



## **TOWN COUNCIL WORK SESSION**

**Monday, October 15, 2018 @ 7:00pm**  
**Town Hall Council Chambers**

### **TOWN/STAFF RELATED ITEMS**

1. 522 North Corridor Reliability Feasibility Study from CHA **(20 minutes)**
2. Ordinance Amendment Request from David Downes to Exempt 14 and 16 Chester Street from the off-street parking requirements of the Town Code – *Director of Planning/ Zoning* **(15 minutes)**
3. FY19 Write Off for Bad Debt – *Director of Finance* **(10 minutes)**
4. FY19 Budget Amendment - Outstanding Purchase Orders– *Director of Finance* **(10 minutes)**
5. Continued Discussion of Police Radio Financing– *Director of Finance* **(15 minutes)**
6. Fund Balance Discussion – *Director of Finance* **(15 minutes)**

### **COUNCIL/MAYOR RELATED ITEMS:**

7. Continued Discussion of Ordinance Amendment to Repeal Chapter 9 and Re-Enact in its Place Buildings and Maintenance Code (*Mayor Tharpe*)
8. Council Discussion/Goals (*time permitting*)

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## Work Session Agenda Form

Item # 1

DATE: October 15, 2018

### AGENDA ITEM: 522 North Corridor Reliability Feasibility Study

**SUMMARY:** The Town and Dominion Power, through the execution of a service agreement would like to increase the reliability of the water supply in the Corridor. Dominion has committed to contribute financially to the project. Based on previous council discussion, the storage tank option has been eliminated, now two general categories of reliability upgrades remain: a waterline “loop” and a parallel waterline.

CHA will provide the feasibility analysis by delivering to the Town a series of Technical Memorandums(TM) for review. The project delivery will be separated into phases to allow for proper decision making as the project progresses.

Phase 1 will include the following Memorandums:

**Technical Memorandum #1-Route Options Identification-** This memorandum will identify the two best general waterline route options available (likely a parallel line and an eastern or “loop” option) to best serve future development and annexed land, reduce easement acquisition and permitting costs, facilitate construction under the river, and maximize hydraulic capacity

**Technical Memorandum #2-Permitting and Constructability-** With two basic routes identified, the constructability of each option will be investigated. The three major concerns for constructability are: River Crossing(s), road crossings, permitting and easement acquisition. Phase 1 will conclude with presentation to Council summarizing information and recommendations developed during execution of TMs 1 and 2. CHA can provide rough budget estimates for each route option after Phase I.

Upon successful selection of a route and approval from the Town, CHA will continue with the following Phase 2 services to progress the project up to the design phase to include detailed cost estimate, layout, recommendations, financing and implementation. Phase 2 will be discussed in further detail after the completion of phase 1.

### BUDGET/FUNDING:

|                                                    |                 |
|----------------------------------------------------|-----------------|
| Project Costs                                      |                 |
| TM1-Route Options Identification                   | \$ 8,100        |
| TM2-Permitting & Constructability                  | \$26,300        |
| Phase 1 Final Feasibility Memorandum               | \$ 6,300        |
| Phase 1 Presentation to Council                    | \$ 3,200        |
| <b>Total Phase 1 Project Costs</b>                 | <b>\$43,900</b> |
| <b>(funds from Water Debt Services, 9672-4005)</b> |                 |

**STAFF RECOMMENDATION:** Recommend moving forward with Feasibility Study

Work Session

2



## Work Session Agenda Form

Item # 2

DATE: October 15, 2018

**AGENDA ITEM:** FRORDAM-000907-2018, Ordinance Amendment Request

**SUMMARY:** David Downes, the owner of 14 and 16 Chester Street (see aerial below), submitted an application for Town Council to consider amending the Town Code to exempt his property from the requirement to have off-street parking. This would be similar to the current exemption that applies to E. Main Street and on E. Jackson Street beside the courthouse (148-870.A.17). The applicant's property currently qualifies for a separate, "lesser", exemption that applies to all legally existing commercial and industrial buildings (175-127). This exemption does not require the Mr. Downes to meet the off-street parking quantity requirements of the Town Code, but it does require that existing parking not be eliminated. Therefore, the applicant is required to maintain the rear parking area of his property, and use it in conjunction with the businesses on the property (Beer Museum and Offices).

The Planning Commission unanimously recommended against the requested change after a public hearing held on September 19, 2018. During the public hearing a significant number of people spoke in favor of the Beer Museum. A few people also spoke in opposition to the request. The Planning Commission commended the Beer Museum's for their success at the location. However, the Planning Commission did not believe that it was appropriate to add more exemptions in the downtown area for any uses or properties until a parking strategy was developed to address the increasing demand in parking in the downtown area. There were three drafts included for consideration at the public hearing. These are attached with this coverletter, along with the Applicant's letter of request.

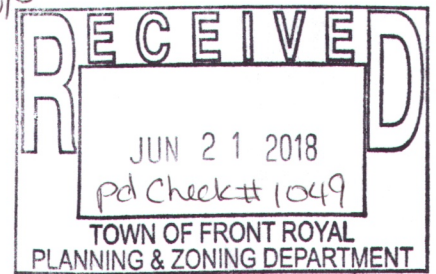


**BUDGET/FUNDING:** No direct impact.

**STAFF RECOMMENDATION:** After considerable review at work sessions and a public hearing, the Planning Commission unanimously recommended against any of the draft options. Their recommendation is for no action on the request at this time. Staff concurs.

FRORDAM-000907-2018

LAW OFFICE OF  
**DAVID A. DOWNES**  
14 Chester Street  
Front Royal, Virginia 22630-3321



Admitted in Virginia  
Admitted in Federal Courts

TELEPHONE (540) 636-8500  
FACSIMILE (540) 636-8501  
E-MAIL: ddownes14@gmail.com

June 21, 2018

Jeremy F. Camp, Zoning Administrator  
Department of Planning & Zoning  
102 East Main Street  
Front Royal, VA 22630-1560

**Hand Delivered**

Re: Amendment to Town Code 175-127.3

Dear Mr. Camp:

As the property owner of 14 and 16 Chester Street, I would respectfully request the amendment of Town Code 175-127.3 to exempt the requirement of "off street parking" requirements for property located on Chester Street between Main Street and Laura Virginia Hale Place.

This amendment will enable property owners in the "Downtown" area of our town to be treated equally and fairly as other property owners located in designated areas of Main Street and other areas in town that currently enjoy public access to public parking.

This amendment would also enable my tenant, the Virginia Beer Museum, to utilize over half of the back yard, currently reserved for parking that is not and will not be used for parking, to exercise a special ABC license approved by the Virginia General Assembly and effective on July 1, 2018.

I would respectfully request this matter be considered at your next meeting scheduled for July 18<sup>th</sup> pursuant to our conversation this morning. Pursuant to that conversation, I have attached a check for Four Hundred Dollars to pay for the application fee of this request.

Very truly yours,

A handwritten signature in blue ink, appearing to read "David A. Downes", enclosed within a large, loopy blue ink scribble or flourish.

David A. Downes

pc: Hollis Tharpe, Mayor of Front Royal



**DRAFT AMENDMENT – OPTION 1 (Applicant’s Request)**

**“REQUEST TO AMEND OFF-STREET PARKING REQUIREMENTS”**

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START -----

**Chapter 175**

**ZONING**

**175-127 PARKING EXEMPTION FOR THE REUSE OF EXISTING PROPERTIES**

Regardless of Section 175-126, the reuse of properties with existing parking areas and/or loading spaces shall be exempt from the requirement to comply with the current parking area and loading space requirements of this Chapter, or Chapter 148; provided that, the following conditions are met.

1. A zoning permit was previously issued by the Town on the property for a business (commercial) or industrial use.
2. Town Council may require site improvements when a special use permit is required.
3. The number of existing parking spaces shall not be reduced for display or other purposes, except in areas that are exempt from off-street parking requirements, as found under Town Code 148-870.A.17.
4. When the existing parking area and/or loading spaces are in disrepair, the Zoning Administrator may require the following types of maintenance improvements at the time of issuance of a zoning permit:
  - a. Additional landscaping.
  - b. The demarcation of existing parking spaces by striping, restriping, wheel stops, or signage.
  - c. The resurfacing of the existing surface material.

except that the requirement of off street parking for property located on Chester Street between Main Street and Laura Virginia Hale Place shall be exempt from the off-street parking requirements.

## Chapter 148

## SUBDIVISION &amp; LAND DEVELOPMENT

## Section 148-870. PARKING &amp; LOADING AREAS.

## 148-870.A. Parking Areas.

1. Off-street parking shall be provided in accordance with this subsection on every lot or parcel on which any use is established or expanded.
2. Based on the type of use, the minimum quantity of required off-street parking spaces is show in the following table.

TABLE 148-870.A.2

| TYPE OF USE                                    | REQUIRED OFF-STREET PARKING SPACES                                                                                                                                                                                                                                                               |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential                                    | Two (2) parking spaces per dwelling unit.                                                                                                                                                                                                                                                        |
| Motels/hotels                                  | One (1) parking space per room and one (1) additional parking space for every ten (10) rooms.                                                                                                                                                                                                    |
| Lodging/boarding/bed and breakfasts            | One (1) parking space per room and an additional two (2) parking spaces for employees.                                                                                                                                                                                                           |
| Shopping Centers                               | Five (5) parking spaces per one thousand (1,000) gross square feet for every shopping center facility ten thousand (10,000) square feet in size or less.<br>Four (4) parking spaces per one thousand (1,000) gross square feet for every shopping center over ten thousand (10,000) square feet. |
| Commercial/retail                              | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                   |
| Furniture/appliance/lumber and building supply | One (1) parking space per four hundred (400) gross square feet.                                                                                                                                                                                                                                  |
| Wholesale, storage and contractor's facilities | One (1) parking space per one thousand (1,000) gross square feet for non public areas.<br>One (1) parking space per one hundred (100) net square feet for public sales areas.                                                                                                                    |
| Self-service storage facilities                | One (1) parking space per twenty (20) individual units, and one (1) additional space per three hundred (300) gross square feet of office area.                                                                                                                                                   |
| Art galleries/museums                          | One (1) parking space per three hundred (300) gross square feet.                                                                                                                                                                                                                                 |
| Professional offices                           | One (1) parking space per three hundred (300) gross square feet.                                                                                                                                                                                                                                 |



|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Medical/dental offices                                 | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                                                                                                                                |
| Indoor recreation facilities                           | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                                                                                                                                |
| Bowling alleys                                         | Three (3) parking spaces per alley.                                                                                                                                                                                                                                                                                                                                                                           |
| Outdoor recreation facilities                          | One (1) parking space per two hundred (200) net square feet of improved area.                                                                                                                                                                                                                                                                                                                                 |
| Personal service facilities                            | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                                                                                                                                |
| Churches/theaters/other assembly buildings/auditoriums | One (1) parking space per four (4) fixed seats in the main assembly area or one (1) parking space per one hundred (100) net square feet.                                                                                                                                                                                                                                                                      |
| Day-care/nursery facilities                            | One (1) parking space per employee and one (1) parking space for every ten (10) children.                                                                                                                                                                                                                                                                                                                     |
| Nursing homes                                          | One (1) parking space for every four (4) beds, and one (1) parking space per employee.                                                                                                                                                                                                                                                                                                                        |
| Hospitals                                              | One (1) parking space for every two (2) beds, and one (1) parking space for each employee, excluding medical doctors.                                                                                                                                                                                                                                                                                         |
| Funeral homes                                          | One (1) parking space for every four (4) fixed seats or one (1) parking space per one hundred (100) square feet net visitation area, plus five (5) employee parking spaces.                                                                                                                                                                                                                                   |
| Restaurants (sit-down)                                 | One (1) parking space for every four (4) seats.                                                                                                                                                                                                                                                                                                                                                               |
| Restaurants (carry-out)                                | One (1) parking space per fifty (50) net square feet of customer service area.                                                                                                                                                                                                                                                                                                                                |
| Restaurants (drive-through)                            | Three (3) parking spaces plus stacking lanes for six (6) vehicles.                                                                                                                                                                                                                                                                                                                                            |
| Industrial uses/office component                       | One (1) parking space per three hundred (300) gross square feet of office area.                                                                                                                                                                                                                                                                                                                               |
| Industrial use/manufacturing/distribution areas        | One (1) parking space per employee and one (1) space for every vehicle used on-site, plus one (1) parking space per delivery/loading bay.                                                                                                                                                                                                                                                                     |
| Automobile/motor vehicle service facilities            | Two (2) spaces per service bay or two (2) spaces for every three hundred sixty (360) square feet. Every such facility shall have a minimum of three (3) parking spaces.                                                                                                                                                                                                                                       |
| Car sales/rental facilities                            | One (1) parking space per each two thousand five hundred (2,500) square feet of open sales display area and one (1) parking space per employee. In addition, there shall be two (2) parking spaces per service bay or two (2) parking spaces for every three hundred sixty (360) square feet of service bay area. There shall be a minimum of three (3) spaces for the service bay areas of these facilities. |
| Car wash (self-service)                                | One (1) parking space for drying vehicles, plus two (2) stacked spaces per car wash bay.                                                                                                                                                                                                                                                                                                                      |
| Car wash (automatic)                                   | Two (2) parking spaces for drying vehicles, plus five (5) stacking spaces per car wash bay.                                                                                                                                                                                                                                                                                                                   |

|                                             |                                                                                                                                                                                                                                                         |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Libraries                                   | One (1) parking space per one thousand (1,000) gross square feet.                                                                                                                                                                                       |
| Public/private schools                      | One (1) parking space per employee, plus parking space for school auditoriums as noted above for auditoriums.                                                                                                                                           |
| Greenhouse and landscape nursery facilities | One (1) parking space per four hundred (400) square feet of structured public selling area; one (1) parking space per one thousand (1,000) square feet of greenhouse/warehouse/plant storage areas; and one (1) parking space for each company vehicle. |
| Veterinary hospitals and kennels            | One (1) parking space per three hundred (300) gross square feet.                                                                                                                                                                                        |

