
Engineer's Report

SANITARY SEWER STUDY

TOWNSHIP OF VERONA



ESSEX COUNTY, NEW JERSEY

PROJECT No. VA-181

Prepared by:



BOSWELL

Headquarters

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A handwritten signature in blue ink, which appears to read "Giselle Diaz", is positioned above a horizontal line.

Giselle Diaz, P.E.
New Jersey License No. 44832

July 16, 2025

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1.0 INTRODUCTION

1.1 General

The Township of Verona (Township) is located within the Northern portion of Essex County, New Jersey. The Township of Verona is bordered by the Township of Cedar Grove to the north, the Township of Montclair to the east, the Township of West Orange to the south, and the Borough of North Caldwell and the Borough of Essex Fells both to the west.

The Township of Verona is approximately 2.5 square miles. According to the United States Census Bureau, the estimated population in 2022 was 14,572 people with a total of 5,714 households.

The Township is serviced by the Verona Wastewater Treatment Plant (WTP), located at Block 1201, Lot 4. The WTP receives domestic and commercial wastewater from the Township of Verona, as well as from the Township of Cedar Grove and the Borough of North Caldwell. The WTP is rated for an average daily flow of 3.0 million gallons per day (MGD) and discharges treated flows into the Peckman River.

This report has been prepared in response to the Inflow and Infiltration (I/I) issues made apparent to the Township after experiencing peak flows at the WTP, in excess of four (4) times the average flow during wet weather conditions.

Boswell was authorized by the Township of Verona to analyze the existing wastewater system and provide the necessary improvements to minimize excessive I/I and normalize peak flows at the WTP.

1.2 Inflow and Infiltration

Inflow and infiltration (I/I) is defined as groundwater and stormwater that enters a sanitary sewer system due to deficiencies within the system, including but not limited to, defects in pipes and manholes, and through illicit connections. I/I can cause increased issues within the sanitary collection system, such as further deterioration of pipelines and manholes, higher costs for wastewater treatment, and environmental impacts.

2.0 EXISTING SANITARY SEWER SYSTEM

The existing sanitary sewer system in Verona flows directly to the Verona WTP via pipeline system comprising of primarily gravity flow pipes, ranging in size from eight inch to 36-inch. The system consists of a 12-inch syphon main and two (2) syphon chambers. There are currently two (2) sanitary pump stations in the Township of Verona, located off of Stocker Road and on Ozone Avenue, that tie into Verona's sanitary sewer system. All municipal sewers are maintained by the Township of Verona, Department of Public Works. Appendix A shows the Township's overall sewer system. In order to accurately determine sources of extraneous flow, Boswell recommended conducting smoke testing of the existing sanitary sewer system. Smoke testing identifies sources of I/I contributing to the sanitary sewer system, while also identifying any illicit connections from homeowners.

3.0 SMOKE TESTING

The Township retained National Water Main Cleaning Co. (NWMC) to perform smoke testing in the sanitary sewer system across the Township. Approximately 181,500 linear feet of sanitary sewer mains in the Township were smoke tested. NWMC utilized a smoke test machine in order to identify defects within the system and illicit cross-connections in the sanitary sewer system, including roof leaders, property drains, inlet connections, and defective laterals connection and mains.

Smoke testing is an inspection procedure that utilizes blowers to introduce smoke into the sewer lines to detect inflow sources in the sewer system. Typical sources of inflow such as roof leaders, cellars, yard and area drain, foundation drains, illicit connections, and leaking joints, can be identified through smoke testing. The smoke is non-toxic and leaves no residue.

From July through September of 2024, NWMC performed smoke testing. Notices were sent to residents to inform them of the testing beforehand.

Smoke testing revealed cross-connections present throughout the Township's system, including 30 inlets illicitly connected into the sanitary system, one (1) defective lateral, two (2) defective sanitary sewer mains as well as smoke emanating from the inactive sewer line located in the wooded area near Howell Drive. Video inspection of the sanitary collection system and laterals where smoke was observed to have been emanating from cored holes and sidewalks, and dye testing is recommended in order to confirm that smoke escaped from damaged pipes.

Smoke testing also revealed the presence of illicit connection from property owners. During Smoke Testing, smoke was found to be emanating from 38 broken and/or missing cleanout caps, seven (7) illicit property drain connections, 20 suspected defective laterals, two (2) illicit downspout connections, and one (1) illicit sump pump connection. Smoke testing also revealed the presence of smoke emanating from the roof of one (1) home, as well as six (6) basement interiors/exterior. As a precautionary measure, homeowners are strongly advised to pursue further testing to accurately identify the underlying problems and take appropriate steps to rectify them.

Please refer to Section 6.0 Summary and Recommendations, for additional information regarding the recommended Township and Residential improvements.

Boswell summarized NWMC's reports to only include the locations where smoke was observed, along with a description. The summary of the smoke test results can be found in Appendix B. Table B-1 and Table B-2. A map of the identified Township and residential locations can be found in Appendix B.

4.0 ILLICIT CONNECTIONS

4.1 Illicit Property Drain and Downspout Connections

Illicit property connections refer to connections of property drains, roof drains and sump pumps into the sanitary sewer system. Smoke testing revealed illicit property owner connection throughout the Township, including property drain connections, suspected defective laterals, downspout connections, and sump pump connection.

The Township's Municipal code on illicit connections and improper disposal of waste is included in Appendix C. Chapter 519, Section 44 specifically addresses illicit connections to the municipal separate storm system. As per Section §470-3 of the Township of Verona Municipal Code, sump pumps installed prior to September 1, 2022 shall not connect into a sanitary sewer. Sump pumps and property drains installed after September 1, 2022 shall be directed to an absorbent surface, however it may be directed to a storm sewer, swale, detention basin, etc. with prior approval and permitting.

The Township shall notify all residents at the addresses of the identified cross connections. An example of a notice to send to the residents is provided in Appendix D.

4.2 Defective Sanitary Clean Out Caps

Defective or missing sanitary clean out caps allow access for storm water to enter directly into the sanitary sewer system through sanitary laterals. Missing and/or defective clean out caps were located at 38 residences throughout the Township.

5.0 VIDEO INSPECTION (CCTV)

Video inspections of the sanitary sewers on Derwent Avenue and Brookside Terrace were conducted over September 20th through October 8th of 2024. After review of the video inspection, it is recommended to complete cleaning and video inspection of various pipe segments which previous video inspections were not able to pass obstructions. As well as, complete chemical root treatment and sanitary sewer lining of various pipe segments. A more in-depth summary of our recommendations as a result of previous video inspection of these sanitary sewers, can be found in Section 6.2 of this report, as well as in Appendix E. An emergency repair has been completed to the highlighted pipe section between MH 22 and MH 23 on Derwent Avenue.

6.0 SUMMARY AND RECOMMENDATIONS

Recommended improvements by the Township include the disconnection of inlets from the sanitary system and their reconnection into the dedicated stormwater system in the street, the lining of defective sanitary sewer mains, the re-establishment of defective sanitary laterals, video inspection of the sanitary collection system within the roadways and laterals where smoke was observed to have been emanating from sidewalks and valve caps, and dye testing of the

stormwater collection system within multiple roadways to confirm connections and outfalls. Additionally, the Township shall notify property owners who have been identified to have an illicit connection.

Boswell proposes a phased plan in order to address the infiltration and inflow into the Township's sewer system. These improvements are intended to decrease the volume of total flow during storm events, thereby reducing or eliminating future peak flows at the WTP. In an effort to coordinate the required with the Road Improvement Program, the project has been divided into seven (7) separate phases over the course of six (6) years.

6.1 Phase 1

In order to fully address the possible inflow from private properties, the Township shall notify all residents at the addresses of the identified cross-connections. Among residential interconnections include seven (7) illicit property drain connections, 20 suspected defective laterals, two (2) illicit downspout connections, one (1) illicit sump pump connection, and 38 missing or defective cleanout caps. Additionally, smoke testing revealed smoke was detected in six (6) home interiors/exterior, such as basements and crawl spaces, and one (1) roof. A map detailing the resident addresses can be found in Appendix B.

Resident letters regarding illicit connections shall be sent to the respective homeowners by the Township of Verona.

6.2 Phase 2

Phase 2 includes the required repairs to the sanitary line on Derwent Avenue, which is an easement behind private properties, as well as the sanitary sewer line on Brookside Terrace.

This phase shall include additional CCTV inspection of approximately 400 linear feet of sewer pipe, approximately 3,865 linear feet of chemical root treatment, lining of approximately 2,705 linear feet of 20" sewer pipe, lining of approximately 1,400 linear feet of 30" sewer pipe sanitary sewer, and approximately 30 linear feet of 20" PVC sewer pipe.

The improvements included in Phase 2 of the sanitary sewer upgrades are included in the Township of Verona's 2025 Capital Budget and will be designed during the third (3rd) quarter of 2025. The construction contract for Phase 2 will be awarded to a Contractor following the official bid process.

The construction cost estimate for Phase 2 is \$1,281,00.00 and can be found in Appendix F.

