

# **Final Report on Potential Community Wastewater Service to the West Charlotte Village**



**Submitted to the Charlotte Selectboard by the  
Charlotte Wastewater Committee**

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## **I. Executive Summary**

This report is respectfully submitted to the Charlotte Selectboard by the Charlotte Wastewater Committee, a task force of Charlotters including Dave Marshall, Vince Crockenberg, Dana Farley, and Winslow Ladue. The charge of the committee was to examine the question of whether a public or community wastewater facility, or facilities, should be constructed for the West Charlotte Village (the village). Over a period of ten months, from August 2010 to May 2011, the committee conducted research, gathered data, developed maps, and sought public opinion on this issue. The committee's work was guided by language in the Town Plan which encourages future growth to be centered in the villages. This report contains our findings and recommendations.

The committee analyzed past village wastewater planning efforts, including work undertaken by Otter Creek Engineering, Civil Engineering Associates, and Michael Munson, Ph.D. An inventory was made of existing Town-controlled wastewater disposal systems, including those on the Burns property, the Lavalette property and Barber Hill. A possible wastewater service area was identified and mapped. Existing demands on the Burns wastewater disposal system were identified.

The committee made an extensive effort to gauge community interest in the provision of additional wastewater service to the village, including holding open meetings twice a month, surveying the residents of the village, preparing three articles for *The Charlotte News*, making a presentation at Town Meeting, surveying Town Meeting attendees, and meeting with the Selectboard and Planning Commission.

An assessment was made of future municipal wastewater needs, including past and projected population trends and forecasts. The committee looked closely at potential non-municipal needs for commercial and residential growth, as well as at the replacement of failing, or potentially failing, wastewater systems in West Charlotte Village.

The committee was advised by the town attorney that the Selectboard could offer unused municipal wastewater capacity to private users without an additional town vote. Nevertheless, the committee recommends that the Selectboard put the question of system expansion and additional private uses of the system to town voters by an article at Town Meeting.

Important to the committee's study was the examination of how an expanded system to provide wastewater capacity to the village would be managed. The committee evaluated the creation of a master plan for future wastewater system improvements, the development of policies for allocation and new connections, and the assurance of quality control. A possible fee program was evaluated, including creating a wastewater system development cost recovery fee and establishing an easement fee and a sinking fund.

With all of the above in mind, the committee recommends that the Selectboard explore the construction of a future wastewater facility in greater detail.

The committee's recommendations include the following:

- Expand the use of the existing municipal wastewater system to allow new users to be served.
- Adopt a master plan for future wastewater system improvements.
- Create and adopt an ordinance that addresses
  - the allocation of unreserved excess wastewater disposal capacity,
  - connection fees, and
  - operation and maintenance of the wastewater facilities.

We thank Charlotte Planning and Zoning staff members, Dean Bloch, Gloria Warden and Tom Mansfield for their valuable assistance throughout.

## **II. Introduction**

During the 2009 Town Meeting, voters approved the following advisory question:

*Will the Selectboard explore the construction of a public or community facility or facilities for the purpose of providing wastewater disposal for residential and commercial use in West Charlotte Village?*

At its August 23, 2010, meeting the Selectboard appointed a citizen task force to examine this issue and report back on the need for such a facility or facilities.

The 2008 Charlotte Town Plan calls for new growth to occur in the existing village areas. Previous studies of the West Charlotte Village demonstrated that on-site wastewater disposal for some properties is challenging due to small lot size and/or inadequate soils.

The committee has reviewed the opportunities to utilize either a portion of the unused capacity of the town's wastewater disposal system on the Burns property or to create additional capacity at other locations. One potential benefit of developing these wastewater disposal areas is the provision of a cost-effective solution to public health issues associated with failed systems. Another potential benefit is support of Town Plan objectives regarding the development of new uses in the village which have previously been hampered by a lack of wastewater disposal capacity.

## **III. Past Wastewater Planning Efforts**

### **Burns and Barber Hill Wastewater Disposal Potential**

In 2004, the Town of Charlotte retained Otter Creek Engineering (OCE) to conduct soil investigations on the Burns property and the Barber Hill properties to determine the potential capacity for on-site wastewater disposal.

OCE prepared a report dated August 2, 2004 (Attachment 3.1 - OCE Report) that identified nine different potential wastewater disposal sites on the two properties with a total potential wastewater disposal capacity of 34,460 gallons per day.

## **Sewer Capacity Master Planning**

In January 2007, the town retained Civil Engineering Associates (CEA) to refine the OCE soil investigation with the goal of identifying how land use on the Burns and Barber Hill properties should be guided so as to not adversely affect the wastewater disposal potential on the two properties.

CEA prepared plans showing the potential disposal locations and footprints of the potential systems. The study identified the locations of existing wells to determine how the isolation requirements from those wells would affect the identified sites.

The CEA study (Attachment 3.2 - CEA Report) refined the capacities for the disposal sites previously included in the OCE work.

## **The Munson Study**

In March 2008, land use planner Michael Munson, PhD, was asked by the town to assemble the wastewater-related information prepared to date and to determine the likely demand for future on-site wastewater disposal. The study area included 89 parcels included within an area bounded by the west side of Route 7 on the east and the railroad tracks on the west and extending north along Greenbush Road to include the Clemmons and Braun properties and south along Greenbush Road to include the Burns and Gaujac properties.

The study's summary findings (Attachment 3.3 – The Munson Study) stated the following:

*...the flows from all properties classified as likely or questionable connections to a community system were totaled and converted to a percent of the total estimated existing flow. The results are as follows:*

<b><i>Total Estimated Existing Flow: 42,385 gpd</i></b>	
<b><i>Potential connections to a community system:</i></b>	
<i>Likely</i>	<i>8,675 gpd</i>
<i>Questionable</i>	<i>8,260 gpd</i>
<b><i>Total</i></b>	<b><i>16,935 gpd</i></b>

***Potential connections as percent of total flow 40%***

## **IV. Community Interest in Expanded Wastewater Service**

### **West Village Wastewater Survey**

Building on the Munson Study, the committee in early November 2010 mailed a survey to all property owners within the West Village-Commercial Zoning District (Attachment 4.1 – Original Survey). This was an effort to determine the level of interest among those property owners in connecting their properties to a possible municipal wastewater system, consisting of one or more sites within the village. Owners were informed that if they were unfamiliar with the status of their wastewater disposal system, whatever information the town had could be obtained by calling Zoning Administrator Tom Mansfield. The committee held a public meeting to discuss the findings to date and to answer any questions property holders may have had about the possibilities for expanded wastewater treatment in the village. In-person discussions were also held with several property and business owners along Ferry Road.

