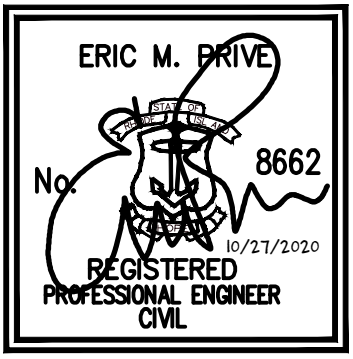
The Village at Curtis Corner

Sewer Feasibility Study

South Kingstown, Rhode Island

October 27, 2020



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Introduction

The Village at Curtis Corner (Site) is proposed as a 32-unit residential subdivision located on approximately 28 acres located off Curtis Corner Road. The residential subdivision proposes the construction of 32 new residential units consisting of a mixture of single-family and duplex homes.

The sewer connection was analyzed using the criteria found in the Code of Ordinances for the Town of South Kingstown, Chapter 19, Article II, Sec. 19-115 (1) b. 2.

> *2. The director shall consider the following criteria in determining if a mandatory connection and/or sewer main extension is required:*
>
> *(i) Conformity to Town of South Kingstown Comprehensive Plan.*
> *(ii) Areas of existing ISDS problems or failures.*
> *(iii) Soil conditions not suitable for ISDS placement.*
> *(iv) Proximity to wetlands, coastal ponds, groundwater resources and other environmentally sensitive areas.*
> *(v) Existing and/or planned municipal potable waterline locations.*
> *(vi) Economic feasibility.*
> *(vii) Lot size.*
> *(viii) Impact on areas in the vicinity of the proposed main extension.*
> *(ix) Potential effect on private or municipal potable water groundwater wells within the future.*

1.0 Conformity to Town of South Kingstown Comprehensive Plan

The proposed residential project is within the Future Sewer Service area which is depicted within Figure 6.2 of the Town's Comprehensive Community Plan (CCP). This is an area of the Town where public sewer service is recommended for any significant new development. The Town of South Kingstown Comprehensive Community Plan specifies that individual developments must be reviewed on a case-by-case basis in order to determine if it is feasible to extend public sewers.

2.0 Areas of Existing OWTS Problems and Failures

Areas of existing OWTS problems and failures proves not to be applicable to this project. Existing information shows that the area surrounding the site is already serviced by public sewer. Using the Town of South Kingstown's Comprehensive Community Plan, it has been determined that the project is to utilize public sewer. This is further confirmed by The State of Rhode Island and Providence Plantations Department of Environmental Management's Rules Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Onsite Wastewater Treatments Systems establishes in Rule 250-RICR-150-10-6.15 E. that OWTS systems would not be approved for this project. Rule 250-RICR-150-10-6.15 E. is as follows:

E. Connection to a Public Wastewater System - An OWTS application shall not be approved if such OWTS is proposed to serve a premises for which a public wastewater system is reasonably accessible as determined by the Director, and for which permission to enter the public wastewater system can be obtained from the authority having jurisdiction. The Director shall require the owner or occupant to connect the structure to a public wastewater system within a specified period of time if the following occur:

1. The OWTS is failing;

2. Public wastewater system is reasonably accessible as determined by the Director; and

3. Permission to connect to the public wastewater system can be obtained from the authority having jurisdiction over it.

Using local and state regulations, it is believed that OWTS systems for the project are not a viable option and that connecting to public sewer is the best option for the project.

3.0 Soil Conditions Not Suitable for OWTS Placement

RIDEM OWTS Regulations Rule 250-RICR-150-10-6.15 E. states that OWTS systems are not an option for this project as shown in the previous section. However, the soils information for this project have been added to this report for reference. Information from Soil Evaluations that were performed on site show that ledge depths on site are greater than 8 feet. There are three different soil types located in the area of the proposed upland area as mapped by the USDA Natural Resources Conservation Service and the soil types are described as follows:

Soil Symbol	Description	Hydrologic Group
BmA	Bridgehampton silt loam, 0 to 3 percent slopes	B
BmB	Bridgehampton silt loam, 3 to 8 percent slopes	B
NbB	Narragansett very stone silt loam, 0 to 8 percent slopes	B

4.0 Proximity to Wetlands, Coastal Ponds, Groundwater Resources & Other Environmental Sensitive Areas

The proposed development is approximately 28 acres and is located on Curtis Corner Road, which is west of Kingstown Road (Route 108). There is a wooded swamp wetland on the property with an associated 50' perimeter wetland. The proposed development does not propose any disturbance to the onsite jurisdictional wetland.

