

Final Report on Expanding Community Wastewater Service in the West Charlotte Village



**Submitted to the Charlotte Selectboard
for consideration.**

July 12, 2016

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I. Executive Summary

Community discussions regarding expansion of municipal wastewater service in the West Village have been going on for several years. The current Town Plan identifies commercial development in both the West and East Villages as a goal in the Economic Development, Future Pattern of Development, and Specific Community Facilities and Services chapters.

With regard to the West Village, the portion of the Village east of Greenbush Road exhibits native soils with poor to very poor on-site wastewater disposal potential. This has hampered expansion plans of existing businesses and challenged new projects along that portion of Ferry Road from Greenbush Road to Route 7. Public health issues related to failed systems have also motivated the discussions.

In 2009, voters at Town Meeting approved 93 -67 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 Charlotte Wastewater Committee submitted its findings in a report to the Selectboard on September 10, 2011. In its report, the Committee recommended that: 1) a presentation be made by the Committee at the March 2012 Town Meeting; 2) a proposed Wastewater Master Plan be created; and 3) proposed municipal ordinances be developed for allocation and use.

The Town Meeting 2012 presentation was made by the Committee. Lacking further instruction from the Seletcboard, the Committee disbanded. In August, 2015, a reconstituted Charlotte Wastewater Committee was formed to address the remaining items.

) **Proposed Wastewater Master Plan**

Elements of the proposed Wastewater Master Plan consist of :

-) Service Area and Expansion Phases;
-) Increase in permitted capacity from 4,999 GPD to 6,499 GPD;
-) Policy on allocations to be reserved for municipal uses;

- J Policy on allocations of unreserved excess wastewater disposal capacity;
- J Policy for metering, operating and maintaining expectations for use of the wastewater system;
- J Connection fee policy;
- J Budget for the wastewater system;
- J Wastewater system improvement phases.

1. Service Area and Expansion Phases, Attachment III(a).

The proposed Phase I service area, a priority, is generally located along the section of Ferry Road from Route 7 to Greenbush Road. Failed systems located along Greenbush Road with no reasonable recourse due to small lot size or close proximity to adjacent wells are also eligible to tie into the municipal collection system.

The Phase II portion of the service area is the southern portions of the commercially zoned properties including the Wildflower Farm, Flea Market and southern portion of the Laboeuf property.

The Town controls a number of “satellite” wastewater disposal sites outside of the Village area proper. The use of these facilities by those properties outside of the Phase I and II service areas is not restricted.

The Committee recommends that the means of expanding the municipal collection system should be through the use of a low pressure collection system. Additionally, The expansion of the collection system should be paid for by the new users of the municipal wastewater system

A plan for expansion, along with plans for engineering and construction, have been prepared and show the proposed routing of the low pressure collection system, as well as details on how each private connection is to be made to the existing gravity collection system and proposed low pressure collection system.

2. Increase in permitted capacity from 4,999 gallons per day (GPD) to 6,499 GPD.

This increase can readily be accommodated without any further construction modifications through the submission of a State of Vermont Wastewater Disposal System application, attachment III(b), by the Town which takes advantage of opportunities set forth in the current State Environmental Protection Rules. This application package, and supporting documents, has been prepared by the Committee and is attached with this report.

3. Policy on allocations to be reserved for municipal uses

Population growth in Charlotte will likely continue to level off over the next several decades. However, for planning purposes, adopting a no-growth approach would be short-sighted given the finite capacity of the Town's wastewater disposal sites.

The Committee recommends that a best-fit equation be used which recognizes the projected population trends and also plans for the future. This would mean planning for a population level of 4,850 in 2050 (2010 census was 3,759) which would include the following future wastewater allocations for municipal uses: 1) Town offices, Library, and Fire and Rescue (1,125 GPD); 2) Senior Center (2,600 GPD); 3) Infiltration (237 GPD); Total = 3, 962 (GPD).

4. Policy on allocations of unreserved excess wastewater disposal capacity

Previous work by the Committee indicated that a wastewater ordinance should include priorities for the distribution of the available excess wastewater disposal capacity controlled by the Town.

The proposed Sewer Allocation Ordinance sets forth certain standards for the allocation of wastewater disposal capacity based upon first demonstrating that the property does not have the on-site wastewater disposal capacity to address the proposed use.

As it relates to the Primary District, the Committee recommends that the prioritization program of potential users be put on hold until the Burns Property System is expanded beyond the 6,499 GPD threshold.

Since the unallocated wastewater disposal within the Burns site, or at the satellite wastewater disposal sites, is finite, it is recommended that the allocation of these resources by the Town only be made to those properties that do not have the means of addressing their own wastewater disposal needs.