At a then-estimated connection cost of \$35,000-\$40,000 and an estimated annual maintenance cost of \$500, residents of the West Village-Commercial Zoning District generally expressed little interest in connecting to a town system, primarily because of the cost. However, in follow-up conversations with businesses and property owners along Ferry Road between Greenbush Road and US Route 7, several expressed considerable interest in adding septic capacity to support expansions to, or new uses of, their current properties. Accordingly, the committee then chose to focus on what was tentatively designated the “Potential West Charlotte Community Wastewater Service System Area—Phase One.” (Attachment 4.2 - Phase I Service Area Plan)

### **Planning Commission Input**

The committee met with the Planning Commission on January 20, 2011. At that meeting, the commission expressed general support for concentrating commercial development and community wastewater disposal in the West Charlotte Village, particularly on Ferry Road, consistent with the 2008 Town Plan. The plan states the following:

*The Town needs to address water and sewer capacity in the Village and Commercial Districts in order to meet the Plan's goal for compact settlement in the village areas. The analysis should include the consideration of a small community system to serve the West Village and Commercial District. This could help to increase developable land opportunities to achieve the current goals for small increases in local employment, some basic retail services, and a concentration of development in the village centers.*

Given the survey and the walkabout results, and consistent with both the Town Plan and the town’s obligation to protect the health, safety and welfare of its residents, the committee advised in an article in *The Charlotte News* (Attachment 4.3 - Charlotte News Articles) that the town could use its reserve wastewater resources for at least four purposes in the village:

- to help resolve failed commercial and residential systems,

- to expand existing municipal and commercial uses,
- to support new commercial and residential development, and
- to save for the use of future generations in circumstances that we cannot foresee.

## Town Meeting Survey

At Town Meeting, the committee asked those attending to respond to a survey on whether—and if so, how—the town might use its reserve wastewater capacity to help implement the 2008 Town Plan. The committee received 85 responses, some more complete than others.

The town’s existing municipal wastewater system was built in 2002 and has 5,000 gallons of capacity, only 3102 gallons of which are currently being used. The survey (Attachment 4.4) asked whether “a portion of the unused capacity of the existing municipal wastewater system [should] be made available for private use ... to support the goal of concentrating development in the West Village center.” A strong majority (53 to 26) answered “Yes.”

Those who answered “Yes” were then asked which uses should have priority over others. This question elicited two kinds of answers. Forty people used the 1 to 10 scale for each proposed use. Their highest priorities were to support the adaptive reuse of existing buildings (7.5), followed by the expansion of existing commercial uses (6.8), new commercial uses (6.4), and resolving failed wastewater systems (6.4). They also expressed significant support for senior housing (6.0), affordable housing (5.8), and expansion of existing residential uses (5.7). They expressed the lowest level of support for new residential uses (4.2).

Seventeen people responded to Question 2 with X’s, indicating priority uses. Among these respondents, senior housing garnered the most support. Affordable housing, failed wastewater systems and the expansion of existing commercial uses all tied for second. Adaptive reuse of existing buildings ranked fifth and new commercial uses ranked sixth. New residential uses and the expansion of existing residential uses again garnered the least support.

Question 3 asked whether new private users should be charged “less than 100 percent of the pro-rated portion of the \$125,000 it cost to build the municipal system in 2002.” The full pro-rata cost to new users would be \$25/gallon (\$125,000/5000 gallons)—or \$11,250 for a 15-seat café and \$10,500 for a three-bedroom house—over and above any new construction costs fully paid for by the property owners. By 43 to 22, respondents rejected this approach to town planning.

	<b>Rating/10</b>	<b>No. of X’s</b>
<b>Adaptive reuse</b>	<b>7.5</b>	<b>8</b>
<b>Expansion of existing commercial uses</b>	<b>6.8</b>	<b>9</b>
<b>New commercial uses</b>	<b>6.4</b>	<b>7</b>
<b>Solving failed wastewater systems</b>	<b>6.4</b>	<b>9</b>
<b>Senior housing</b>	<b>6.0</b>	<b>10</b>
<b>Affordable housing</b>	<b>5.8</b>	<b>9</b>
<b>Expansion of existing residential uses</b>	<b>5.7</b>	<b>3</b>
<b>New residential uses</b>	<b>4.2</b>	<b>5</b>

Finally, survey respondents suggested a number of ideas for the committee’s consideration.

Several residents who supported private residential and commercial access to the existing system urged that new users be charged the full prorated *inflation-adjusted* cost of what it would take today to replace the current municipal system. They recommended that the system be self-sustaining financially with no support from taxpayer dollars for new users. In addition, a few people suggested that all new users be required to meet strict water efficiency standards (e.g., low-flow toilets and showers, no in-sink disposals) as a condition of connecting to the system.

Some who supported the use of the reserve wastewater capacity for increased development in the village also suggested that the town consider charging different rates for new commercial than for new residential connections. There was no agreement, however, on which users should get the benefit of a lower rate. Others suggested charging less than the full prorated connection cost for existing businesses and nonprofit enterprises while charging full costs for all other new connections. Suggestions also included having the town explore the purchase of additional property near the village to expand its capacity to meet future wastewater disposal needs.

Several people opposed the use of wastewater subsidies to encourage further development—either commercial or residential—in the village. Said one respondent, “Just because the Town Plan encourages compact development in the village centers, does not mean that the Town should provide septic in order to encourage that development.” Others emphasized that the town should preserve the existing municipal system for municipal and public purposes only—including future municipal expansion—and that the owners of private residential and commercial property should solve their own wastewater issues at their own expense. As one person put it, “This is a town asset and should be saved for municipal purposes.” Some suggested that those purposes should include consideration of the future septic needs of Charlotte Central School. Others suggested that new non-municipal connections to the system might be permitted if they demonstrably benefit the town as a whole.