3. When a use is not specifically listed above, the Director shall determine which of the above categories to use to determine the spaces required, based on similarities between the characteristics of the uses. When a use is not specifically listed above, the Director may also use information provided by the applicant or other sources of information to determine the number of spaces required.
4. Off-street parking areas shall be oriented to the buildings they are designed to serve and shall be within three hundred (300) feet walking distance. Before off-site parking facilities are approved, a written agreement thereto assuring their retention for such purposes shall be properly drawn and executed by the parties concerned, and approved as to form by the Town Attorney, and for compliance with the requirements of this Chapter by the Director.
5. The access to off-street parking areas shall be designed so as not to obstruct the free flow of street traffic. There shall be adequate provision for ingress and egress to ensure ease of mobility, ample clearance and the safety of vehicles and pedestrians. For corner lots, the distance from the center line of the parking lot entrance to the curblane or pavement edge of the street intersection shall be adequate to, in the opinion of the Director, provide a safe and sufficient margin for normal traffic patterns and pedestrians at or about the intersection in question.
6. Up to 20 percent of the total number of required off-street parking spaces may be designated for compact cars if signage is posted in front of the space to notify vehicles that the space is only for compact vehicles.
7. With the exception of off-street compact car spaces, and off-street parallel spaces, off-street parking spaces shall include an area of not less than 162 square feet (9' x 18'). Compact car spaces shall include an area not less than 144 square feet (8' x 18').
8. The width of all interior parking lot aisles providing direct one-way access to individual parking spaces shall be as follows:

87 **TABLE 148-870.A.8.**

| <b>Parking Angle (degrees)</b> | <b>Aisle Width (feet)</b> |
|--------------------------------|---------------------------|
| 30                             | 12                        |
| 45                             | 15                        |
| 60                             | 18                        |
| 90                             | 22                        |

\*The minimum width of all interior parking lot aisles designed for two way traffic flow shall be twenty (20) feet, except where 90 degree aisles are used, which shall required twenty-two (22) feet.

88 9. parking space shall be at least three (3) feet from a side or rear property line,  
89 except where the parking is designed to be shared by the abutting property. No  
90 parking space for multiple-family dwelling shall be less than ten (10) feet from a  
91 residential structure.

92 10. Parking areas shall be setback a minimum of five (5) feet from any building or  
93 structure. This setback area may be used for sidewalks or landscaping.

94 11. Parking space already provided to meet off-street parking requirements for stores,  
95 office buildings and industrial establishments lying within three hundred (300)  
96 feet of the place of public assembly, as measured along lines of public access,  
97 which are not normally in use on Sundays or between the hours of 6:00 p.m. and  
98 12:00 midnight on other days may be used to meet not more than seventy-five  
99 percent (75%) of the off-street parking requirements of a church or other similar  
100 place of public assembly.

101 12. Any flea market, farmers' market or other open-air commercial activity not listed  
102 above shall provide one (1) parking space for each one hundred (100) square feet  
103 of land to be used by said flea market, farmers' market or other commercial  
104 activity in its open-air operations. The amount of land to be used shall be  
105 designated by the respective open-air business in its application for a special  
106 permit. If no special permit is required under this chapter, the land to be used shall  
107 be designated in the application for a business license. No business shall then use  
108 more land than has been designated in its application for special permit or  
109 business license without the filing of a new application for a special permit or  
110 business license as required herein and then complying with the parking space  
111 requirements of this section.

112 13. For every commercial or industrial parking area located within fifteen (15) feet of  
113 the side or rear boundary of a residentially zoned lot or a lot with a residential use,  
114 an opaque ornamental fence or masonry wall with a minimum height of four (4)  
115 feet shall be erected and maintained. The provisions of this section shall not  
116 compel such fence or wall to extend into the required front yard of the premises.

117 14. Parking areas, including aisles and maneuvering areas, shall be paved with  
118 bituminous concrete, or similar hard surface material. The Director may approve

- 119 stone, in lieu of pavement, for parking areas of no more than 4,500 square feet in  
120 size.
- 121 15. Lights used to illuminate parking areas shall be arranged and shielded to minimize  
122 light pollution to adjoining properties.
- 123 16. All parking areas shall meet the landscaping requirements of Section 156-6 of the  
124 Town Code.
- 125 17. Off-street parking shall not be required for permitted uses that are located in the  
126 following areas: ~~on any lot fronting on that portion of Main Street which extends~~  
127 ~~from Royal Avenue to Happy Creek or upon that portion of Jackson Street which~~  
128 ~~extends between South Royal Avenue and Church Street.~~
- 129 a. Any lot with frontage on E. Main St. from Royal Ave. to Happy Creek.  
130 b. Any lot with frontage on E. Jackson St. from S. Royal Ave. to Church St.  
131 c. Any lot with frontage on Chester St. from E. Main St. to Laura Virginia  
132 Hale Pl.
- 133  
134 For the purposes of the above, the term “frontage” shall mean where a lot  
135 physically abuts the specific portion of public right-of-way that is specified.
- 136 18. As with the other standards of this chapter, off-street parking requirements may  
137 be waived by special exception, in accordance with Section 148-211 of this  
138 Chapter.
- 139 19. Off-street parking requirements shall be waived by the Zoning Administrator for  
140 expansion of an existing use for any property located within the Historic Front  
141 Royal District where the following criteria are met:  
142
- 143 a. The development activity proposed includes the retention and/or the  
144 substantial renovation of a contributing structure in the district.  
145 b. The square footage of additions or new construction shall not be more than  
146 twice that of the original structure.  
147 c. The proposed project has been found by the Board of Architectural Review  
148 to be in keeping with the scale of development in the surrounding area and  
149 with the character of the district as a whole.  
150 d. All efforts have been made to provide parking whenever possible.  
151
- 152 20. Alleys shall be upgraded to a minimum pavement width of 24 feet when they are  
153 used as the primary access to parking areas, excluding individual parking for  
154 single-family, two-family, and duplex uses.  
155
- 156 21. Existing parking facilities shall be maintained in a safe condition, including the  
157 repair of damaged areas, restriping, and resurfacing when necessary.  
158

159 -----END  
160 **Editorial Notes:** All language shown in **yellow highlight** and *italics* is proposed new text. All language shown in ~~strikethrough~~ is  
161 existing language that is proposed to be removed. Regular text shown is existing language with no changes proposed. No  
162 changes are proposed to other portions of the section not shown. Editorial notes are shown in brackets ([...]) for reference  
163 purposes only.  
164  
165 Drafted 08/08/18 (JFC).

**DRAFT AMENDMENT – OPTION 2 (SUP ALTERNATIVE)**

**“REQUEST TO AMEND OFF-STREET PARKING REQUIREMENTS”**

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START -----

**Chapter 175**

**ZONING**

**175-127 PARKING EXEMPTION FOR THE REUSE OF EXISTING PROPERTIES**

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2. Town Council may require site improvements when a special use permit is required.
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  - c. The resurfacing of the existing surface material.

except that the requirement of off street parking for property located on Chester Street between Main Street and Laura Virginia Hale Place shall be exempt from the off-street parking requirements.



## Chapter 148

## SUBDIVISION &amp; LAND DEVELOPMENT

## Section 148-870. PARKING &amp; LOADING AREAS.

## 148-870.A. Parking Areas.

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TABLE 148-870.A.2

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| Shopping Centers                               | Five (5) parking spaces per one thousand (1,000) gross square feet for every shopping center facility ten thousand (10,000) square feet in size or less.<br>Four (4) parking spaces per one thousand (1,000) gross square feet for every shopping center over ten thousand (10,000) square feet. |
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|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Medical/dental offices                                 | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                                                                                                                                |
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| Nursing homes                                          | One (1) parking space for every four (4) beds, and one (1) parking space per employee.                                                                                                                                                                                                                                                                                                                        |
| Hospitals                                              | One (1) parking space for every two (2) beds, and one (1) parking space for each employee, excluding medical doctors.                                                                                                                                                                                                                                                                                         |
| Funeral homes                                          | One (1) parking space for every four (4) fixed seats or one (1) parking space per one hundred (100) square feet net visitation area, plus five (5) employee parking spaces.                                                                                                                                                                                                                                   |
| Restaurants (sit-down)                                 | One (1) parking space for every four (4) seats.                                                                                                                                                                                                                                                                                                                                                               |
| Restaurants (carry-out)                                | One (1) parking space per fifty (50) net square feet of customer service area.                                                                                                                                                                                                                                                                                                                                |
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| Industrial uses/office component                       | One (1) parking space per three hundred (300) gross square feet of office area.                                                                                                                                                                                                                                                                                                                               |
| Industrial use/manufacturing/distribution areas        | One (1) parking space per employee and one (1) space for every vehicle used on-site, plus one (1) parking space per delivery/loading bay.                                                                                                                                                                                                                                                                     |
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| Car sales/rental facilities                            | One (1) parking space per each two thousand five hundred (2,500) square feet of open sales display area and one (1) parking space per employee. In addition, there shall be two (2) parking spaces per service bay or two (2) parking spaces for every three hundred sixty (360) square feet of service bay area. There shall be a minimum of three (3) spaces for the service bay areas of these facilities. |
| Car wash (self-service)                                | One (1) parking space for drying vehicles, plus two (2) stacked spaces per car wash bay.                                                                                                                                                                                                                                                                                                                      |
| Car wash (automatic)                                   | Two (2) parking spaces for drying vehicles, plus five (5) stacking spaces per car wash bay.                                                                                                                                                                                                                                                                                                                   |

|                                             |                                                                                                                                                                                                                                                         |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Libraries                                   | One (1) parking space per one thousand (1,000) gross square feet.                                                                                                                                                                                       |
| Public/private schools                      | One (1) parking space per employee, plus parking space for school auditoriums as noted above for auditoriums.                                                                                                                                           |
| Greenhouse and landscape nursery facilities | One (1) parking space per four hundred (400) square feet of structured public selling area; one (1) parking space per one thousand (1,000) square feet of greenhouse/warehouse/plant storage areas; and one (1) parking space for each company vehicle. |
| Veterinary hospitals and kennels            | One (1) parking space per three hundred (300) gross square feet.                                                                                                                                                                                        |

3. When a use is not specifically listed above, the Director shall determine which of the above categories to use to determine the spaces required, based on similarities between the characteristics of the uses. When a use is not specifically listed above, the Director may also use information provided by the applicant or other sources of information to determine the number of spaces required.
4. Off-street parking areas shall be oriented to the buildings they are designed to serve and shall be within three hundred (300) feet walking distance. Before off-site parking facilities are approved, a written agreement thereto assuring their retention for such purposes shall be properly drawn and executed by the parties concerned, and approved as to form by the Town Attorney, and for compliance with the requirements of this Chapter by the Director.
5. The access to off-street parking areas shall be designed so as not to obstruct the free flow of street traffic. There shall be adequate provision for ingress and egress to ensure ease of mobility, ample clearance and the safety of vehicles and pedestrians. For corner lots, the distance from the center line of the parking lot entrance to the curblin or pavement edge of the street intersection shall be adequate to, in the opinion of the Director, provide a safe and sufficient margin for normal traffic patterns and pedestrians at or about the intersection in question.
6. Up to 20 percent of the total number of required off-street parking spaces may be designated for compact cars if signage is posted in front of the space to notify vehicles that the space is only for compact vehicles.
7. With the exception of off-street compact car spaces, and off-street parallel spaces, off-street parking spaces shall include an area of not less than 162 square feet (9' x 18'). Compact car spaces shall include an area not less than 144 square feet (8' x 18').
8. The width of all interior parking lot aisles providing direct one-way access to individual parking spaces shall be as follows:

87 **TABLE 148-870.A.8.**

| <b>Parking Angle (degrees)</b> | <b>Aisle Width (feet)</b> |
|--------------------------------|---------------------------|
| 30                             | 12                        |
| 45                             | 15                        |
| 60                             | 18                        |
| 90                             | 22                        |

\*The minimum width of all interior parking lot aisles designed for two way traffic flow shall be twenty (20) feet, except where 90 degree aisles are used, which shall required twenty-two (22) feet.

88 9. parking space shall be at least three (3) feet from a side or rear property line,  
89 except where the parking is designed to be shared by the abutting property. No  
90 parking space for multiple-family dwelling shall be less than ten (10) feet from a  
91 residential structure.

92 10. Parking areas shall be setback a minimum of five (5) feet from any building or  
93 structure. This setback area may be used for sidewalks or landscaping.

94 11. Parking space already provided to meet off-street parking requirements for stores,  
95 office buildings and industrial establishments lying within three hundred (300)  
96 feet of the place of public assembly, as measured along lines of public access,  
97 which are not normally in use on Sundays or between the hours of 6:00 p.m. and  
98 12:00 midnight on other days may be used to meet not more than seventy-five  
99 percent (75%) of the off-street parking requirements of a church or other similar  
100 place of public assembly.