The proposed Wastewater Master Plan sets forth policies for eligibility in both the primary and secondary service areas, as well as a review process.

5. Policy on metering, operating and maintaining expectations for use of the wastewater system

The proposed Sewer Use Ordinance, Attachment IV(b), addresses the obligations of those existing and future users of the municipal collection and wastewater disposal system. In order for there to be an equitable allocation of costs, the proposed Sewer Use Ordinance requires the use of water meters to document actual water usage. It establishes a process for managing

new connections. It also details issues such as a user charge system; construction standards; fee schedules; billing procedures and a customer inquiry policy.

6. Connection fee policy

In order to determine what future connection fees would be, the Committee prepared estimates of probable construction costs for the expansion of the wastewater system. Discussion of the recommended connection fees includes a number of public policy decisions on whether historic costs should be recovered and whether certain uses should be promoted through reduced connection fees. The proposed Sewer Allocation Ordinance references the method by which the connection fees would be calculated.

The recommended connection fee is \$65.69 for each GPD of design flow.

7. Budget for the wastewater system

To support an understanding of how the finances of the expanded municipal wastewater collection and disposal system would work, the Committee has developed an outline of the likely operating costs for the system. The proposed Sewer Use Ordinance addresses the rules associated with the use of the system and payment of quarterly sewer use fees.

In order to provide flexibility to adjust for changes in on-going operating costs, the Committee recommends that 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.

) Proposed Municipal Ordinances

) Sewer Allocation Ordinance (Allocation of unreserved excess wastewater disposal capacity), Attachment IV(a)

The proposed Sewer Allocation Ordinance addresses the methods for the allocation of wastewater disposal capacity from the unreserved capacity (that capacity not encumbered by reservation for future municipal or public health issues) in the existing and future expanded wastewater disposal system. It addresses capacity allocation, pollution abatement, capacity for individual developments, cost recovery for sewer expansion, connection authorization, and monitoring final flows.

**) Sewer Use Ordinance (Operation and maintenance of the wastewater facilities),
Attachment IV(b)**

The proposed Sewer Use Ordinance addresses the rules associated with the use of the system and payment of quarterly sewer use fees associated with the maintenance of the system. It references the means by which the proposed connection fees would be calculated. In order to determine what the future connections fees would be, the Committee prepared estimates of probable construction costs to facilitate the future expansion of the wastewater disposal system. The recommended connection fees include a number of public policy decisions on whether historic costs should be recovered and whether certain uses should be promoted through reduced connection fees.

II. Background

In 2009, the voters at Town Meeting approved by a 93 -67 margin 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, the Charlotte Wastewater Committee, to examine this issue and report back on the need for such a facility or facilities. The Committee consisted of Dave Marshall, Vince Crockenberg, Dana Hanley and Winslow Ladue.

In September, 2011, the Committee submitted a report to the Selectboard on the potential expansion of community wastewater service in the West Charlotte Village.

The Committee’s work was guided by language in the Town Plan which clearly encourages future growth to be centered in the two Villages. The Committee reviewed past Village wastewater planning efforts, made extensive efforts to gauge community interest in the provision of expanded wastewater services, and assessed future municipal wastewater needs. It 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 the West Charlotte Village. The report addressed the management of an expanded wastewater system. The report also considered development of policies for allocation, new connections, and the assurance of quality control. A possible fee program was considered, including creating a cost recovery fee and establishing an easement fee and a sinking fund.

The Committee’s recommendations to the Selectboard included 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 municipal ordinances that address allocation of unreserved excess wastewater disposal capacity, including connection fees, as well as the operation and maintenance of the wastewater facilities.

In August, 2015, based in part on increasing public inquiries about the opportunities to utilize the excess capacity in the existing municipal system, the Selectboard decided to reconstitute the Charlotte Village Wastewater Committee to further examine the recommendations of its report, chiefly creating a Master Plan for future wastewater improvements, as well as municipal allocation and use ordinances.

The new Committee (Dave Marshall, Dana Hanley, and Selectboard liaison Fritz Tegatz) submitted a report to the Selectboard on June 20, 2016 including a proposed **Wastewater Master Plan** addressing:

-) Service area and expansion phases;
-) Increased permitted capacity from 4,999 GPD to 6,499 GPD;
-) Policy on allocations reserved for municipal uses;
-) Policy on allocations of unreserved excess wastewater disposal capacity;
-) Policy on metering, operating and maintaining the system, as well as on managing expectations for its use;
-) Connection Fee policy;
-) Budget for the expanded wastewater system.

The report includes the creation of two **municipal ordinances** including:

-) Sewer Allocation Ordinance (of unreserved excess wastewater disposal capacity);
-) Sewer Use Ordinance (the operation and maintenance of the wastewater system).

