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# **WASTEWATER CONVEYANCE SYSTEM**

## **YEAR 2019 REPORT ON PHYSICAL CONDITIONS**

*Prepared For:*  
The Township of Hillsborough  
Municipal Utilities Authority



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- SEWERAGE FACILITIES PLAN (Revised April 2009)

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Report contents include information provided by the Authority.

I. EXECUTIVE SUMMARY

The purpose of this report is to provide a general assessment of the present condition of The Township of Hillsborough Municipal Utilities Authority ("Authority") wastewater collection and conveyance facilities.

The Authority currently operates and maintains approximately 180 miles of gravity sewer, 16 sewage pumping stations, and  $\pm 16$  miles of force main, and conducts ongoing inspections to determine the condition of the system.

The Authority continues its program to locate the existing wastewater collection/conveyance system using Global Positioning System (GPS) and Geographic Information System data collection equipment with the eventual goal of incorporating this data into Somerset County base mapping. The Authority currently has approximately 65% of the sewer system located and continues to expand its data base.

## II. INTRODUCTION/ BACKGROUND

The Authority, established in 1965, has provided sanitary sewer service to the Township of Hillsborough since 1966 within a twenty (20) square mile service area situated in the Royce's Brook Drainage Basin and adjacent Hillsborough Township areas. Currently the Authority conveys an average daily flow of 4.15 million gallons generated by approximately 12,000 residential and 2,220 and industrial users.

All wastewater collected by the Authority system is discharged to the Somerset-Raritan Valley Sewerage Authority (SRVSA) interceptor for treatment and disposal at the SRVSA plant in Bridgewater Township. The following information is taken from SRVSA "Analysis of Sewage Flow, Fourth Quarter 2019", prepared by Sherwin Ulep, P.E., and dated January 22, 2020:

SRVSA Meter Number

9H

| Flow from                         | 1 <sup>st</sup> Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter | Total      |
|-----------------------------------|-------------------------|-------------|-------------|-------------|------------|
|                                   | Flow in Million Gallons |             |             |             |            |
| TTHMUA                            | 446.767                 | 399.541     | 290.074     | 380.614     | 1,516.996  |
| Total received by SRVSA           | 2,131.445               | 1,914.110   | 1,312.054   | 1,623.358   | 6,980.967  |
| TTHMUA Flow as % of SRVSA Total   | 20.96                   | 20.87       | 22.11       | 23.45       | 21.73      |
|                                   |                         |             |             |             |            |
|                                   | Charge in Dollars       |             |             |             |            |
| TTHMUA                            | 1,154,450               | 1,032,418   | 749,554     | 983,510     | 3,919,933  |
| Total charged by SRVSA            | 5,507,676               | 4,946,079   | 3,390,360   | 4,194,773   | 18,038,889 |
| TTHMUA Charge as % of SRVSA Total | 20.96                   | 20.88       | 22.11       | 23.45       | 21.73      |

Appendices A, B and C, of this Report, include a Sewerage Facility Inventory and Schedule of Cost for the Authority system, pumping station inspection reports, maintenance log forms and a sewerage facilities plan showing the Authority service area and collection system.

### III. SUPPORT FACILITIES AND MAINTENANCE EQUIPMENT

The Authority administrative offices are located in Hillsborough Township at the New Center Village shopping center complex on Triangle Road. At this location, the Authority coordinates daily operation of the system, maintains plans and records concerning new construction, extensions and connections and schedules inspection/maintenance activities.

Maintenance functions are conducted out of the facility adjacent to the Sunnymead Pumping Station near Harrison Street consisting of a repair shop with crew quarters and a separate 7,200 square foot storage garage containing vehicles and equipment.