101 12. Any flea market, farmers' market or other open-air commercial activity not listed  
102 above shall provide one (1) parking space for each one hundred (100) square feet  
103 of land to be used by said flea market, farmers' market or other commercial  
104 activity in its open-air operations. The amount of land to be used shall be  
105 designated by the respective open-air business in its application for a special  
106 permit. If no special permit is required under this chapter, the land to be used shall  
107 be designated in the application for a business license. No business shall then use  
108 more land than has been designated in its application for special permit or  
109 business license without the filing of a new application for a special permit or  
110 business license as required herein and then complying with the parking space  
111 requirements of this section.

112 13. For every commercial or industrial parking area located within fifteen (15) feet of  
113 the side or rear boundary of a residentially zoned lot or a lot with a residential use,  
114 an opaque ornamental fence or masonry wall with a minimum height of four (4)  
115 feet shall be erected and maintained. The provisions of this section shall not  
116 compel such fence or wall to extend into the required front yard of the premises.

117 14. Parking areas, including aisles and maneuvering areas, shall be paved with  
118 bituminous concrete, or similar hard surface material. The Director may approve

- 119 stone, in lieu of pavement, for parking areas of no more than 4,500 square feet in  
120 size.
- 121 15. Lights used to illuminate parking areas shall be arranged and shielded to minimize  
122 light pollution to adjoining properties.
- 123 16. All parking areas shall meet the landscaping requirements of Section 156-6 of the  
124 Town Code.
- 125 17. Off-street parking shall not be required for permitted uses that are located in the  
126 following areas: ~~on any lot fronting on that portion of Main Street which extends~~  
127 ~~from Royal Avenue to Happy Creek or upon that portion of Jackson Street which~~  
128 ~~extends between South Royal Avenue and Church Street.~~
- 129 a. Any lot with frontage on E. Main St. from Royal Ave. to Happy Creek.  
130 b. Any lot with frontage on E. Jackson St. from S. Royal Ave. to Church St.  
131 c. Upon submission, review and approval of a Special Use Permit for any lot  
132 with frontage on Chester St. from E. Main St. to Laura Virginia Hale Pl.  
133
- 134 For the purposes of the above, the term “frontage” shall mean where a lot  
135 physically abuts the specific portion of public right-of-way that is specified.
- 136 18. As with the other standards of this chapter, off-street parking requirements may  
137 be waived by special exception, in accordance with Section 148-211 of this  
138 Chapter.
- 139 19. Off-street parking requirements shall be waived by the Zoning Administrator for  
140 expansion of an existing use for any property located within the Historic Front  
141 Royal District where the following criteria are met:  
142
- 143 a. The development activity proposed includes the retention and/or the  
144 substantial renovation of a contributing structure in the district.  
145 b. The square footage of additions or new construction shall not be more than  
146 twice that of the original structure.  
147 c. The proposed project has been found by the Board of Architectural Review  
148 to be in keeping with the scale of development in the surrounding area and  
149 with the character of the district as a whole.  
150 d. All efforts have been made to provide parking whenever possible.  
151
- 152 20. Alleys shall be upgraded to a minimum pavement width of 24 feet when they are  
153 used as the primary access to parking areas, excluding individual parking for  
154 single-family, two-family, and duplex uses.  
155
- 156 21. Existing parking facilities shall be maintained in a safe condition, including the  
157 repair of damaged areas, restriping, and resurfacing when necessary.  
158

159 -----END  
160 **Editorial Notes:** All language shown in **yellow highlight** and *italics* is proposed new text. All language shown in ~~strikethrough~~ is  
161 existing language that is proposed to be removed. Regular text shown is existing language with no changes proposed. No  
162 changes are proposed to other portions of the section not shown. Editorial notes are shown in brackets ([...]) for reference  
163 purposes only.  
164  
165 Drafted 08/08/18 (JFC).

**DRAFT AMENDMENT – OPTION 3 (APPLICANT’S ALTERNATIVE)**

**“REQUEST TO AMEND OFF-STREET PARKING REQUIREMENTS”**

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START -----

**Chapter 175**

**ZONING**

**175-127 PARKING EXEMPTION FOR THE REUSE OF EXISTING PROPERTIES**

Regardless of Section 175-126, the reuse of properties with existing parking areas and/or loading spaces shall be exempt from the requirement to comply with the current parking area and loading space requirements of this Chapter, or Chapter 148; provided that, the following conditions are met.

1. A zoning permit was previously issued by the Town on the property for a business (commercial) or industrial use.
2. Town Council may require site improvements when a special use permit is required.
3. The number of existing parking spaces shall not be reduced for display or other purposes, except in areas that are exempt from off-street parking requirements, as found under Town Code 148-870.A.17.
4. When the existing parking area and/or loading spaces are in disrepair, the Zoning Administrator may require the following types of maintenance improvements at the time of issuance of a zoning permit:
  - a. Additional landscaping.
  - b. The demarcation of existing parking spaces by striping, restriping, wheel stops, or signage.
  - c. The resurfacing of the existing surface material.

except that the requirement of off street parking for property located on Chester Street between Main Street and Laura Virginia Hale Place shall be exempt from the off-street parking requirements.



## Chapter 148

## SUBDIVISION &amp; LAND DEVELOPMENT

## Section 148-870. PARKING &amp; LOADING AREAS.

## 148-870.A. Parking Areas.

1. Off-street parking shall be provided in accordance with this subsection on every lot or parcel on which any use is established or expanded.
2. Based on the type of use, the minimum quantity of required off-street parking spaces is show in the following table.

TABLE 148-870.A.2

| TYPE OF USE                                    | REQUIRED OFF-STREET PARKING SPACES                                                                                                                                                                                                                                                               |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential                                    | Two (2) parking spaces per dwelling unit.                                                                                                                                                                                                                                                        |
| Motels/hotels                                  | One (1) parking space per room and one (1) additional parking space for every ten (10) rooms.                                                                                                                                                                                                    |
| Lodging/boarding/bed and breakfasts            | One (1) parking space per room and an additional two (2) parking spaces for employees.                                                                                                                                                                                                           |
| Shopping Centers                               | Five (5) parking spaces per one thousand (1,000) gross square feet for every shopping center facility ten thousand (10,000) square feet in size or less.<br>Four (4) parking spaces per one thousand (1,000) gross square feet for every shopping center over ten thousand (10,000) square feet. |
| Commercial/retail                              | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                   |
| Furniture/appliance/lumber and building supply | One (1) parking space per four hundred (400) gross square feet.                                                                                                                                                                                                                                  |
| Wholesale, storage and contractor's facilities | One (1) parking space per one thousand (1,000) gross square feet for non public areas.<br>One (1) parking space per one hundred (100) net square feet for public sales areas.                                                                                                                    |
| Self-service storage facilities                | One (1) parking space per twenty (20) individual units, and one (1) additional space per three hundred (300) gross square feet of office area.                                                                                                                                                   |
| Art galleries/museums                          | One (1) parking space per three hundred (300) gross square feet.                                                                                                                                                                                                                                 |
| Professional offices                           | One (1) parking space per three hundred (300) gross square feet.                                                                                                                                                                                                                                 |

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Medical/dental offices                                 | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                                                                                                                                |
| Indoor recreation facilities                           | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                                                                                                                                |
| Bowling alleys                                         | Three (3) parking spaces per alley.                                                                                                                                                                                                                                                                                                                                                                           |
| Outdoor recreation facilities                          | One (1) parking space per two hundred (200) net square feet of improved area.                                                                                                                                                                                                                                                                                                                                 |
| Personal service facilities                            | One (1) parking space per two hundred (200) gross square feet.                                                                                                                                                                                                                                                                                                                                                |
| Churches/theaters/other assembly buildings/auditoriums | One (1) parking space per four (4) fixed seats in the main assembly area or one (1) parking space per one hundred (100) net square feet.                                                                                                                                                                                                                                                                      |
| Day-care/nursery facilities                            | One (1) parking space per employee and one (1) parking space for every ten (10) children.                                                                                                                                                                                                                                                                                                                     |
| Nursing homes                                          | One (1) parking space for every four (4) beds, and one (1) parking space per employee.                                                                                                                                                                                                                                                                                                                        |
| Hospitals                                              | One (1) parking space for every two (2) beds, and one (1) parking space for each employee, excluding medical doctors.                                                                                                                                                                                                                                                                                         |
| Funeral homes                                          | One (1) parking space for every four (4) fixed seats or one (1) parking space per one hundred (100) square feet net visitation area, plus five (5) employee parking spaces.                                                                                                                                                                                                                                   |
| Restaurants (sit-down)                                 | One (1) parking space for every four (4) seats.                                                                                                                                                                                                                                                                                                                                                               |
| Restaurants (carry-out)                                | One (1) parking space per fifty (50) net square feet of customer service area.                                                                                                                                                                                                                                                                                                                                |
| Restaurants (drive-through)                            | Three (3) parking spaces plus stacking lanes for six (6) vehicles.                                                                                                                                                                                                                                                                                                                                            |
| Industrial uses/office component                       | One (1) parking space per three hundred (300) gross square feet of office area.                                                                                                                                                                                                                                                                                                                               |
| Industrial use/manufacturing/distribution areas        | One (1) parking space per employee and one (1) space for every vehicle used on-site, plus one (1) parking space per delivery/loading bay.                                                                                                                                                                                                                                                                     |
| Automobile/motor vehicle service facilities            | Two (2) spaces per service bay or two (2) spaces for every three hundred sixty (360) square feet. Every such facility shall have a minimum of three (3) parking spaces.                                                                                                                                                                                                                                       |
| Car sales/rental facilities                            | One (1) parking space per each two thousand five hundred (2,500) square feet of open sales display area and one (1) parking space per employee. In addition, there shall be two (2) parking spaces per service bay or two (2) parking spaces for every three hundred sixty (360) square feet of service bay area. There shall be a minimum of three (3) spaces for the service bay areas of these facilities. |
| Car wash (self-service)                                | One (1) parking space for drying vehicles, plus two (2) stacked spaces per car wash bay.                                                                                                                                                                                                                                                                                                                      |
| Car wash (automatic)                                   | Two (2) parking spaces for drying vehicles, plus five (5) stacking spaces per car wash bay.                                                                                                                                                                                                                                                                                                                   |

|                                             |                                                                                                                                                                                                                                                         |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Libraries                                   | One (1) parking space per one thousand (1,000) gross square feet.                                                                                                                                                                                       |
| Public/private schools                      | One (1) parking space per employee, plus parking space for school auditoriums as noted above for auditoriums.                                                                                                                                           |
| Greenhouse and landscape nursery facilities | One (1) parking space per four hundred (400) square feet of structured public selling area; one (1) parking space per one thousand (1,000) square feet of greenhouse/warehouse/plant storage areas; and one (1) parking space for each company vehicle. |
| Veterinary hospitals and kennels            | One (1) parking space per three hundred (300) gross square feet.                                                                                                                                                                                        |

3. When a use is not specifically listed above, the Director shall determine which of the above categories to use to determine the spaces required, based on similarities between the characteristics of the uses. When a use is not specifically listed above, the Director may also use information provided by the applicant or other sources of information to determine the number of spaces required.
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5. The access to off-street parking areas shall be designed so as not to obstruct the free flow of street traffic. There shall be adequate provision for ingress and egress to ensure ease of mobility, ample clearance and the safety of vehicles and pedestrians. For corner lots, the distance from the center line of the parking lot entrance to the curblin or pavement edge of the street intersection shall be adequate to, in the opinion of the Director, provide a safe and sufficient margin for normal traffic patterns and pedestrians at or about the intersection in question.
6. Up to 20 percent of the total number of required off-street parking spaces may be designated for compact cars if signage is posted in front of the space to notify vehicles that the space is only for compact vehicles.
7. With the exception of off-street compact car spaces, and off-street parallel spaces, off-street parking spaces shall include an area of not less than 162 square feet (9' x 18'). Compact car spaces shall include an area not less than 144 square feet (8' x 18').
8. The width of all interior parking lot aisles providing direct one-way access to individual parking spaces shall be as follows:

87 **TABLE 148-870.A.8.**

| <b>Parking Angle (degrees)</b> | <b>Aisle Width (feet)</b> |
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| 30                             | 12                        |
| 45                             | 15                        |
| 60                             | 18                        |
| 90                             | 22                        |

\*The minimum width of all interior parking lot aisles designed for two way traffic flow shall be twenty (20) feet, except where 90 degree aisles are used, which shall required twenty-two (22) feet.