III. Proposed Wastewater Master Plan

1. Service Areas and System Expansion Phases

The existing municipal wastewater system was constructed and completed in the late Fall of 2001 at the total cost of \$140,400 for design, permitting and construction. All maintenance costs to date have been incurred by the Town.

The existing municipal system consists of:

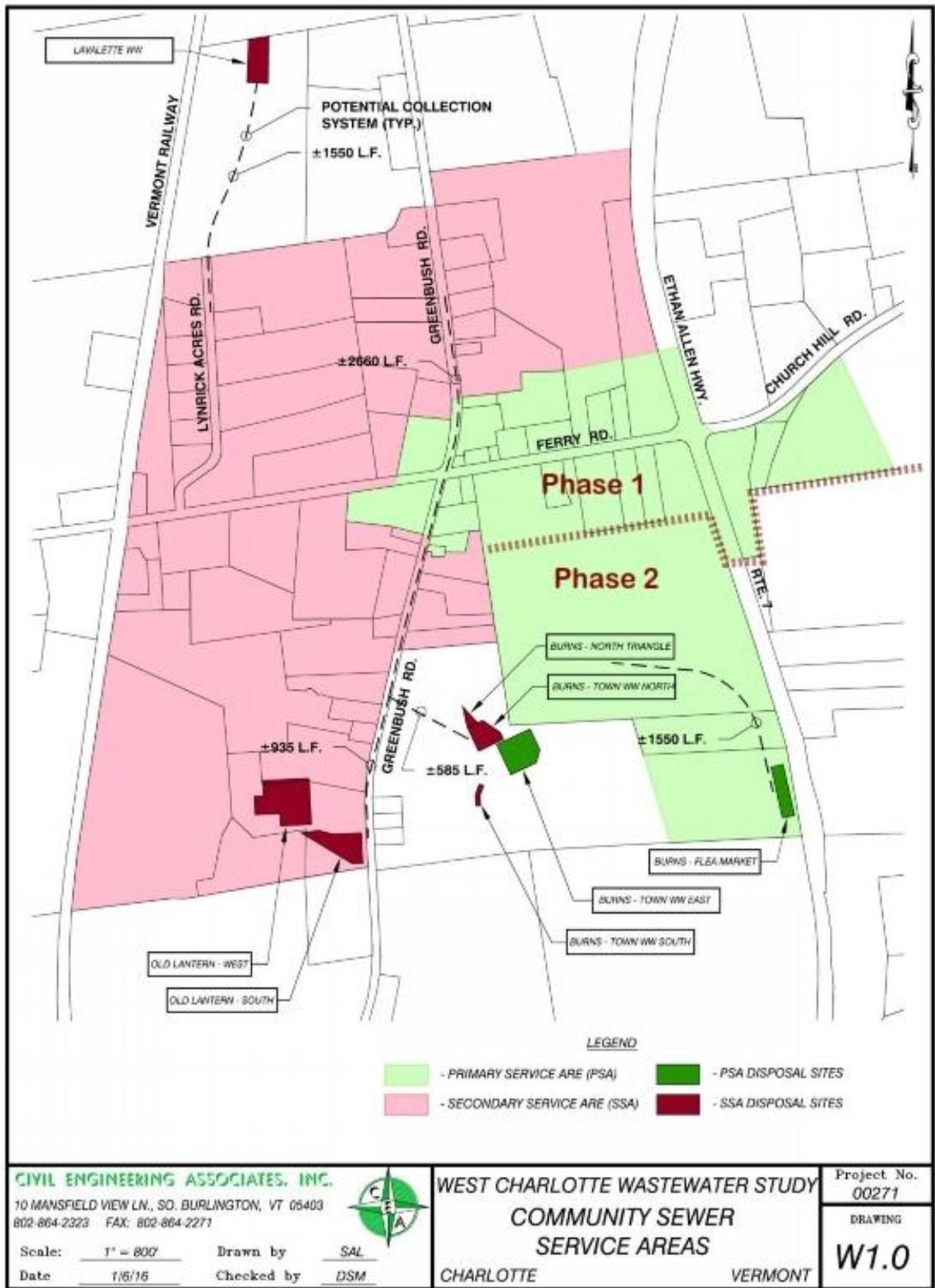
-) A conventional subsurface wastewater disposal system located on the Burns property on Greenbush Road near the old Burns gravel pit.
-) A gravity collection system serving the:
 - a. Charlotte Town Offices
 - b. Charlotte Library
 - c. Charlotte Senior Center
 - d. Charlotte Volunteer Fire Department
-) All collected sewage effluent flows to a pump station (located at the north end of the Town Office Lawn), which is then conveyed by a force main (pipe with pressurized fluids) that first runs west along Ferry Road and then southerly along Greenbush Road to the wastewater system.