6.3 Phase 3

Phase 3 entails the CCTV testing and lining of sanitary sewers throughout the Township. As per the smoke testing results, suspected defective sewer mains were identified on Fairview Avenue, at the location of Verona Highschool, as well as on Douglas Place, where smoke was seen emanating from the water main valve. Smoke was also seen emanating from the woods on Howell Drive, where an inactive sewer line is suspected. Phase 3 shall include the following:

- Lining of approximately 650 L.F. of 8-inch sanitary sewer.
- Re-connect approximately 12 sewer laterals.
- Cap inactive sewer line on Howell Drive.

The construction cost estimate for Phase 3 is \$267,000.00, and can be found in Appendix G, Exhibit 1.

6.4 Phase 4

Phase 4 includes the required repairs on Hamilton Road, Birdseye Glen, and Montrose Avenue. Phase 4 includes:

- Disconnect four (4) inlets from the sanitary system and reconnect them to the dedicated stormwater system in the street.
- Install approximately 370 linear feet of storm pipe.

The construction cost estimate for Phase 4 is \$294,000.00, and can be found in Appendix G, Exhibit 2.

6.5 Phase 5

Phase 5 includes the required repairs on Derwent Avenue, Cumberland Avenue, Edgemere Road, and Floyd Terrace. Phase 5 includes:

- Disconnect nine (9) inlets from the sanitary system and reconnect them to the dedicated stormwater system in the street.
- Install approximately 395 linear feet of storm pipe.

The construction cost estimate for Phase 5 is \$393,000.00, and can be found in Appendix G, Exhibit 3.

6.6 Phase 6

Phase 6 includes the required repairs on Fellswood Drive, Oakridge Road, Morningside Road and Hillside Avenue. Phase 6 includes:

- Disconnect eight (8) inlets from the sanitary system and reconnect them to the dedicated stormwater system in the street.
- Install approximately 680 linear feet of storm pipe.

The construction cost estimate for Phase 6 is \$493,000.00, and can be found in Appendix G, Exhibit 4.

6.7 Phase 7

Phase 7 includes the required repairs on Lakeview Place, Sunset Avenue, Brookdale Avenue and Claremont Avenue. Phase 7 includes:

- Disconnect nine (9) inlets from the sanitary system and reconnect them to the dedicated stormwater system in the street.
- Installation of approximately 560 linear feet of storm pipe.
- Re-establish one (1) sewer laterals at the Verona Township Park restroom.

The construction cost for Phase 7 is \$509,000.00, and can be found in Appendix G, Exhibit 5.