This site is not located within any of the following areas: Narrow River Special Area Management Plan (CRMC), Salt Ponds Special Area Management Plan (CRMC), Groundwater Protection Overlay District (Town), OWTS Critical Resource Area (RIDEM), Drinking Water Supply (RIDEM).

The Site is within the Asa Pond watershed (RI0010045L-02), which does not have a Total Maximum Daily Loading (TMDL) associated with it.

The residential development is not proposed with onsite wastewater treatment systems (OWTS's) and the project will not contribute additional pathogens to watershed. A Rhode Island Pollutant Discharge Elimination System permit is currently pending with RIDEM to ensure that the project complies to the program regulations for stormwater water quality treatment and mitigation. A copy of the RIPDES Permit will be provided to the town prior to final approval.

5.0 Existing and/or Planned Municipal Potable Water Line Locations

The site is serviced by municipal public water. Public utilities exist adjacent to the Site along Curtis Corner Road. Suez Water Rhode Island Inc. (SWRI) is the authority with jurisdiction over access to public water in the area of the development. A connection to the existing 12" water main in Curtis Corner Road is proposed for servicing the Site. Confirmation has been received via letter from Suez Water Rhode Island, that both domestic water service and fire protection is available from the Curtis Corner Road water main.

6.0 Economic Feasibility

There are no reasonable alternatives to the proposed sewer connection to the main located in Curtis Corner Road. As such, economic feasibility is not a consideration for this project. The proposed sewer system has been designed as a gravity system with manholes at all major bends and intersections to provide inspection/maintenance access locations. Below is the Schedule of Values for the proposed sewer system:

Land Development Performance Cost Estimate **Rev. 10/27/20**

Project Name: The Village at Curtis Corner
Land Developer: 5A Builders, LLC
Cost Estimate Prepared By: DiPrete Engineering
Date: October 2020

ITEM NO.	DESCRIPTION	UNIT	QUAN.	UNIT COST	PRE-RECORDING NON-BOND ITEM COST	POST RECORDING BOND ITEM COST	LUMP SUM ITEM COST
7.0 Sewer							
	4' Diameter Sewer Manhole	EACH	7	$2,400.00	$16,800.00	$0.00	$16,800.00
	SMH Frame and Cover (TSK STD)	EACH	7	$640.00	$4,480.00	$0.00	$4,480.00
	6" SDR 35 PVC Sewer Pipe	LF	620	$60.00	$37,200.00	$0.00	$37,200.00
	8" SDR 35 PVC Sewer Pipe	LF	630	$60.00	$37,800.00	$0.00	$37,800.00
	Crushed Gravel (Sewer Pipe bedding & initial backfill)	CY	140	$36.00	$5,040.00	$0.00	$5,040.00
	Sewer Tests (Pressure, Vacuum, Mandrel)	EACH	1	$500.00	$500.00	$0.00	$500.00
	Traceable Sewer Tape	EACH	1	$80.00	$80.00	$0.00	$80.00
				Subtotal	**$101,900.00**	**$0.00**	**$101,900.00**

*CONSTRUCTION COSTS BASED ON RHODE ISLAND DEPARTMENT OF TRANSPORTATION (RIDOT) WEIGHTED AVERAGE PRICES, DATA OBTAINED FROM SOUTH KINGSTOWN ENGINEERING DEPARTMENT, AND DIPRETE ENGINEERING ASSOCIATES LOCAL KNOWLEDGE

7.0 Lot Size

The Site includes a total of approximately 28 acres with frontage on Curtis Corner Road. The project is proposed as 32 unit residential subdivision.

While public sewers are available in Curtis Corner Road, we analyzed the alternative for the feasibility/potential for an Onsite Wastewater Treatment System (OWTS) on the property. Soil evaluations were performed by an RIDEM Class IV Licensed Soil Evaluator and were determined to be 54-96" throughout the site. RIDEM criteria for minimum seasonal high groundwater table to support an OWTS is 24" depth, so it is feasible on the property. Also, the site is not located within any RIDEM Critical Resource Areas, therefore a conventional leachfield can be utilized. Also, the subject property and surrounding properties are serviced by public water through Suez Water, therefore additional setback requirements to private/public wells are not required.