Major items of maintenance equipment include the following:

- 2019 3,000 gallon vacuum tank truck
- John Deere 310A backhoe/loader – (On property, does not work.)
- John Deere 310SG backhoe/loader - Current
- Sterling M8500 5/7 cubic yard dump truck (40,000 GVWR)
- 2010 VAC CON Sewer Cleaning Truck – (Jetter)
- 2010 CAM 20 Ton Tilt Bed Trailer
- Ford 3.5 cubic yard dump truck
- Seven (7) crew pickup trucks
- 2 Jeep Compass compact crossover SUV
- Dodge van
- 1 4-inch Godwin centrifugal, solids handling bypass pump
- 2-Closed-circuit television systems for lateral and sewer connection inspection
- Envirosight Closed-circuit television system with pan/tilt self propelled camera. (In Dodge Van)
- Two Toshiba Mag Flow Meters – (Part of Force Main – Inoperative)
- Two Flo-Dar Gravity Flow Meters – (Inoperative and Outdated)
- John Deere Gator
- Billy Goat Brushcutter
- One (1) Panametrics Transit Time Meter
- Geographic Information System (GIS) data collection equipment
- SCADA Pump Station Monitoring System
- 3 Assorted Utility Trailers

The maintenance facility and equipment listed above is reported to be in serviceable condition.

#### IV. AUTHORITY OPERATION AND MAINTENANCE PROCEDURES

As in past years and as a means of monitoring the condition of gravity sewers, the Authority periodically measures the volume of wastewater transported at key points throughout the system with portable metering equipment. Where metering results may not correlate with calculated flow estimates, selected sections of the sewers are visually inspected and/or examined with closed circuit television equipment to locate possible sources of extraneous flow. Depending on the nature of the problem, pressure grouting or replacement may be employed as a means of gravity sewer repair.

The Authority utilizes a pumping station Inspection Report form to record basic station data such as pump running time, generator fuel consumption and general observations made during these routine inspections. Under normal conditions each station is inspected twice a week except for the Sunnymead station which is inspected daily.

In addition to daily/weekly inspection report forms, more specific Authority maintenance functions are identified on Maintenance Record Logs that include date entries for each item of work completed. Copies of the Pumping Station Inspection Report and Maintenance Record Log forms are included in Appendix B.

In order to proactively identify the need for less obvious replacement/repair needs at older stations, preventative maintenance programs are also being developed to audit mechanical/electrical system equipment conditions. These audits are typically performed by contractors specializing in this work.

With respect to safety procedures, Authority personnel have been trained in accordance with OSHA/PEOSHA regulations and are equipped with a full complement of safety equipment.

## V. SYSTEM IMPROVEMENTS/ REPAIRS

### A. Mulford Lane Sewage Pumping Station

New electrical service; new circuit board based controls system, main breaker switch, meter). Isolating relay system for floats installed in new system to allow for a low voltage floats to prevent any safety hazards. Transfer switch replacement anticipated to a lower voltage because when voltage drops in neighborhood occur, the transfer switch activates and pump stations runs on generator. Flow meter system to be replaced.

### B. Royce Brook (Sunnymeade) Sewage Pumping Station

Authority has commenced on the initial steps for the construction of a new Pump Station to permit abandonment of the existing Sunnymeade Pumping Station. Control system is very problematic and acts up. Pump Station was recently serviced by crew members, repacking pump seals and verifying all pump operations.

### C. Blackwells Mills Sewage Pumping Station

New pumps and volutes have been ordered. Generator to be replaced this year. The 30+ year-old station is anticipated to be worked on after the Royce Brook (Sunnymeade) Station. Plan is to replace existing dry and wet well with a new wet well housing submersible pumps.

### D. Ivy Hill Sewage Pumping Station

Authority has replaced all gate and check valves that were not replaced last year. Appearance rehab is anticipated to be redone in the next couple years.

### E. Gumble Court PS

There have been a few pump issues. Pumps were repaired and once placed in the system, pumps failed again and have been serviced again.

### F. Rohill Sewage Pumping Station

Slight property work has been done. Natural gas generator is anticipated to be replaced. The generator is unreliable because it does not always turn on. Pump and Wet Well Rehab is also anticipated in the near future. Control system is old and troublesome to troubleshoot, so a new control system is requested by maintenance.

### G. Hidden Brook (Operating, but not owned)

New fence was added, driveway has been paved, and water service has been installed. Bioxide needs to be fixed before being turned over to the authority.

