SANITARY SEWER CAPACITY ANALYSIS

FOR

420 Bloomfield Avenue
Lot 3, Block 701
Township of Verona
Essex County, New Jersey

Applicant
GOMES CONSULTING LLC
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NEWARK, NJ 07105
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Prepared by
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Jarmel Kizel Project No. GOMESGR24-190
Dated: October 2, 2026

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Signature

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SUMMARY OF ANALYSIS

At the request of the Township, we analyzed the capacity of the wastewater collection system downstream of the proposed 420 Bloomfield Avenue project. The study area included the existing 8" sanitary sewer line along Claremont Avenue directly in front of our site. The study was conducted for a duration of approximately four (4) weeks. See weekly and average summaries at end of report conducted by **Steadyflow Services, Inc**., PO Box 294, Basking Ridge, NJ 07920, 908-221-1344, jeff@steadyflowservices.com.

We determined that during **wet weather** conditions the calculated additional peak flow (based on NJDEP rates) from the proposed development combined with the existing measured peak flow does not exceed the capacity of the wastewater collection system within the study area. Capacity Full for the existing pipe is 2.89 cubic feet per second, where the proposed peak is estimated to be 1.20 cubic feet per second.

See Sanitary Sewer Capacity Summary Table 1

Sanitary Sewer Capacity Analysis

420 Bloomfield Avenue, Verona, NJ

8" SANITARY LINE ON CLAREMONT AVENUE

24-199 420 Bloomfield Avenue

Table 1 - Summary of Sanitary Domestic Loading (Wet Weather Conditions)

Pipe Section	Upstream Manhole ID	Downstream Manhole ID	Size [in]	Slope [%]	Existing Domestic Flow				Proposed Development Calculated Flow				Total Combined Flow				Full Flow Capacity [cfs]
					Measured Average Flow		Measured Peak Flow		Calculated Average Flow		Calculated Peak Flow (2)		**Total Combined Average Flow**		**Total Combined Peak Flow**		
					[MGD]	[CFS]	[MGD]	[CFS]	[MGD]	[CFS]	[MGD]	[CFS]	**[MGD]**	**[CFS]**	[MGD]	[CFS]	
A	MH-A	MH-B	8	5.7	0.092	0.14	0.734	1.14	0.011	0.02	0.044	0.07	0.103	**0.16**	0.778	**1.20**	**2.89**

Notes:

1. Estimated flow rate from "Treatment Works Approval Regulations - Revised Through March 1999". Section 7:14A-23.3 Projected flow criteria.
2. Peaking factor = 4, per Treatment Works Approval Regulations, Section: 7:14A-23.6 (b)
3. Manning's N = 0.013, per Treatment Works Approval Regulations, 7:14A-23.6

Therefore, based on the above, the existing Town wastewater collection system has more than adequate capacity to accommodate the calculated peak flows from the proposed development.

PROJECT SANITARY SEWER INFORMATION

The Redevelopment Plan permits construction of retail spaces and housing stock, in this case rental units designed in the form of apartments. Based upon the New Jersey Department of Environmental Protection "Projected Flow Criteria," the sewage flow from a one bedroom unit is 150 gallons per day (gpd); a two-bedroom unit is 225 gpd; and a three-bedroom or larger dwelling unit is listed as 300 gpd. Based on the site plan design, the anticipated flow is:

Retail Breakdown
Retail building —4,715 sf × 0.10 gpsf = 472 gpd

Residential Breakdown

One-Bedroom Apartments—52 Units × 150 gpd =	7,800 gpd
Two-Bedroom Apartments—10 Units × 225 gpd =	2,250 gpd
Three-Bedroom Apartments—3 Units × 300 gpd =	900 gpd
	10,950 gpd

TOTAL PROJECTED FLOW 11,372 GPD (0.011MGD)

The proposed building on 420 Bloomfield Ave will be serviced with a new gravity sanitary sewer of 8-inch PVC pipe. Sanitary sewer systems are generally sized to accommodate fully developed land use areas and are designed to "carry twice the anticipated flow while flowing half full," the addition of 11,372 gpd would have a minimal impact on the sanitary sewer system. There is sufficient capacity in the existing sanitary line and the wastewater treatment plant. There are no sewer bans or moratoriums restricting connections into the sewer system currently.