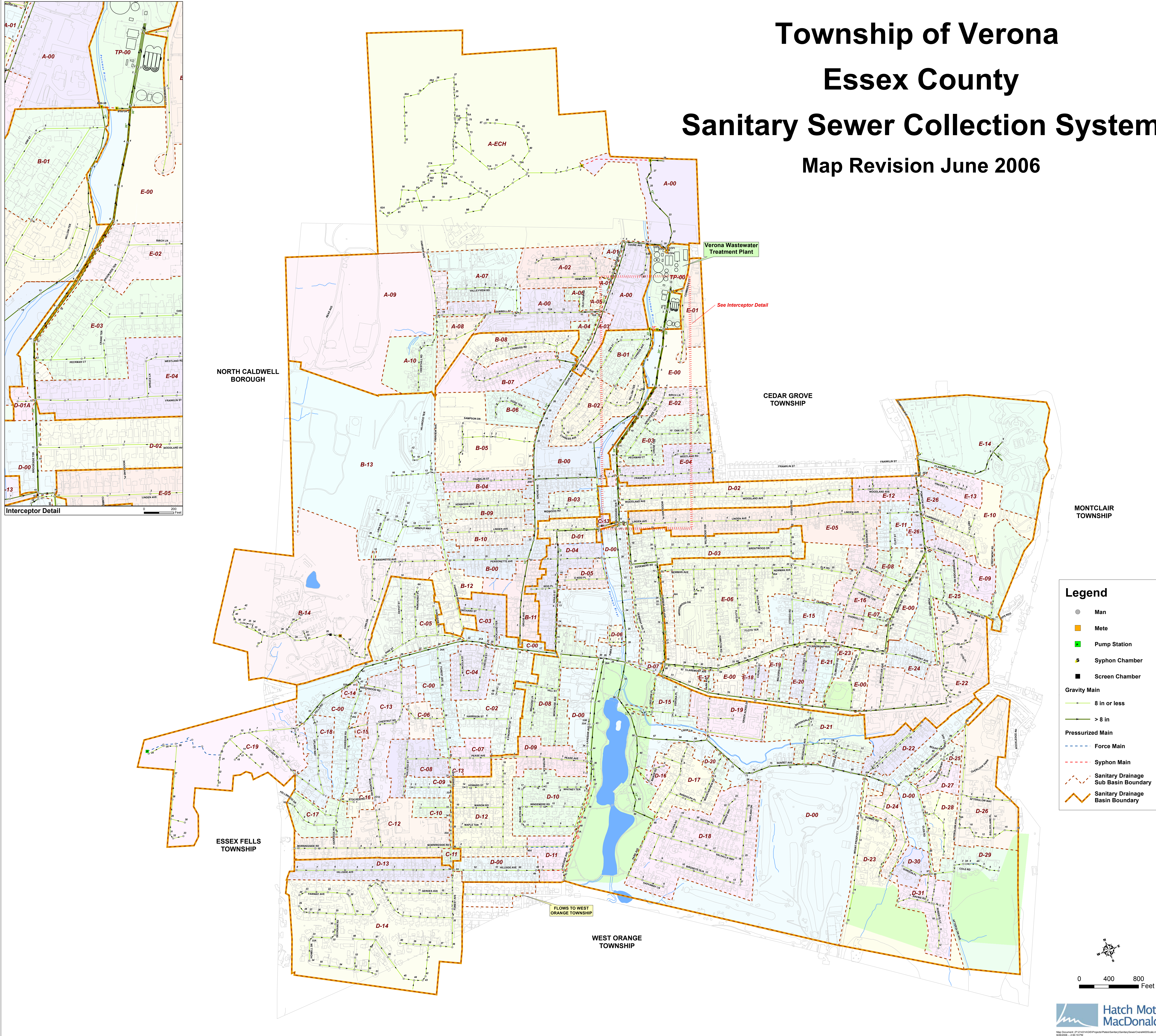
Appendix A. Sanitary Sewer Map

Township of Verona

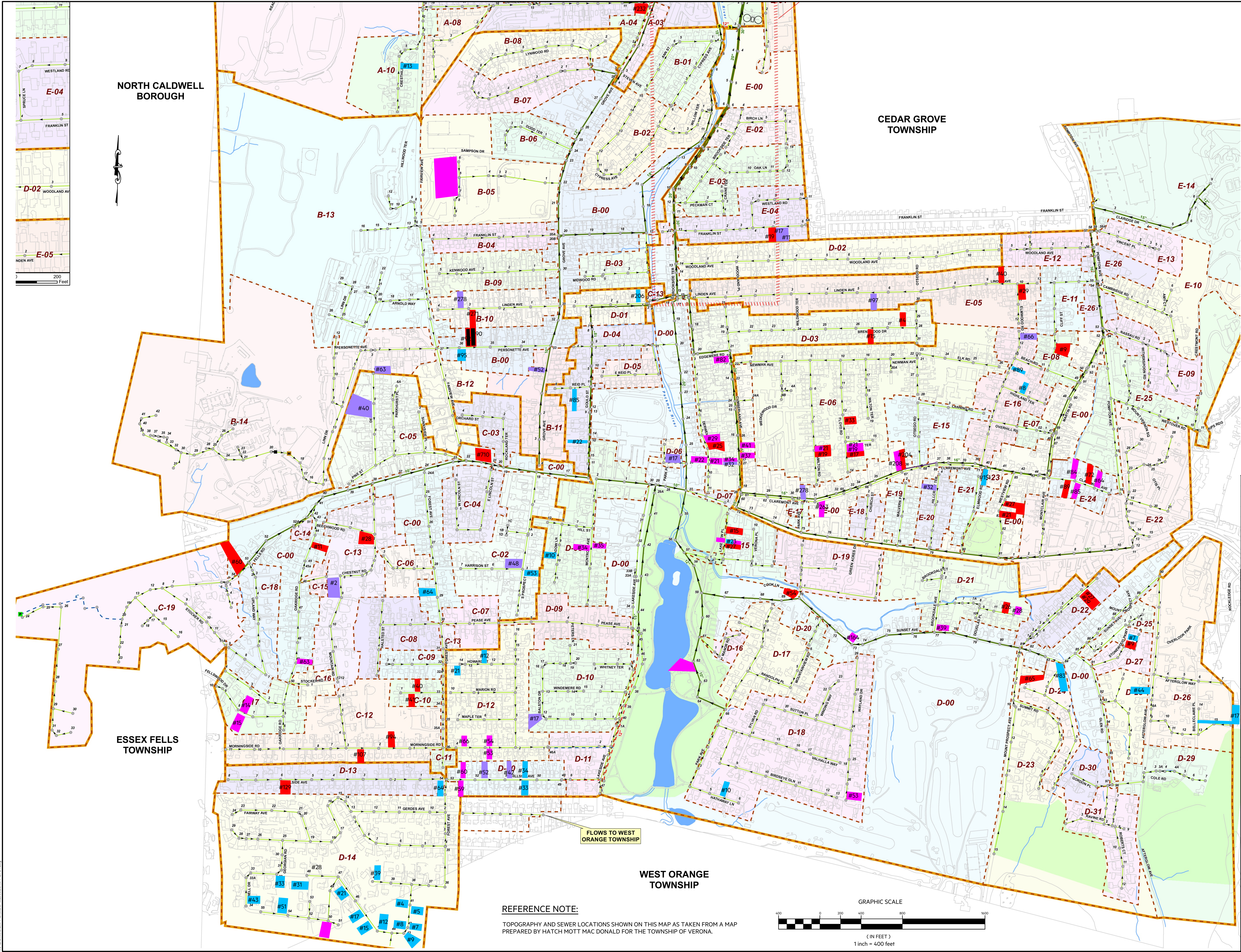
Essex County

Sanitary Sewer Collection System

Map Revision June 2006



Appendix B. Smoke Testing Results



LEGEND

- DEFECTIVE OR MISSING CLEAN OUT CAPS
- RESIDENTIAL DETECTED SMOKE LOCATIONS (IN HOMES)
- ILLICIT RESIDENTIAL CONNECTIONS AND DEFECTIVE LATERALS
- TOWNSHIP DETECTED SMOKE LOCATIONS
- COUNTY DETECTED SMOKE LOCATIONS

NO.	DATE	DESCRIPTION	REVISED BY	CHECKED BY

BOSWELL
330 PHILLIPS AVENUE
SOUTH HAVEN, CT 06488
TEL: (203) 641-0770

PO BOX 57180 MAIN STREET
CHESHIRE, NJ 07004
TEL: (908) 879-6309

17 MOORE AVENUE
ROCKFELLER, NJ 08853
TEL: (609) 466-0002

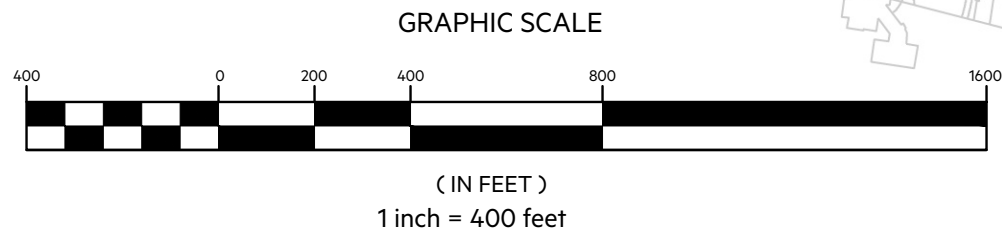
N.J. CERTIFICATE OF AUTHORIZATION No. 24GA27988000

SANITARY SEWER STUDY

SMOKE TESTING RESULTS MAP

TOWNSHIP OF VERONA ESSEX COUNTY NEW JERSEY			
SURVEYED BY:	DESIGNED BY:	DATE:	JOB NO.:
DRAWN BY:	CHECKED BY:	SCALE:	SHEET:
G.K.T.	G.D.	1"=400'	1 OF 1

REFERENCE NOTE:
TOPOGRAPHY AND SEWER LOCATIONS SHOWN ON THIS MAP AS TAKEN FROM A MAP PREPARED BY HATCH MOTT MAC DONALD FOR THE TOWNSHIP OF VERONA.



APPENDIX B, TABLE B-1: TOWNSHIP INTERCONNECTIONS

ADDRESS	UPSTREAM MANHOLE	DOWNSTREAM MANHOLE	DETECTED SMOKE LOCATION
VERONA HIGHSCHOOL	9	5A	SIDEWALK
VERONA PARK RESTROOM	66	27	GROUND IN TWO LOCATIONS
14 FELLSWOOD DRIVE	10	5	CATCH BASIN
15 FELLSWOOD DRIVE	10	5	CATCH BASIN
164 SUNSET AVENUE	74	70	CATCH BASIN
19 FLOYD ROAD	14	10	CATCH BASIN
208 CLAREMONT AVENUE	71	60	CATCH BASIN
21 DERWENT AVENUE	11	17	CATCH BASIN
21 FLOYD ROAD	14	10	CATCH BASIN
21 HAMILTON ROAD	9	5	CATCH BASIN
22 DERWENT AVENUE	11	17	CATCH BASIN
23 LAKEVIEW PLACE	7	4	CATCH BASIN
263 CLAREMONT AVENUE	70	60	CATCH BASIN
28 DOUGLAS PLACE	12	9	WATER MAIN VALVE CAP
29 DERWENT AVENUE	11	17	CATCH BASIN
34 CUMBERLAND AVENUE	18	17	CATCH BASIN
35 MONTROSE AVENUE	6	2	CATCH BASIN
36 MONTROSE AVENUE	6	2	CATCH BASIN
37 CUMBERLAND AVENUE	18	17	CATCH BASIN
39 BROOKDALE AVENUE	5	77	CATCH BASIN
41 CUMBERLAND AVENUE	18	17	CATCH BASIN
53 MORNINGSIDE ROAD	11	2	CATCH BASIN
53 WAYLAND DRIVE	27	24	CATCH BASIN
54 MORNINGSIDE ROAD	11	2	CATCH BASIN
59 HILLSIDE AVENUE	8	54	CATCH BASIN
60 HILLSIDE AVENUE	8	54	CATCH BASIN
63 OAKRIDGE ROAD	1	42	CATCH BASIN
64 CLAREMONT AVENUE	3	85	CATCH BASIN
66 MORNINGSIDE ROAD	11	2	CATCH BASIN
82 CUMBERLAND AVENUE	18	17	CATCH BASIN
84 CLAREMONT AVENUE	3	85	CATCH BASIN
85 CLAREMONT AVENUE	3	85	CATCH BASIN
ACROSS FROM 23 LAKEVIEW PLACE	7	4	CATCH BASIN
ACROSS FROM 61 HOWELL DRIVE	55	50	GROUND IN WOODED AREA

