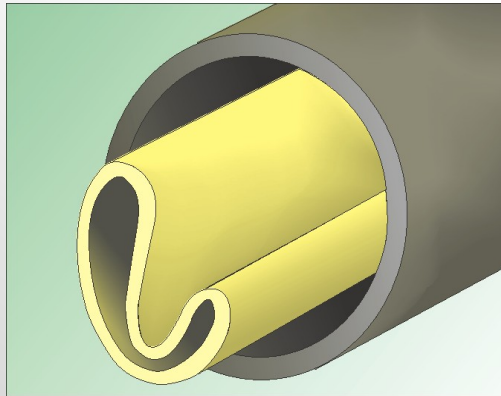


- In May of 2003, MSD received an AMSA National Environmental Achievement Award for the Pipe Rating Program
- Developed in-house with a vertical team using off-the-shelf software
- MSD and Los Angeles only two US utilities to receive this award





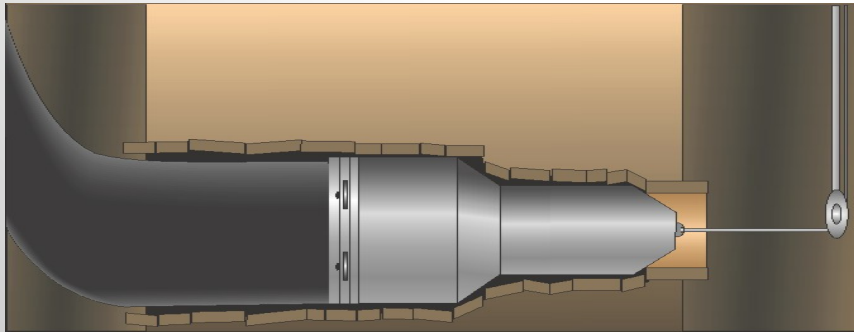
Trenchless Technologies Pipe Lining





Trenchless Technologies

Pipe Bursting





Recently Completed Plant Projects

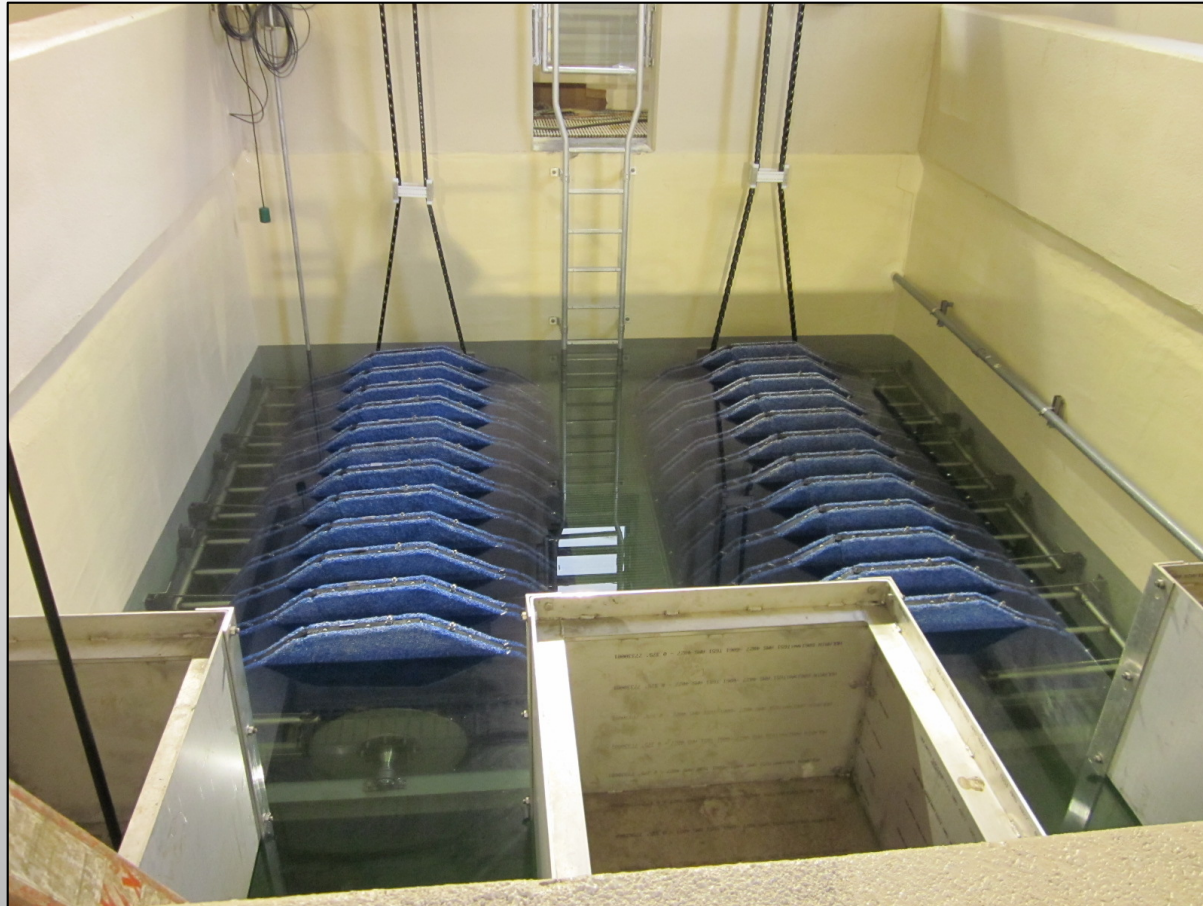


New \$10 Million Aqua Disk Filters





Initial Testing of New Filters





Filter Installation Project

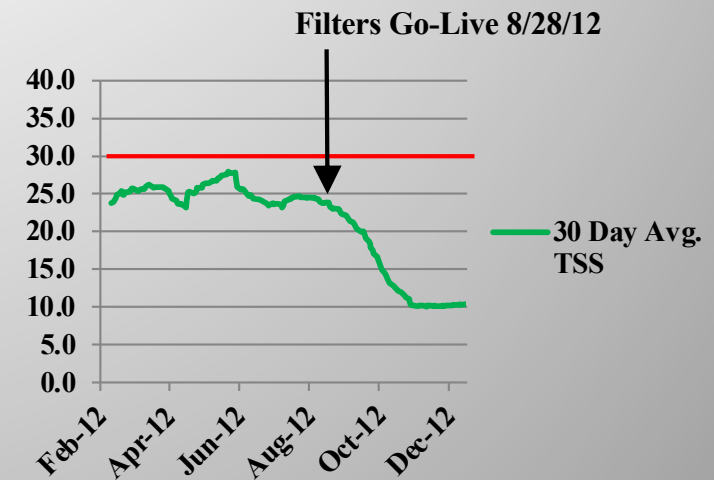
Old System

- *18 existing "Microscreens" – all problematic.*
- *Performance failure – very little suspended solids removal*

New System

- *Board awarded construction contract in October 2010.*
- *\$9.2M construction cost, over three fiscal years.*
- *Facility startup August 2012.*