The Town controls easements for a number of potential “satellite” on-site wastewater disposal sites located both near (Burns Hill Subdivision) or outside (Lavalette on Greenbush Road) of the West Village area.

Service areas

It is recommended that two service areas be created.

-) **Primary Service Area** – This area would follow the current limits of the West Village Commercial Zoning District. This would enable properties located within this zoning district to petition the Selectboard for permission to tie into the wastewater disposal system located on the Burns property in accordance with the standards set forth in the proposed Charlotte Sewer Use Ordinance.
-) **Secondary Service Area** – This area generally follows along the remaining portions of Greenbush Road located within the West Village Residential Zoning District. These properties are permitted to petition the Selectboard for the use of those remote wastewater disposal system sites for properties with failed systems, for adaptive re-use of existing homes into duplex structures, and for home occupations allowed within that zoning district. The recommended service areas are depicted on the map on the following page.



CIVIL ENGINEERING ASSOCIATES, INC.
 10 MANSFIELD VIEW LN., SO. BURLINGTON, VT 05403
 802-864-2323 FAX: 802-864-2271



Scale: 1" = 800' Drawn by SAL
 Date 1/6/16 Checked by DSM

WEST CHARLOTTE WASTEWATER STUDY
COMMUNITY SEWER
SERVICE AREAS
 CHARLOTTE VERMONT

Project No. 00271

DRAWING
W1.0

System Expansion Phases:

The 2011 Charlotte Wastewater Committee report considered an extension of the existing gravity sewer main in the following directions:

- J Easterly to the high point of Ferry Road near the driveway to the Library; and
- J Westerly along Ferry Road with a short extension south to the high point of Greenbush Road.

However, this “traditional” approach to expanding the wastewater collection system:

- Had a high initial capital expense;
- Created technical challenges and mitigation costs due to the close proximity of private wells along this route;
- Created significant initial construction impacts associated with the deep excavation typical of gravity collection systems; and
- Had higher long term maintenance cost exposures than other collection systems.

With the goal of minimizing the footprint of impact of the proposed collection system in mind, this Committee recommends the use of a low pressure collection system, as its benefits include:

- ✚ The use of small diameter pipes which can be installed with directional boring technology which reduces the amount of excavation and surface disturbance required;
- ✚ The low pressure collection system can be installed at a shallower depth as it can more readily follow the existing contour;
- ✚ A lower potential for leakage as this is installed and tested as a pressure tested system; and
- ✚ The use of a pressure rated pipe eliminates the required inclusion of an infiltration allowance which reduces the remaining capacity at the disposal system.

The Committee recommends that the expansion of the collection system be paid for by the new users of the municipal wastewater disposal system. This eliminates any up-front financing or physical improvements that have the potential, in the worst case, to go for years without use. The details of how these costs will be equitably attributed between first time expansion costs

and those tying in to the same collection system installed and paid for by others is reviewed in greater detail in Section III(6).

Phase I

This Committee recommends that the collection system be extended 800 feet to the east to service those properties fronting Ferry Road and the commercial properties located on the east side of Route 7 majority of the existing structures on Ferry Road. The collection system would be extended 560 feet to the west, or to the intersection of Greenbush Road.

Phase II

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

Recommendation & Discussion:

The properties located within the commercially zoned district that have the greatest challenges with regard to the creation of expansion of wastewater disposal systems are those that are located east of Greenbush Road. Beyond the retention of the existing gravity collection system, all new connections would utilize a low-pressure collection system that relies upon pump stations to move the wastewater in small-diameter force mains to the gravity collection system.

2. Increase the existing permitted capacity from 4,999 GPD to 6,499 GPD.

This increase can readily be accomplished through the submission of a State Wastewater Disposal System application which allows applicants to take advantage of the opportunities set forth in the current State of Vermont Environmental Protection Rules.

The Vermont Agency of Natural Resources has two different programs for regulating the disposal of sewage to on-site disposal systems.

-) **The State Wastewater Disposal and Water Supply Small Scale Program** is managed by the regional Agency of Natural Resources offices and applies to design flows of less than 6,500 GPD (Charlotte is a 'delegated community' which administers the program locally).
-) **The State Indirect Discharge Program** is for large scale disposal systems with design flows greater than or equal to 6,500 GPD.

The current municipal system was permitted under the State's Small Scale Program for the site but the original design utilized application rates limited to those consistent with the State Indirect Discharge Program. This program has design values that are more conservative than the Small Scale Program.