### H. Sewage Pumping Station Repairs

In addition to system improvements identified above and routine station and conveyance system repairs, sewage pumps over the last five years have been reconditioned at the following stations:

| Station  | Year Repair Completed |      |   |         |  |
|--|-----------------------|------|---|---------|--|
|  | 2015                  | 2016 | 2017  | 2018    | 2019                                       |
| <b>Mulford Lane</b>                                |                       |      |   |         |  |
| - Control system                                   |                       |      | New control system installed with Electric Company coordinated shut down. |         | New control system circuit board installed |
| - Electrical                                       |                       |      |   |         | New electrical service                     |
| <b>Blackwells Mills</b>                            |                       |      |   |         |  |
| - Pump 1   |                       |      |   | Rebuilt | New Pump and Volute                        |
| - Pump 2   |                       |      |   | Rebuilt | New Pump and Volute                        |
| <b>Claremont</b>                                   |                       |      |   |         |  |
| - Pump 1 Replaced                                  |                       |      | X   |         |  |
| - Pump 2 Replaced                                  |                       |      | X   |         |  |
| <b>Route 206</b>                                   |                       |      |   |         |  |
| - PLC Number 1 Replaced                            |                       |      | X   |         |  |
| - PLC Number 2 Replaced                            |                       |      | X   |         |  |
| <b>Carriage Hill</b>                               |                       |      |   |         |  |
| - Check Valve Pump 1 Replaced                      |                       |      | X   |         |  |
| - Check Valve Pump 2 Replaced                      |                       |      | X   |         |  |
| <b>Sunnymead</b>                                   | X                     |      |   |         |  |
| - Pump 1 Reconditioned                             |                       |      | New VFD   |         |  |
| - Pump 2 Reconditioned                             |                       |      | New VFD   | X       |  |
| - Pump 3 Reconditioned                             |                       |      | New VFD   |         |  |
| <b>River Road</b>                                  |                       |      |   |         |  |
| - Replaced entire mechanical/ electrical equipment |                       |      | X   |         |  |
| <b>Ivy Hill</b>                                    |                       |      |   |         |  |
| - Pump 1 Rebuilt                                   |                       |      |   | X       |  |
| - Pump 2 Rebuilt                                   |                       |      |   | X       |  |
| <b>Gumble Court</b>                                |                       |      |   |         |  |
| - Pump 1 Repaired                                  |                       |      |   |         | X  |
| - Pump 2 Repaired                                  |                       |      |   |         | X  |



VI. 2020 CAPITAL IMPROVEMENT PLAN

TOWNSHIP OF HILLSBOROUGH MUNICIPAL UTILITIES AUTHORITY

2020 YEAR CAPITAL IMPROVEMENT PLAN  
(Anticipated 2020 Expenditures)

|   | <u>5 Year Capital Plan</u> | <u>2020 Plan</u>   |
|---|----------------------------|--------------------|
| A. SUNNYMEAD PUMP STATION UPGRADE   | \$3,000,000                | \$2,000,000        |
| B. REHABILITATION OF BLACKWELL'S MILLS<br>PUMP STATION                    | \$250,000                  | \$150,000          |
| C. COMPUTER SYSTEM UPGRADE (Software & Hardware)                          | \$25,000                   | \$20,000           |
| D. REHABILITATION OF DISCHARGE LINE FROM<br>BLACKWELL'S MILL PUMP STATION | \$125,000                  | \$0                |
| E. REHABILITATION OF ROUTE 206 SEWER LINES                                | \$25,000                   | \$150,000          |
| F. PUMPING STATION UPGRADES   | \$500,000                  | \$100,000          |
| G. SATELLITE LATERAL TV SYSTEM  | \$250,000                  | \$250,000          |
| H. REPLACE VIDEO TV/GROUTING TRUCK  | \$20,000                   | \$15,000           |
| I. SUNNYMEAD PUMPING STATION BY-PASS PUMP                                 | \$100,000                  | \$0                |
| J. VEHICLE REPLACEMENTS   | \$300,000                  | \$55,000           |
| K. CLEARING OPERATIONS  | \$100,000                  | \$80,000           |
| L. INFILTRATION AND INFLOW PROGRAM  | \$675,000                  | \$300,000          |
| M. SUNNYMEAD PUMPING THIRD FORCE MAIN INSTALL                             | \$1,500,000                | \$400,000          |
| N. MISC. EQUIPMENT  | \$220,000                  | \$12,000           |
| O. REHABILITATION OF SEWER LINES  | \$25,000                   | \$50,000           |
| P. RECONSTRUCT DISCHARGE LINES AT SUNNYMEAD                               | \$200,000                  | \$200,000          |
| Q. CONSULTING ENGINEERING SERVICES  | <u>\$1,000,000</u>         | <u>\$950,000</u>   |
| <b>TOTAL ESTIMATED COST</b>   | <b>\$8,315,000</b>         | <b>\$4,732,000</b> |