Excellent Results





Incinerator System Emissions Upgrades





Incinerator Emissions Upgrade Project

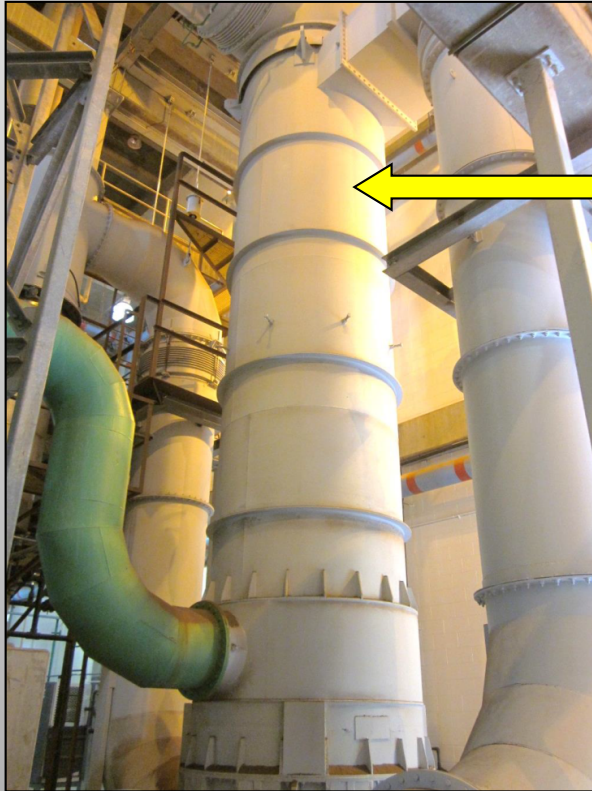
- EPA imposed aggressive schedule upon MSD, so MSD staff managed an accelerated design timeframe with consultant (CDM Smith) and prepurchased critical equipment.
- MSD pilot tested a new mebrane technology used in other applications.
- This new technology reduced capital costs by \$5M and anuual costs by over \$100K.
- Was operational December 2015, ahead of schedule.
- Passed final compliance testing in 2016, staff continues to fine-tune operational parameters to maximize mercury removal rates.
- Project won 2017 NACWA Environmental Achievement Award.





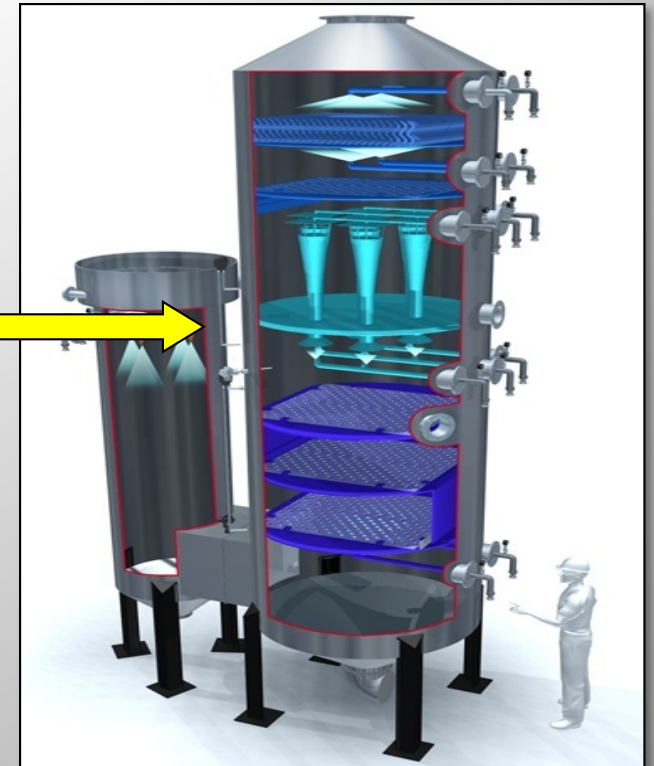
Incinerator Emissions Upgrade Project

High-wear components have been replaced



Heat Exchanger
(Recovers Heat)

Venturi
(Removes Particulates)

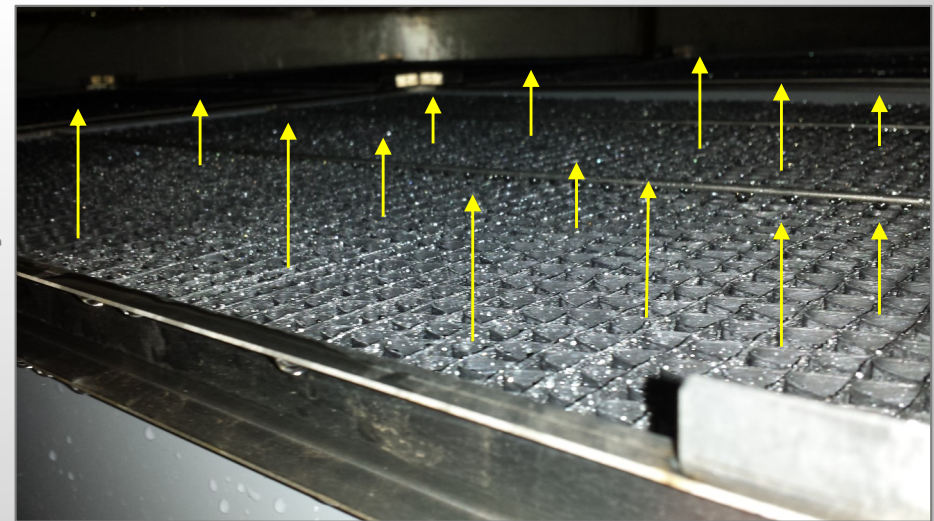




New Mercury Removal System



Three stories up - sorbent panel layers.