APPENDIX B, TABLE B-2: RESIDENTIAL INTERCONNECTIONS			
SMOKE DETECTED LOCATIONS			
ADDRESS	UPSTREAM MANHOLE	DOWNSTREAM MANHOLE	DETECTED SMOKE LOCATION (NON-ILICIT CONNECTIONS)
11 FRANKLIN STREET	6A	13	BATHROOM IN BASEMENT
17 BALSTON DRIVE	20	1	TOILET IN BASEMENT
17 FRANKLIN STREET	6A	13	SINK IN BASEMENT
17 PARK PLACE	3	26	TOILET INSIDE HOME
2 MOUNTAIN ROAD	13	8A	TOILET ON FIRST FLOOR OF HOME
278 CLAREMONT AVENUE	70	60	TOILET IN BASEMENT
278 LINDEN AVENUE	4	31	BATHROOM IN BASEMENT
32 CUMBERLAND AVENUE	18	17	TOILET IN BASEMENT
32 HILLCREST TERRACE	4	1E	TOILET IN BASEMENT
40 DEPOT STREET	10	7	SHOWER IN BASEMENT
42 HILLSIDE AVENUE	8	54	BATHROOM IN BASEMENT
48 SOUTH PROSPECT STREET	5	18	SHOWER DRAIN INSIDE HOME
52 GROVE AVENUE	4	20B	TOILET INSIDE HOME
52 HILLSIDE AVENUE	8	54	BATHROOM ON FIRST FLOOR OF HOME
63 DEPOT STREET	10	7	KITCHEN SINK INSIDE HOME
66 ELMWOOD ROAD	13	71	TOILET IN BASEMENT
97 LINDEN AVENUE	11	2A	UPSTAIRS BATHROOM
ADDRESS	UPSTREAM MANHOLE	DOWNSTREAM MANHOLE	DETECTED SMOKE LOCAITON (ILICIT CONNECTIONS AND DEFECTIVE LATERALS)
10 HATHAWAY LANE	6	4	CLEANOUT CAP
129 HILLSIDE AVENUE	8	54	GUTTERS
15 BRENTWOOD DRIVE	29	19	BASEMENT
15 LAKEVIEW PLACE	7	4	BROKEN LATERAL
17 FLOYD ROAD	14	10	FRONT STEPS
19 FRANKLIN STREET	6A	13	BASEMENT
19 HAMILTON ROAD	9	5	GROUND IN FRONT YARD
21 HAMILTON ROAD	9	5	DRAINAGE PIPE IN RETAINING WALL
21 WESTVIEW ROAD	85	81	RETAINING WALL
232 GROVE AVENUE	4	20B	TRENCH DRAIN IN DRIVEWAY
25 DERWENT AVENUE	11	17	GUTTERS
26 DOUGLAS PLACE	12	9	ROOF OF HOME
27 MOUNT PROSPECT AVENUE	11	81	GROUND IN FRONT YARD ALONG SIDEWALK
27 WESTVIEW ROAD	85	81	RETAINING WALL
271 LINDEN AVENUE	4	31	GROUND NEAR FLOWER BEDS
28 CHESTNUT ROAD	8	38	BASEMENT
29 LINDEN AVENUE	11	2A	BASEMENT
29 MOUNT PROSPECT AVENUE	11	81	GROUND IN FRONT YARD ALONG WALKWAY
33 FLOYD ROAD	14	10	GROUND ALONG FRONT STEPS
4 BRENTWOOD DRIVE	29	19	BASEMENT
40 LINDEN AVENUE	11	2A	BASEMENT
54 PARK AVENUE (KIMBERLY GARDENS)	11	9	PIPE IN RETAINING WALL DISCHARGING TO RIVER OUTFALL
60 FELL'S ROAD	23	41	GROUND IN FRONT YARD
65 MOUNT PROSPECT AVENUE	3	7	CATCH BASIN ON PROPERTY
710 BLOOMFIELD AVENUE	41	16	CATCH BASIN BASIN ON PROPERTY
72 CLAREMONT AVENUE	3	85	SUMP PUMP
9 CLIFF STREET	3	1A	GROUND IN FRONT OF RETAINING WALL
9 STONEWOOD PARKWAY	4	91	CATCH BASIN IN BACK YARD
90 PERSONETTE AVENUE	37	33	EXPOSED DRAINAGE PIPE IN FRONT LAWN AND GROUND IN FRONT LAWN
94 MORNINGSIDE ROAD	11	2	GROUND SMOKING FROM CORED HOLE IN DRIVEWAY
10 MEADOW LANE	11	8	CLEANOUT CAP
12 HOWARD STREET	14	11	CLEANOUT CAP IN BASEMENT
12 HOWELL DRIVE	48	38	CLEANOUT CAP
13 CRESTHILL ROAD	8	4	CLEANOUT CAP
15 HOWELL DRIVE	48	38	CLEANOUT CAP
151 CLAREMONT AVENUE	3	80	CLEANOUT CAP
17 BELLECLAIRE PLACE	14	13	CLEANOUT CAP
17 HOWELL DRIVE	48	38	CLEANOUT CAP
206 LINDEN AVENUE	3	1	CLEANOUT CAP
21 HOWARD STREET	14	11	CLEANOUT CAP
21 HOWELL DRIVE	48	38	CLEANOUT CAP
22 GOULD STREET	11	3	CLEANOUT CAP
23 LAKEVIEW PLACE	7	4	CLEANOUT CAP
3 OLD FARM ROAD	1	11	CLEANOUT CAP
31 HOWELL DRIVE	48	38	CLEANOUT CAP
33 HILLSIDE AVENUE	8	54	CLEANOUT CAP
33 HOWELL DRIVE	34	32	CLEANOUT CAP
34 HILLSIDE AVENUE	8	54	CLEANOUT CAP
39 CUNNINGHAM ROAD	40	38	CLEANOUT CAP
4 HOWELL DRIVE	48	38	CLEANOUT CAP
43 HOWELL DRIVE	34	32	CLEANOUT CAP
44 AFTERGLOW AVENUE	93	1	CLEANOUT CAP
5 HOWELL DRIVE	48	38	CLEANOUT CAP
51 HOWELL DRIVE	55	50	CLEANOUT CAP
53 SOUTH PROSPECT STREET	5	18	CLEANOUT CAP
64 FOREST AVENUE	30	24A	CLEANOUT CAP
67 HILLSIDE AVENUE	8	54	CLEANOUT CAP
7 HOWELL DRIVE	48	38	CLEANOUT CAP
7 STONEWOOD PARKWAY	7	4	CLEANOUT CAP
8 HIGHLAND TERRACE	8	6B	CLEANOUT CAP

8 HOWELL DRIVE	48	38	CLEANOUT CAP
83 SUNSET AVENUE	2	84	CLEANOUT CAP
85 REID PLACE	8	6A	CLEANOUT CAP
89 ELMWOOD ROAD	13	71	CLEANOUT CAP
9 HOWELL DRIVE	48	38	CLEANOUT CAP
95 PERSONETTE AVENUE	37	33	CLEANOUT CAP
37 MONTROSE AVENUE	N/A	2	CLEANOUT CAP
11 OAKRIDGE ROAD	1	42	SIDEWALK
27 LAKEVIEW PLACE	7	4	SIDEWALK
40 MARION ROAD	1	33	SIDEWALK
41 MARION ROAD	1	33	SIDEWALK
107 MORNINGSIDE	11	2	GROUND BETWEEN SIDEWALK AND ROAD
92 PERSONETTE AVENUE	37	33	GROUND BETWEEN SIDEWALK AND ROAD
204 CLAREMONT AVENUE	71	60	SIDEWALK
89 CLAREMONT AVENUE	3	85	SIDEWALK

Appendix C. Verona Municipal Sewer Regulations

§ 519-39. Definitions.

For the purposes of this article, unless the context specifically indicates otherwise, the meanings of the following terms shall be as follows:

BIOCHEMICAL OXYGEN DEMAND (BOD) — The quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five days at 20° C. expressed in milligrams per liter (mg/l).

BRANCH CONNECTION — A T or W attached to or built in a public sewer to a building sewer.

BUILDING DRAIN — That part of the lowest horizontal piping of a drainage system which receives the discharge from soil and waste pipes inside the walls of the building and conveys it to the building sewer beginning at the outside face of the building wall.

BUILDING SEWER — The extension from the building drain to the branch connection at the public sewer or other place of disposal, also known as the "building lateral."

COLLECTOR OF SEWER FEES — The Collector-Treasurer as appointed by the Township Council of the Township of Verona or his duly authorized deputy, agent or representative.

COMBINED SEWER — A sewer in which both surface runoff or stormwater and sewage are received.

COMMERCIAL OR INDUSTRIAL USER — Any business, industry, store, restaurant or office, and shall include any single-family residential dwelling having a business or business office located therein if both the residential use and the business or office use are served by the same water meter.

EQUIVALENT CONNECTION — A standard unit of sewer use applicable to a single-family residential user, as defined in this chapter, based upon the averaged gallons per day (GPD) of metered water consumption for a single-family residential dwelling and established as being 220 GPD.

GARBAGE — Solid wastes from the preparation, cooking and disposing of foods and from the handling, storage and sale of produce.

HEALTH OFFICER — The duly appointed Health Officer of the Township of Verona.

INDUSTRIAL WASTES — The wastewater from industrial processes, trade, businesses as distinguished from domestic or sanitary wastes.

INSTITUTIONAL USER — Any school, church, hospital or correctional facility or building, whether publicly or privately owned, but shall not include any facility or building owned or operated by the Township of Verona. **[Amended 4-6-1998 by Ord. No. 5-98]**

MULTIFAMILY RESIDENTIAL USER — Any apartment building or multifamily house or building, including buildings under cooperative or condominium form of ownership, in which more than one dwelling unit is served by a single water meter.

OPERATOR — The licensed operator of the sewage treatment plant duly appointed by the Township Council of the Township of Verona.

PERSON — Any individual, firm, company, association, society, corporation or group.

pH — The logarithm of the reciprocal of hydrogen ions in grams per liter of solution.

PUBLIC SEWER — A sanitary sewer to which all owners of abutting properties have equal rights and which is controlled and maintained by a governmental agency or public authority.

SANITARY SEWER — A sewer which carries sewage and in which stormwater, surface water and groundwaters are not permitted to enter and flow.

SEWAGE — A combination of the water-carried wastes from any buildings or structures; also referred to as "wastewater."

SEWAGE TREATMENT PLANT — Any arrangement of mechanical, biological or chemical devices or structures used for treating sewage.

SEWER — A pipe or conduit for carrying sewage.

SINGLE-FAMILY RESIDENTIAL USER — Any single-family residence, house, dwelling, condominium unit or townhouse unit which is served by a single separate water meter.

SLUG — Any discharge of water or wastewater which in concentration of any given constituent or in quantity of flow exceeds, for any period of duration longer than 15 minutes, more than five times the average twenty-four-hour concentration or flows during normal operation and/or adversely affects the collection system and/or performance of the wastewater treatment plant.

STORM SEWER or STORM DRAIN — A pipe or conduit for conveying water, groundwater, subsurface water or unpolluted water from any source.

SUPERINTENDENT — The Superintendent of the Sewage Treatment Plant, duly appointed by the Township Council of the Township of Verona.

SUSPENDED SOLIDS — Solids that either float on the surface of or are in suspension in water, sewage or other liquids and which are removable by laboratory filtering.

TOWNSHIP ENGINEER — The duly appointed Engineer of the Township of Verona.

WATERCOURSE — A natural or artificial channel for the passage of water, either continually or intermittently.

§ 519-40. Connection required.

The owners of all houses, buildings, public buildings or properties used for human occupancy, employment or recreation or other purposes, situated within the Township and abutting on, or having a permanent right of access to, any street, alley or right-of-way in which there is now located or may in the future be located a public sanitary sewer of the Township, are hereby required at their expense to install suitable toilet facilities therein and to connect such facilities directly with the proper public sewer in accordance with the provisions of this chapter, within 60 days after the date of the official notice from the Township of Verona to do so, provided that said public sewer is within 100 feet of any property line or right of access. The sewer service charge for the use of the sewer shall begin 30 days after the date of the official notice as set forth above.