METHODOLGY

Based upon the request of Township, the existing sanitary sewer system was analyzed starting at the downstream sanitary sewer manhole, which flows down Claremont Avenue to Cumberland Avenue sewer system.

The existing sanitary sewer system in Claremont Avenue which the project would connect to is a 8 inch clay pipe and has an average wet weather flow of approximately 0.0922 million gallons per day (mgd) (64.03gpm per site statistics) and a measured peak of approximately 0.734 million gallons per day (mgd) (510.10gpm per site statistics) .

As noted above, anticipated sewer flows were determined by utilizing the "Projected Flow Criteria" table found in the N.J.A.C. Treatment Works Approval regulations (N.J.A.C. 7:14A-23).

The immediate downstream collection system is composed of clay pipe. Thus, a Manning's roughness coefficient "n" of 0.013 was utilized to determine the hydraulic capacity of the pipe.

The state regulations under N.J.A.C. 7:14A-23 require that the sanitary pipe be only "half full" when it is carrying twice the estimated average daily flow. That is, the average estimated daily flow of the project is multiplied by a factor of four to determine peak flows when the pipes are "flowing full." The Sanitary Sewer Capacity Summary table spreadsheet provides an analysis of the sewer system's ability to safely convey the expected flows.

The existing sanitary system from the manholes downstream from our project, located at the intersection of Claremont Avenue and Cumberland Avenue were analyzed. The pipe between the two manholes is 7 linear feet with a invert difference of 0.40 feet (357.3-356.9), which equates to a slope of 5.7 percent. This information was used in the spreadsheet to determine the pipe capacities.

CONCLUSION

The study has determined that the existing sanitary sewer collection system is capable of carrying twice the projected sewer flows when the pipes are flowing half full which comply with state standards.