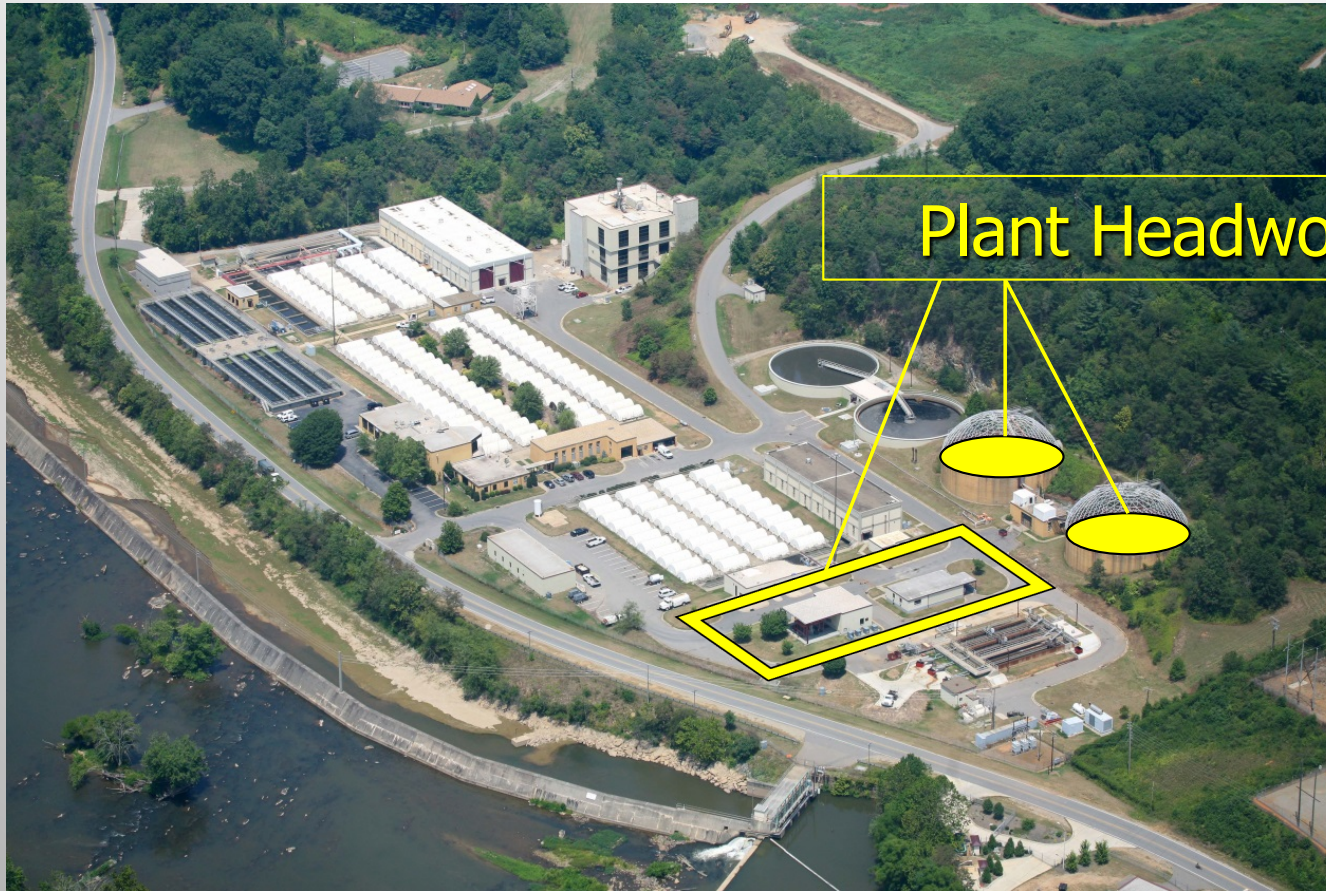


Up close - the exhaust flows up through the baffles. Impregnated with activated carbon, they remove mercury.

These are manufactured by Gore Industries (aka Gore-Tex)

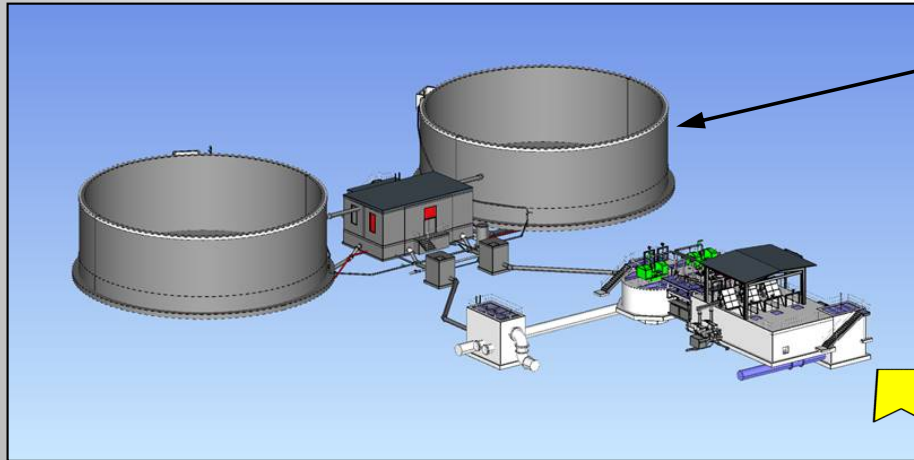


Current Plant Improvement Projects



Plant Headworks Project

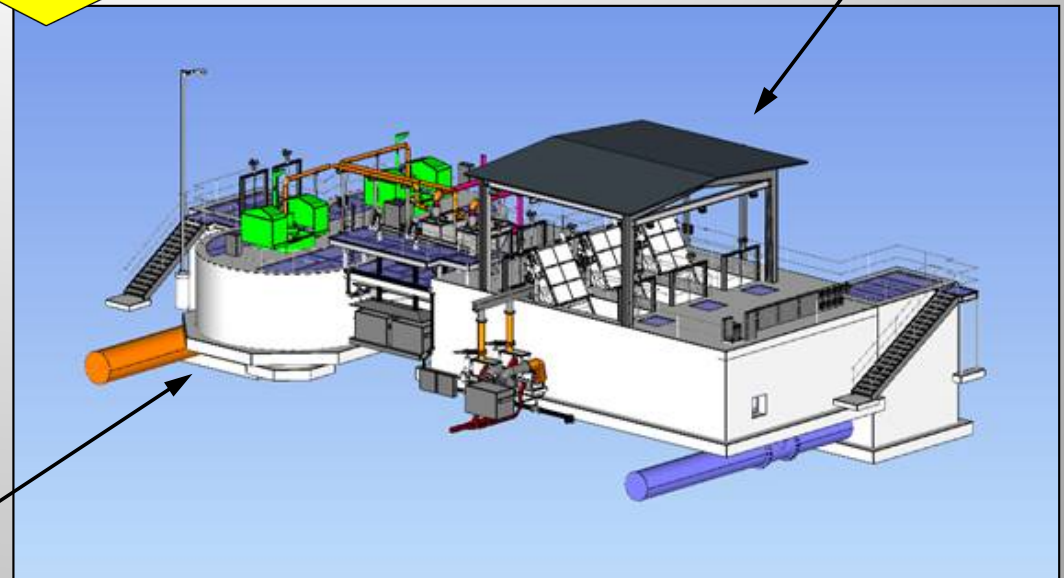
- New Bar Screens
- Improved Fine Screens
- Grit Removal
- Surge System for Peak Flows
- Construction complete
- Total Project cost approx. \$9.6 Million