## VII. RECOMMENDATIONS

Given the age of older components of the wastewater conveyance system, the Authority continues to pay increasing emphasis on prioritizing and implementing preventative maintenance programs and proceeding with repair and replacement work where required and permissible. This particularly applies to the more complex power distribution, emergency power, sewage pumping equipment and control systems. Potential operation and maintenance, and energy cost savings afforded by newer technologies continue to be a consideration.

We concur with the approach taken by the Township of Hillsborough Municipal Utility Authority to maintain the wastewater conveyance system and related facilities and recommend that current efforts be continued in the present manner.

## APPENDIX A

Township of Hillsborough Municipal Utilities Authority  
Sewerage Facilities Inventory - October 2019  
**Gravity Sewers Constructed by TTHMUA and PRIVATE Developers to Date:**

| PIPE DIA. (IN.) | HTMUA (L.F.)   | PRIVATE (L.F.) | TOTALS (L.F.)  |
|-----------------|----------------|----------------|----------------|
| 8               | 82,495         | 715,561        | 798,055        |
| 10              | 1,230          | 9,553          | 10,783         |
| 12              | 16,827         | 16,838         | 33,665         |
| 14              | 0              | 2,408          | 2,408          |
| 15              | 1,223          | 0              | 1,223          |
| 16              | 8,598          | 2,030          | 10,628         |
| 18              | 23,623         | 7,003          | 30,626         |
| 21              | 5,678          | 0              | 5,678          |
| 24              | 29,677         | 0              | 29,677         |
| 27              | 5,669          | 0              | 5,669          |
| 30              | 15,464         | 0              | 15,464         |
| 36              | 1,571          | 0              | 1,571          |
| <b>Totals:</b>  | <b>192,055</b> | <b>753,393</b> | <b>945,447</b> |

**Force Mains Constructed to Date:**

| PIPE DIA. (IN.) | TOTALS (L.F.) |
|-----------------|---------------|
| 1.5             | 1,396         |
| 2               | 3,470         |
| 4               | 7,052         |
| 6               | 53,185        |
| 8               | 2,600         |
| 10              | 3,630         |
| 12              | 1,233         |
| 14              | 3,630         |
| 16              | 1,233         |
| <b>Total</b>    | <b>77,229</b> |

**Total Number of Manholes:** 4,522

| <b>Pump Stations:</b>            |                   |                  |              |            |
|----------------------------------|-------------------|------------------|--------------|------------|
|                                  | Blackwell's Mills | Country Classics | Ivy Hill     | River Road |
|                                  | Boehm Way         | Gumble Court     | Mulford Lane | Rohill     |
|                                  | Carriage Hill     | Hidden Brook*    | Oxford Place | Route 206  |
|                                  | Country Classics  | Hodge Road       | Ninth Street | RoyceBrook |
| * Operating, but not taken over. |                   |                  |              |            |

**Meter Chambers:**

Chamber #9H (Flume) - Southside Avenue, Somerville  
12" Parshall Flume (o/o by SRVSA)

Chamber #9H (Pipe) – Hillsborough-Somerville Trunk  
Transit-Time Open Channel Flowmeter (o/o by SRVSA)

**Inverted Siphons:**

345 L.F. each of 8, 14 & 16-Inch Diameter  
Polyethylene Pipe and Siphon Inlet Chamber

## APPENDIX B



PUMPING STATION:

MONTH: 20

MAINTENANCE RECORD LOG

[illegible]

PUMPING STATION: \_\_\_\_\_

MONTH: 20

### MAINTENANCE RECORD LOG

[illegible]



## APPENDIX C

SEWERAGE FACILITIES PLAN (REVISED APRIL 2009)

## — Sewerage Facilities Plan —