The following calculations provide a rough sizing for an OWTS on the property:

- 32 residential homes @ 2-bedrooms per unit = 64 bedrooms total
- 64 bedrooms @ 115 gallons per day (gpd)/bedroom (per RIDEM OWTS Regulations) = 7,360 gpd
- Assuming a soil loading rate of 0.61 square feet (sf) per gallon for sandy loam, the leachfield size would need to be a minimum of 12,066 sf (7,360 gpd / 0.61 = 12,066 sf)

At a minimum leachfield size of 12,066 sf (or 3.7% of the upland suitable area), there is more than adequate space for a proposed leachfield area, if it were necessary.

8.0 Impact on Areas in the Vicinity of the Proposed Main Extension

Future Service Area

According to Figure 6.2 of the Town's Comprehensive Community Plan (CCP) the site is located in a Future Sewer Service Area and is to utilize public sewer.

Property Value

Connection to the existing sewer main will not require an easement and will not diminish the property value of adjacent properties.

Overall Wastewater Flow Rates

The Technical Review Committee (TRC) comments from Department of Public Services also requested that a downstream carrying capacity analysis be performed to determine the ability of the existing wastewater infrastructure to handle the proposed flows. The existing sewer line within Curtis Corner Road is a 12" diameter gravity main with a 0.22% slope. The existing 12" gravity sewer main within Curtis Corner Road can transmit approximately 1.4 cubic feet per second (cfs) of flow, which equates to approximately 0.90 million gallons per day (MGD). The Village at Curtis Corner is proposing a 32 unit subdivision with an estimate average daily flow of 300 gpd per unit. The calculated average daily flow is 9,600 gpd for the development. The 9,600 gpd flow represents 1.1% of the pipe capacity proving to be a negligible impact on the system.

Impact on Receiving Wastewater Treatment Facilities

Flow from this development ultimately discharges to the South Kingstown Regional Wastewater Treatment Facility (WWTF). The South Kingstown Regional Wastewater Treatment Facility serves Narragansett, South Kingstown, and the University of Rhode Island (URI). Although the Regional WWTF has an average design capacity of 5.0 MGD, according to the Town's RIPDES permit issued by RIDEM, available capacity at the Regional WWTF is based upon the highest three (3) consecutive months of wastewater flow. The highest three (3) months of flow for the past two years is as follows: 71.59% in FY 2017-18 and 76.04% in FY 2018-19. The proposed development design flow of 9,600 gpd is an approximate 0.8% increase to the available capacity (9,600 gpd/1.2 MGD = 0.8%). The Regional WWTF will not be impacted by the proposed 32 unit residential subdivision.

9.0 Potential Effect on Private or Municipal Potable Water Groundwater Wells Within the Future

It has been determined that a proposed sewer connection would not affect any groundwater wells being that there are none in the area. RIDEM OWTS regulations state in Rule 250-RICR-150-10-6.15 E. that OWTS systems are not feasible options for this project which entirely rules out the potential effect on groundwater wells by OWTS systems. Information from RIDEM and the Town of South Kingstown was used for this determination.

10.0 Conclusion

After reviewing the criteria found in the Code of Ordinances for the Town of South Kingstown, Chapter 19, Article II, Sec. 19-115 (1) b. 2. and considering RIDEM OWTS Regulations Rule 250-RICR-150-10-6.15 E., connecting to the sewer main in Curtis Corner Road is the only feasible option.

Factors for generating conclusion:

- Surrounding properties are connected to the public sewer lines by means of gravity sewer
- The project is within the Town of South Kingstown's Comprehensive Community Plan Future Sewer Service Area
- Projected flow from the project accounts for negligible increase to the existing infrastructure
- Ledge excavation is not anticipated
- The Curtis Corner Road sewer main can adequately convey the additional wastewater flow from the project
- The Curtis Corner Road sewer line is downgradient of the Site, which provides optimal elevations to extend a gravity sewer to the proposed development
- The project adheres to RIDEM OWTS Regulations Rule 250-RICR-150-10-6.15 E. that rules out the option of individual OWTS
- The project does not abut any other streets

In conclusion, the project provides a gravity sewer line that will serve the proposed development and connects to the existing Curtis Corner Road gravity sewer main. It is DiPrete Engineering's professional opinion that a gravity sewer line connection to Curtis Corner Road has been proven to be the most feasible option for The Village at Curtis Corner project.

Appendix A: Locus Map

Appendix B: Town Ordinance

Sec. 19-115. Connection policy.