Surge System for Peak Storm Flows

Headworks Project

Re-purposed 2@2.1 MG Digester Tanks



Fine Screens

Grit Removal

Fine Screens and Grit Removal



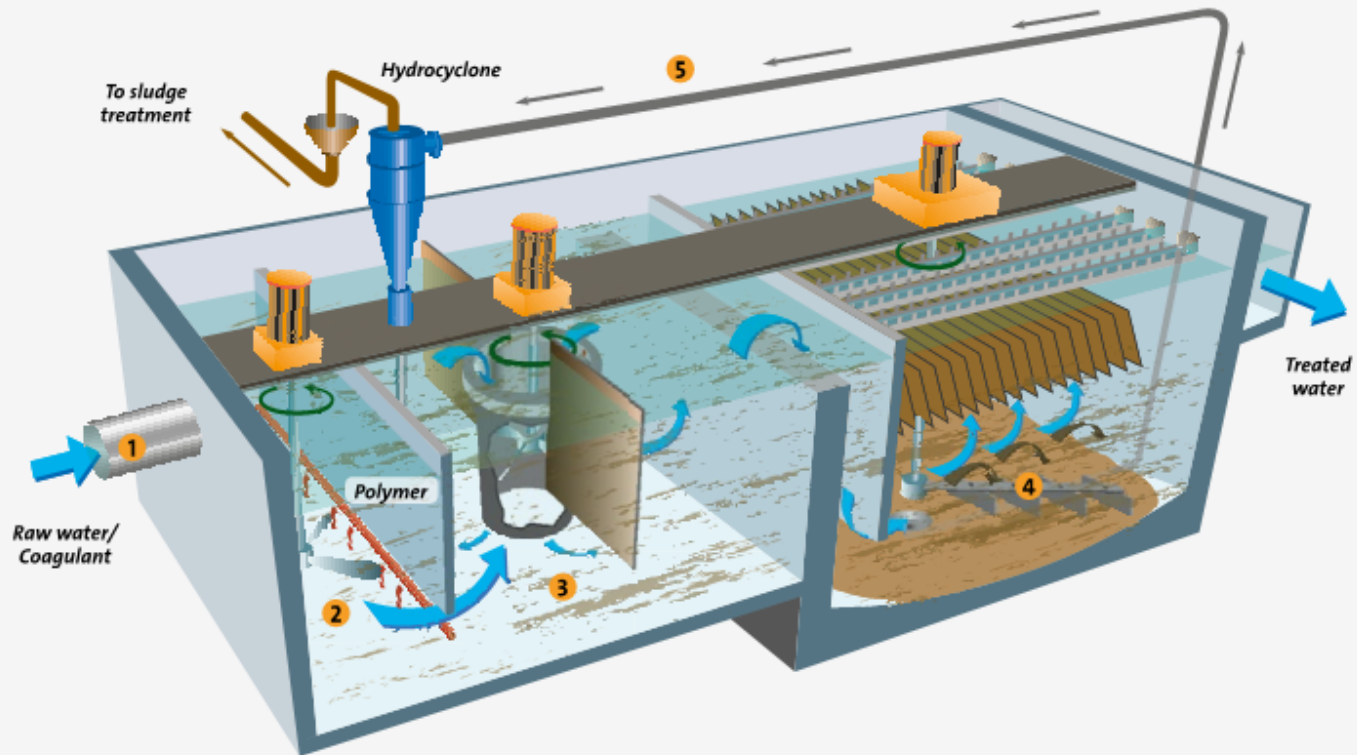
High Rate Primary Clarification

- New clarification process, there is none currently.
- Will significantly improve treatment process.
- Under Construction till January 2021.
- Total Project Cost \$15 Million