- 88 9. parking space shall be at least three (3) feet from a side or rear property line,  
 89 except where the parking is designed to be shared by the abutting property. No  
 90 parking space for multiple-family dwelling shall be less than ten (10) feet from a  
 91 residential structure.
- 92 10. Parking areas shall be setback a minimum of five (5) feet from any building or  
 93 structure. This setback area may be used for sidewalks or landscaping.
- 94 11. Parking space already provided to meet off-street parking requirements for stores,  
 95 office buildings and industrial establishments lying within three hundred (300)  
 96 feet of the place of public assembly, as measured along lines of public access,  
 97 which are not normally in use on Sundays or between the hours of 6:00 p.m. and  
 98 12:00 midnight on other days may be used to meet not more than seventy-five  
 99 percent (75%) of the off-street parking requirements of a church or other similar  
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- 101 12. Any flea market, farmers' market or other open-air commercial activity not listed  
 102 above shall provide one (1) parking space for each one hundred (100) square feet  
 103 of land to be used by said flea market, farmers' market or other commercial  
 104 activity in its open-air operations. The amount of land to be used shall be  
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 106 permit. If no special permit is required under this chapter, the land to be used shall  
 107 be designated in the application for a business license. No business shall then use  
 108 more land than has been designated in its application for special permit or  
 109 business license without the filing of a new application for a special permit or  
 110 business license as required herein and then complying with the parking space  
 111 requirements of this section.
- 112 13. For every commercial or industrial parking area located within fifteen (15) feet of  
 113 the side or rear boundary of a residentially zoned lot or a lot with a residential use,  
 114 an opaque ornamental fence or masonry wall with a minimum height of four (4)  
 115 feet shall be erected and maintained. The provisions of this section shall not  
 116 compel such fence or wall to extend into the required front yard of the premises.
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- 119 stone, in lieu of pavement, for parking areas of no more than 4,500 square feet in  
120 size.
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122 light pollution to adjoining properties.
- 123 16. All parking areas shall meet the landscaping requirements of Section 156-6 of the  
124 Town Code.
- 125 17. Off-street parking shall not be required for permitted uses that are located in the  
126 following areas: ~~on any lot fronting on that portion of Main Street which extends~~  
127 ~~from Royal Avenue to Happy Creek or upon that portion of Jackson Street which~~  
128 ~~extends between South Royal Avenue and Church Street.~~
- 129 a. Any lot with frontage on E. Main St. from Royal Ave. to Happy Creek.  
130 b. Any lot with frontage on E. Jackson St. from S. Royal Ave. to Church St.  
131 c. Any permitted art gallery or museum use within the Historic Overlay  
132 District.
- 133  
134 For the purposes of the above, the term “frontage” shall mean where a lot  
135 physically abuts the specific portion of public right-of-way that is specified.
- 136 18. As with the other standards of this chapter, off-street parking requirements may  
137 be waived by special exception, in accordance with Section 148-211 of this  
138 Chapter.
- 139 19. Off-street parking requirements shall be waived by the Zoning Administrator for  
140 expansion of an existing use for any property located within the Historic Front  
141 Royal District where the following criteria are met:  
142
- 143 a. The development activity proposed includes the retention and/or the  
144 substantial renovation of a contributing structure in the district.  
145 b. The square footage of additions or new construction shall not be more than  
146 twice that of the original structure.  
147 c. The proposed project has been found by the Board of Architectural Review  
148 to be in keeping with the scale of development in the surrounding area and  
149 with the character of the district as a whole.  
150 d. All efforts have been made to provide parking whenever possible.  
151
- 152 20. Alleys shall be upgraded to a minimum pavement width of 24 feet when they are  
153 used as the primary access to parking areas, excluding individual parking for  
154 single-family, two-family, and duplex uses.  
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- 156 21. Existing parking facilities shall be maintained in a safe condition, including the  
157 repair of damaged areas, restriping, and resurfacing when necessary.  
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163 purposes only.  
164  
165 Drafted 08/08/18 (JFC), 8/23/2018 (JFC).

3



## Work Session Agenda Form

Item # 3

DATE: 10/15/18

### AGENDA ITEM: Write Off for Bad Debt

**SUMMARY:** Council is requested to approve the removal of seven years or older of outstanding accounts receivable (bad debts) on the Town's ledger in the amount of \$166,191 from enterprise and general fund liability accounts. This value includes 358 utility accounts. All recourse of attempting to collect these amounts has been completed.

**BUDGET/FUNDING:** No funding is required, journal entry will be done effecting balance sheet only.

**STAFF RECOMMENDATION:** The Town's bad debt write off policy was adopted in 2013 per request of the Town's auditors Mitchell & Company.

Staff has determined that the accounts presented meet the criteria for uncollectible as determined by the Town's bad debt write off policy:

- 1) No activity on closed account for at least 7 years
- 2) Account has entered a status of "bankruptcy" with no activity for 5 years
- 3) All other methods of collection have been exhausted

The amount of bad debt approved to be removed by Council continues to decrease:

|            |                                              |
|------------|----------------------------------------------|
| Dec 2013 - | \$848,191 – approved for removal             |
| Dec 2014 - | \$144,049 – approved for removal             |
| Feb 2016 - | \$225,318 – approved for removal             |
| Feb 2017 - | \$203,808 – approved for removal             |
| Nov 2017 - | \$175,999 – approved for removal             |
| Oct 2018 - | \$166,191- requesting approval to be removed |

The FY19 budgeted revenue for the sales of electric, water, sewer, & refuse totals approximately \$30.8 million. The amount of \$166,191 represents approximately 0.5% of the budgeted sales.



## FY19 Uncollectible Utility Accounts

| Balance | Service Address               | Final Bill Due Date |
|---------|-------------------------------|---------------------|
| 450.85  | 1346 FOREST HILL DR           | 10/19/2010          |
| 32.90   | 1368 FOREST HILL DR           | 8/10/2010           |
| 1665.84 | 60 W STRASBURG RD             | 4/11/2011           |
| 266.14  | 84 E STRASBURG RD #4          | 12/31/2010          |
| 293.39  | 150 KELLEY DR                 | 9/8/2010            |
| 34.00   | 75 SPOON SQUARE LOT #198      | 8/2/2010            |
| 780.72  | 135 CROOKED RUN PLAZA SUITE # | 12/9/2010           |
| 71.90   | 135 CROOKED RUN PLAZA SUITE # | 4/6/2011            |
| 479.68  | 132 RUGBY RD                  | 3/11/2011           |
| 135.72  | 221 W DUCK ST                 | 1/19/2011           |
| 349.58  | 374 W DUCK ST                 | 7/9/2010            |
| 226.03  | 1423 RIVER CT                 | 10/19/2010          |
| 253.19  | 331 W DUCK ST                 | 2/28/2011           |
| 281.01  | 1320 QUEENS HWY               | 12/1/2010           |
| 686.44  | 1320 QUEENS HWY               | 8/25/2010           |
| 82.95   | 47 W 18TH ST                  | 9/3/2010            |
| 524.13  | 47 W 18TH ST                  | 2/16/2011           |
| 968.14  | 43 W 18TH ST                  | 8/27/2010           |
| 1279.45 | 323 E 18TH ST                 | 9/2/2010            |
| 242.94  | 21 CRESTVIEW DR               | 7/9/2010            |
| 190.07  | 49 CRESTVIEW DR               | 1/26/2011           |
| 241.82  | 1656 EDMONT AVE               | 1/9/2011            |
| 732.29  | 1502 SCRANTON AVE             | 12/7/2010           |
| 630.59  | 1410 BELMONT AVE              | 11/24/2010          |
| 673.91  | 808 W 15TH ST                 | 5/25/2011           |
| 251.04  | 1416 N SHENANDOAH AVE #1      | 8/27/2010           |
| 88.59   | 1416 N SHENANDOAH AVE #8      | 2/3/2011            |
| 155.08  | 517 W 14TH ST                 | 9/6/2010            |
| 124.82  | 25 W 13TH ST #1               | 1/19/2011           |
| 1149.58 | 14 W 13TH ST                  | 8/26/2010           |
| 481.89  | 1340 BELMONT AVE              | 10/31/2010          |
| 68.73   | 127 W 12TH ST                 | 9/17/2010           |
| 1111.68 | 132 W 12TH ST                 | 8/31/2010           |
| 1044.74 | 108 W 12TH ST                 | 10/20/2010          |
| 166.80  | 1099 N ROYAL AVE #4           | 3/21/2011           |
| 147.00  | 1095 N ROYAL AVE #1           | 1/31/2011           |
| 178.17  | 1095 N ROYAL AVE #2           | 9/30/2010           |
| 188.44  | 1095 N ROYAL AVE #9           | 1/31/2011           |
| 61.01   | 1010 N SHENANDOAH AVE #1      | 12/8/2010           |
| 1219.39 | 330 W 10TH ST                 | 9/16/2010           |
| 42.71   | 340 W 9TH ST                  | 6/17/2011           |
| 251.00  | 324 W 9TH ST                  | 2/1/2011            |
| 298.45  | 930 VIRGINIA AVE              | 12/10/2010          |
| 1364.76 | 1331 MONROE AVE               | 9/14/2010           |
| 2118.48 | 713 W 14TH ST                 | 3/28/2011           |
| 335.72  | 713 W 14TH ST                 | 6/10/2011           |
| 1270.62 | 803 W 14TH ST                 | 2/10/2011           |
| 48.54   | 825 W 14TH ST                 | 8/10/2010           |

## FY19 Uncollectible Utility Accounts

| Balance | Service Address      | Final Bill Due Date |
|---------|----------------------|---------------------|
| 1476.82 | 706 W 14TH ST        | 9/16/2010           |
| 490.27  | 713 W 13TH ST        | 12/10/2010          |
| 511.84  | 715 W 13TH ST        | 4/25/2011           |
| 381.57  | 747 W 13TH ST        | 7/11/2011           |
| 299.25  | 700 W 13TH ST        | 5/8/2011            |
| 937.18  | 1308 ADAMS AVE       | 3/16/2011           |
| 262.95  | 834 W 11TH ST        | 8/12/2010           |
| 266.24  | 725 W 11TH ST        | 8/25/2010           |
| 180.66  | 716 W 11TH ST        | 6/20/2011           |
| 396.85  | 710 W 11TH ST        | 10/20/2010          |
| 862.11  | 710 W 11TH ST        | 5/23/2011           |
| 294.81  | 708 W 11TH ST #5     | 4/19/2011           |
| 531.94  | 833 W 11TH ST        | 8/26/2010           |
| 194.39  | 650-A W 11TH ST      | 10/27/2010          |
| 333.51  | 644 W 11TH ST        | 6/23/2011           |
| 919.99  | 618 W 11TH ST        | 6/23/2011           |
| 918.94  | 614-B W 11TH ST      | 8/31/2010           |
| 691.55  | 612-A W 11TH ST      | 11/30/2010          |
| 437.80  | 612-A W 11TH ST      | 4/30/2011           |
| 257.54  | 612-A W 11TH ST      | 4/30/2011           |
| 742.79  | 612-B W 11TH ST      | 4/25/2011           |
| 347.42  | 608 W 11TH ST        | 12/29/2010          |
| 341.10  | 343 KENDRICK LN #9   | 8/27/2010           |
| 89.08   | 343 KENDRICK LN #11  | 8/3/2010            |
| 38.56   | 343 KENDRICK LN #12  | 10/30/2010          |
| 184.28  | 353 KENDRICK LN #37  | 10/31/2010          |
| 102.85  | 353 KENDRICK LN #35  | 8/31/2010           |
| 182.55  | 353 KENDRICK LN #24  | 6/30/2011           |
| 341.26  | 363 KENDRICK LN #53  | 9/30/2010           |
| 155.41  | 363 KENDRICK LN #54  | 7/31/2010           |
| 128.51  | 363 KENDRICK LN #45  | 1/5/2011            |
| 159.21  | 363 KENDRICK LN #48  | 3/31/2011           |
| 132.34  | 363 KENDRICK LN #42  | 5/31/2011           |
| 166.59  | 1208 MASSANUTTEN AVE | 6/20/2011           |
| 252.83  | 1324-A MADISON AVE   | 5/15/2011           |
| 184.46  | 1308-A MADISON AVE   | 9/30/2010           |
| 379.73  | 639 W 13TH ST        | 10/13/2010          |
| 568.66  | 607 W 13TH ST        | 7/29/2010           |
| 1325.57 | 355 W 11TH ST        | 11/13/2010          |
| 600.84  | 365 W 9TH ST         | 7/12/2011           |
| 742.86  | 366 W 11TH ST        | 9/5/2010            |
| 1141.76 | 813 N ROYAL AVE      | 6/14/2011           |
| 780.94  | 406 N ROYAL AVE #5   | 3/11/2011           |
| 823.36  | 229 VIRGINIA AVE     | 1/26/2011           |
| 512.54  | 427 VIRGINIA AVE     | 12/8/2010           |
| 336.94  | 427 VIRGINIA AVE     | 7/20/2011           |
| 89.70   | 21-A W 6TH ST        | 9/3/2010            |
| 141.36  | 21-C W 6TH ST        | 7/31/2010           |