§ 519-41. Permits; rules.

- A. It shall be unlawful to install any building sewer or to make any connection to the public sewer without first obtaining a building sewer permit, and such installations and connections shall be made under the direction and supervision of the Township Engineer in the manner

hereinafter set forth.

- B. The fee for all building sewer permits shall be as set forth in Chapter A565, Fees. **[Amended 4-6-1998 by Ord. No. 5-98]**
- C. The owner or his agent shall make application on a form furnished by the Township. The permit applications shall be supplemented by any plans, specifications or other information considered pertinent in the judgment of the Township Engineer or required by state law.
- D. Permits will expire four weeks after date of issue but will be subject to renewal for a further period of four weeks.
- E. Where the building sewer has been extended by the Township from main or lateral to the curb or property line, the following rules shall apply:
 - (1) After securing the building sewer permit, the applicant shall notify the Township Engineer when the excavation is made and the pipe is installed and connected. No backfill is to be placed without the written permission of the Township Engineer.
- F. Where the building sewer has not been extended by the Township from main or lateral to the curb or property line, the following rules shall apply:
 - (1) The applicant shall secure a building sewer permit and pay the required fee.
 - (2) The applicant shall do all of the excavation required, supply all of the materials and do all of the work.
 - (3) The applicant shall notify the Township Engineer 24 hours before the excavation is ready for the installation of the branch connection.
 - (4) After the inspection by the Township Engineer, the work shall be completed by the applicant.
 - (5) The street opening fee, backfilling and repaving shall be as required under Chapter 460, Streets and Sidewalks.
- G. The joint made between the building sewer and the building drain shall be secure and watertight. Standard fittings, approved by the Township Engineer and/or the Plumbing Inspector, shall be used for this joint.
- H. All excavations for building sewer installations shall be adequately guarded with barricades and lights so as to protect the public from hazard.
- I. It shall be the duty of the Township Engineer when notified to inspect the installation of any branch connection or building sewer, to determine whether the same complies with all of the provisions hereof and any other ordinances, the enforcement of which is within his jurisdiction. When he is satisfied that the installation complies with the aforesaid requirements, he shall evidence his written approval on the permit.
- J. All costs and expenses incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the Township of Verona from any loss or damage that may indirectly or directly be occasioned by the installation of the building sewer.

In order to guarantee and protect the Township of Verona for any loss or damage that may indirectly or directly occur by the installation of said building sewer from the main to the curb or property line or the excavation for the installation of any branch connection or any other work, the owner or his agent shall post with the Township of Verona a performance bond in the amount of \$5,000 to guarantee the payment of any damage which may occur to the property of the Township of Verona; such performance bond shall be written by a surety company authorized to do business in the State of New Jersey and approved by the Township Council of the Township of Verona and shall be posted with the Township of Verona prior to the issuance of the building sewer permit.

- K. A separate and independent building sewer shall be provided for every building except where one building stands at the rear of another on an interior lot and the rear building is an accessory use as established under Chapter 150, Zoning, and while both buildings remain under the same ownership.
- L. Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the Township Engineer and/or Plumbing Inspector, to meet all the requirements of this chapter.
- M. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sewage carried by such drain shall be lifted by a sewage ejector.

§ 519-42. Meters and measuring devices.

All meters or other measuring devices installed or required to be used under the provisions of this chapter shall be under the control of the Township and of a type specified by the Township and shall be installed by the owner at the owner's expense. The owner of the property upon which any such measuring device is installed shall be responsible for its maintenance and safekeeping, and all repairs thereto shall be made at the owner's cost, whether such repairs are made necessary by ordinary wear and tear or other causes. Costs for such repairs, if made by the Township, shall be due and payable at the same time, collected in the same manner and be subject to the same penalties as are the charges for sewer use.

§ 519-43. Tampering with system equipment.

No person shall break, damage, destroy, uncover, deface or tamper with any structure, appurtenance or equipment which is part of the Township of Verona sewage disposal system.

§ 519-44. Use restrictions.

- A. No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, swimming pool or pond water or cooling water to any sanitary sewer.
- B. Except as hereinafter provided, no person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewer:
 - (1) Explosive wastes. Wastes which create fire or explosive hazard to the treatment plant, collection system or the operation of the system. Prohibited materials include, but are

not limited to, gasoline, kerosene, naphtha, benzene, toluene, xylene and ethers. Materials that flash below 90° using the Pensky-Martens closed tester (ASTM-D93-80) are prohibited.

- (2) Corrosive wastes. Wastes which will cause corrosion or deterioration of the treatment plant or collection system. All wastes shall have a pH not less than 5.5 or greater than 9.5.
- (3) Solids and viscous wastes. Solids or viscous wastes in amounts which would cause obstruction to the flow in a sewer or otherwise interfere with the proper operation of the treatment plant. Prohibited materials include, but are not limited to, uncomminuted garbage, bones, hides or fleshings, cinders, sand, glass, ashes, mud, straw, shavings, metal, rags, feathers, offal, plastics, wood, paunch manure, hair, entrails, lime residues, beet or distillery slops, chemical slops, chemical residues, paint or ink residues, cannery waste bulk solids, antibiotic wastes, free mineral acid, concentrated pickling wastes or plating solutions or any other solid or viscous substance capable of causing obstruction to the flow or other interference with the proper operation of the Township of Verona's sewerage treatment plant system.¹
- (4) Noxious materials. Noxious or malodorous compounds which, either singly or by interaction with other wastes, are capable of creating a public nuisance or hazard to life or are or may be sufficient to prevent entry into a sewer for its maintenance or repair.
- (5) Radioactive wastes. Radioactive wastes or isotopes of such half-life or concentration that they do not comply with regulations or orders issued by the appropriate authority having control over their use and which will, or may, cause damage or hazards to the treatment plant or personnel operating the system.
- (6) Interference. Any waste, including oxygen-demanding wastes, released at a flow rate or concentration which will cause interference with the Verona treatment plant or with disposal of the sludge resulting from the treatment process.
- (7) Excessive discharge rate. Industrial wastes discharged in a slug of adequate volume or strength to cause a treatment process upset or loss of treatment plant efficiency.
- (8) Heat. Any discharge which contains heat in amounts which could inhibit biological activity in the treatment process or cause loss of treatment efficiency or cause the temperature of the influent to the Verona treatment plant to exceed 104° C.
- (9) Unpolluted wastes. Any unpolluted water, including but not limited to cooling water or uncontaminated stormwater, which will increase the hydraulic load on the treatment plant.
- (10) Dilution water. Any water added for the purpose of diluting wastes which would otherwise exceed applicable maximum concentration limits.
- (11) Violations. Wastes which cause the Verona Treatment Plant to violate its New Jersey

1. Editor's Note: Former § 146-43B(4) of the 1981 Code, Garbage or refuse, which previously followed this subsection, was repealed 10-21-1996 by Ord. No. 12-96.

Pollutant Discharge Elimination System permit, applicable receiving water standards, permit regulating sludge disposal or any other permit issued to the Township of Verona sewerage treatment plant.

- (12) Extremely hazardous wastes. Those wastes designated by the United States Environmental Protection Agency as sufficiently toxic that they shall not be discharged to a sanitary sewer in any concentration.
- (13) Septic tank or cesspool wastes will not be accepted.
- (14) Slug. Any discharge of water or wastewater which in concentration of any given constituent or in quantity of flow exceeds, for any period of duration longer than 15 minutes, more than five times the average twenty-four-hour concentration or flows during normal operation and/or may adversely affect the collection system and/or performance of the wastewater treatment works.
- (15) Any wastewater which contains total dissolved sulfides in excess of:
 - (a) Two-tenths milligrams per liter where the discharge's point of connection to the system is a gravity sewer line; or
 - (b) Four-tenths milligrams per liter where the discharge's point of connection to the system is a pressure of force main.
- (16) Any water or wastes containing toxic or poisonous substances in such concentration either singly or by interaction with other wastes as to constitute a hazard to humans or animals, or to interfere with any sewage treatment process, or to create any hazard in the receiving waters of the sewage treatment plant.
- (17) Any high strength waste or special waste.
- (18) Any water or waste which may contain soluble oil or grease or any water containing floatable fats, oils, greases or other substances in sufficient concentrations that might solidify and/or cause to solidify or become viscous at temperatures between 32° F. and 150° F. (0° C. and 65° C.).
- (19) Any concentrated dye wastes, spent tanning solutions or other wastes which are highly colored or wastes which are of usual volume, concentration of solids or composition that may create obstruction to the flow in sewers or other interference with the proper operation of the system or the quality of the effluent from the system.
- (20) Concentration and characteristics.
 - (a) Any waters containing suspended solids of such character and quantity that unusual provision, attention or expense is required to handle such materials at the sewage treatment plant.