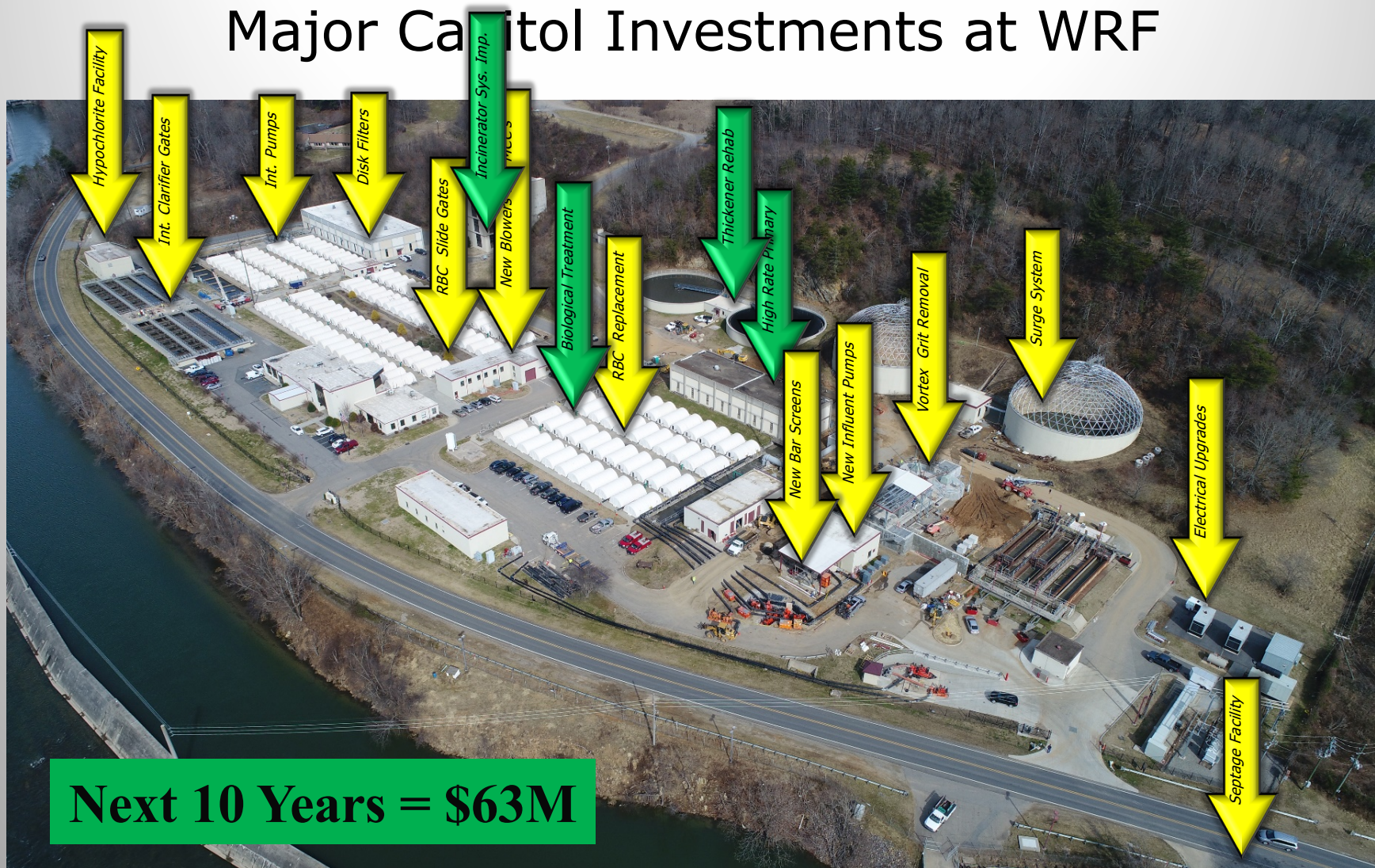


■ ACTIFLO System

High Rate Primary Treatment Project Overview



Major Capital Investments at WRF



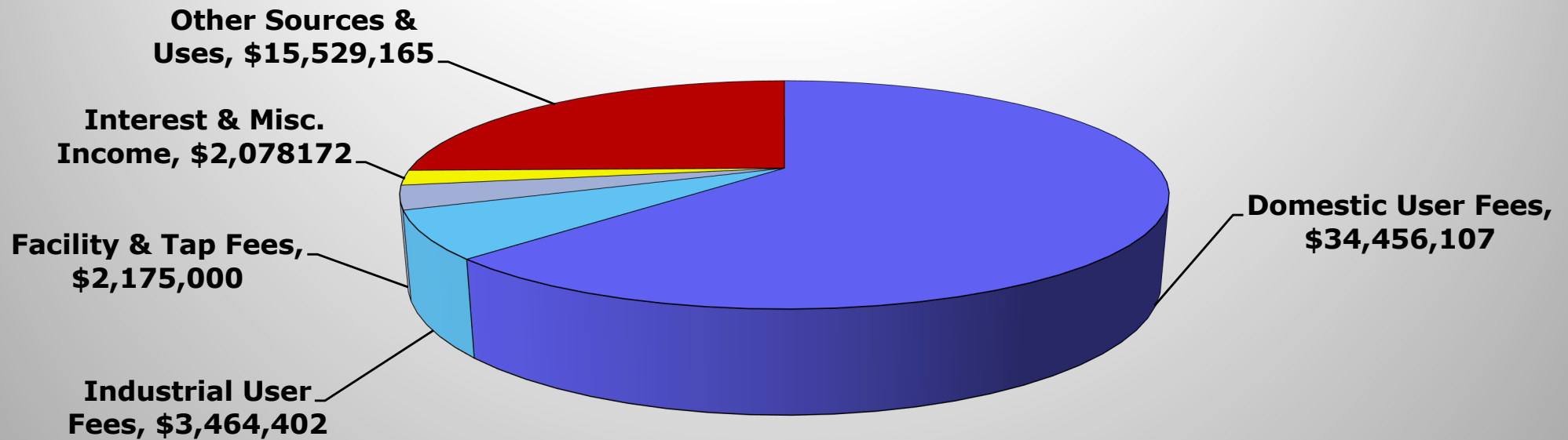


5. Financial Overview of District



Budgeted Revenue for Fiscal Year 2020

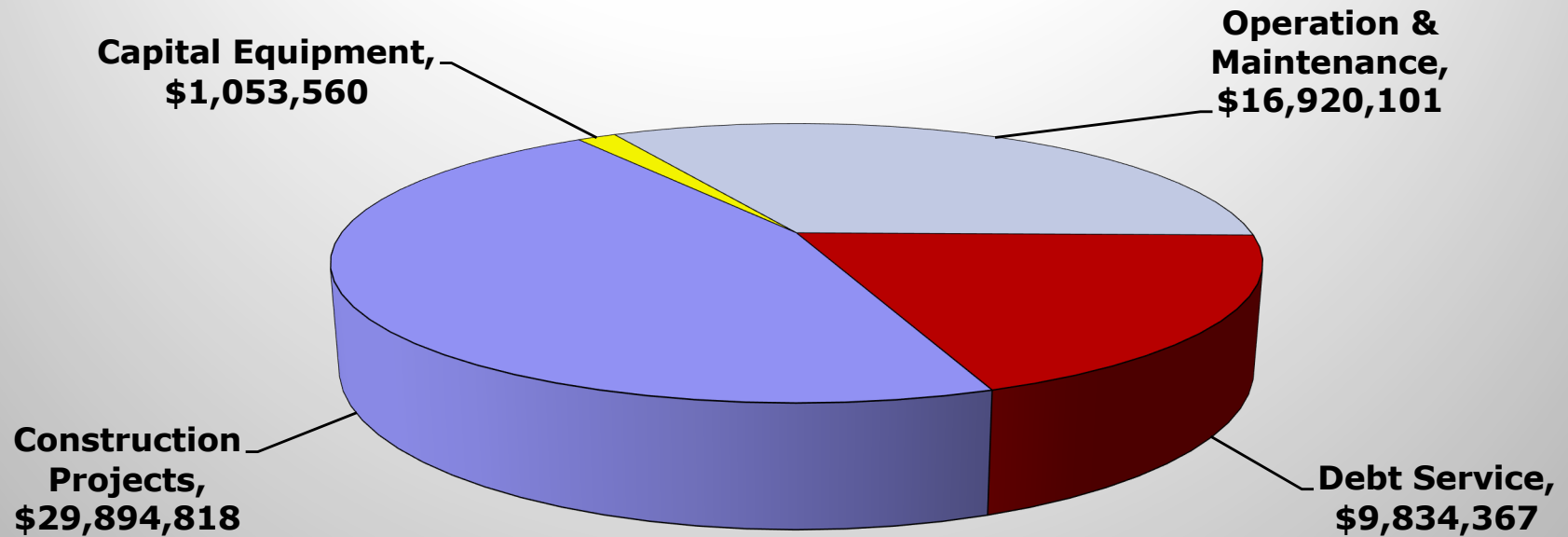
Total Budget = \$57,702,846





Budgeted Expenditures for Fiscal Year 2016

Total Budget = \$57,702,846

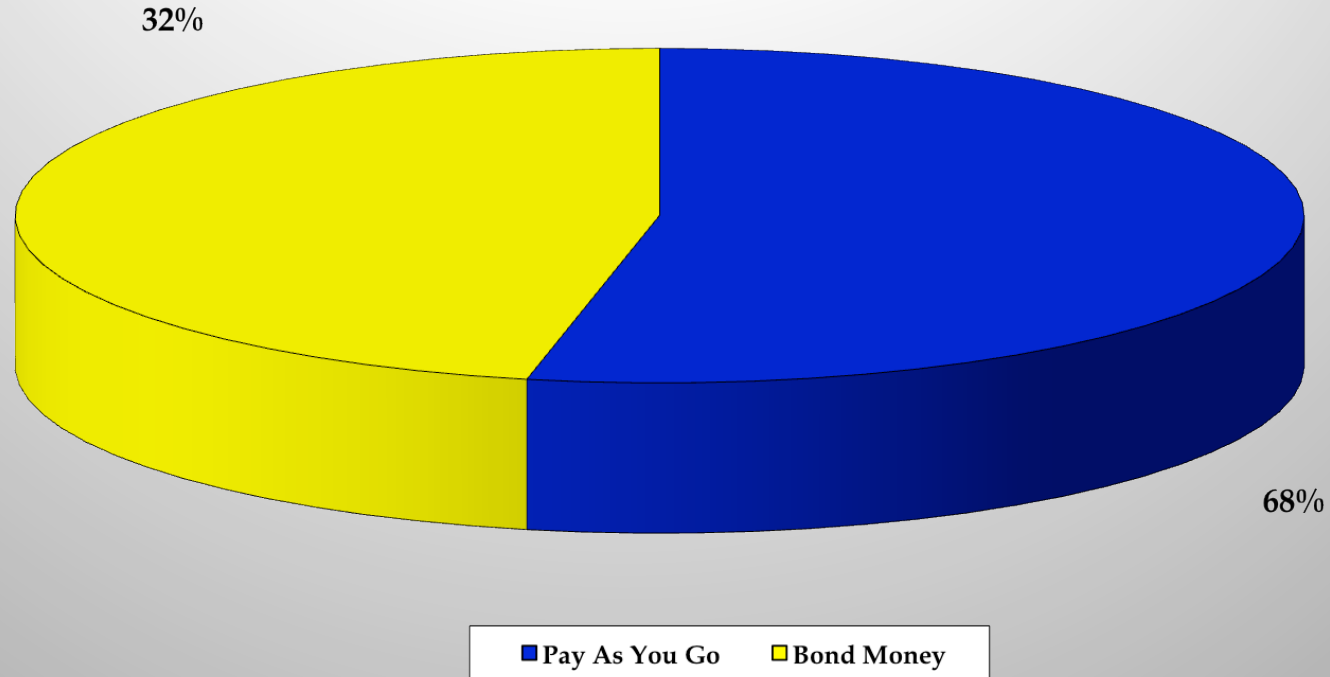




Capital Improvements and Sources of Funding

FY 2012 to FY 2021

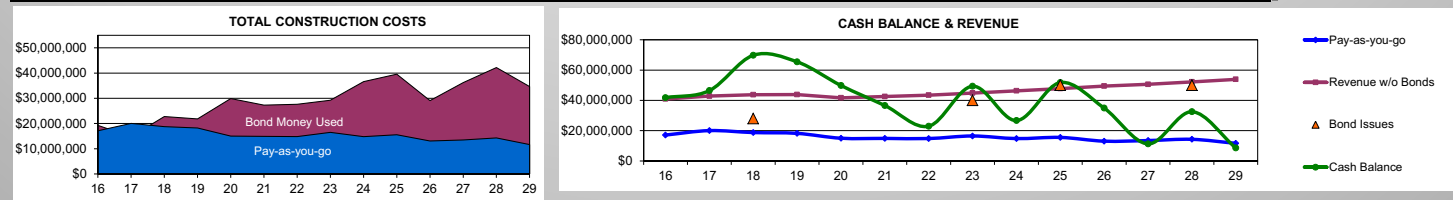
\$148.6 Million



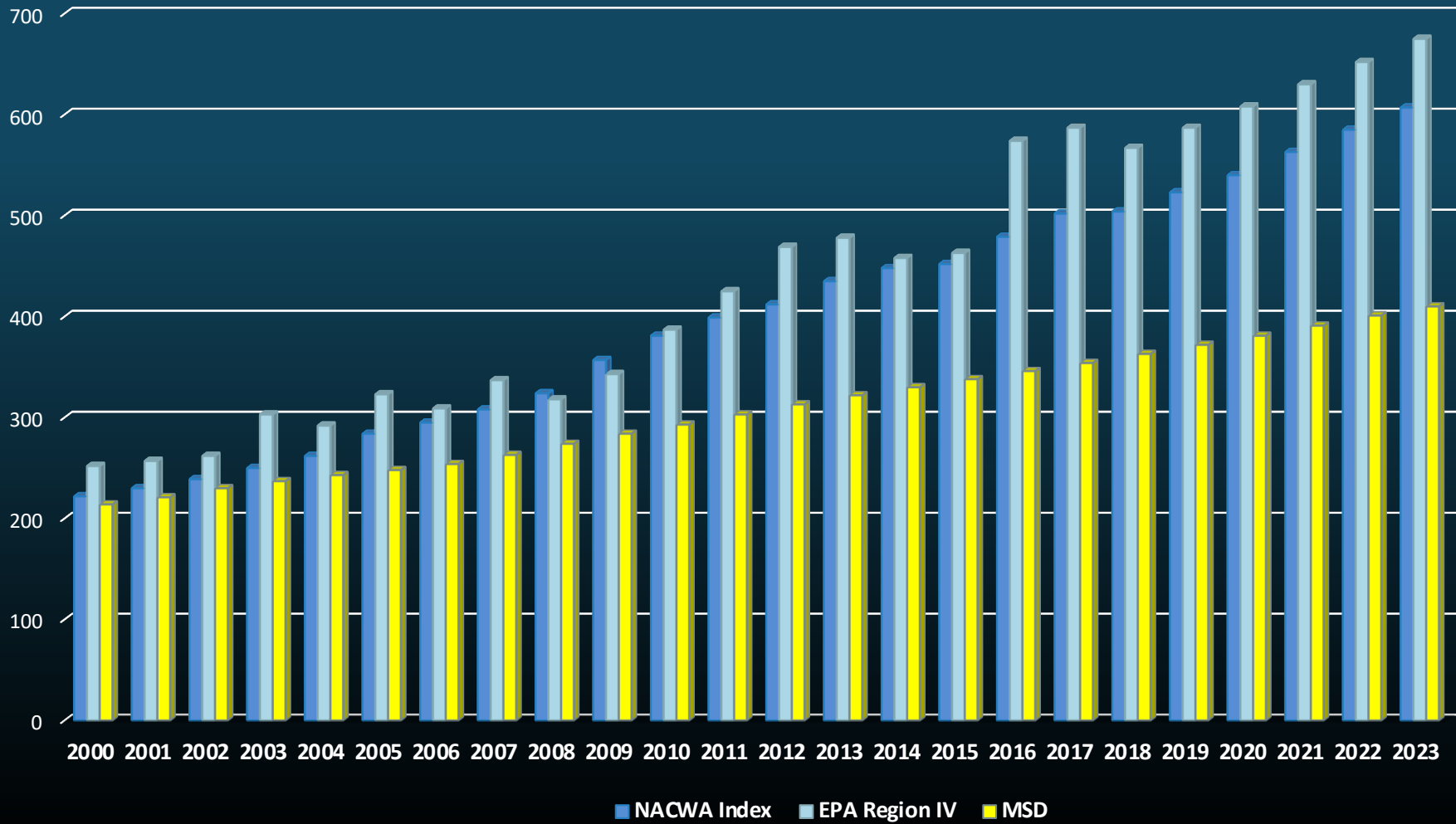


MSD Business Plan Future Projection

| Business Plan - Current FY20 | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.5% | 2.50% | 2.50% | 2.75% | 2.75% | 2.75% | 2.75% | 2.75% | Sewer Rate Increase | |
|--|------------------------------------|------------|-------------|-------------|-------------|------------|------------|-------------|------------|-------------|-------------|------------|-------------|------------|--|--|
| | \$29.15 | \$29.88 | \$30.62 | \$31.36 | \$32.17 | \$32.97 | \$33.80 | \$34.64 | \$35.51 | \$36.49 | \$37.49 | \$38.52 | \$39.58 | \$40.67 | Average Monthly Bill | |
| | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 | FY 2029 | Assumptions | |
| | July 1- Available for Construction | 44,585,099 | 41,819,146 | 46,455,838 | 69,792,374 | 65,459,390 | 49,825,911 | 36,601,452 | 22,955,916 | 49,354,762 | 26,666,485 | 51,773,588 | 34,892,240 | 11,280,151 | 32,504,757 | Minimum of 365 Days Cash on Hands |
| REVENUE: | | | | | | | | | | | | | | | | Consumption and Account Growth |
| Domestic Users | 29,581,170 | 30,842,462 | 31,935,658 | 32,531,584 | 33,623,113 | 34,732,618 | 35,860,421 | 37,006,848 | 38,233,303 | 39,557,512 | 41,241,300 | 42,674,046 | 44,194,128 | 45,740,039 | | |
| Industrial Users (No growth) | 3,344,074 | 3,909,925 | 4,159,767 | 3,745,625 | 3,464,402 | 3,544,137 | 3,625,866 | 3,709,637 | 3,795,503 | 3,892,317 | 3,716,793 | 3,819,005 | 3,924,028 | 4,031,939 | | |
| Billing and Collections (User Fee) | 754,317 | 768,833 | 795,574 | 811,883 | 832,994 | 861,327 | 887,167 | 913,782 | 941,195 | 969,431 | 998,514 | 1,028,470 | 1,059,324 | 1,091,104 | | |
| Tap Fees | 526,415 | 571,126 | 604,047 | 500,000 | 175,000 | 175,000 | 175,000 | 175,000 | 175,000 | 175,000 | 175,000 | 175,000 | 175,000 | 175,000 | | |
| Facility Fees | 5,798,181 | 6,405,971 | 4,752,960 | 4,500,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | 2,000,000 | | |