## FY19 Uncollectible Utility Accounts

| Balance | Service Address          | Final Bill Due Date |
|---------|--------------------------|---------------------|
| 385.35  | 21-E W 6TH ST            | 3/31/2011           |
| 2025.49 | 719 VIRGINIA AVE         | 8/31/2010           |
| 60.97   | 520 VIRGINIA AVE #3      | 3/31/2011           |
| 257.69  | 520 VIRGINIA AVE #10     | 3/31/2011           |
| 246.85  | 506 VIRGINIA AVE #4      | 12/29/2010          |
| 669.72  | 506 VIRGINIA AVE #4      | 6/20/2011           |
| 97.22   | 116 W 4TH ST             | 7/22/2011           |
| 71.34   | 204 VIRGINIA AVE #306    | 7/29/2011           |
| 856.78  | 211 W 1ST ST             | 10/18/2010          |
| 253.22  | 22 W 1ST ST #2           | 10/15/2010          |
| 752.16  | 223 N ROYAL AVE          | 6/23/2011           |
| 4428.07 | 144 CHESTER ST #1        | 5/23/2011           |
| 158.76  | 10-A CHESTER ST          | 12/29/2010          |
| 241.47  | 135 CHESTER ST #2        | 1/26/2011           |
| 178.83  | 103 COMMERCE AVE         | 12/8/2010           |
| 212.00  | 134 HILLIDGE ST #2       | 9/14/2010           |
| 229.33  | 124 E 2ND ST             | 4/22/2011           |
| 608.45  | 213 CHESTER ST #1        | 4/22/2011           |
| 197.21  | 235 CHESTER ST #2        | 12/29/2010          |
| 41.08   | 235 CHESTER ST #1        | 5/27/2011           |
| 402.69  | 122 E 4TH ST             | 4/18/2011           |
| 1474.67 | 108 E 4TH ST             | 8/13/2010           |
| 776.08  | 417 N ROYAL AVE #2       | 9/30/2010           |
| 47.21   | 613 N ROYAL AVE #2       | 11/8/2010           |
| 130.43  | 613 N ROYAL AVE #6       | 10/14/2010          |
| 99.46   | 718 WARREN AVE #2        | 10/31/2010          |
| 56.71   | 718 WARREN AVE #3        | 8/27/2010           |
| 581.57  | 716 WARREN AVE #3        | 3/11/2011           |
| 652.53  | 518 WARREN AVE           | 7/9/2010            |
| 303.27  | 508-C WARREN AVE         | 1/18/2011           |
| 158.07  | 508-A WARREN AVE         | 4/27/2011           |
| 241.78  | 508-B WARREN AVE         | 10/19/2010          |
| 1025.53 | 503 WARREN AVE           | 8/30/2010           |
| 89.43   | 501 COMMERCE AVE.        | 2/1/2011            |
| 2953.74 | 515 COMMERCE AVE UNIT #C | 2/1/2011            |
| 957.90  | 213 E 6TH ST UNIT#A      | 2/1/2011            |
| 335.12  | 217 E 6TH ST UNIT #C     | 2/1/2011            |
| 449.20  | 209 E 6TH ST             | 1/27/2011           |
| 171.90  | 213 E 6TH ST UNIT#A      | 2/1/2011            |
| 191.04  | 215 E 6TH ST UNIT #B     | 2/1/2011            |
| 225.17  | 637 COMMERCE AVE         | 3/14/2011           |
| 40.40   | 130 E MAIN ST #2         | 10/28/2010          |
| 90.63   | 112 E MAIN ST #1         | 10/20/2010          |
| 132.53  | 112 E MAIN ST #2         | 7/11/2011           |
| 82.06   | 112 E MAIN ST #10        | 9/30/2010           |
| 578.99  | 419 VISCOSE AVE          | 7/29/2010           |
| 170.87  | 422 VISCOSE AVE #4       | 3/2/2011            |
| 272.22  | 422 VISCOSE AVE #1       | 7/29/2010           |

## FY19 Uncollectible Utility Accounts

| Balance | Service Address                | Final Bill Due Date |
|---------|--------------------------------|---------------------|
| 805.34  | 422 VISCOSE AVE #1             | 6/5/2011            |
| 288.21  | 412 VISCOSE AVE                | 9/6/2010            |
| 125.44  | 518 VISCOSE AVE #2             | 10/11/2010          |
| 54.10   | 518 VISCOSE AVE. #2 WATER ACCO | 10/11/2010          |
| 533.23  | 620 VISCOSE AVE                | 4/14/2009           |
| 423.26  | 101 S SHENANDOAH AVE           | 1/18/2011           |
| 248.39  | 105-A S SHENANDOAH AVE         | 9/16/2010           |
| 321.77  | 30 NORTH ST                    | 12/20/2010          |
| 276.80  | 113 E MAIN ST #7               | 11/18/2010          |
| 77.68   | 117 E MAIN ST #2               | 10/13/2010          |
| 64.70   | 117 E MAIN ST #1 ABOVE THEATRE | 10/10/2010          |
| 309.51  | 303 E MAIN ST #2               | 8/27/2010           |
| 105.46  | 401 E MAIN ST (WATER)          | 10/3/2010           |
| 274.25  | 409-B E MAIN ST                | 3/21/2011           |
| 209.06  | 529 E MAIN ST #7               | 9/30/2010           |
| 271.40  | 529 E MAIN ST #10              | 7/29/2010           |
| 105.59  | 19 S ROYAL AVE #3              | 11/17/2010          |
| 79.45   | 19 S ROYAL AVE #6              | 3/29/2011           |
| 137.08  | 19 S ROYAL AVE #8              | 11/9/2010           |
| 238.47  | 19 S ROYAL AVE #9              | 3/22/2011           |
| 731.13  | 23-B S ROYAL AVE 2ND FLOOR-RE  | 5/6/2011            |
| 408.41  | 23 S ROYAL AVE - 3RD FLOOR     | 4/18/2011           |
| 137.74  | 27 S ROYAL AVE #450-470        | 11/8/2010           |
| 952.61  | 211 S ROYAL AVE                | 1/2/2011            |
| 904.20  | 126 ELSIA DR                   | 12/27/2010          |
| 183.26  | 539 S ROYAL AVE #1             | 2/28/2011           |
| 240.89  | 609 S ROYAL AVE C-24           | 1/31/2011           |
| 434.92  | 214 LEE ST                     | 7/20/2011           |
| 729.40  | 24-A W STONEWALL DR            | 3/2/2011            |
| 238.43  | 20 W STONEWALL DR #1           | 6/23/2011           |
| 172.08  | 233 ORCHARD ST                 | 11/19/2010          |
| 1424.40 | 301 SKYLINE PL                 | 8/31/2010           |
| 812.50  | 305 SKYLINE PL                 | 8/31/2010           |
| 1701.72 | 307 SKYLINE PL                 | 7/31/2010           |
| 467.31  | 323 SKYLINE PL                 | 8/31/2010           |
| 342.01  | 329 SKYLINE PL                 | 10/31/2010          |
| 777.37  | 331 SKYLINE PL                 | 8/31/2010           |
| 271.13  | 326 SALEM AVE                  | 10/18/2010          |
| 304.94  | 319 PEAKOVA LN                 | 8/27/2010           |
| 1068.97 | 405 SALEM AVE                  | 4/15/2011           |
| 563.34  | 124 S SHENANDOAH AVE           | 7/3/2011            |
| 544.30  | 109-B S SHENANDOAH AVE         | 4/18/2011           |
| 1579.93 | 425 S SHENANDOAH AVE           | 1/12/2011           |
| 140.79  | 401 KERFOOT AVE                | 12/20/2010          |
| 861.73  | 711 RIVER DR                   | 10/12/2010          |
| 1855.93 | 324 DUNCAN AVE                 | 8/31/2010           |
| 188.41  | 346 CHERRYDALE AVE             | 7/20/2011           |
| 675.02  | 322 CHERRYDALE AVE             | 7/9/2010            |

## FY19 Uncollectible Utility Accounts

| Balance | Service Address            | Final Bill Due Date |
|---------|----------------------------|---------------------|
| 199.83  | 322 CHERRYDALE AVE         | 9/7/2010            |
| 460.66  | 325 CHERRYDALE AVE #2      | 9/30/2010           |
| 379.89  | 325 CHERRYDALE AVE #3      | 8/31/2010           |
| 202.17  | 325 CHERRYDALE AVE #5      | 7/20/2011           |
| 658.74  | 325 CHERRYDALE AVE #6      | 10/25/2010          |
| 348.91  | 325 CHERRYDALE AVE #8      | 10/17/2010          |
| 257.44  | 343 CHERRYDALE AVE #3      | 3/31/2011           |
| 484.09  | 343 CHERRYDALE AVE #12     | 11/9/2010           |
| 678.92  | 345 CHERRYDALE AVE         | 11/24/2010          |
| 336.45  | 367 CHERRYDALE AVE         | 6/23/2011           |
| 360.68  | 409 CHERRYDALE AVE         | 1/26/2011           |
| 703.61  | 611 BROWN AVE              | 4/18/2011           |
| 261.70  | 609 BROWN AVE              | 4/22/2011           |
| 124.24  | 390 CHERRYDALE AVE         | 7/31/2010           |
| 140.40  | 406 CHERRYDALE AVE         | 8/16/2010           |
| 368.78  | 432 CHERRYDALE AVE         | 4/12/2011           |
| 114.13  | 454 CHERRYDALE AVE         | 7/6/2011            |
| 821.72  | 466 CHERRYDALE AVE         | 8/2/2010            |
| 193.31  | 86 W CRISER RD             | 7/29/2010           |
| 990.02  | 108 W CRISER RD            | 6/2/2011            |
| 115.31  | 112 W CRISER RD            | 5/6/2011            |
| 151.20  | 124 W JACKSON ST #1        | 12/20/2010          |
| 706.71  | 5238 BROWNTOWN ROAD        | 4/25/2011           |
| 118.16  | 403 E CRISER RD #203       | 9/20/2010           |
| 77.79   | 403 E CRISER RD #203       | 3/11/2011           |
| 230.77  | 403 E CRISER RD #304       | 5/29/2011           |
| 112.26  | 423 E CRISER RD #104       | 12/30/2010          |
| 123.40  | 419 E CRISER RD #103       | 4/22/2011           |
| 215.03  | 419 E CRISER RD #202       | 8/2/2010            |
| 174.47  | 417 E CRISER RD #102       | 2/24/2011           |
| 58.27   | 409 E CRISER RD #203       | 9/29/2010           |
| 117.63  | 409 E CRISER RD #301       | 11/18/2010          |
| 188.26  | 204 E CRISER RD            | 9/30/2010           |
| 283.52  | 60 E CRISER RD             | 9/28/2010           |
| 413.41  | 60 E CRISER RD             | 3/31/2011           |
| 309.21  | 235 SOUTH ST               | 7/19/2010           |
| 180.00  | 472 HILL ST                | 8/25/2010           |
| 461.27  | 408 HILL ST #1             | 2/28/2011           |
| 360.24  | 502 REMOUNT RD             | 9/27/2010           |
| 374.53  | 5 SHENANDOAH COMMONS WAY # | 7/31/2010           |
| 694.23  | 11 SHENANDOAH COMMONS WAY  | 2/25/2011           |
| 243.04  | 15 SHENANDOAH COMMONS WAY  | 3/30/2011           |
| 156.13  | 15 SHENANDOAH COMMONS WAY  | 10/4/2010           |
| 48.45   | 15 SHENANDOAH COMMONS WAY  | 10/28/2010          |
| 62.15   | 19 SHENANDOAH COMMONS WAY  | 6/15/2011           |
| 107.85  | 19 SHENANDOAH COMMONS WAY  | 5/16/2011           |
| 288.56  | 19 SHENANDOAH COMMONS WAY  | 8/31/2010           |
| 131.87  | 23 SHENANDOAH COMMONS WAY  | 10/19/2010          |

## FY19 Uncollectible Utility Accounts

| Balance | Service Address               | Final Bill Due Date |
|---------|-------------------------------|---------------------|
| 153.89  | 23 SHENANDOAH COMMONS WAY     | 8/31/2010           |
| 257.71  | 13 SHENANDOAH COMMONS WAY     | 4/15/2011           |
| 880.41  | 450 S COMMERCE AVE #3         | 11/30/2010          |
| 607.08  | 130 THE HILL                  | 11/4/2010           |
| 721.69  | 298 COOK LN                   | 4/19/2011           |
| 257.63  | 432 BEL AIR AVE               | 7/19/2011           |
| 1028.56 | 433 BEL AIR AVE               | 10/28/2010          |
| 910.96  | 433 BEL AIR AVE               | 6/14/2011           |
| 206.44  | 423 MANASSAS AVE              | 5/18/2011           |
| 269.17  | 513 WASHINGTON AVE            | 12/2/2010           |
| 183.51  | 979 AUBURN CT                 | 9/2/2010            |
| 560.41  | 984 VIEW CREST CT             | 1/24/2011           |
| 106.47  | 998 MEADOW CT                 | 9/3/2010            |
| 151.64  | 1118 HAPPY RIDGE DR           | 7/7/2011            |
| 478.77  | 1146 HAPPY RIDGE DR           | 3/2/2011            |
| 663.07  | 1306 IMBODEN DR               | 1/26/2011           |
| 1631.90 | 1497 HAPPY CREEK RD           | 9/28/2010           |
| 278.30  | 843 VILLAGE CT                | 10/19/2010          |
| 1683.91 | 1289 PROGRESS DR              | 4/25/2011           |
| 51.93   | 832 E 6TH ST                  | 7/9/2010            |
| 339.14  | 103 STEELE AVE                | 10/28/2010          |
| 558.62  | 107 STEELE AVE                | 4/28/2011           |
| 1065.03 | 136 STEELE ST                 | 9/30/2010           |
| 284.84  | 127 STEELE AVE                | 10/31/2010          |
| 1550.29 | 512 PROCTOR LN                | 10/13/2010          |
| 389.72  | 512 PROCTOR LN                | 2/8/2011            |
| 874.69  | 515-B CARTER ST               | 2/3/2011            |
| 781.88  | 515-B CARTER ST               | 4/22/2011           |
| 302.31  | 306 S ROYAL AVE #1            | 10/4/2010           |
| 252.69  | 306 S ROYAL AVE #2            | 8/27/2010           |
| 155.46  | 222 S. ROYAL AVE. #2 UPSTAIRS | 4/25/2011           |
| 720.98  | 24 E STONEWALL DR #6          | 11/4/2010           |
| 275.55  | 24 E STONEWALL DR #1          | 4/3/2011            |
| 331.03  | 18 E STONEWALL DR             | 9/27/2010           |
| 128.96  | 120-C S ROYAL AVE             | 10/6/2010           |
| 349.28  | 120-B S ROYAL AVE             | 9/6/2010            |
| 260.92  | 120-B S ROYAL AVE             | 12/20/2010          |
| 322.25  | 116-A S ROYAL AVE             | 3/2/2011            |
| 97.20   | 116-B S ROYAL AVE             | 3/31/2011           |
| 266.77  | 227 CHURCH ST #4              | 12/30/2010          |
| 423.85  | 227 CHURCH ST #1              | 8/2/2010            |
| 184.41  | 334 PINE ST                   | 7/30/2010           |
| 86.56   | 329 LAUREL ST #3              | 2/24/2011           |
| 526.17  | 347 OSAGE ST #4               | 12/30/2010          |
| 261.50  | 207 CLOUD ST #2               | 4/22/2011           |
| 269.60  | 207 CLOUD ST #3               | 4/22/2011           |
| 175.80  | 225 CLOUD ST                  | 1/25/2011           |
| 482.39  | 341 CLOUD ST APT #5           | 7/29/2010           |