The town hereby establishes the following policy relative to future connections to the sewer system:

(1) *Property within the existing and/or future sewer service area.* Any parcel of land located within the existing and/or future sewer service area as defined in figure 6.2 entitled "Sewer Service Areas," of the Town of South Kingstown Comprehensive Community Plan, may be required to connect to the sanitary sewer system. The property owner agrees to abide by all conditions, restrictions, standards, specifications, design criteria, and to pay all fees which may be established by the town. The property owner shall also pay any cost(s) associated with sewer service connection and/or sewer main extensions.

a. Property located along and abutting an existing sewer line shall be governed by section 19-33.

b. Property not located along and not abutting an existing sewer line where the property will require a sewer line extension shall be governed by section 19-111 and the following:

1. The utilities director may require that property(s) proposed for development be required to connect to the sanitary sewer system provided the following conditions are met: i.) satisfactory grades are established meeting the approval of the utilities director, and ii.) permanent rights-of-way and easements are granted to the town (where required).

2. The utilities director shall consider the following criteria in determining if a mandatory connection and/or sewer main extension is required:

(i) Conformity to Town of South Kingstown Comprehensive Plan.

(ii) Areas of existing ISDS problems or failures.

(iii) Soil conditions not suitable for ISDS placement.

(iv) Proximity to wetlands, coastal ponds, groundwater resources and other environmentally sensitive areas.

(v) Existing and/or planned municipal potable waterline locations.

(vi) Economic feasibility.

(vii) Lot size.

(viii) Impact on areas in the vicinity of the proposed main extension.

(ix) Potential effect on private or municipal potable water groundwater wells within the future.

3. if connection is mandated, then the individual property owner(s) must submit an extension request under the following procedure. The owner of property, or his agent, shall apply in writing to the utilities department giving the following information:

(i) Name.

(ii) Street.

(iii) Address.

(iv) Assessor's plat and lot.

(v) Proposed use of property.

(vi) Number of units (residential).

(vii) Proposed daily wastewater flow (nonresidential).

c. Individual sewer lift or pumping stations will be subject to approval by the utilities director. Only pressure connections to individual lots constructed perpendicular to a gravity sewer main will be considered. The pressure sewer line shall transition to a gravity sewer lateral at the applicant's property line. Community low-pressure sewer mains and/or laterals serving more than one (1) property is prohibited.

d. An applicant requesting sewer main extensions within the existing and/or future sewer service area shall prepare an engineering study at applicant's expense by a registered professional engineer delineating various wastewater methodologies satisfactory to the utilities director. This study shall address, as a minimum, the criteria identified in subsection (1)b.2 to the satisfaction of the utilities director. This document will be subject to applicable local, state and federal regulations.

e. The requested sewer connection must demonstrate that the existing sewer main designated for extension is of sufficient capacity to properly accommodate the projected sewer flows as determined by the utilities director.

f. All sewer main extensions for land subdivisions as defined in the Subdivision Regulations of the Town of South Kingstown shall be subject to planning board approval.

g. The utilities director may waive the requirement for mandatory sewer connection when in the opinion of the director sufficient evidence indicates that sewer connection is not feasible based upon criteria delineated in subsections (1) b.2 and (1)c–e.

(2) *Properties abutting or beyond the future sewer service area.* Any applicant requesting sanitary sewers for property(s) either abutting or beyond the future sewer service area which meets the criteria delineated for such extensions in the comprehensive plan may be permitted. The applicant for said extension shall submit an application to the town clerk for amendment to the future sewer service area map of the comprehensive plan in accordance with the procedure set forth in chapter 45-22.2 of the General Laws, the Rhode Island Comprehensive Planning and Land Use Regulation Act. The application for amendment to the comprehensive plan shall be accompanied by all information required under subsection (1)b.

(3) *Appeals.* Appeals contrary to the utilities director's decision regarding sanitary sewer connection shall be made to the town manager.

(4) *Property owner/developer obligations.* The following obligations apply to all sewer line connections:

a. The property owner and/or developer agrees to abide by all conditions, restrictions, standards, specifications, design criteria and to pay all fees which may be established by the town and/or the State of Rhode Island. All costs for sewer main extensions shall be paid for by the developer and/or property owner, including pipelines and services, and will not be entitled to any refunds or rebates.

b. The developer's contractor shall submit evidence satisfactory to the utilities