| Interest & Non-operating Revenues | 207,246 | 306,110 | 885,718 | 1,500,000 | 1,296,960 | 972,308 | 670,020 | 813,495 | 950,266 | 980,501 | 1,083,323 | 692,586 | 656,774 | 617,036 | | |
| City of Asheville (annex-Enka) | 37,146 | 35,834 | 34,522 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | 35,000 | 0 | 0 | 0 | 0 | | |
| Rental Income | 78,925 | 71,399 | 81,826 | 71,641 | 71,641 | 71,641 | 71,641 | 71,641 | 71,641 | 71,641 | 71,641 | 71,641 | 71,641 | 71,641 | | |
| Transfer from Reserves (to / from) | 430,058 | (214,395) | 298,619 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Miscellaneous | 170,897 | 138,469 | 171,097 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | 140,000 | | |
| Total Revenues | 40,928,429 | 42,835,734 | 43,719,788 | 43,835,733 | 41,639,110 | 42,532,031 | 43,465,115 | 44,865,404 | 46,341,908 | 47,786,402 | 49,426,571 | 50,600,748 | 52,220,895 | 53,866,759 | Bond Issues figured at: 4.0% yield FY23 4.5% yield FY25 5.0% yield FY28 | |
| State and Federal (EPA) Grants | | | | | | | | | | | | | | | | |
| Revenue Bonds/Stimulus | | | 28,003,632 | | | | | 40,000,000 | | 50,000,000 | | | 50,000,000 | | | |
| Total Funds Available | 85,513,528 | 84,654,881 | 118,179,258 | 113,628,107 | 107,098,500 | 92,357,942 | 80,066,567 | 107,821,320 | 95,696,670 | 124,452,887 | 101,200,160 | 85,492,988 | 113,501,046 | 86,371,516 | | |
| EXPENSES: | | | | | | | | | | | | | | | | 3% inflation in O & M, Replacement Funds and Engineering Force Account |
| Operations & Maintenance | 14,804,769 | 14,874,149 | 15,538,788 | 16,163,063 | 16,793,404 | 17,793,395 | 18,828,983 | 19,475,331 | 20,161,257 | 20,875,778 | 21,620,299 | 22,396,257 | 23,205,244 | 23,948,859 | | |
| Replacement Funds (WRF & Fleet) | 625,000 | 625,000 | 660,000 | 730,000 | 750,000 | 830,000 | 830,000 | 860,000 | 865,000 | 865,000 | 865,000 | 865,000 | 865,000 | 865,000 | | |
| Debt Service | 9,003,519 | 7,918,557 | 9,423,689 | 9,448,115 | 9,834,367 | 9,837,382 | 9,823,943 | 8,899,361 | 11,394,314 | 11,366,407 | 14,737,511 | 14,731,468 | 14,730,209 | 18,269,556 | | |
| CIP (including Bond Projects) | 19,261,094 | 14,781,337 | 22,764,407 | 21,827,539 | 29,894,818 | 27,295,713 | 27,627,726 | 29,231,865 | 36,609,614 | 39,572,114 | 29,085,110 | 36,220,112 | 42,195,835 | 34,657,129 | ENR 10-year Construction Index @ 2.90% | |