## FY19 Uncollectible Utility Accounts

| Balance | Service Address                  | Final Bill Due Date |
|---------|----------------------------------|---------------------|
| 87.84   | 341 CLOUD ST #4                  | 8/12/2010           |
| 681.47  | 242 SHORT ST                     | 12/1/2010           |
| 407.88  | 224 SHORT ST                     | 2/24/2011           |
| 128.28  | 320 CLOUD ST #5                  | 6/6/2011            |
| 394.45  | 310 PROSPECT ST                  | 8/25/2010           |
| 1257.25 | 310 PROSPECT ST                  | 5/4/2011            |
| 52.18   | 10 HIGH ST #2                    | 3/31/2011           |
| 694.49  | 329 BLUE RIDGE AVE               | 11/4/2010           |
| 465.47  | 337 BLUE RIDGE AVE               | 3/15/2011           |
| 126.44  | 356 BLUE RIDGE AVE #3            | 12/20/2010          |
| 219.03  | 356 BLUE RIDGE AVE #1            | 2/4/2011            |
| 283.55  | 352 BLUE RIDGE AVE #2            | 11/10/2010          |
| 303.02  | 352 BLUE RIDGE AVE #1 DOWNSTAIRS | 7/4/2011            |
| 369.86  | 348 BLUE RIDGE AVE               | 8/10/2010           |
| 134.47  | 10 BLUE RIDGE AVE #1             | 4/22/2011           |
| 433.89  | 222 MOSBY LN                     | 11/24/2010          |
| 306.79  | 220 FLETCHER ST                  | 3/30/2011           |
| 975.46  | 328 RITENOUR ST                  | 11/12/2010          |
| 220.77  | 322 RITENOUR ST                  | 9/1/2010            |
| 1215.75 | 322 RITENOUR ST                  | 7/13/2011           |
| 508.78  | 308 RITENOUR ST                  | 2/1/2011            |
| 440.26  | 564 E PROSPECT ST                | 1/10/2011           |
| 756.02  | 568 PROSPECT ST                  | 10/14/2010          |
| 295.33  | 309 FRONT ST                     | 10/13/2010          |
| 165.45  | 309 FRONT ST                     | 4/15/2011           |
| 222.47  | 406 SHORT ST                     | 10/28/2010          |
| 603.74  | 406 SHORT ST                     | 4/12/2011           |
| 537.40  | 413 SHORT ST                     | 10/31/2010          |
| 894.14  | 524 SHORT ST                     | 5/10/2011           |
| 915.07  | 516 SHORT ST                     | 10/17/2010          |
| 3088.92 | 4 S MARSHALL ST                  | 5/30/2011           |
| 174.44  | 812 STONEWALL DR                 | 9/6/2010            |
| 55.40   | 11 N MARSHALL ST                 | 5/30/2011           |
| 442.76  | 15 N MARSHALL ST                 | 9/20/2010           |
| 3886.76 | 111 ACCOMAC RD                   | 7/9/2010            |
| 441.28  | 101 PINECREST ST                 | 10/20/2010          |
| 97.30   | 101 PINECREST ST                 | 11/30/2010          |
| 323.47  | 1020 STONEWALL DR                | 3/14/2011           |
| 110.65  | 79 ROYAL LN #10                  | 10/1/2010           |
| 455.95  | 27 ROYAL LN #2                   | 2/28/2011           |
| 280.62  | 27 ROYAL LN #10                  | 9/29/2010           |
| 62.88   | 27 ROYAL LN #12                  | 4/22/2011           |
| 294.51  | 35 ROYAL LN #6                   | 2/24/2011           |
| 60.00   | 61 ROYAL LN #3                   | 8/31/2010           |
| 184.83  | 67 ROYAL LN #4                   | 3/18/2011           |
| 344.80  | 66 ROYAL LN                      | 4/6/2011            |
| 162.33  | 125 BIGGS DR #6                  | 1/2/2011            |
| 97.31   | 1692 COMMONWEALTH DR             | 7/10/2011           |

## FY19 Uncollectible Utility Accounts

| Balance | Service Address                 | Final Bill Due Date |
|---------|---------------------------------|---------------------|
| 611.00  | 18 LAKE AVE                     | 6/30/2011           |
| 739.97  | 1484 JOHN MARSHALL HWY          | 8/31/2010           |
| 383.60  | 1474 JOHN MARSHALL HWY          | 10/17/2010          |
| 272.73  | 1474 JOHN MARSHALL HWY          | 3/11/2011           |
| 1762.09 | 1468 JOHN MARSHALL HWY          | 8/31/2010           |
| 790.79  | 1468 JOHN MARSHALL HWY          | 3/11/2011           |
| 997.93  | 1452 JOHN MARSHALL HWY          | 11/30/2010          |
| 194.95  | 1473 ANDERSON ST                | 8/2/2010            |
| 319.10  | 1415 ANDERSON ST                | 2/24/2011           |
| 596.17  | 72 WALKER AVE                   | 5/31/2011           |
| 275.07  | 1410 JOHN MARSHALL HWY UPSTAIRS | 2/4/2011            |
| 431.27  | 81 WESTMINSTER DR               | 1/2/2011            |
| 146.86  | 1250 JOHN MARSHALL HWY          | 9/3/2010            |
| 498.05  | 516 BRAXTON RD                  | 1/3/2011            |
| 281.50  | 507 ROSS AVE                    | 4/17/2011           |
| 209.77  | 488 HAMILTON CIR                | 4/12/2011           |
| 142.23  | 603 STOCKTON RD                 | 8/27/2010           |
| 352.39  | 726 RODNEY AVE                  | 2/24/2011           |
| 197.87  | 217 CLYMER AVE                  | 9/3/2010            |
| 392.82  | 235 RANDOLPH AVE                | 10/31/2010          |
| 836.93  | 4 EVELYN CT                     | 11/30/2010          |

166190.93



4



## Work Session Agenda Form

Item # 4

DATE: October 15, 2018

### AGENDA ITEM: FY19 Budget Amendment - Outstanding Purchase Orders

**SUMMARY:** Council is requested to approve a budget amendment to carry forward unpaid balances on purchase orders not completed at the end of June 2018 for fiscal year 2019.

**BUDGET/FUNDING:** Funding will be offset from the appropriate fund balance reserves for each fund indicated, the revenue for these projects have been connected in previous budget cycle.

|                  |                     |
|------------------|---------------------|
| General Fund     | \$ 447,908.78       |
| Special Projects | 1,384,772.81        |
| Electric Fund    | 539,112.61          |
| Sewer Fund       | 7,247,675.70        |
| Water Fund       | 3,147,458.28        |
| Solid Waste Fund | 28,907.79           |
| Street Fund      | <u>1,858,490.99</u> |
| TOTAL            | \$14,654,326.96     |

**STAFF RECOMMENDATION:** Staff recommends Council move forward with a public hearing on this item, an increase of greater than 1% of the original budget requires a public hearing. Staff further recommends approval of these funds as this is a yearly housekeeping item.

|                              | <u>PO#</u> | <u>Account#</u> | <u>Vendor</u>            | <u>Amount</u>          | <u>Year Reserved</u> | <u>Description</u>               |
|------------------------------|------------|-----------------|--------------------------|------------------------|----------------------|----------------------------------|
| <b>Projects</b>              | 28341      | 9130 - R47013   | FACILITY STUDY           | \$ 264,949.65          | FY15-FY18            | POLICE DEPT HQ                   |
|                              | 29306      | 9130 - R47961   | COMMUNITY PLANNING PARTN | \$ 62,775.57           | FY18                 | CBDG PROJECT MANAGMENT           |
|                              | 29379      | 9130 - R47982   | G.B. FOLTZ CONTRACTING,  | \$ 1,057,047.59        | FY18                 | W MAIN CONNECTOR                 |
|                              |            |                 |                          | <u>\$ 1,384,772.81</u> |                      |                                  |
| <b>Council</b>               | 28237      | 1101 - R43002   | COMMUNITY DEVELOPMENT    | \$ 45,896.96           | FY15                 | COMMUNITY DEVELOPMENT            |
|                              | 28953      | 1101 - R43002   | COMMUNITY DEVELOPMENT    | \$ 1,236.64            | FY17                 | COMMUNITY DEVELOPMENT            |
|                              | 29034      | 1101 - R43002   | MILLIMAN, INC.           | \$ 7,975.00            | FY17                 | ACTURIAL SERVICES                |
|                              |            |                 |                          | <u>\$ 55,108.60</u>    |                      |                                  |
| <b>Town Manager</b>          | 29419      | 1201 - R45428   | SWANK MOTION PICTURES, I | \$ 1,260.00            | FY18                 | GAZEBO FLICKS                    |
|                              |            |                 |                          | <u>\$ 1,260.00</u>     |                      |                                  |
| <b>HR</b>                    | 29033      | 1202 - R45504   | INTERNATIONAL PUBLIC MAN | \$ 2,520.00            | FY17                 | TRAINING FEES                    |
|                              | 29038      | 1202 - R42013   | CAPELLA UNIVERSITY INC   | \$ 400.00              | FY17                 | TUITION ASSISTANCE - 4 CL        |
|                              |            |                 |                          | <u>\$ 2,920.00</u>     |                      |                                  |
| <b>Fleet<br/>Maintenance</b> | 29055      | 1203 - R47009   | BAUGHAN & BAUKHAGES, PLL | \$ 93,818.90           | FY16-FY17            | ARCHITECTURAL SERVICES           |
|                              | 29058      | 1203 - R45412   | W W GRAINGER INC         | \$ 2,800.00            | FY17                 | ASSORTED OFFICE FURNITURE        |
|                              | 29422      | 1203 - R47003   | BEARCOM                  | \$ 6,370.77            | FY18                 | GPS BACKUP BATTERY               |
|                              |            |                 |                          | <u>\$ 102,989.67</u>   |                      |                                  |
| <b>I/T</b>                   | 29020      | 1204 - R47007   | SYNTAX COMMUNICATIONS,   | \$ 13,748.56           | FY17                 | FIBER UPGRAD                     |
|                              | 29053      | 1204 - R45504   | (ISC)2                   | \$ 8,000.00            | FY17                 | IT STAFF - SECURITY TRAIN        |
|                              | 29087      | 1204 - R43005   | RICOH USA, INC.          | \$ 5,078.60            | FY18                 | RICOH                            |
|                              | 29088      | 1204 - R43005   | RICOH USA, INC.          | \$ 4,513.02            | FY18                 | COPIER LEASE                     |
|                              | 29089      | 1204 - R43005   | SHENTEL SERVICE COMPANY  | \$ 3,145.00            | FY18                 | 100 MBPS INTERNET ACCESS         |
|                              | 29141      | 1204 - R45421   | CDW GOVERNMENT, INC.     | \$ 556.56              | FY18                 | APPLE KEYBOARD & DOCKING STATION |
|                              | 29374      | 1204 - R43005   | ADOBE SYSTEM INC.        | \$ 5,279.04            | FY18                 | CREATIVE CLOUD & PHOTOSHO        |
|                              | 29397      | 1204 - R43005   | POWER DMS                | \$ 5,532.00            | FY18                 | 2 YEARS RENEWAL SDMS-AS          |
|                              | 29415      | 1204 - R47007   | SHI CORP.                | \$ 4,000.00            | FY18                 | TOWN COUNCIL I-PAD REPLACEMENTS  |
|                              |            |                 |                          | <u>\$ 49,852.78</u>    |                      |                                  |