## **V. Existing Town-Controlled Wastewater Disposal Systems**

### **Burns Property**

**(a) Existing Disposal Area (G):** This is a conventional in-ground system that serves the Town Offices, Library, Fire Department and Senior Center. The system stem is located approximately 1,500 feet east of the former Burns (currently O’Dea/Wyghams) house (Attachment 5.1 - Municipal System Plan).

**Capacity**

Existing Permitted 4,999 gpd  
Existing Usage 3,102 gpd\_(Attachment 5.2 - Design Flow Breakdown)  
**Unused Capacity 1,897 gpd**

**(b) Expansion Potential (G): 6,499 gpd.** Based on current State of Vermont wastewater rules, the existing system can be readily expanded with no physical modifications. Wastewater disposal systems with capacities of greater than, or equal to, 6,500 gpd, however, require the issuance of an Indirect Discharge Permit from the state and the standards under this program are much more stringent than the small scale system program. The soils at this site have the hydraulic capacity to accept additional wastewater but will require a significant amount of testing to demonstrate that the effluent will not have an adverse impact on the groundwater quality.

**Secondary Uses:** There are exceptions to the 6,500 gpd wastewater disposal limitation on one property. The primary exemption is when two separate, unrelated users dispose of wastewater on one property. The existing scenario at the Burns property is that Habitat for Humanity currently uses 1,260 gpd of disposal capacity on this property. Since this is not part of the “municipal” system, it does not count against the running total for the “municipal” system. This would also hold true if a third party (such as a privately operated senior housing project) were to approach the town for use of the disposal capacity on the property.

**(c) Satellite Sites:** The remaining sites on the Burns property have the following identified disposal capacities (Attachment 3.2 - CEA Report):

	<b>Description</b>	<b>CEA</b>
D	Burns – Southwest	500
E	Burns - North Triangle	480
F	Burns - Town WW – North	2620
G	Burns - Town WW East	7300
H	Burns - Town WW South	100
I	Burns - Flea Market	1130
	<b>Total Primary System Capacity</b>	<b>12,130*</b>

**\*NOTE:** Site capacities, in italics, still need to be permitted by the State of Vermont. These flows will need further detailed evaluation to determine how the requirements for the replacement fields will impact the total capacity. The reported value is 50% of the estimated total capacity of each site to account for the state-mandated replacement capacity. The remaining 50% has been allocated for the required replacement area.

**Lavalette Property**

The town owns an easement that is located approximately 800 feet westerly of the Sabin property near the railroad (Attachment 5.3 - Lavalette Design Plans). This is a permitted, but not

yet constructed, at-grade disposal system designed to accept filtrate wastewater with an additional level of pretreatment.

**(a) Permitted Capacity**

Existing Design	900 gpd
Existing Usage	0 gpd
<b>Reserve Capacity</b>	<b>900 gpd</b>

It should be noted State Permit #WW-4-1150 issued for this site allows 900 gpd for the Town of Charlotte and 1,080 gpd for the Charlotte Land Trust. For discussion purposes, the portion permitted for the Town of Charlotte is reviewed.

**(b) Expansion Potential: 1,200 gpd** (potential permitted capacity).

Under current wastewater rules, this system can be redesigned to occupy the primary and replacement footprints (Attachment 5.4 - Expansion Layout). The state wastewater disposal rules now permit the previously required replacement area to be integrated into the construction of the primary system, and this system can be redesigned to handle 1,200 gallons per day. This expansion allows the hydraulic and biological demands on the system to be spread, which will likely enable any future corrective measures to be implemented within the footprint of the primary system.

**(c) Additional Capacity: 1080 gpd**

In the immediate vicinity of this system is an additional 1,080 gpd of capacity permitted and retained by the Charlotte Land Trust (Attachment 5.5- Deed). The Trust is willing to discuss with the Selectboard the terms on which it might transfer control of the septic resources on the property to the town.

## **Barber Hill**

**(a)** A series of wastewater disposal sites are located on the original Barber Hill property (Attachment 2.2 - CEA Report).

	<b>Description</b>	<b>CEA</b>
B	Old Lantern - West	4,200
C	Old Lantern - South	2,880

All of the systems would need to be of the mound type due to the shallow depth to seasonal high groundwater. The south system is an elongated site located within a portion of the Old Lantern Banquet Hall overflow parking area at the base of the hillside. The Old Lantern-West capacity comprises a series of small to moderate size mounds on the west side of the Banquet Hall. (Attachment 2.2 - CEA Report)

**(b) Expansion Potential: limited, at best**

It appears that hydraulic limitations will limit any significant increase in the design capacity of these systems. In fact, the locational relationship of the systems on the west side of the Banquet Hall will likely require a reduction in the disposal potential once the hydraulic work has been undertaken.

**(c) Restrictions on Use**

Twenty-five percent of the design capacity may be used by the town for municipal uses. (Attachment 5.6 - Contract Requirements)

**Summary of Wastewater Disposal Capacity**

	<b>Site</b>	<b>Existing Permitted Capacity</b>	<b>Potential Additional Capacity Using New WW Rules</b>
G	Burns East (Existing)	<b>4,999</b>	1,500
E	Burns - North Triangle		480
F	Burns – North		2,620
G	Burns – East (Additional)		4,800
I	Burns - Flea Market		1,130
B	Old Lantern - West		2,100
C	Old Lantern - South		1,440
J	Lavalette	<b>900</b>	300
	<b>Total Primary Capacity</b>	<b>5,899</b>	<b>14,370</b>

**VI. Current Demands on the Existing Municipal System**

The current design flows allocated against the 4,999 gpd are as follows (see Attachment 5.2 for additional detail on the break-out of each use):

Existing Town Office Building	320 gpd
Existing Library	195 gpd
Fire Department	350 gpd
Senior Center	2,000 gpd
Gravity Sewer Infiltration Allowance	<u>237 gpd</u>
<b>Total</b>	<b>3,102 gpd</b>

The infiltration allowance represents an estimate of the groundwater that will infiltrate into the collection system that will in turn be sent to the wastewater disposal field. This infiltration represents a hydraulic impact on the operation of the wastewater disposal system. The estimate of the amount of infiltration is based upon the amount and size of the sewer mains in the collection system.