| Total Expenses | 43,694,382 | 38,199,043 | 48,386,884 | 48,168,717 | 57,272,589 | 55,756,490 | 57,110,652 | 58,466,557 | 69,030,185 | 72,679,299 | 66,307,920 | 74,212,837 | 80,996,288 | 77,740,544 | | |
| Pay-as-you-go (Current Revenue only) | 17,120,141 | 20,043,028 | 18,757,311 | 18,224,555 | 15,011,339 | 14,901,254 | 14,812,190 | 16,490,711 | 14,786,337 | 15,544,217 | 13,068,762 | 13,473,023 | 14,285,441 | 11,648,344 | | General Sewer Rehab to cover approx. 45,000 lineal ft / year |
| Debt Coverage (User Fees only) | 2.1 | 2.6 | 2.3 | 2.2 | 2.2 | 2.2 | 2.2 | 2.5 | 2.0 | 2.1 | 1.7 | 1.7 | 1.8 | 1.5 | | |
| Debt Coverage with Total Revenue | 2.9 | 3.5 | 3.0 | 2.9 | 2.5 | 2.5 | 2.5 | 2.8 | 2.3 | 2.4 | 1.9 | 1.9 | 2.0 | 1.6 | | |
| Target Debt Coverage 1.5 | | | | | | | | | | | | | | | | |
| April 4, 2019 | | | | | | | | | | | | | | | | No growth in Industries - Rate Parity for Flow in 2020 |
| 10-Year Capital Improvement Program | | | | | | | | | | | | | | | | |
| Active Plan CIP | FY 2016 | FY 2017 | FY 2018 | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | FY 2026 | FY 2027 | FY 2028 | FY 2029 | | |
| Interceptor/Wet Weather Rehabilitation | 618,050 | 760,970 | 1,726,500 | 1,366,293 | 5,514,370 | 3,753,278 | 746,748 | 2,113,722 | 18,902,492 | 23,191,399 | 12,939,537 | 9,387,533 | 50,907 | 1,606,294 | | |
| General Sewer Rehabilitation | 9,104,792 | 8,859,631 | 13,213,448 | 10,377,703 | 8,085,700 | 10,618,946 | 12,918,178 | 12,632,866 | 7,770,707 | 9,847,432 | 9,444,616 | 10,797,557 | 15,611,101 | 13,530,041 | | |
| Private Sewer Rehabilitation | 2,000 | 646,000 | 51,200 | 0 | 6,500 | 84,275 | 294,834 | 20,700 | 2,179,841 | 0 | 0 | 0 | 0 | 0 | | |
| Treatment Plant / Pump Stations | 7,181,959 | 1,868,250 | 5,291,691 | 7,112,321 | 11,756,250 | 9,874,284 | 10,628,646 | 11,348,726 | 4,561,936 | 3,193,324 | 3,285,930 | 12,542,771 | 22,962,227 | 15,867,633 | | |
| Engineering Force Account | 2,254,293 | 2,546,486 | 2,481,568 | 2,705,222 | 2,795,998 | 2,864,930 | 2,939,320 | 3,015,851 | 3,094,638 | 3,239,959 | 3,315,027 | 3,392,251 | 3,471,600 | 3,553,161 | | |
| Reimbursements | 100,000 | 100,000 | 0 | 266,000 | 736,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | 100,000 | | |
| Contingency | 0 | 0 | 0 | 0 | 1,000,000 | | | | | | | | | | | |
| Capital Improvement Program Totals | 19,261,094 | 14,781,337 | 22,764,407 | 21,827,539 | 29,894,818 | 27,295,713 | 27,627,726 | 29,231,865 | 36,609,614 | 39,572,114 | 29,085,110 | 36,220,112 | 42,195,835 | 34,657,129 | | |