Site statistics - Verona Clairmount 8 inch - 2026-09-25T14:06:43.890

Verona Clairmount 8 inch

Start of interval

Timestamp	Flow Rate-Average [gpm]	Flow Rate-Max [gpm]	Time Flow Rate-Max [gpm]	Flow Rate-Min [gpm]	Time Flow Rate-Min [gpm]	Flow Rate-Volume [gal]
08/18/2026 00:00:00	15.85	53.34	08/18/2026 12:55:00	0.00	08/18/2026 10:45:00	12603.40
08/19/2026 00:00:00	18.11	44.27	08/19/2026 17:55:00	2.66	08/19/2026 08:05:00	26085.28
08/20/2026 00:00:00	31.35	372.46	08/20/2026 18:05:00	10.00	08/20/2026 20:45:00	45144.74
08/21/2026 00:00:00	12.60	35.48	08/21/2026 01:15:00	1.32	08/21/2026 23:30:00	18137.68
08/22/2026 00:00:00	3.52	18.03	08/22/2026 15:10:00	0.00	08/22/2026 01:20:00	5062.61
08/23/2026 00:00:00	16.93	53.27	08/23/2026 18:25:00	0.00	08/23/2026 01:20:00	24380.65
08/24/2026 00:00:00	30.29	70.92	08/24/2026 19:50:00	3.74	08/24/2026 04:15:00	43621.22
08/25/2026 00:00:00	34.44	68.32	08/25/2026 20:35:00	10.73	08/25/2026 02:25:00	49592.21
08/26/2026 00:00:00	32.35	77.83	08/26/2026 20:25:00	8.54	08/26/2026 04:55:00	46588.04
08/27/2026 00:00:00	32.55	74.01	08/27/2026 08:55:00	12.81	08/27/2026 23:55:00	46867.10
08/28/2026 00:00:00	20.04	47.80	08/28/2026 11:50:00	11.66	08/28/2026 23:00:00	28863.74
08/29/2026 00:00:00	15.55	50.60	08/29/2026 19:35:00	5.87	08/29/2026 19:05:00	22395.93
08/30/2026 00:00:00	11.84	40.29	08/30/2026 14:20:00	3.33	08/30/2026 09:10:00	17042.60
08/31/2026 00:00:00	17.59	34.55	08/31/2026 07:05:00	4.09	08/31/2026 03:50:00	25335.71
09/01/2026 00:00:00	11.73	23.84	09/01/2026 06:35:00	0.00	09/01/2026 18:05:00	16890.46
09/02/2026 00:00:00	11.09	25.22	09/02/2026 20:20:00	0.00	09/02/2026 07:10:00	15970.03
09/03/2026 00:00:00	12.92	22.39	09/03/2026 08:00:00	0.00	09/03/2026 06:25:00	18606.33
09/04/2026 00:00:00	9.23	32.68	09/04/2026 07:10:00	0.00	09/04/2026 07:35:00	13290.85
09/05/2026 00:00:00	8.91	22.50	09/05/2026 14:25:00	0.00	09/05/2026 09:00:00	12828.39
09/06/2026 00:00:00	9.88	26.96	09/06/2026 13:20:00	0.00	09/06/2026 09:45:00	14230.02
09/07/2026 00:00:00	11.03	31.34	09/07/2026 20:10:00	0.00	09/07/2026 15:15:00	15876.63
09/08/2026 00:00:00	14.07	35.76	09/08/2026 21:45:00	3.42	09/08/2026 11:00:00	20257.11
09/09/2026 00:00:00	11.55	28.34	09/09/2026 06:40:00	0.00	09/09/2026 08:35:00	16628.52
09/10/2026 00:00:00	6.94	23.21	09/10/2026 15:20:00	0.00	09/10/2026 07:25:00	9988.72
09/11/2026 00:00:00	5.15	21.24	09/11/2026 01:55:00	0.00	09/11/2026 12:30:00	7421.82
09/12/2026 00:00:00	4.76	17.10	09/12/2026 00:25:00	0.00	09/12/2026 12:05:00	6850.57
09/13/2026 00:00:00	53.54	510.10	09/13/2026 09:50:00	0.00	09/13/2026 06:15:00	77100.56
09/14/2026 00:00:00	10.27	34.01	09/14/2026 20:50:00	0.00	09/14/2026 03:05:00	14792.99
09/15/2026 00:00:00	9.25	39.35	09/15/2026 11:15:00	3.16	09/15/2026 21:05:00	13320.68
09/16/2026 00:00:00	10.61	41.53	09/16/2026 14:40:00	0.00	09/16/2026 01:05:00	15274.03
09/17/2026 00:00:00	14.41	38.29	09/17/2026 18:05:00	5.05	09/17/2026 13:35:00	20750.02
09/18/2026 00:00:00	8.71	33.84	09/18/2026 03:15:00	0.00	09/18/2026 09:40:00	12540.50

Report generated by jheiner@daveheinerassoc.com

Dataset	Start Date	End Date	Minimum Value	Minimum value Time	Maximum Value	Maximum value Time	Average Value	Total Value	Number of Points
Flow Rate-Average [gpm]	08/18/2026 00:00:00	09/18/2026 23:59:59	3.52	08/22/2026 00:00:00	53.54	09/13/2026 00:00:00	16.16	744566.40	32
Flow Rate-Max [gpm]	08/18/2026 00:00:00	09/18/2026 23:59:59	17.10	09/12/2026 00:25:00	510.10	09/13/2026 09:50:00	64.03		32
Flow Rate-Min [gpm]	08/18/2026 00:00:00	09/18/2026 23:59:59	0.00	08/18/2026 10:45:00	12.81	08/27/2026 23:55:00	2.70		32
Flow Rate-Volume [gal]	08/18/2026 00:00:00	09/18/2026 23:59:59	5062.61	08/22/2026 00:00:00	77100.56	09/13/2026 00:00:00	22948.10	734339.14	32