Characteristics	Item	Limitation
Temperature	Maximum	110°
pH	Allowable range	5.5 to 9.0
Biochemical oxygen demand (BOD)	5-day maximum	220 mg/l
Suspended solids	Maximum	220 mg/l
Color	Maximum	220 co. pt. units
Nitrogen	Maximum	40 ppm
Phosphorus	Maximum	15 ppm

- (b) The above-listed concentrations and characteristics may be altered by the Township of Verona's sewage treatment plant as required by regulatory agencies, treatment or reuse requirements or in the event of cumulative overload of the system.
- (c) Maximum allowable concentrations. Users not subject to categorical standards shall not exceed following limits:

Item	Mg/l
Acetylene generation sludge	None
Arsenic	1.0
Barium	4.2
Cadmium	0.1
Chromium (total)	8.0
Copper	8.0
Cyanide	0.1
Iron (total)	5.0
Lead	0.5
Mercury	0.1
Mineral acid (free)	None
Nickel	1.0
Nitrous oxide 10.0	10.0
Oils, minerals	15.0
Selenium	0.05
Silver	0.03

Item	Mg/l
Sulphur dioxide	0.4
Zinc	8.0

(21) No person shall discharge or cause to be discharged stormwater, surface water and groundwater roof runoff, subsurface drainage, swimming pool or pond water or cooling water into a sewer which carries sewage through the use of a basement sump pump, or by any other water removal device or means. **[Added 8-8-2022 by Ord. No. 2022-23]**

C. Grease, oil and sand interceptors.

- (1) Grease, oil and sand interceptors shall be provided when necessary, in the opinion of the Township Engineer, for the proper handling of liquid wastes containing grease in excessive amounts or any flammable wastes, sand and other harmful ingredients. Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight and equipped with easily removable covers which, when bolted in place, shall be gastight and watertight.
- (2) Where installed, all grease, oil and sand interceptors shall be maintained by the owner, at his expense, in continuously efficient operation at all times.

§ 519-45. Sewer extensions.

- A. Extensions of the public sewer lines shall be by and at the expense of the person making the extension. He shall submit complete plans and specifications prepared by a qualified licensed professional engineer, of the extension that is contemplated, to the Township Engineer, along with an application for a sewer extension permit, the fee for which is included in Chapter A565, Fees, to be paid to the Township of Verona when the application is made. **[Amended at time of adoption of Code (see Ch. 1, General Provisions, Art. I)]**
- B. The applicant shall proceed with the construction of the sewer extension as shown on the approved plans, and all of his work shall be subject to the inspection and approval of the Township Engineer. No work shall be covered or backfilled without the approval of the Township Engineer.
- C. In addition to the sewer extension permit fee provided for in this section, the applicant or the user of the sewer shall secure a building sewer permit for each connection to the extension and shall pay the fee provided for under this chapter.
- D. Any permit for sewer extension shall expire at the end of six months from the date of issue. Such permit may be extended by the Township Engineer for an additional six months if, in his opinion, such an extension is in the interest of the Township.

§ 519-46. Power and authority of inspectors.

The Township Engineer and other duly authorized employees of the Township bearing proper credentials and identification shall be permitted to enter in and upon all buildings, structures

and properties for the purpose of inspection, observation, measurement, sampling and testing in accordance with the provisions of this chapter.

§ 519-47. Sewer connection fees.

A. Fee established.

(1) There shall be a connection fee payable to the Township of Verona for all buildings, structures or premises which shall hereafter be connected to the Township sanitary sewer system. The amount of the connection fee for any building, structure or premises shall be determined by the number of equivalent connections assigned to the building, structure or premises to be connected, in accordance with the following standards:

(a) Single-family detached residential buildings: one equivalent connection.²

(b) All other buildings: Equivalent connections shall be determined by the Township Engineer based upon projected daily sewer use flows by applying design flow standards promulgated by the New Jersey Department of Environmental Protection, as amended and supplemented. The projected daily sewer use flow shall be divided by 220 gallons, and the resulting quotient shall be the number of equivalent connections assigned to the building, structure or premises.

(2) The fee for each equivalent connection shall be as set forth in Chapter A565, Fees, of the Verona Code as may be from time to time amended by the Verona governing body.

B. Connection fees shall be due and payable to the Township at such time as a building sewer permit is issued for connection to the sanitary sewer system. **[Amended 7-15-2002 by Ord. No. 7-2002]**

C. In the event of a change in the use of any building, structure or premises resulting in an increase in projected daily sewer use flows, the Township Engineer shall determine the increase in the equivalent connections assigned to such building, structure or premises and there shall be an additional connection fee payable to the Township equal to the increase in equivalent connections multiplied by the fee for each sewer connection fee per equivalent connection as set forth in Chapter A565. **[Added 7-15-2002 by Ord. No. 7-2002]**

§ 519-48. Sewer user charges. [Amended 4-6-1998 by Ord. No. 5-98; 6-5-2017 by Ord. No. 2017-14; 1-8-2017 by Ord. No. 2017-29]

There is hereby established an annual sewer user charge for use of the public sanitary sewer of the Township of Verona. Such annual charges shall be payable to the Township by the owner of any building or premises connected to the Township sanitary sewer and shall be payable in the amount and in the manner prescribed hereunder.

A. Single-family residential users. The annual charge for a single-family residential user shall be equal to the charge for one equivalent connection as set forth in Chapter A565, Fees.

2. Editor's Note: Former § 146-46A(1)(b) of the 1981 Code, regarding other residential buildings, which previously followed this subsection, was repealed 7-15-2002 by Ord. No. 7-2002.

- B. Two-family residential dwelling users. The annual charge for a two-family residential dwelling user shall be the charge of 1.4 equivalent connections as set forth Chapter A565, Fees.
- C. All other multifamily residential users. The annual charge for all other multifamily residential users other than single-family residential users and two-family residential dwelling users shall be calculated by summing the total number of bedroom equivalent dwelling units (EDUs) in the dwelling, rounding to the nearest half number and multiplying by the annual sewer user charge as set forth in Chapter A565, Fees. The bedroom EDUs shall be as follows:
 - (1) Studio or one-bedroom unit shall be equivalent to 0.75 EDU.
 - (2) Two-bedroom unit shall be equivalent to 0.90 EDU.
 - (3) Three or more bedrooms shall be equivalent to 1.0 EDU.
- D. Institutional users. The annual charge for institutional users of the Township sanitary sewer shall be an amount equal to the fee for one equivalent connection as established under Chapter A565, Fees, multiplied by the number of equivalent connections chargeable to the sewer user as determined by the Tax Collector in accordance with the method prescribed under Subsection E hereof.
- E. For all users of the Township sanitary sewer, except single-family residential users, two-family residential dwelling users, and all other multifamily residential users, the Tax Collector shall determine the daily average gallons per day (DGPD) of metered water consumption by the sewer user by using the total consumption of metered water used for the previous year or previous four quarters divided by the number of days of metered consumption. The daily averaged gallons per day (DGPD) of metered water consumption for a single-family residential dwelling unit as being established as 220 GPD/EDU. The daily average gallons per day (DGPD) usage shall be then divided by 220 GPD/EDU to determine the users equivalent dwelling unit (EDU) for billing purposes. The resulting quotient rounded to the nearest whole number shall constitute the number of equivalent connections (EDU). In no event shall the number of equivalent connections (EDU) chargeable to such user be less than one equivalent unit.

§ 519-49. Establishment of rates and charges. [Added 7-15-2002 by Ord. No. 7-2002]

Rates and charges payable to the Township of Verona for sewer connection fees, sewer user charges, and for services provided pursuant to this chapter shall be as set forth in Chapter A565, Fees. The Township governing body shall annually review such fees and charges as provided by law.

Appendix D. Sample Resident Notice

TOWNSHIP OF VERONA
COUNTY OF ESSEX, NEW JERSEY

TOWNSHIP MANAGER
KEVIN O'SULLIVAN

TOWNSHIP CLERK
JENNIFER KIERNAN



DEPUTY MANAGER

TOWNSHIP ATTORNEY
BRIAN J. ALOIA, ESQ.

VERONA COMMUNITY CENTER
880 BLOOMFIELD AVENUE
VERONA, NEW JERSEY 07044

MUNICIPAL BUILDING
600 BLOOMFIELD AVENUE
VERONA, NEW JERSEY 07044

(973) 239-3220
www.veronanj.org

DEPARTMENT OF PUBLIC WORKS
10 COMMERCE COURT
VERONA, NEW JERSEY 07044

July XX, 2025

Recipient Name
XXX Brentwood Drive
Verona, NJ 07044

Re: Illicit Sanitary/Storm Connection
XXX Brentwood Drive
Block X, Lot X
Township of Verona
Essex County, New Jersey
Our File No. VA-181

Dear Property Owner:

The Township of Verona inspected the sanitary sewer system located along Brentwood Drive in August 2024. The results of the inspection indicate smoke coming out of your basement, which may indicate an illicit storm connection between the basement of your home at XXX Brentwood Drive and the Township's sanitary sewer system. You are required to take an appropriate measure to further investigate this connection and, as necessary, properly disconnect from the sanitary sewer system and make a connection to the storm sewer system in accordance with New Jersey State Statutes and Verona's Municipal Sewer Regulations, Article IV. Photo documentation of the inspection is attached.