## **VII. Projected Municipal Wastewater Needs**

The existing municipal system serves the town offices, library, volunteer fire department and senior center. As the existing wastewater collection and disposal system was constructed primarily with these facilities in mind, it is paramount that the future needs of these facilities be identified, and capacity retained, before sharing any of the capacity with the community at large.

The current usage of these facilities is 3,102 gallons per day. The design flow for each of these facilities is primarily based on either the number of employees or number of visitors hosted at each one of them. As such, it is likely that increases in demand from these facilities could be influenced by an increase in population.

### **Past Population Trends**

The Town Plan lists the historical population levels from the first U.S. Census in 1791 to the year 2000. During this period, Charlotte experienced a peak population of 1,702 in 1830, followed by a continual reduction for the next 110 years until 1940 when the population level stood at 1,082. It wasn't until 1950 that Charlotte surpassed its original population peak in 1830. (See Attachment 7.1- Town Plan Population Excerpt).

From 1960 to 1980, Charlotte experienced an explosion in growth, with the population increasing at an annual rate of 3.5% per year, followed by an annual growth rate of 2.1% from 1980 to 1990 and 1.25% from 1990 to 2000, at which point the U.S. Census population for Charlotte was set at 3,569.

The recently released U.S. Census results for 2010 show a population level of 3,754, which is only six residents off the published estimated set by the U.S. Census Bureau in 2001 (Attachment 7.2 - Annual Projections Summary). The population change over the past ten years represents an annual growth rate of 0.5%.

### **Future Population Trends**

The population trend over the past 10 years shows a significant reduction from the explosive growth period experienced by the town from 1960 to 2000. The reasons for this past growth pattern are not clear; however growth in Charlotte does appear to be slowing. In fact, a trend in public policy oriented towards placing new development in established growth areas with the infrastructure to support it will likely place more growth in already built-up portions of Chittenden County than in outlying areas like Charlotte.

The Massachusetts Institute for Social and Economic Research has projected the population levels in each one of the towns and cities in Vermont through the year 2020 (Attachment 7.3 - Population Projection). For Charlotte, it shows no growth (actually a slight decrease) from 2010 to 2020.

When projecting the population of Charlotte out to the year 2050, however, it would be imprudent to take only the last 10 years of projected growth as the sole source of information. In fact, if that approach had been used in 1830, the projected population levels for the next 100 years would have been wildly inaccurate. With that in mind, the committee applied a best-fit equation to the historical data to provide a conservative high estimate of the population level in Charlotte over the next 40 years. The results of this show a high population level of 4,850 in the year 2050, or 27 people (0.7%) per year. (Attachment 7.2 - Annual Projections Summary)

## **Future Municipal Wastewater Needs**

In interviews with the existing managers of municipal and quasi-municipal facilities, the committee identified the following needs:

### **(a) Town Office Building**

Staffing levels may increase in the future to meet services needs, but probably not as fast as the population, as some of the positions are currently part time. No other future municipal needs were identified. The Selectboard accordingly asked that the future wastewater needs of the Town Hall be based on expected future town growth.

### **(b) Town Library**

While library use continues to go up, the trustees foresee no immediate need to increase staffing levels.

### **(c) Fire Department and Rescue Services**

These organizations have no planned expansions in services; however, the frequency of the use of their services would likely rise with any increase in population levels.

### **(d) Senior Center**

The Senior Center Board of Directors has reviewed the current traffic population of the Charlotte Senior Center and also its planned expansion over the next 10 years. Although the Senior Center currently provides a luncheon for 60 persons, on some occasions it already serves as many as 75. Moreover, it occasionally provides dinners for up to 100 persons during the year and rents its space on behalf of the Town for meals up to 100 persons. The board anticipates that within ten years it will also likely provide regular breakfasts for up to 25 people. In addition to meal service, daily attendance including evening meetings already reaches a peak rate of 100 per day.

While the board expects that in the next decade an increasing number of people will use its facilities over the course of any given week, it expects that on any given day, use of its facilities will increase by no more than 50 percent over current use. Accordingly, the board estimates that it will need wastewater capacity of approximately 2025 gallons per day:

100-person lunch/dinner x 8 gpd/person	= 800 gpd
100-person daily attendance x 5 gpd/person	= 500
25-person breakfast x 8 gpd/person	= <u>200</u>
<b>Sub-total</b>	<b>= 1500</b>
Less 10% low-flow fixture credit	= <u>(150)</u>
<b>Total</b>	<b>= 1350</b>
Future expansion of 50%	= <u>675</u>
<b>Total Reservation Needed</b>	<b>= 2025 gpd</b>

## Conclusions and Recommendations

Population growth in Charlotte will likely continue to level off over the next several decades. Yet adopting a no-growth approach for the future would be irresponsible planning with regard to the finite capacity of the town's wastewater disposal sites. Consequently, the committee recommends that estimates of future design flows for these municipal facilities be tied generally to the higher rather than lower projections of future population growth in Charlotte.

The best-fit equation, which recognizes the historical population trends of the town, calls for a planned population level of 4,850 people in the year 2050, a 29% increase over current levels. With this in mind, the committee recommends that future municipal needs for the town offices, library, and fire and rescue services be allocated an additional 30% over current design flow values to a total of  $(865 \times 1.3 = 1,125)$  gallons per day.

The Senior Center board advised the committee that its long term needs would likely require 2,025 gpd of design flow. As such, the committee recommends that the future allocation reserved for the Senior Center be set at 25 gpd for a total of 2,025.

In order to support and expanded user group within the West Village, the collection system will need to be expanded. To accommodate the state minimum design requirements for infiltration, the committee recommends that 150 gpd be reserved for the state-mandated infiltration allowance associated with the potential expansion of the gravity sewer collection system.

The Committee accordingly recommends that a total of 3,110 gpd be allocated for future municipal uses, plus the 237 infiltration allowance, for a total of 3,537 gallons per day. This value represents a minimum reserve allocation, and new municipal uses should be considered along with other possible future uses.