Based on current State of Vermont wastewater rules, the existing system disposal capacity can be expanded with no physical modifications. Until the design flows exceed 6,500 GPD, the system can remain under the State's Small Scale Program. The application rate can be increased based on the original percolation rates developed for the project.

Action Items:

-) The preparation of a State Wastewater Disposal and Potable Water Supply permit application which outlines the documentation for this request (This has been completed with the supporting attachments and is awaiting signature by the Selectboard).*
-) An application fee (Current rules call for fees of \$500 per unit which would equate to approximately \$1,500) would need to be paid to the Town unless waived by the Selectboard.*

It should be noted that there are exceptions to the 6,500 GPD wastewater disposal limit on one property. The primary exemption is when two separate, unrelated users dispose of wastewater on one property. This exception is currently in play at the Burns property in that the Habitat for Humanity currently uses 1,260 GPD of disposal capacity on the property. Since this is not part of the "municipal" system, it does not count against the running total for the property. 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 and remains the premise for potential third party use of the secondary disposal sites on the Burns property.

3. Policy on allocations to be reserved for municipal uses

As the existing wastewater collection and disposal system was constructed primarily with service to the town office, library, volunteer fire and rescue department, and Senior Center 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 design flow for 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, the tourist economy, or use by non-Charlotte residents.

Historic Population Trends

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 U.S. Census results for 2010 shows a population level of 3,754, which is only six residents off the published estimate by the U.S. Census Bureau in 2001. 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 growth period experienced by the town from 1960 to 2000. The slower growth in Charlotte may be related to overall population shifts away from rural areas toward growth centers and the urban core. The trend in county-wide 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.

Realtors advise that new home owners are looking to be located in areas where multiple shopping, leisure and entertainment opportunities exist, which runs parallel with the efforts to focus housing in established growth areas where these facilities are already in place. Pressures on all Chittenden County towns to meet regional affordable housing targets will remain high.

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. 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.

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.

Future Municipal Wastewater Needs

In follow-up interviews with the existing users of municipal and quasi-municipal facilities, the Committee identified the following needs:

(a) Town Office Building

Staffing levels fluctuate to meet service needs, both in number of employees and hours worked. While there is no expected expansion of the building, the Selectboard accordingly has expressed that the future wastewater needs of the Town Offices be based on expected future town growth. The Town Administrator has noted that the Town should be aware of the potential impacts of the ongoing decrease in the school-age population.

(b) Town Library

Recent use of the library facilities has increased, but library trustees foresee no immediate need to increase staffing levels. There is a noticeable increase in the use of the sanitary facilities during the summer by tourists, especially cycling groups.

(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.

It should be noted that the Charlotte Senior Center is the only facility of its type in the general area. Although there are a number private senior living communities located in Shelburne, there is no facility in Shelburne (or for that matter, Ferrisburgh or Hinesburg) catering to those seniors not associated with those privately managed facilities. Testimony has been provided which indicates that out-of-town residents are utilizing some of those services offered here in Charlotte. As such, the Committee has recommended that the design flows for the Senior Center be augmented with a line item for program use of the facilities of 50 full time equivalent individuals per day in addition to the meal program offered at the facility. Lastly pressure of outside use, coupled with an increasing senior population in Charlotte has led the Committee to recommend a 70% increase in reserve capacity for this facility.

Accordingly, the board estimates that it will need wastewater capacity of approximately 2025 gallons per day based on the following break-out of uses:

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	=	200
50- person Program Attendance x 5 gpd/person	=	<u>200</u>
Sub-total	=	1,700
Less 10% low-flow fixture credit	=	<u>(170)</u>
Total	=	1,530
Future expansion of 70%	=	<u>1,070</u>
Total Reservation Needed	=	2,600 gpd

Recommendations

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 x 1.3 =) 1,125 gallons per day.**

The Senior Center board advised the committee that its long term needs would likely require 2,600 GPD of design flow. As such, the committee recommends that the future allocation reserved for the Senior Center be set **at 600 GPD for a total of 2,600 GPD**

The Committee’s previous work in 2010 identified the need to include an increase in the sewer main infiltration allowance. This report recommends the use of a low pressure sewer collection system which eliminates the need to account for future infiltration along the expanded portions of the collection system.

The Committee accordingly recommends that a total of 3,725 GPD be allocated for future municipal uses, plus the existing 237 GPD infiltration allowance, **for a total of 3,962 GPD.** This value represents a minimum reserve allocation, and new municipal uses should be considered along with other possible future uses.