Please contact Chuck Molinaro, the Superintendent of the Township's Department of Public Works via phone at 973-857-4806 or email at cmolinaro@veronanj.org for information required to address this issue. If you should have any additional questions, please contact this office. Please provide a response to the Department of Public Works within 60 days from the date of this letter.

Very truly yours,

Kevin O'Sullivan
Township Manager

Appendix E. Derwent Avenue Sanitary Sewer Recommendations



BOSWELL
330 PHILLIPS AVENUE, SOUTH HACKENSACK, NJ 07606
P. 201-641-0770 | F. 201-641-1831
Sanitary Sewer Pipe Video Review & Recommendations
Township of Verona
Essex County, New Jersey

Prepared by: JH

File No: VA-155
Date: 10/15/2024

START MH	END MH	FLOW DIRECTION	STREET	MATERIAL	DIAMETER (IN.)	TOTAL LENGTH (FT.)	SURVEYED LENGTH (FT.)	INSPECTION NOTES	RECOMMENDATION
24	23	Upstream	Derwent Ave	VCP	20	UNKNOWN	28.5	Roots throughout pipe, survey abandoned, camera could not pass large root ball at 28.5 ft	Video and clean rest of pipe, root treat entire pipe and line entire pipe.
23	22	Upstream	Derwent Ave	VCP	20	190	12.5	Roots throughout pipe, pipe egging for first 35 ft of pipe, as well as from 170 ft to 190 ft.	Root treat entire pipe, point repair from 0' to 35' of 20" HDPE and point repair from 160' to 190' of 20" HDPE.
20	18	Upstream	Derwent Ave	VCP/PVC	20	UNKNOWN	61.3	Roots throughout pipe, survey abandoned, camera could not pass roots at joints.	Video and clean rest of pipe. Root treat entire pipe and line pipe.
18	17	Upstream	Derwent Ave	PVC	20	50	50	No issues	No issues
17	16	Upstream	Derwent Ave	VCP/PVC	20	11.1	11.1	No issues	No issues
16	15	Upstream	Derwent Ave	VCP	20	43.7	43.7	No issues	No issues
13	15	Downstream	Brookside Ter	PVC	20	UNKNOWN	16.4	Water level was too high, survey abandoned	Video and clean rest of pipe.
13	11?	Upstream	Brookside Ter	VCP	30	UNKNOWN	132.3	Roots throughout pipe, camera could not pass roots, survey abandoned.	Video and clean rest of pipe, root treat entire pipe and line entire pipe.
11	12	Upstream	Brookside Ter	VCP	30	220	220	Roots throughout pipe.	Root treat and line entire pipe.
20	22	Downstream	Derwent Ave	VCP	20	UNKNOWN	6.1	Roots throughout pipe, camera could not pass roots, survey abandoned.	Video and clean rest of pipe, root treat entire pipe and line entire pipe.
14	12	Upstream	Brookside Ter	VCP	20	310.1	310.1	Roots throughout pipe, minor egging of pipe at 224.5 ft.	Root treat and line entire pipe.
12	10	Upstream	Brookside Ter	VCP	30	182	182	Roots throughout pipe.	Root treat and line entire pipe.
11	10	Upstream	Brookside Ter	VCP	20	263.5	263.5	Roots throughout pipe.	Root treat and line entire pipe.
10	9	Upstream	Brookside Ter	VCP	20	221.6	221.6	Roots throughout pipe.	Root treat and line entire pipe.



330 PHILLIPS AVENUE, SOUTH HACKENSACK, NJ 07606

P. 201-641-0770 | F. 201-641-1831

Sanitary Sewer Pipe Video Review & Recommendations

Township of Verona
Essex County, New Jersey

Prepared by: JH

File No: VA-155

Date: 10/15/2024

START MH	END MH	FLOW DIRECTION	STREET	MATERIAL	DIAMETER (IN.)	TOTAL LENGTH (FT.)	SURVEYED LENGTH (FT.)	INSPECTION NOTES	RECOMMENDATION
9	8	Upstream	Brookside Ter	VCP	20	249.5	249.5	Roots and grease throughout pipe.	Root treat and line entire pipe.
8	6	Upstream	Brookside Ter	VCP	20	196.7	196.7	Roots and grease throughout pipe.	Root treat and line entire pipe. Point repair of 20 20 LF of 20" PVC from 120-140 ft from MH 8 (or7?) to MH 6.
6	5	Upstream	Brookside Ter	VCP	20	256.7	256.7	Roots and grease throughout pipe.	Root treat and line entire pipe.
5	4	Upstream	Brookside Ter	VCP	20	260	260	Roots throughout pipe. Pipe broken at 11.5 ft.	Root treat and line entire pipe. Point repair of 10 ft of 20" HDPE from 5-15 ft from MH 5 to MH 6.
3	4	Downstream	Brookside Ter	VCP	30	252	252	Roots throughout pipe.	Root treat and line entire pipe.
1	2	Upstream	Brookside Ter	VCP	30	235.7	235.7	Minor cracking at various spots, pipe section broken, soil visible.	Line pipe if needed.
1	Tank	Upstream	Brookside Ter	VCP	30	UNKNOWN	27.9	Grease at top of pipe, survey abandoned at what seems to be the entrance to the tank on sewer plant.	Clean pipe.

Appendix F. Derwent Avenue Sanitary Sewer Cost Estimate



BOSWELL
330 PHILLIPS AVENUE, SOUTH HACKENSACK, NJ 07606
P. 201-641-0770 | F. 201-641-1831
ENGINEER'S ESTIMATE

Project: Sanitary Sewer Video Inspection
Municipality: Verona
County: Essex County
Prepared by: J.H./ C.B.

Job No: VA-181
Date: 6/23/2025

Item No.	Description	Unit	Total Quantity	Unit Cost	Total Amount
1	Mobilization	L.S.	1	\$ 61,000.00	\$ 61,000.00
2	20 inch PVC Sewer Pipe	L.F.	30	\$ 300.00	\$ 9,000.00
3	30 inch Sewer Liner, In Place	L.F.	1,400	\$ 250.00	\$ 350,000.00
4	20 inch Sewer Liner, In Place	L.F.	2,705	\$ 225.00	\$ 608,625.00
5	Sewer Line Chemical Root Treatment	L.F.	3,865	\$ 50.00	\$ 193,250.00
6	CCTV Testing	L.F.	400	\$ 10.00	\$ 4,000.00
7	Maintenance and Protection of Traffic	L.S.	1	\$ 10,000.00	\$ 10,000.00
8	Allowance for Unforeseen Contingencies	Allow	1	\$ 25,000.00	\$ 25,000.00
9	Allowance for Police Traffic Directors	Allow	1	\$ 20,000.00	\$ 20,000.00
				Construction Subtotal	\$ 1,280,875.00
				Construction Total	\$ 1,281,000.00
Design and C/I		L.S	1	\$ 256,200.00	\$ 256,200.00
				Total	\$ 1,537,200.00

*Cost Estimate is based on 2025 rates and material prices.

Appendix G. Township Sanitary Sewer Improvement Phase Map

Appendix H. Township Sanitary Sewer Cost Estimates



BOSWELL
330 PHILLIPS AVENUE, SOUTH HACKENSACK, NJ 07606
P. 201-641-0770 | F. 201-641-1831
ENGINEER'S ESTIMATE
APPENDIX G: EXHIBIT 1

Project: Sanitary Sewer Study - Phase 3
Municipality: Verona
County: Essex County
Prepared by: C.B./S.T.

Job No: VA-181
Date: 6/23/2025

Item No.	Description	Unit	Total Quantity	Unit Cost	Total Amount
1	Mobilization	L.S.	1	\$ 13,000.00	\$ 13,000.00
2	Re-connect Sewer Laterals	Units	12	\$ 1,500.00	\$ 18,000.00
3	8-Inch Sewer Line, In Place	L.F.	650	\$ 250.00	\$ 162,500.00
4	Maintenace and Protection of Traffic	L.S.	1	\$ 20,000.00	\$ 20,000.00
5	Allowance for Unforeseen Contingencies	Allow	1	\$ 18,000.00	\$ 18,000.00
6	Allowance for Police Traffic Directors	Allow	1	\$ 35,000.00	\$ 35,000.00
				Construction Subtotal	\$ 266,500.00
				Construction Total	\$ 267,000.00
Design and C/I		L.S.	1	\$ 53,400.00	\$ 53,400.00
				Total	\$ 320,400.00

*Cost estimate is based on 2025 rates and material pricing.



BOSWELL
330 PHILLIPS AVENUE, SOUTH HACKENSACK, NJ 07606
P. 201-641-0770 | F. 201-641-1831
ENGINEER'S ESTIMATE
APPENDIX G: EXHIBIT 2

Project: Sanitary Sewer Study - Phase 4
Municipality: Verona
County: Essex County
Prepared by: C.B./S.T.