User	Existing	Future Increase	Total
Town offices, library and fire and rescue	865 gpd	260 gpd	1,125 gpd
Senior Center	2,000	25	2,025
Infiltration	237	150	387
<b>Total</b>			<b>3,537 gpd</b>

## VIII. Potential Non-Municipal Uses

Section 4.4.3, *Pattern of Development*, of the 2008 Town Plan says this:

*The number-one element of the vision for the Town expressed by the plan is that the Town is committed to (re)enforcing historic settlement patterns by focusing growth in the village centers. Every plan since 1990 has supported compact development patterns that place more people within close proximity to services, public transportation, and each other to reduce the need for automobile travel and to create a center for commercial activity.*

*Additionally, the Town needs to provide for a variety of housing opportunities, especially affordable family and senior housing, in order to maintain economic and age diversity here. Furthermore, the villages are the most appropriate locations for such housing, particularly for senior, because of the proximity to existing and prospective services.*

Given this clearly articulated objective, the committee researched the opportunities for and interest in future commercial and residential development in the West Village if additional sewage disposal capacity were to become available. As noted above, a paper survey was sent to 89 property owners in the West Village Commercial Zoning Area. The text of the survey is incorporated in this report, as is a summary of the results (Section IV - Community Interest in Expansion of Wastewater Service).

### Commercial Uses

Existing commercial uses in the West Village Commercial Zoning Area include small-scale grocery and delis, a day care center, The Old Lantern event facility, an automotive service station, a future inn and various home occupations. Many of these commercial uses are located along the stretch of Ferry Road between US Route 7 and Greenbush Road. As noted above, the committee conducted both a paper and in-person survey relating to interest in additional sewage disposal capacity.

Some existing commercial uses have involved “adaptive re-use,” which is the conversion of a pre-existing use, such as a residence, into a small business or home occupation. This is the case with the Charlotte Children’s Center, for example. Several current residential uses along Ferry

Road have the potential for future conversion into commercial uses such as office or retail space. There are also possibilities for the development of new commercial uses in other locations in the village, including behind (south of) the Town Hall.

The Town Plan states that potential future uses in the village include:

- restaurants
- dentists
- hairdressers
- antique or gift shops
- prepared food delivery to homes

Other potential uses may include:

- office space
- art center / gallery
- small non-profit center
- professional offices

It is important to note that while the objective of strengthening the village core is important, future commercial uses must be compatible with Charlotte's small-town character (Section 2.1.1 of the Town Plan). In addition, there may be other limitations, beyond sewage disposal capacity, to increased residential and commercial growth in the village, including access, parking, and dimensional requirements imposed by the zoning regulations.

## **Residential Uses**

The Town Plan also expresses support for infill residential growth in the West Village, again in keeping with the Charlotte's small-town character. Affordable and senior housing are specifically emphasized.

*Section 5.2.1, Affordable Housing Policies*, of the Town Plan states as follows:

*“Sites for affordable housing...should be encouraged primarily in village areas where moderate density housing is envisioned that is convenient to municipal, commercial and transportation services....”*

Along with traditional single-family home residential uses in the village, future infill uses could include mixed-income and multifamily dwellings, affordable senior housing and the adaptive re-use of barns and carriage houses into accessory apartments. Enabling the provision of alternative residential uses in the village will require the provision of additional sewage disposal capacity. Charlotte's land-use regulations currently allow affordable housing in the village areas with ¼ acre minimum lot sizes. Providing offsite community wastewater disposal may allow minimum sizes to be reduced even further.

The 2006 Chittenden County Regional Plan housing targets call for 40 units of moderate income housing and 20 units of affordable housing within a ten-year time frame. Given that the Town Plan directs such residential growth to the village areas, additional sewage capacity will be necessary.

## **Challenged Systems**

Of paramount concern to the town with regard to any future allocation of additional sewage disposal capacity is the ability, in order to ensure public health, to help correct failed, or potentially failing systems, where on-site solutions are prohibitively expensive, or otherwise not feasible.

Charlotte Zoning Administrator Tom Mansfield conducted an inventory of existing individual and shared systems, permitting status, repaired systems and challenged systems, and the committee conducted soils mapping to ascertain the potential for additional capacity (Attachment 8.1 - Challenged Systems Summary). As noted in the Munson study, which tabulated and analyzed Mansfield's inventory (Attachment 3.3 - The Munson Study) the systems serving at least some of the existing development in the village are likely to fail, and those properties will be candidates for connection to a municipal/community system.

## **Service Life Considerations**

Vermont has seen a significant state policy change with regard to long term planning for small scale wastewater disposal systems. In the past, the approach was to simply discard a system that was not operating properly in favor of constructing a new one. This past policy has been put aside in favor of a combination of pro-active management of the biological loading to the systems and in-place renovation of permitted systems.

This approach represents the more current thinking for handling challenged wastewater disposal systems and also precludes the need to set aside redundant replacement areas.

This change in state rules results in two outcomes that can benefit Charlotte:

- 1) Systems permitted under the old rules may have up to twice the septic capacity previously permitted.
- 2) It is now more likely that a "fix" can be designed on an existing lot to solve a problem with an existing leach field.

## **IX. Management of Wastewater Resource for Non-Municipal Uses**

The existing system constructed by the town includes 296 linear feet (lf) of gravity sewer main collection system, a duplex pump station, 3160 lf of 4" diameter force main, and a conventional wastewater disposal field with approximately 5,000 sf of trench with a disposal capacity of 4,999 gallons per day. (Attachment 5.1 - Municipal System Plan)

In order to expand the existing municipal service, the existing collection system will need to be expanded. The committee also recommends that the disposal capacity on the Burns site be increased from 4,999 gpd to 6,499 gpd. A description of the means to accomplish this recommendation is outlined in Attachment 9.1.

Currently, there are no municipal funds available to expand the wastewater disposal system. The committee offers the following recommendations to address the management of an expanded system with minimal use of additional municipal funds.

### **Wastewater Allocations**

The State of Vermont requires that an adequate means of wastewater disposal be demonstrated for each new structure or change in use that requires an increase in wastewater disposal capacity. The following process could be used to allocate unreserved excess capacity in the disposal system to applicants for their use in proceeding with the state permitting process.