Recommended future reserve capacity for municipal uses:

User	Existing	Future Increase	Total
TO, L and F&R*	865 GPD	260 GPD	1,125 GPD
Senior Center	2,000	600	2,600
Infiltration	237	0	<u>237</u>
Total			3,962GPD

* TO, L and F&R = town offices, library, and fire and rescue

4. Policy on the allocation of unreserved excess wastewater disposal capacity

As noted above, the Committee recommends that the proposed sewer allocation ordinance include two separate service districts:

-) **The Primary District** follows the existing Commercial Zoning District;
-) **The Secondary District** is located within the current Village Residential Zoning District.

Previous work by the Committee indicated that a wastewater allocation ordinance should include priorities for the distribution of the available excess wastewater disposal capacity controlled by the Town. As it relates to the Primary District, there is only a moderate amount of capacity that would be available for the public. Coupled with the fact that there are no funds available to enable the expansion of the system to its upper limits, the Committee recommends that the potential prioritization of users be put on hold until the Burns Primary system is expanded beyond the 6,499 GPD threshold. This will enable a broader group of properties and land uses to take advantage of the opportunity to tie into the municipal system while creating seed money for the future expansion of the wastewater disposal system.

Since the available unallocated wastewater disposal capacity within the Burns site or at the satellite wastewater disposal sites is finite, it is recommended that the allocation of these resources by the Town only be made to those properties that do not have the means of addressing their wastewater disposal needs.

General Eligibility

In order to be eligible for a wastewater allocation, applicants must demonstrate that there are no feasible on-site wastewater disposal solutions that are less expensive than the connection fee in place at the time of application.

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

The analysis would include a review of all properties controlled by the applicant within 500 feet of the proposed land use location.

Eligibility in the Primary Service Area

All Permitted or Conditional Use land uses located within the Village Commercial Zoning District are eligible. All Phase I flows are to be directed to the Burns property Primary wastewater disposal system. Phase II development may utilize the estimated 2,260 GPD disposal capacity for the Flea Market Site. Failed residential systems are not eligible in this district.

Eligibility in the Secondary Service Area

Land uses eligible to utilize the wastewater disposal capacity in the satellite wastewater disposal facilities are limited to:

- (a) Failed wastewater disposal systems;
- (b) Home occupations;
- (c) Conversion of single family homes to duplex structures;
- (d) Additions to single family homes for an apartment.

Review Process:

-) The Selectboard shall review the application for compliance with allocation standards and the available unreserved excess capacity. The Selectboard has 30 days to review and act on a complete application. If the application satisfies the allocation standards, the Selectboard shall recommend approval of 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..
-) 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.
-) 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.

5. Policy on metering, operating, and maintaining expectations for the wastewater facilities

Meter Existing Flows

The design flows assigned to each use by the State Environmental Protection Rules 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 potential reduction in the estimated 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.

Due to the cost of installing a master meter on the flow out of the pump station (\$12,000), it is recommended that the existing buildings be retrofitted with individual meters on the water supply service inside each building. The installation of individual meters will be required anyways to enable the reading of actual usage in support of the quarterly billing, cycle. The daily reading of each meter can be handled administratively by existing staff who open the buildings each day.

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. The recommended means to finance an expansion of the system is to use connection fees to incrementally extend the system.

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.

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.

6. Connection Fee Policy

The expansion of the municipal wastewater disposal system to accommodate more than a moderate number of users has generally two cost components:

1. The cost of expanding the system;
2. The cost of the supporting collection system.

Expansion of the Disposal System:

- A. The cost for sharing the existing unallocated capacity is limited primarily to the original construction costs with an adjustment for inflation. The WW report's recommended unallocated capacity to be made available to the public is 1,037 (4,999 – 3,962) GPD.
- B. The cost to expand the system from the current 4,999 GPD to 6,499 GPD is rather small as this would simply require the processing of a wastewater disposal system amendment application. This would increase the unallocated reserve non-municipal capacity to 2,517 (6,499 – 3,962) GPD.
- C. The cost to expand the existing system to any value greater than 6,500 GPD triggers the need for a State Indirect discharge Permit. This process is fairly conservative in nature and requires more disposal field area per applied gallon than the current Small Scale wastewater disposal system rules that governs the existing system.

There is additional suitable area adjacent to the existing Burns property wastewater disposal system for expansion of the disposal capacity.

It should be noted that this wastewater disposal site is challenged due to the limited amount of dilution caused by the small size of the receiving stream and its contributing watershed. Alternate methods to demonstrate compliance with the State water quality standards will require a large investment in consultant services with a chance that they will not be successful.

Based upon the most conservative siting standard set forth in the State Indirect Discharge (large scale system) rules, the estimated maximum capacity of the system is 15,000 GPD which would yield an unallocated reserve non-municipal capacity to 10,088 GPD.