|                     | <u>PO#</u> | <u>Account#</u> | <u>Vendor</u>            | <u>Amount</u>        | <u>Year Reserved</u> | <u>Description</u>          |
|---------------------|------------|-----------------|--------------------------|----------------------|----------------------|-----------------------------|
| <b>Tourism</b>      | 28285      | 1205 - R43018   | 4IMPRINT                 | \$ 2,803.44          | FY15                 | PROMOTIONAL SUPPLIES        |
|                     | 28645      | 1205 - R43006   | COMMERCIAL PRESS, INC    | \$ 869.74            | FY16                 | PRINTING SERVICES           |
|                     | 28694      | 1205 - R43040   | NATIONAL MEDIA SERVICES, | \$ 10,000.00         | FY16                 | WAYFINDING SIGNS            |
|                     |            |                 |                          | <u>\$ 13,673.18</u>  |                      |                             |
|                     |            |                 |                          |                      |                      |                             |
| <b>Finance</b>      | 29427      | 1222 - R45504   | COMMONWEALTH OF VIRGINIA | \$ 550.00            | FY18                 | VCA CLASS                   |
|                     |            |                 |                          | <u>\$ 550.00</u>     |                      |                             |
|                     |            |                 |                          |                      |                      |                             |
| <b>Police</b>       | 29391      | 3101 - R45425   | TSSI                     | \$ 165.60            | FY18                 | LOW ROLL DISTRACTION DEVICE |
|                     | 29391      | 3101 - R45425   | TSSI                     | \$ 2,154.50          | FY18                 | 40MM OC FERRET              |
|                     | 29406      | 3101 - R45410   | MARLOW WHITE UNIFORMS, I | \$ 1,490.80          | FY18                 | MARLOW WHITE QUOTE          |
|                     | 29406      | 3101 - R45413   | MARLOW WHITE UNIFORMS, I | \$ 456.00            | FY18                 | MARLOW WHITE QUOTE          |
|                     | 29354      | 3102 - R45409   | CIVIL DISTURBANCE UNIT   | \$ 19,560.00         | FY18                 | POLICE PATROL SUPPLIES      |
|                     |            |                 |                          | <u>\$ 23,826.90</u>  |                      |                             |
|                     |            |                 |                          |                      |                      |                             |
| <b>B &amp; G</b>    | 28570      | 4302 - R43004   | LOWE'S                   | \$ 21,500.00         | FY16-FY18            | ROOF REPLACEMENT            |
|                     | 29326      | 4302 - R47009   | CARTER MACHINERY CO INC  | \$ 29,225.99         | FY18                 | FY18 GENERAL PROPERTIES D   |
|                     | 29394      | 4302 - R47009   | LANTZ CONSTRUCTION WINCH | \$ 53,774.87         | FY18                 | TOWN HALL GENERATOR         |
|                     |            |                 |                          | <u>\$ 104,500.86</u> |                      |                             |
|                     |            |                 |                          |                      |                      |                             |
| <b>Horticulture</b> | 29396      | 4305 - R45413   | SPRINGTIME GARDEN CENTER | \$ 5,317.30          | FY18                 | PORTSMOUTH ROAD PROJECT     |
|                     |            |                 |                          | <u>\$ 5,317.30</u>   |                      |                             |
|                     |            |                 |                          |                      |                      |                             |
| <b>P&amp;Z</b>      | 27531      | 8101 - R47014   | AIR SURVEY CORPORATION   | \$ 54,105.00         | FY14                 | UPDATE AERIAL IMAGERY DAT   |
|                     | 28342      | 8101 - R43026   | RENAISSANCE PLANNING GRO | \$ 29,809.49         | FY15                 | COMP PLAN UPDATES           |
|                     | 28693      | 8101 - R43002   | SABRA, WANG & ASSOCIATES | \$ 3,995.00          | FY16                 | PROFESSIONAL SERVICES REN   |
|                     |            |                 |                          | <u>\$ 87,909.49</u>  |                      |                             |

|          | <u>PO#</u> | <u>Account#</u> | <u>Vendor</u>            | <u>Amount</u>          | <u>Year Reserved</u> | <u>Description</u>         |
|----------|------------|-----------------|--------------------------|------------------------|----------------------|----------------------------|
| Streets  | 29100      | 4102 - R45474   | CLATTERBUCK PAVEMENT MAR | \$ 292.77              | FY18                 | THERMOPLASTIC PAVEMENT MA  |
|          | 28869      | 4102 - R47933   | RACEY PAVING & EXCAVATIN | \$ 3,036.76            | FY17                 | CRISER ROAD TRAIL          |
|          | 29063      | 4107 - R45515   | TREASURER OF VIRGINIA    | \$ 1,500.00            | FY17                 | TRAINING AND LICENSE FEES  |
|          | 28302      | 4500 - R45407   | CARMEUSE LIME AND STONE  | \$ 13,567.78           | FY15                 | VARIOUS GRADE OF STONE     |
|          | 29316      | 4500 - R45407   | VULCAN, INC.             | \$ 5,498.00            | FY18                 | VARIOUS HARDWARE           |
|          | 29100      | 4500 - R45474   | CLATTERBUCK PAVEMENT MAR | \$ 207.14              | FY18                 | THERMOPLASTIC PAVEMENT MA  |
|          | 29421      | 4500 - R45474   | MIDATLANTIC MARKING INC  | \$ 4,368.04            | FY18                 | THERMOPLASTIC PAVEMENT MA  |
|          | 29380      | 4500 - R45477   | LANTZ CONSTRUCTION WINCH | \$ 3,606.00            | FY18                 | WALL DEMOLITION WITH CLEA  |
|          | 29177      | 4500 - R45478   | CARGILL, INC.            | \$ 12,618.81           | FY18                 | DEICING ROAD SALT          |
|          | 29110      | 4500 - R47001   | WINCHESTER EQUIPMENT COM | \$ 3,880.75            | FY18                 | BOBCAT 72" SWEEPER BOX AN  |
|          | 28932      | 4500 - R47005   | CAPITAL GMC TRUCKS, INC. | \$ 148,894.00          | FY17-FY18            | DUMP TRUCK                 |
|          | 28461      | 4500 - R47909   | ARTHUR CONSTRUCTION CO., | \$ 124,025.00          | FY16                 | WESTMINSTER DRIVE SIDEWAL  |
|          | 29337      | 4500 - R47926   | ARCHER WESTERN CONSTRUCT | \$ 668,253.50          | FY18                 | CRISER ROAD BRIDGE         |
|          | 29171      | 4500 - R47927   | W-L CONSTRUCTION AND PAV | \$ 456,914.94          | FY18                 | PAVING PROJECTS            |
|          | 29338      | 4500 - R47941   | LANTZ CONSTRUCTION WINCH | \$ 48,519.25           | FY18                 | CURB & GUTTER - THROUGH J  |
|          | 29321      | 4500 - R47956   | SLURRY PAVERS INCORPORAT | \$ 195,300.00          | FY18                 | SLURRY SEAL                |
|          | 29162      | 4500 - R47957   | BRANCH HIGHWAYS, INC.    | \$ 146,351.25          | FY18                 | LEACH RUN PARKWAY CONSTRU  |
|          | 29392      | 4500 - R47962   | MATTERN & CRAIG          | \$ 21,657.00           | FY18                 | ENGINEERING ON CRISER RD   |
|          |            |                 |                          | <u>\$ 1,858,490.99</u> |                      |                            |
| Electric | 29428      | 9499 - R40001   | WELLS FARGO BANK, NA     | \$ 87,000.00           | FY18                 | AMI DEBT SERVICE           |
|          | 29428      | 9499 - R40005   | WELLS FARGO BANK, NA     | \$ 120,000.00          | FY18                 | AMI DEBT SERVICE           |
|          | 28390      | 9401 - R43002   | ENGINEERING TECHNIQUES,  | \$ 4,500.00            | FY16                 | MAIN STREET CANOPY LIGHTS  |
|          | 28743      | 9401 - R43002   | GDS ASSOCIATES, INC.     | \$ 3,000.00            | FY17                 | POWER SUPPLY CONSULTING S  |
|          | 28541      | 9401 - R43004   | MORETZ CONSULTING        | \$ 3,800.00            | FY16                 | ELECTRIC VEHICLE DC FAST   |
|          | 29189      | 9401 - R43004   | PITTMAN'S TREE & LANDSCA | \$ 39,512.03           | FY18                 | TREE TRIMMING              |
|          | 29269      | 9401 - R45407   | PAINTER-LEWIS, P.L.C.    | \$ 1,639.68            | FY18                 | DEQ PERMIT                 |
|          | 29295      | 9401 - R45407   | UNITED UTILITY           | \$ 5,025.00            | FY18                 | ATB240BLEDE70MVOLTR3PCLL   |
|          | 29400      | 9401 - R45407   | ANIXTER INC.             | \$ 10,000.00           | FY18                 | ELECTRIC SYSTEM ON LEACH   |
|          | 29011      | 9401 - R45410   | SAFETY ZONE SPECIALISTS  | \$ 1,000.00            | FY17                 | FR CLASS 3 HI-VIS SHORT S  |
|          | 29304      | 9401 - R47005   | ALTEC INDUSTRIES, INC.   | \$ 40,000.00           | FY18                 | FIRST PAYMENT REPLACE #344 |
|          | 29370      | 9401 - R47502   | UNITED UTILITY           | \$ 2,838.00            | FY18                 | LNH2LU5MOITR5BA W/PHOTOCE  |
|          | 29399      | 9401 - R47910   | ECONOLITE CONTROL PRODUC | \$ 10,800.00           | FY18                 | TRAFFIC LIGHT SUPPLY       |
|          | 29242      | 9401 - R47938   | SOUTHEASTERN CONSULTING  | \$ 126,534.96          | FY18                 | KENDRICK LANE TRANSFORMER  |
|          | 27543      | 9417 - R47001   | SUPERION                 | \$ 83,462.94           | FY14                 | AMI - PROGRAM              |
|          |            |                 |                          | <u>\$ 539,112.61</u>   |                      |                            |

| <b>Sewer</b> | <b><u>PO#</u></b> | <b><u>Account#</u></b> | <b><u>Vendor</u></b>     | <b><u>Amount</u></b>   | <b><u>Year Reserved</u></b> | <b><u>Description</u></b> |
|--------------|-------------------|------------------------|--------------------------|------------------------|-----------------------------|---------------------------|
|              | 29087             | 9502 - R43005          | RICOH USA, INC.          | \$ 584.13              | FY18                        | COPIER                    |
|              | 29277             | 9801 - R43002          | PENNONI ASSOCIATES, INC. | \$ 3,826.75            | FY18                        | ROYAL PHOENIX, LOT 6 PUMP |
|              | 29346             | 9801 - R43002          | STANTEC CONSULTING, INC. | \$ 25,000.00           | FY18                        | WATER SEWER RATE ANALYSIS |
|              | 29030             | 9801 - R43004          | W W GRAINGER INC         | \$ 1,500.00            | FY17                        | SHELVING                  |
|              | 29085             | 9801 - R43005          | WASTE MANAGEMENT OF WEST | \$ 56,324.24           | FY18                        | BIOSOLIDS DISPOSAL SERVIC |
|              | 29250             | 9801 - R43005          | ABB, INC.                | \$ 1,080.09            | FY18                        | QUARTERLY SERVICE CONTRAC |
|              | 29425             | 9801 - R43005          | WASTE MANAGEMENT OF WEST | \$ 22,000.00           | FY18                        | BISOLIDS DISPOSAL         |
|              | 29222             | 9801 - R43077          | INBODEN ENVIRONMENTAL SE | \$ 12,759.60           | FY18                        | PERMIT REQUIRED TESTING T |
|              | 27930             | 9801 - R45407          | GHD INC.                 | \$ 16,882.00           | FY14                        | FAN PRESS                 |
|              | 29031             | 9801 - R45407          | USABBLUEBOOK             | \$ 10,000.00           | FY17                        | EFFLUENT COMPOSITE SAMPLE |
|              | 29174             | 9801 - R45407          | COMMONWEALTH CONTROLS CO | \$ 3,537.39            | FY18                        | VARIABLE FREQUENCY DRIVE, |
|              | 29245             | 9801 - R45407          | APPLIED INDUSTRIAL TECHN | \$ 6.97                | FY18                        | MARTIN 1-1/4" SROCKET     |
|              | 29245             | 9801 - R45407          | APPLIED INDUSTRIAL TECHN | \$ 49.89               | FY18                        | 1 HP 480 V 3 PHASE MOTOR  |
|              | 29245             | 9801 - R45407          | APPLIED INDUSTRIAL TECHN | \$ 272.08              | FY18                        | DODGE GEAR DRIVE          |
|              | 29412             | 9801 - R45412          | PIFER OFFICE SUPPLY      | \$ 8,300.00            | FY18                        | OFFICE FURNITURE          |
|              | 29091             | 9801 - R45413          | WINSCHER ENVIRONMENTAL,  | \$ 3,740.00            | FY18                        | BRENNTAG WINFLOC 7BC1 POL |
|              | 29389             | 9801 - R45413          | EVOQUA WATER TECHNOLOGIE | \$ 3,000.00            | FY18                        | MAGNETITE                 |
|              | 27549             | 9801 - R47009          | LANTZ CONSTRUCTION WINCH | \$ 70,000.00           | FY14                        | CROOKED RUN PUMP STATION  |
|              | 28563             | 9801 - R47009          | LANTZ CONSTRUCTION WINCH | \$ 32,562.00           | FY16                        | BLOWER BUILDING           |
|              | 28885             | 9801 - R47009          | PATTERSON CONSTRUCTION C | \$ 500,000.00          | FY17                        | RIVERTON & CRKD RUN PUMP  |
|              | 29339             | 9801 - R47009          | G.B. FOLTZ CONTRACTING,  | \$ 469,381.92          | FY18                        | ROYAL PHOENIX NORTHERN PU |
|              | 28187             | 9801 - R47015          | ADAMS ROBINSON ENTERPRIS | \$ 2,667,355.75        | FY15                        | WWTP EXPANSION            |
|              | 28375             | 9801 - R47015          | GHD INC.                 | \$ 240,424.58          | FY16                        | WWTP UPGRADE              |
|              | 28309             | 9802 - R47998          | D & S CONTRACTORS        | \$ 2,904,640.55        | FY15-FY18                   | I & I ABATEMENT           |
|              | 28666             | 9802 - R47998          | CHA CONSULTING, INC.     | \$ 194,447.76          | FY16                        | I & I ABATEMENT           |
|              |                   |                        |                          | <u>\$ 7,247,675.70</u> |                             |                           |