- (a) New connection applicants shall prepare an application on a form prepared by the Selectboard which identifies the proposed address and type of use, and provides information required for allocation, including but not limited to the proposed design flows and strength of wastewater. An application fee shall be paid to cover administrative costs.
- (b) Wastewater allocations shall be assigned on a priority system set forth by the Selectboard guided by the goals in the Town Plan.
- (c) The town shall reserve sufficient capacities in the existing system before allocating any excess capacity to private uses. The following amounts seem appropriate.
  - 245 gpd for future expansion of municipal uses.
  - 150 gpd for additional system infiltration
  - 900 gpd to address public health issues in the West Village associated with failed systems.

A detailed breakdown of the existing and proposed design flows is outlined below.

User	( GPD) Existing	( GPD) Future Increase	( GPD) Total
Town offices, library, and fire and rescue	865	260	1,125
Senior Center	2,000	25	2,025
Infiltration	237	150	387
Future Challenged	0	900	900
Future Allocations	1, 947		2,062
<b>TOTAL</b>	<b>4,999</b>		<b>6,499</b>

(d) In order to be eligible for a wastewater allocation, the applicant shall demonstrate that no feasible on-site wastewater disposal solution is less expensive than the connection fee in place at the time of application.

This process shall be supported with a report, prepared by a professional engineer or site technician licensed by the State of Vermont for wastewater design that summarizes the existing conditions, proposes on-site options and breaks down the estimated costs.

e) The Selectboard shall review the application for compliance with allocation standards and the available unreserved excess capacity. The Selectboard has 40 days to review and act on a completed application. If the application satisfies the allocation standards, the Selectboard shall approve or deny the application. If the application is found to be deficient, the applicant shall be notified by US mail within 15 days of the decision with an explanation of why the application was denied.

(f) The wastewater allocation issued by the Selectboard is valid for one year. The new service shall be placed in operation within one year of Selectboard authorization or the allocation shall be forfeited. The applicant may make a new application to the Selectboard without prejudice if the allocation is forfeited.

(g) If the applicant requires an extension, the applicant shall make a request to the Selectboard prior to the expiration date. The applicant shall pay 10% of the current connection fee to secure an extension of the wastewater allocation for one additional year. If the service connection is not placed into service within the extension period, the allocation and the partial connection fee payment shall be forfeited.

(h) The remainder of the connection fee shall be paid before the connection is placed into service.

## **Master Plan**

**System Expansion:** The committee recommends that the town create a master plan detailing the method by which the existing collection system will be expanded (see Attachment 9.2- Existing Burns Disposal System Expansion Plan). Project components would include:

### **Phase I**

- 1) Extending the gravity collection system 300 feet to the east to service the majority of the existing structures on Ferry Road.
- 2) Expanding the gravity collection system 560 feet to the west to the intersection of Greenbush Road.

Expanding the system from the Ferry Road/Greenbush Road intersection 300 feet to the south to cover the limits of the Village Commercial zoning district.

## **Phase II**

Utilizing a low-pressure collection system (force main) to enable users outside of the core service area to tie into the system.

The committee recommends additional investigations of the existing wastewater disposal system characteristics in the West Village Core area to determine how many of the properties utilize pump stations. A lack of pump stations would reinforce the use of a gravity collection system to readily enable future connections to the municipal system. If the majority of the properties had pump stations, then a low-pressure force main collection system might be more appropriate.

**Disposal Field Capacity:** In light of the limited capacity in the existing Burns property wastewater disposal system (after the removal of the recommended 260 gpd allocation for municipal uses and 900 gpd for public health uses), we recommend that the existing Burns system be expanded to 6,499 gpd under the state’s small-scale wastewater disposal program as part of the initial planning and system expansion process. The costs for this expansion will be included in shaping the fee program cost components.

**Meter Existing Flows:** The design flows assigned to each use incorporate a safety factor to protect against system overloads. The state allows for systems to propose alternate wastewater design flows provided that adequate information is available on the actual flows to the wastewater disposal system. This sometimes can result in documentation that the actual flows are less than the design flows, especially when multiple users are tied into one “community” facility.

In order to maximize the number of users that can be tied into the system, the committee recommends that the amount of sewage collected and sent to the disposal field be metered. This can take the form of one master meter at the pump station (this will also account for any infiltration) or by metering the water use at each individual connection. For this alternative to be fully functional, existing and new users would need to have water meters installed. This alternative would not recognize any reduction in infiltration that may be experienced by the collection system. A multi-meter system would require that daily readings be collected at each structure. The master meter approach would enable the use of an automatic flow recorder to record daily flows.

## **New Connections**

When new users have gained permission to connect to the existing system, they will be asked to make payment to the Selectboard in accordance with the current connection fee schedule. There are at least two possible ways to finance an expansion of the system.

- Use connection fees to incrementally extend the system.
- Bond and construct system expansion and then collect connection fees to re-pay the bond.

## 1. Use Connection Fees to Incrementally Expand the System Option

**Pay for Expansion:** If the new connection requires the extension of the master-planned collection system, then each new user will contract for, obtain the necessary permits for, and construct the required extension.

If the cost of this extension is less than the connection fee, the new user will pay the difference into the utility operating fund.

If the cost is greater than the connection fee, the new user will pay the entire cost up front and will be reimbursed the difference by the utility operating fund. If the utility operating fund has adequate funding, this reimbursement will occur upon completion of construction. If the utility operating fund does not have adequate funds, new users will be reimbursed when enough future connection fees from other new users are collected.

The **advantages** of this approach include:

- System expansion is undertaken on an as-needed basis.
- Quality control costs are paid for by new users.
- No municipal bonding is required.

The **disadvantages** to this approach include:

- Construction disruptions in the village area could periodically extend for many years.
- Quality control is not under direct control of the Town.
- First-in users connecting to the system may have to pay more initially with no guarantee on when they will be repaid.
- No well-orchestrated public design and construction process would be in place.

## 2. Use Municipal Bonding to Construct System Expansion

The Selectboard will propose a municipal bond or other financing mechanisms to pay for the permitting and construction of the new shared infrastructure. The Selectboard will retain engineering and construction services to install the new shared infrastructure. Repayment of the loan will be made by the users or property owners within the proposed service district.

The **advantages** of this approach include:

- A well-orchestrated design and construction process;
- A consolidated construction schedule; and
- Town management of quality control.

The **disadvantages** to this approach include:

- Using municipal bonding capacity,
- Making bond payments with tax money if there are few or no connections to the system, and/or
- Requiring all owners of property within the sewer service district to pay into the system.