- D. The Town also has easements for potential wastewater disposal systems located at:
- a. The Old Lantern
 - b. Lavalette Property off of Greenbush Road.

Both of these areas could be used to either expand the capacity of the Burns property wastewater disposal field or they could be used to address localized needs but would require supporting design, permitting and construction at a cost greater than the \$60 per GPD base fee recommended for the use of the Burns Property wastewater disposal system.

Collection System: The recommended options for collecting wastewater from private properties within the existing core service area includes:

A hybrid of the two types of systems in which:

- The existing gravity based system is retained which uses 6" to 8" diameter pipes to convey flows from high points to the pump station at the system low point; and
- All future expansions of the collection system which will utilize a low pressure collection system with individual private pump stations to move the wastewater from the private property to a common force main which discharges to the gravity collection system

A. Gravity Collection System

The existing system operates by gravity through a series of service lines and a sewer main located on Ferry Road. Flows at the low point in the collection system are sent to an existing pump station which conveys the wastewater through a 2" force main to the Burns property wastewater disposal field.

B. Low Pressure Collection System

This type of system typically has lower first time costs for the conveyance force main as it can be adjusted to follow the contour of the land and can be readily expanded beyond the traditional limitations of a gravity collection system. The drawback of this type of system is that it requires that each property install pump station to move wastewater from the private property into the common conveyance force main. For retrofit systems

where the existing property's wastewater system flows by gravity from the house to the private disposal system, this represents an additional construction cost.

The cost of this system is highly dependent on the areal extent of the collection system.

Discussion

The proposed expansion of the systems will have costs that include the installation of new pump station to convey the wastewater from the individual properties into the existing collection system. They also will require the use of directional boring technology as a means of minimizing impacts on the existing roadway pavement systems and remaining areas within the existing rights-of-way.

Utilizing an estimate of four new service connections within the Phase I service area, an estimate of the probable construction cost of \$106,800 was developed. Based upon the remaining 2,537 (6,499 – 3,962) gallons per day of remaining capacity of the system, the per gallon per day cost allocation is \$42.10 per gallon of design flow.

Recommendation:

In order to provide an equitable distribution of the costs to expand the system, which are to be paid by the proposed users, and not the Town, an estimate of the costs to complete the low pressure collection system expansion has been undertaken it is recommended that the connection fee include a system expansion cost component of:

$$\mathbf{\$106,800 / 2,537\ GPD = \$42.10\ per\ GPD\ of\ Design\ Flow.}$$

Existing System Cost Recovery

The Town of Charlotte invested approximately \$140,400 in the original wastewater disposal system for the four municipal buildings.

Policy question:

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 \$21.60 (\$140,400/6,499) 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 \$21.60 per gallon of design flow.

Inflation Adjustment

The original system was installed in 2001. The Consumer Price Index inflation factor from 2001 to 2016 is 1.378, meaning that \$1 of goods purchased in 2001 would cost \$1.38 today.

Policy question:

On the high end, this will add \$8.17 ($\$21.60 \times \0.378) per gallon of capacity used.

Discussion:

Should the time use of money should be recovered as part of the connection fee?

If the system were constructed today, the costs would be higher than they were in 2001 and system users would pay accordingly.

Recommendation:

The full CPI should be integrated into the price adjustment for the cost for the system.

$$1.378 \times \$21.60 = \$29.78 \text{ per gallon}$$

Depreciation

Another factor to be consideration is that the existing system is not brand new. The system is now fifteen years old and its value has depreciated to some degree.

Policy question:

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 \$10.80 per gallon (\$21.60 x 15/30).

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 15/30 depreciation for this structure, while 1/10 depreciation is recommended for the pump station. The disposal field should be depreciated half of the 15-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:

Pumps	$1/10 \times \$10,000 =$	\$1,000
Pump Station	$15/30 \times \$20,000 =$	\$10,000
Disposal Field	$50\% \times 15/30 \times \$25,000 =$	\$ 6,250
Remaining	$15/60 \times \$70,000 =$	<u>\$17,500</u>
		\$34,750

$$\mathbf{\$34,750 \times 1.38 \text{ inflation factor} / 6,499 \text{ gal} = \mathbf{\$7.37/\text{gal credit}}}$$

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').

Policy question:

Should 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 \$2,500 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 not require any additional area when the current replacement area standards are applied.