Average Annual Service Charge



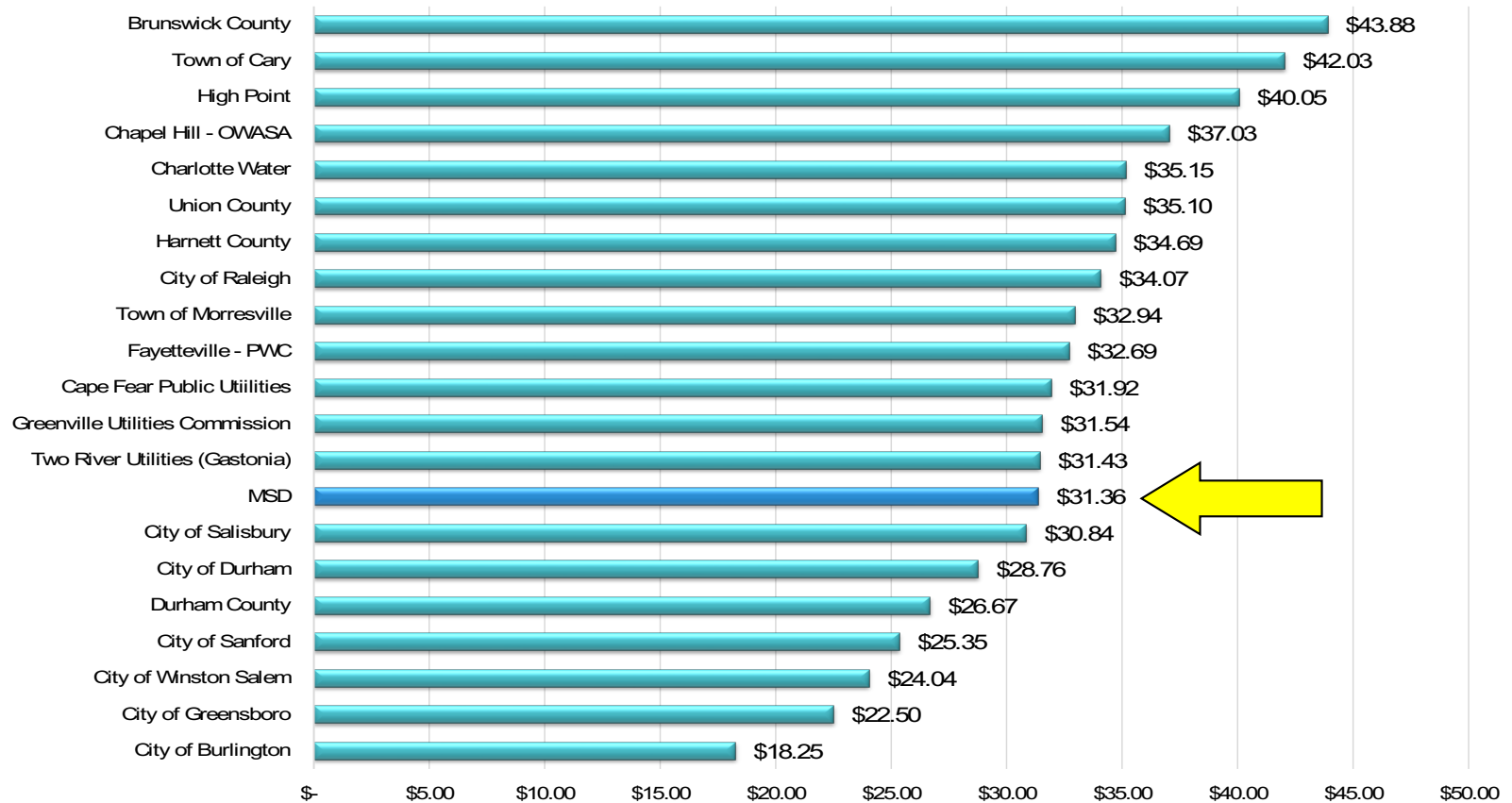
5 CCF Customer Bill Comparison to EPA Regions Avg. Monthly Bill





Comparative Monthly Residential Bills

5 CCF Customer Bill Comparison to AA& AAA NC Units of Government



Source: UNC Environmental Resource Center



Thursday, April 13, 2017, 10:25:56 am

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WELCOME TO MSD!

Holiday Closing

MSD offices will be closed on Friday, April 14, 2017 for the Good Friday Holiday.

As always, emergency services are available at the number below, 24/7 - 365 days a year.

Important Information

If you have an emergency, call MSD first at 828-255-0061.

Don't throw grease or trash down the drain! Learn more about what you can do with your grease and trash by [clicking here](#).

New information on Flushable wipes from the NACWA. [Click here](#) for more information. Be sure to watch the short clips from *The Dr. Oz Show* in the link.

All documents on this website require a pdf reader. You may download one by visiting [FoxIt Software](#) or [Adobe](#).

Street Interruptions

Street interruption information due to MSD construction is now available. [Click here](#) for more information.

Preventive Cleaning

Preventive cleaning areas. [Click here](#) for more information.

Wastewater Treatment Plant (Click picture for plant tour.)





Our End Product



Questions ?

www.msdbc.org