**Quality Control:** New users, at their own cost, shall retain a professional engineer, licensed in the State of Vermont, to periodically inspect and conduct testing of the improvements to certify the following:

*In the exercise of my reasonable professional judgement, the installation-related information submitted is true and correct and the wastewater system was installed in accordance with the permitted design and all of the permit conditions, were inspected, were properly tested, and have successfully met those performance tests.*

## **X. Possible Fee Program Policies**

### **Existing System Development Cost Recovery**

The Town of Charlotte invested approximately \$125,000 in the original wastewater disposal system for its four municipal buildings. **The policy question is how much of the original system construction costs should be recovered by the future users of this system?** The existing system has an easily permitted disposal capacity of 6,499 gallons per day.

A high end recovery would require that each gallon of new discharge be charged \$19.23 (\$125,000/6,499) per gallon. From this high end, the scale can slide all the way down to zero depending on how much of the system development costs will be charged off in the interest of providing the necessary infrastructure to support the goals of the Town Plan.

**Discussion** – The costs of constructing the wastewater collection and disposal system should be recovered in whole or in part. The Town Plan calls for growth to be focused in the village areas (while preserving our surrounding open space areas), and wastewater disposal capacity is a critical component. In addition, the general sentiment of the town’s citizens and boards is that they would like to see a more vibrant commercial component in the village.

The general response to the Town Meeting questionnaire indicated that all of the original system costs should be recovered from future users and that a subsidy through non-collection of a portion of these costs should not be implemented.

**Recommendation** – Based on the input from citizen respondents, the committee recommends that all of the original system development costs be recovered on a prorated basis. **This equates into connection fees of \$19.23 per gallon of design flow.**

## Inflation Adjustment

The original system was installed in 2002. The Consumer Price Index inflation factor from 2002 to 2011 is 1.27, meaning that \$1 of goods purchased in 2002 would cost \$1.27 today. **The policy question is whether the time use of money should be recovered as part of the connection fee?** On the high end, this will add \$5.19 ( $\$19.23 \times \$0.27$ ) per gallon of capacity used.

**Discussion** – If the system were constructed today, the costs would be higher than they were in 2002 and system users would pay accordingly.

**Recommendation** –The full CPI be integrated into the price adjustment for the cost for the system.

$$1.27 \times \$19.23 = \$24.42 \text{ per gallon}$$

## Depreciation Adjustment

Another factor to be consideration is that the existing system is not brand new. The system is now nine years old and its value has depreciated to some degree. **The policy question is whether a connection fee should be adjusted down to reflect the age of the system.** Assuming a 30-year design life for the system and straight line depreciation, the high end connection fee would be reduced \$5.77 per gallon ( $\$19.23 \times 9/30$ ).

**Discussion** –New users will buy into a system with a reduced design life. On the one hand, there is a mechanical component, the pump station, which has shown signs of age, and the pumps were recently upgraded at a cost of \$10,000. On the other hand, the town has a wastewater disposal field that has been well underutilized. A full depreciation of this system component would be overly conservative. In this case, half of the expanded capacity has been used within a system where the nine-year use period represents approximately one-third of its 30-year design life. The gravity sewer main and force main components typically have design lives of 50-75 years.

**Recommendation** – The primary increased exposure a new user will have by connecting to the system would typically be the condition of the wastewater pump station, except that it was recently refurbished. Accordingly, the committee recommends a full 9/30 depreciation for this structure, while 1/10 depreciation is recommended for the pump station. The disposal field should be depreciated half of the nine-year use period due to the limited use it has received to date. The remaining system costs should be depreciated over a 60 year period. This yield the following:

<b>Pumps</b>	$1/10 \times \$10,000 =$	\$1,000
<b>Pump Station</b>	$9/30 \times \$20,000 =$	\$4,500
<b>Disposal Field</b>	$50\% \times \$25,000 =$	\$3,750
<b>Remaining</b>	$9/60 \times \$70,000 =$	<u>\$10,500</u>
		\$19,750

$$\$19,750 \times 1.27 \text{ inflation factor} / 6,499 \text{ gal} = \$3.86/\text{gal credit}$$

## Easement Fee

The existing system utilizes approximately 1.26 acres of the Burns property. The underground force main that crosses the property uses 0.42 acres (920' x 20'), and the primary and replacement wastewater disposal fields use 0.84 acres ((175' x 210'). **The policy question is whether a fee should be charged for the use of the Burns property.** The value of agricultural lands has been set by the Vermont Department of Agriculture at approximately \$5,000 per acre in Chittenden County. It is also known that that lands containing wastewater disposal potential are valued more highly than “open space” lands. The recommended expansion of the wastewater disposal system to 6,499 gpd will require no additional area when the current replacement area standards are applied. Using the \$5,000 per acre value, the high end allocation of costs would be \$0.97 per gallon (1.26 acres x \$5,000/acre /6,499 gpd).

**Discussion** – The wastewater disposal field reduces the agricultural potential of the Burns property due to its shallow bury depth (tilling issues). Both the disposal field and the force main are underground. This creates no visual impact on the open space value of the property. Provided that the future needs of the municipality are addressed (a separate planning issue), the impacts are marginal.

The value of the wastewater disposal capacity lands can be of great debate. Without the benefit of professional assistance on this matter, we have assigned a value of four times that of the agricultural open space value or \$20,000 (4 x \$5,000) per acre.

**Recommendation** – The committee recommends no use fee for the force main component, as it has negligible impact on the open space enjoyment of the property. Regarding the disposal field area, the full 0.84 acres should be assigned an easement fee of:

$$0.84 \text{ acres} \times \$20,000/\text{acre} = \$16,800/6,499 \text{ gal} = \$2.58/\text{gal}$$

## Sinking Fund

Wastewater systems require periodic maintenance. This involves repairs to the mechanical components of the pump station, corrective measures that may be required for the distribution system at the disposal field, and eventual construction of the replacement disposal field when the existing field no longer functions.

The State of Vermont requires that municipal wastewater treatment facilities begin planning for expansion and continued growth of their service districts when the existing use reaches 80% of the design capacity. The planning costs associated with design and permitting of a system expansion should be included in the sinking fund. In this case, the next step would be to expand the disposal capacity of the existing town wastewater disposal system from the current 4,999 gallons per day to 6,499 gpd.