Using the \$2,500 per acre value, the high end allocation of costs would be \$0.97 per gallon
(1.26 acres x \$2,500/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 \$10,000 (4 x \$2,500) 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:

$$0.84 \text{ acres} \times \$10,000/\text{acre} = \$8,400/6,499 \text{ gal} = \$1.29/\text{gal}$$

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

Existing System Cost Recovery	\$21.60
Inflation Adjustment	\$8.17

Depreciation	(\$7.37)
Easement Fee	\$1.29
System Expansion Costs	<u>\$42.10</u>
Connection Fee Total	\$65.79 per gallon

Example: 15 seat restaurant x 30 gpd /seat x \$65.79 = \$29,606

Example: 3 bedroom home x 140 gpd /bedroom x \$65.79 = \$27,632

7. Budget for the Wastewater System

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 costs for this work are limited to just the application fee for the amendment to the State wastewater disposal permit, as the Committee has already prepared the technical submittal materials.

As it relates to the operation and maintenance of the existing system components, 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.

Policy question:

Should these costs be collected as part of the initial connection fee or should they should be integrated into an annual users fee?

Policy question:

Who should pay for 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 Committee recommends that the Thompson’s Point model be utilized as it relates to the maximizing and pumping of the septic tanks on an as needed basis as this smooths out the annual operating costs for all users and allows for easier annual budgeting.

Another 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 & 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

\$74,667/ 6,499 gal

Total **\$11.49/gal**

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 ($\0.49×420 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.

Annual Operating Fee

\$0.87 per gallon

Example: 15 seat restaurant x 30 gpd/ seat x \$0.87 = \$391.50

Example: 3 bedroom home x 140 / bedroom x \$0.87= \$365.40

Proposed Municipal Ordinances (Attachments IV(a) and IV(b))

- a. **Attachment IV(a)** : Sewer Allocation Ordinance (Allocation of unreserved excess wastewater disposal capacity)
- b. **Attachment IV(b)**: Sewer Use Ordinance (Operation and maintenance of the wastewater system)

Abridged version -
Remaining portion
of this attachment
not included

January 3, 2016

Ms. Jeanine McCrumb, Health Officer
Town of Charlotte Offices
PO Box 119
Charlotte, Vermont 05445

**Re: Town of Charlotte Wastewater Disposal System
Proposed Expansion of Capacity
State Wastewater & Potable Water Supply Permit Application**

Dear Ms. McCrumb:

The Town of Charlotte is looking to increase the disposal capacity of the existing municipal wastewater disposal system located on the former Burns property from the currently permitted 4,999 gallons per day (GPD) to 6,499 GPD. This application specifically seeks to amend Item 14 of the original permit WW-4-1485 to accordingly increase the reserve sewer allocation of the municipal wastewater disposal system.

Background - The original design work completed by Civil Engineering Associates (CEA) and the hydrogeological study completed by Wagner, Heindel & Noyes (WH&N) on behalf of the Town of Charlotte, limited the hydrogeologic review of the site to a design flow of 4,999 GPD. This value was chosen at the time as the permitting requirements set forth in the State Environmental Protection Rules (EPR's) for small scale (<6,500 GPD) wastewater disposal systems required that systems with design flows of 5,000 GPD or greater, that the replacement area system be constructed coincidentally with the primary system and the primary and secondary wastewater disposal fields be alternated on an annual basis. In order to avoid those capital costs, the original system was limited to a design capacity of 4,999 GPD.

Since then, the Environmental Protection Rules have eliminated this requirement for disposal systems with capacities in excess of 5,000 GPD and as such, there is the possibility to expand the permitted disposal capacity of the wastewater disposal system without any construction improvements or capital costs.

System Size and Allowable Application Rate - Sheet C5 of the original approved plan set identified the maximum allowable application rate to be 1.13 GPD per Square Foot (GPD/SF). When applied to the 5,760 SF of trench area constructed for the primary system and depicted for the replacement area, this equate to a

Town of Charlotte

Phase I Collection System Expansion

Estimate of Probable Construction Cost

June 18, 2016

Item	Qty	Unit		Unit Price		Cost
1000 Gallon Septic Tank	4	EA	x	\$ 2,500	=	\$ 10,000
Simplex Pump Station	4	EA	x	\$ 4,200	=	\$ 16,800
2" Force Main - Open Cut	250	LF	x	\$ 30	=	\$ 7,500
Direction Bore Pits	8	EA	x	\$ 800	=	\$ 6,400
Direct. Bore Mob & Demob.	3	EA	x	\$ 1,500	=	\$ 4,500
2" Directional Bore	1450	LF	x	\$ 20	=	\$ 29,000
Connection to Existing SMH	2	EA	x	\$ 1,500	=	\$ 3,000
Incremental Serv. Connection	3	EA	x	\$ 1,600	=	\$ 4,800
Directional Bore Site Repair	2700	SF	x	\$ 4	=	\$ 10,800
				<i>Subtotal</i>		\$ 92,800
				6499 - 3962	=	\$ 2,537
				Estimated cost per gallon for system expansion	=	\$ 36.58