Job No: VA-181
Date: 6/23/2025

Item No.	Description	Unit	Total Quantity	Unit Cost	Total Amount
1	Mobilization	L.S.	1	\$ 14,000.00	\$ 14,000.00
2	Select Fill	C.Y	240	\$ 50.00	\$ 12,000.00
3	Rock Excavation	C.Y.	105	\$ 125.00	\$ 13,125.00
4	Test Pits	C.Y.	5	\$ 50.00	\$ 250.00
5	Modify Existing Inlets	Unit	6	\$ 2,500.00	\$ 15,000.00
6	12-Inch HDPE Storm Sewer Pipe	L.F.	190	\$ 300.00	\$ 57,000.00
7	15-Inch HDPE Storm Sewer Pipe	L.F.	140	\$ 350.00	\$ 49,000.00
8	18-Inch HDPE Storm Sewer Pipe	L.F.	40	\$ 400.00	\$ 16,000.00
9	Proposed Storm Manhole	Unit	1	\$ 6,500.00	\$ 6,500.00
10	Modify Existing Storm Manhole	L.F.	1	\$ 5,000.00	\$ 5,000.00
11	Modify Existing Sanitary Manhole	Unit	3	\$ 5,000.00	\$ 15,000.00
12	Belgium Block Curb	L.F.	145	\$ 100.00	\$ 14,500.00
13	Concrete Driveway Apron	S.Y.	15	\$ 50.00	\$ 750.00
14	Maintenace and Protection of Traffic	L.S.	1	\$ 25,000.00	\$ 25,000.00
15	Allowance for Unforeseen Contingencies	Allow	1	\$ 25,000.00	\$ 25,000.00
16	Allowance for Police Traffic Directors	Allowance	1	\$ 25,000.00	\$ 25,000.00
				Construction Subtotal	\$ 293,125.00
				Construction Total	\$ 294,000.00
Design and C/I		L.S.	1	\$ 58,800.00	\$ 58,800.00
				Total	\$ 352,800.00

*Cost estimate is based on 2025 rates and material pricing.



BOSWELL
330 PHILLIPS AVENUE, SOUTH HACKENSACK, NJ 07606
P. 201-641-0770 | F. 201-641-1831
ENGINEER'S ESTIMATE
APPENDIX G: EXHIBIT 3

Project: Sanitary Sewer Study - Phase 5
Municipality: Verona
County: Essex County
Prepared by: C.B./S.T.

Job No: VA-181
Date: 6/23/2025

Item No.	Description	Unit	Total Quantity	Unit Cost	Total Amount
1	Mobilization	L.S.	1	\$ 19,000.00	\$ 19,000.00
2	Select Fill	C.Y.	240	\$ 50.00	\$ 12,000.00
3	Rock Excavation	C.Y.	105	\$ 125.00	\$ 13,125.00
4	Test Pits	C.Y.	5	\$ 50.00	\$ 250.00
5	Modify Existing Inlets	Unit	11	\$ 2,500.00	\$ 27,500.00
6	12-Inch HDPE Storm Sewer Pipe	L.F.	85	\$ 300.00	\$ 25,500.00
7	15-Inch HDPE Storm Sewer Pipe	L.F.	235	\$ 350.00	\$ 82,250.00
8	18-Inch HDPE Storm Sewer Pipe	L.F.	45	\$ 400.00	\$ 18,000.00
9	36-Inch HDPE Storm Sewer Pipe	L.F.	30	\$ 800.00	\$ 24,000.00
10	Modify Existing Sanitary Manhole	Unit	6	\$ 5,000.00	\$ 30,000.00
11	Modify Existing Storm Manhole	L.F.	1	\$ 5,000.00	\$ 5,000.00
12	Proposed Dog House Manhole	Unit	1	\$ 6,000.00	\$ 6,000.00
13	9" x 18" Concrete Vertical Curb	L.F.	50	\$ 50.00	\$ 2,500.00
14	Belgium Block Curb	L.F.	200	\$ 100.00	\$ 20,000.00
15	Concrete Driveway	S.Y.	10	\$ 50.00	\$ 500.00
16	Concrete Sidewalk	S.Y.	35	\$ 100.00	\$ 3,500.00
17	Detectable Warning Surface	S.Y.	1.8	\$ 1,000.00	\$ 1,800.00
18	ADA Concrete Curb Ramp	Unit	2	\$ 5,000.00	\$ 10,000.00
19	Maintenance and Protection of Traffic	L.S.	1	\$ 22,000.00	\$ 22,000.00
20	Allowance for Unforeseen Contingencies	Allow	1	\$ 25,000.00	\$ 25,000.00
21	Allowance for Police Traffic Directors	Allow	1	\$ 45,000.00	\$ 45,000.00
				Construction Subtotal	\$ 392,925.00
				Construction Total	\$ 393,000.00
Design and C/I		L.S.	1	\$ 78,600.00	\$ 78,600.00
				Total	\$ 471,600.00

*Cost estimate is based on 2025 rates and material pricing.



BOSWELL
330 PHILLIPS AVENUE, SOUTH HACKENSACK, NJ 07606
P. 201-641-0770 | F. 201-641-1831
ENGINEER'S ESTIMATE
APPENDIX G: EXHIBIT 4

Project: Sanitary Sewer Study - Phase 6
Municipality: Verona
County: Essex County
Prepared by: C.B./S.T.

Job No: VA-181
Date: 7/16/2025

Item No.	Description	Unit	Total Quantity	Unit Cost	Total Amount
1	Mobilization	L.S.	1	\$ 24,000.00	\$ 24,000.00
2	Select Fill	C.Y.	465	\$ 50.00	\$ 23,250.00
3	Rock Excavation	C.Y.	205	\$ 125.00	\$ 25,625.00
4	Test Pits	C.Y.	5	\$ 50.00	\$ 250.00
5	Modify Existing Inlets	Unit	11	\$ 2,500.00	\$ 27,500.00
6	12-Inch HDPE Storm Sewer Pipe	L.F.	185	\$ 300.00	\$ 55,500.00
7	15-Inch HDPE Storm Sewer Pipe	L.F.	190	\$ 350.00	\$ 66,500.00
8	18-Inch HDPE Storm Sewer Pipe	L.F.	305	\$ 400.00	\$ 122,000.00
9	Proposed Dog House Manhole	Unit	1	\$ 6,000.00	\$ 6,000.00
10	Modify Existing Sanitary Manhole	Unit	5	\$ 5,000.00	\$ 25,000.00
11	Belgium Block Curb	L.F.	310	\$ 100.00	\$ 31,000.00
12	Concrete Driveway Apron	S.Y.	40	\$ 50.00	\$ 2,000.00
13	Maintenance and Protection of Traffic	L.S.	1	\$ 25,000.00	\$ 25,000.00
14	Allowance for Unforeseen Contingencies	Allow	1	\$ 24,000.00	\$ 24,000.00
15	Allowance for Police Traffic Directors	Allowance	1	\$ 35,000.00	\$ 35,000.00
				Construction Subtotal	\$ 492,625.00
				Construction Total	\$ 493,000.00
Design and C/I		L.S.	1	\$ 98,600.00	\$ 98,600.00
				Total	\$ 591,600.00

*Cost estimate is based on 2025 rates and material pricing.



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ENGINEER'S ESTIMATE
APPENDIX G: EXHIBIT 5

Project: Sanitary Sewer Study - Phase 7
Municipality: Verona
County: Essex County
Prepared by: C.B./S.T.

Job No: VA-181
Date: 7/16/2025

Item No.	Description	Unit	Total Quantity	Unit Cost	Total Amount
1	Mobilization	L.S.	1	\$ 25,000.00	\$ 25,000.00
2	Select Fill	C.Y.	370	\$ 50.00	\$ 18,500.00
3	Rock Excavation	C.Y.	160	\$ 150.00	\$ 24,000.00
4	Test Pits	C.Y.	5	\$ 50.00	\$ 250.00
5	Modify Existing Inlets	Unit	11	\$ 2,500.00	\$ 27,500.00
6	15-Inch HDPE Storm Sewer Pipe	L.F.	430	\$ 350.00	\$ 150,500.00
7	18-Inch HDPE Storm Sewer Pipe	L.F.	75	\$ 400.00	\$ 30,000.00
8	24-Inch HDPE Storm Sewer Pipe	L.F.	55	\$ 600.00	\$ 33,000.00
9	Modify Existing Sanitary Manhole	Unit	6	\$ 5,000.00	\$ 30,000.00
10	Modify Existing Storm Manhole	Unit	5	\$ 5,000.00	\$ 25,000.00
11	Proposed Dog House Manhole	Unit	1	\$ 6,000.00	\$ 6,000.00
12	Re-establish Sewer Laterals	Unit	1	\$ 1,500.00	\$ 1,500.00
13	Belgium Block Curb	L.F.	420	\$ 100.00	\$ 42,000.00
14	Maintenace and Protection of Traffic	L.S.	1	\$ 25,000.00	\$ 25,000.00
15	Allowance for Unforeseen Contingencies	Allow	1	\$ 30,000.00	\$ 30,000.00
16	Allowance for Police Traffic Directors	Allow	1	\$ 40,000.00	\$ 40,000.00
				Construction Subtotal	\$508,250.00
				Construction Total	\$509,000.00
Design and C/I		L.S.	1	\$ 101,800.00	\$ 101,800.00
				Total	\$ 610,800.00

*Cost estimate is based on 2025 rates and material pricing.