The estimated long-term costs to be included in the Sinking Fund:

- \$3,000 Pump Station Electrical Replacement every 10 years
- \$8,000 Pump and Slide Rail Replacement every 12 years
- \$30,000 Disposal Field Replacement/Renovation every 30 years
- \$5,000 Planning Costs for System Expansion
- \$20,000 System expansion for capacity replacement

Recurring short-term costs would include:

- \$1,000 Annual inspection and cleaning of the pump station.
- \$1,200 Annual inspection of the septic tanks, collection system and wastewater disposal field.
- \$1,000 Average annual cost of pumping of system users septic.
- \$10 Annual electrical cost for operating the pump station.

**The policy question is whether these costs should be collected as part of the initial connection fee or whether they should be integrated into an annual users fee.**

**Another policy question is who pays the cost of pumping the septic tanks. At Thompson’s Point, pumping is done on an as-needed basis and is coordinated and paid for by the utility, which then distributes these maintenance costs to all of the system users.**

*Discussion* – The primary issue is whether increased cash flow in the form of a lump-sum payment as part of the connection fee would be beneficial for the operators of the system, or whether the combination of a reduced connection fee and increased operating costs (to cover the sinking fund) is more beneficial to achieving some of the overarching goals in the village.

The recurring short-term costs of approximately \$3,200 per year—or \$0.64 (\$3,200/6,499 gal) per gallon, which translates into \$269 per year (\$0.64 X 420 gal) per equivalent unit—should be part of an annual user fee.

The total long-term maintenance and planning costs over a 30-year design life, translated into a one-time connection fee, would be approximately:

Pump station electrical	\$3,000/10 years x 30 years	=	\$9,000
Pumps and railing	\$8,000/12 years x 30 years	=	\$20,000
Disposal field expansion	\$20,000/30 years	=	\$667
Disposal field renovation	\$30,000/30 years x 30 years	=	\$30,000
Planning costs	\$5,000/10 years x 30 years	=	<u>\$15,000</u>
			\$74,667
<b>Total costs</b>	<b>\$74,667/ 6,499 gal</b>	=	<b>\$11.49/gal</b>

Under the lump-sum payment approach, an equivalent unit would be assessed an additional \$4,826 (420 gal x \$11.49/gal) at the time of connection to the system.

If these costs are paid as part of an annual assessment, then the annual fee for all users would be roughly \$2,485 per year (\$74,557/30 years) or \$0.38 per gallon (\$2,485/6,499 GPD).

The short-term maintenance and planning costs of approximately \$3,200 (\$96,000/30 years) per year, when paid on an annual basis, are in the same ball park as the short-term costs. These costs would be \$0.49 (\$3,200/6,499 gal) per gallon, which translates into \$206 (\$0.49 X 420 gal) per year per equivalent unit.

**Recommendation** – In order to provide flexibility to adjust for changes in on-going operating costs, the committee recommends that the sinking fund fees be collected as part of the annual use assessment at the initial rate of \$0.87/gal (\$0.49 short term maintenance costs + \$0.38 long-term maintenance costs), which is to be set annually by the Selectboard.

## **Wastewater System Improvement Phases**

The town should adopt a master plan for how the existing collection system will be expanded.

### **Phase I**

- Extend the gravity collection system 300 feet to the east to service the majority of the existing structures on Ferry Road.
- Expand the gravity collection system 560 feet to the west, or to the intersection of Greenbush Road.
- Expand the gravity system from the Ferry Road/Greenbush Road intersection 300 feet to the south to cover the limits of the Village Commercial zoning district.

(These improvements include the service lines located within the public right-of-way.)

### **Phase II**

- Utilize a low-pressure collection system (force main) to enable users outside of the core service area to tie into the system.

**Discussion** – The use of gravity sewer in the Phase I expansion takes advantage of the existing topography and enables those properties with gravity-based disposal systems to readily tie into the collection system. Areas beyond the recommended limits of the gravity collection system would connect to the system through a low-pressure collection system that relies upon pump stations to move the wastewater in small-diameter force mains to the gravity collection system.

**The estimated cost for completing Phase I of the system expansion is \$125,000.**

**Recommendation** – That the system expansion be paid for by **new** users at the rate of \$125,000/(6,499 – 3.102) gpd = \$36.80 per gallon.

Based on the above estimates, the connection and annual operating fees should be set as follows:

Existing System Cost Recovery	\$19.23	
Inflation Adjustment	\$5.19	
Depreciation	(\$3.86)	
Easement Fee	\$2.58	
System Expansion Costs	<u>\$36.80</u>	
<b>Connection Fee Total</b>	<b>\$59.94 per gallon</b>	
<i>Example: 15 seat restaurant x 30 gpd /seat x \$59.94</i>		= \$26,973.00
<i>Example: 3 bedroom home x 140 gpd /bedroom x \$59.94</i>		= \$25,174.80
<b>Annual Operating Fee</b>	<b>\$0.87 per gallon</b>	
<i>Example: 15 seat restaurant x 30 gpd / seat x \$0.87</i>		= \$391.50
<i>Example: 3 bedroom home x 140 / bedroom x \$0.87</i>		= \$365.40

## **XI. Recommendations**

### **1. Place the following question before the voters at Town Meeting 2012:**

*Should the Town of Charlotte allow private property owners to connect to the existing municipal wastewater system for the purpose of providing wastewater disposal for residential and commercial uses in West Charlotte Village?*

If the question is answered in the affirmative, expand the existing municipal wastewater system.

### **2. Adopt a wastewater master plan with the following components:**

- a. Identified service area and expansion phases,
- b. Increases in the existing permitted capacity from 4,999 GPD to 6,499 GPD,
- c. Identified reserved allocations,
- d. A policy for allocations of unreserved excess wastewater disposal capacity,
- e. Metering, operation and maintenance expectations for the wastewater facilities,
- f. A budget for the wastewater system,
- g. Connection fees, and
- h. A plan for system expansion, along with plans for engineering and construction.

### **3. Create and adopt an ordinance addressing:**

- a. Allocation of unreserved excess wastewater disposal capacity,
- b. Connection fees, and
- c. Operation and maintenance of the wastewater facilities.