| <b>Water</b> | <b><u>PO#</u></b> | <b><u>Account#</u></b> | <b><u>Vendor</u></b>     | <b><u>Amount</u></b>   | <b><u>Year Reserved</u></b> | <b><u>Description</u></b>  |
|--------------|-------------------|------------------------|--------------------------|------------------------|-----------------------------|----------------------------|
|              | 29087             | 9501 - R43005          | RICOH USA, INC.          | \$ 584.13              | FY18                        | COPIER                     |
|              | 28287             | 9601 - R43002          | CHA CONSULTING, INC.     | \$ 25,000.00           | FY15                        | WATER TREATMENT PLANT RES  |
|              | 29017             | 9601 - R43002          | CHA CONSULTING, INC.     | \$ 18,940.00           | FY17                        | WATER DISTRIBUTION/SYSTEM  |
|              | 29346             | 9601 - R43002          | STANTEC CONSULTING, INC. | \$ 25,000.00           | FY18                        | WATER SEWER RATE ANALYSIS  |
|              | 29424             | 9601 - R43002          | VIRGINIA DEPARTMENT OF H | \$ 52,500.00           | FY18                        | VULNERABILITY/ASSET MANA   |
|              | 29012             | 9601 - R43004          | EASTERN SUPPLY INC       | \$ 1,200.00            | FY17                        | BASIN CONTROL EQUIPMENT E  |
|              | 29416             | 9601 - R43004          | LOWE'S                   | \$ 2,300.00            | FY18                        | WATER PLANT FLOORS STRIPP  |
|              | 29250             | 9601 - R43005          | ABB, INC.                | \$ 1,080.10            | FY18                        | QUARTERLY SERVICE CONTRAC  |
|              | 29270             | 9601 - R45407          | ENGINEERED FLUID, INC.   | \$ 303.56              | FY18                        | SMITH BLAIR COUPLING 12"   |
|              | 29176             | 9601 - R45413          | UNIVAR USA INC           | \$ 3,760.00            | FY18                        | SODIUM FLUORIDE - (80)50#  |
|              | 29184             | 9601 - R45413          | COYNE CHEMICAL           | \$ 2,246.41            | FY18                        | POTASSIUM PERMANGANATE -   |
|              | 27546             | 9601 - R47009          | CHA CONSULTING, INC.     | \$ 125,000.00          | FY14                        | RESERVIOR REPAIRS & PIER   |
|              | 28119             | 9601 - R47009          | CHA CONSULTING, INC.     | \$ 460,000.00          | FY14-FY16                   | FAIRGROUND ROAD WATER TAN  |
|              | 28327             | 9601 - R47009          | CHA CONSULTING, INC.     | \$ 300,000.00          | FY15-FY17                   | JAMESTOWN PUMP STATION     |
|              | 28559             | 9601 - R47009          | CARTER MACHINERY CO INC  | \$ 11,240.00           | FY16                        | REPLACEMENT CONTROL FOR T  |
|              | 28871             | 9601 - R47009          | FLOMEC, INC.             | \$ 300,000.00          | FY17-FY18                   | FILTER MEDIA               |
|              | 29016             | 9601 - R47009          | UTILITY SERVICE CO INC   | \$ 18,690.08           | FY17                        | RAW WATER INTAKE LINE CLE  |
|              | 29018             | 9601 - R47009          | LONG FENCE               | \$ 35,000.00           | FY17                        | ALUMINUM HAND RAIL REPLAC  |
|              | 29019             | 9601 - R47009          | COMMERCIAL PAINTING CORP | \$ 5,880.00            | FY17                        | FILTER MEDIA AREA PAINTIN  |
|              | 27494             | 9601 - R47903          | MCGRANE FENCE COMPANY    | \$ 39,729.00           | FY13                        | SECURITY IMPROVEMENTS      |
|              | 29413             | 9602 - R43002          | UTILITY SERVICES ASSOCIA | \$ 72,360.00           | FY18                        | LEAK DETECTION SURVEY      |
|              | 29414             | 9602 - R45504          | AMERICAN WATER WORKS ASS | \$ 4,600.00            | FY18                        | TRAINING                   |
|              | 29313             | 9602 - R47513          | BUSHONG CONTRACTING CORP | \$ 1,048,446.80        | FY18                        | WATERLINE UPGRADES         |
|              | 29409             | 9602 - R47513          | W-L CONSTRUCTION AND PAV | \$ 99,158.20           | FY18                        | PAVING WATERLINE REPAIRS   |
|              | 28992             | 9617 - R47001          | CORE & MAIN              | \$ 391,440.00          | FY17-FY18                   | WATER METERS               |
|              | 29343             | 9672 - R40001          | U.S. BANK                | \$ 29,000.00           | FY18                        | DEBT SERVICE ON WATER LOOP |
|              | 29343             | 9672 - R40005          | U.S. BANK                | \$ 74,000.00           | FY18                        | DEBT SERVICE ON WATER LOOP |
|              |                   |                        |                          | <u>\$ 3,147,458.28</u> |                             |                            |

| <b>Solid Waste</b> | <b><u>PO#</u></b> | <b><u>Account#</u></b> | <b><u>Vendor</u></b> | <b><u>Amount</u></b> | <b><u>Year Reserved</u></b> | <b><u>Description</u></b> |
|--------------------|-------------------|------------------------|----------------------|----------------------|-----------------------------|---------------------------|
|                    | 29060             | 4203 - R47001          | TOTER LLC            | \$ 3,174.60          | FY17                        | DUMPSTERS WITH LIDS, CART |
|                    | 29143             | 4203 - R45407          | BEARSAVER            | \$ 1,736.97          | FY18                        | BEAR PROOF REFUSE CONTAIN |
|                    | 29167             | 4203 - R47001          | TOTER LLC            | \$ 5,960.40          | FY18                        | 96 GALLON ROLL OUT CART   |
|                    | 29172             | 4203 - R47001          | TOTER LLC            | \$ 5,300.00          | FY18                        | 96 GALLON REFUSE CART     |
|                    | 29279             | 4203 - R47001          | BEARSAVER            | \$ 1,601.00          | FY18                        | RESIDENTIAL TRASH CART EN |
|                    | 29395             | 4203 - R47001          | TOTER LLC            | \$ 11,134.82         | FY18                        | TRASH CARTS AND/OR LIDS   |
|                    |                   |                        |                      | <u>\$ 28,907.79</u>  |                             |                           |

|                                 |                        |
|---------------------------------|------------------------|
| General Fund                    | \$ 447,908.78          |
| Special Projects                | \$ 1,384,772.81        |
| Street Fund                     | \$ 1,858,490.99        |
| <b>TOTAL GOVERNMENTAL FUNDS</b> | <b>\$ 3,691,172.58</b> |

|                           |                         |
|---------------------------|-------------------------|
| Electric Fund             | \$ 539,112.61           |
| Sewer Fund                | \$ 7,247,675.70         |
| Water Fund                | \$ 3,147,458.28         |
| Solid Waste Fund          | \$ 28,907.79            |
| <b>TOTAL OF ALL FUNDS</b> | <b>\$ 14,654,326.96</b> |



5



## Work Session Agenda Form

Item # 5

DATE: October 15, 2018

### AGENDA ITEM: Additional Discussion of Police Radio Financing

**SUMMARY:** On September 10<sup>th</sup>, 2018 Town Council approved the purchase of a new radio system for the Police Department in the amount of \$545,000. The funding was taken from the General Fund Balance with the intention that future discussion would take place regarding options of financing or loans from fund balance.

The Town has been made aware of additional funding that will be needed in order to provide appropriate network connectivity for the radio system. Following this cover sheet you will find various options provided by the Town's Information Technology Department. Two of the three options may require the Town to obtain additional financing, the third option from Shentel would not require additional financing, but would require future annual budget allocations should the Town choose to move forward with the third option.

Council is requested to review the following options with the assumption that the cost for the radio system remains \$545,000 and the network connectivity will be absorbed in the annual budgets moving forward :

#### Option A

Make no changes and allow general fund balance to pay for the full radio system

#### Option B

Finance the full balance of \$545,000 using an option through VML Vaco with an annual interest rate of 3.389% over a 10 year period with annual payments totaling \$65,305.46. Total interest paid over the ten year period would be approximately \$106,650.

#### Option C

Pursue financing half of the purchase price (\$272,500) and taking half of the purchase price from fund balance. Financing for a term of 5 years with payments of approximately \$62,000 or financing for a term of 10 years with payments of approximately \$33,000.

#### Option D

Making an internal loan from water or sewer fund balance for the full amount of \$545,000 with no interest over a 10 year period; annual payment of \$54,500.

**BUDGET/FUNDING:**

Budgeting is dependent on option chosen.

**STAFF RECOMMENDATION:**

Staff recommends to move forward Option B, financing the full amount of \$545,000 with VML Vaco and making payments of \$65,305.46 for a period of 10 years.

Staff does not recommend to use funds from the water fund or sewer fund until additional information is known regarding major projects such as the water looping project or the possible further expansion of the waste water treatment plant.



**TOWN OF FRONT ROYAL**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
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FRONT ROYAL, VIRGINIA 22630-1560  
(540) 631-3600  
WWW.FRONTROYALVA.COM

TODD C. JONES  
Director  
tjones@frontroyalva.com

## **MEMORANDUM**

TO: BJ Wilson, Director of Finance

FROM: Todd C. Jones, Director of Information Technology

DATE: October 2nd, 2018

RE: WTP/Radio Shack Connectivity

BJ,

Thank you for your assistance with the funding for the PD radio system. Included with this document are the estimates for three options to provide the Water Treatment Plant and the radio shack with appropriate connectivity to Town network systems as required by the new radio system.

Option 1: Microwave link from Town Hall.  
\$40,011 (Estimate only, final cost will vary depending on inspections and detailed plans)

Option 2: 48 strand fiber connectivity from Town Hall provided by Syntax Communications.  
\$95,000 (Estimate only, final cost will vary depending on inspections and detailed plans)

This plan has the greatest flexibility and provides additional connectivity to a Town substation or other Town offices on the south side. This plan is also a first step in completing a fiber loop.

Option 3: 4 Strand dark fiber lease from Shentel.  
\$20,340 per year with a 1-year term or  
\$11,940 per year with a 3-year term or  
\$9,000 per year with a 5-year term.



**TOWN OF FRONT ROYAL**  
**DEPARTMENT OF INFORMATION TECHNOLOGY**  
102 E. MAIN STREET  
PO BOX 1560  
FRONT ROYAL, VIRGINIA 22630-1560  
(540) 631-3600  
[WWW.FRONTROYALVA.COM](http://WWW.FRONTROYALVA.COM)

TODD C. JONES  
Director  
[tjones@frontroyalva.com](mailto:tjones@frontroyalva.com)

This is a turn key solution. Completion is estimated at 90 days. This option is contingent upon a signed franchise agreement with Shentel.

With the expectation of the Water Treatment Plant not moving in the next five years, the quick turnaround and maintenance being handled by Shentel, my recommendation is to move forward with the five-year option by Shentel.

Full funding is available via PO 29366 – Fiber expansion project.

Please let me know if you have any questions.

-Todd

Todd,

We have completed a preliminary design and budgetary pricing for a microwave system. Attached are a catalog sheet for the microwave radios and a path study/performance report.

#### **Scope of Work**

- Provide Cambium PTP820 licensed 23 GHz microwave link
  - Non-redundant configuration
  - 236.8 Mbps throughput in each direction (473.6 Mbps aggregate)
  - 99.9996% predicted reliability
- FCC Licensing
- Structural analysis of the tower at the Water Treatment Plant
- Installation on tower at the Water Treatment Plant
- Installation on roof of Town of Front Royal Courthouse
- Path alignment, testing and optimization of link configuration
- Link configured to carry traffic for the Motorola radios system being purchased for the Front Royal Police Department
- The link can carry additional non-radio traffic, however routers, switches or other networking equipment needed to accommodate non-radio traffic are not included
- Spare equipment or redundant links can be quoted as options

#### **Pricing**

|           |                 |
|-----------|-----------------|
| Equipment | \$19,951        |
| Services  | <u>\$20,060</u> |
| Total     | \$40,011        |

If you would like to proceed, the next steps would be for us to visit the courthouse to plan the installation and have a structural analysis performed to confirm that the tower can support the antenna and maintain the antenna alignment in high winds. The structural analysis is a paid service performed by a licensed engineer. The estimated cost is \$5,714 and this is included in the services price above. After completing these tasks we will provide a detailed, firm proposal, throughput and reliability expectations, and price.

Please let me know if you have any questions.

Thanks,

Gerry Boyd  
Vice President  
Teltronic, Inc.  
301-575-3950

# PTP 820S Licensed Microwave Radio



## All-Outdoor Specifications

### RADIO

- 6-38 GHz
- 1+0, 1+1 HSB, 2+0

#### Radio Features

- Protection: 1+1 HSB
- QPSK to 2048 QAM w/ACM
- Advanced Frequency Reuse (AFR)

### ETHERNET

#### Ethernet Interfaces

- Traffic Interfaces – 1 x 10/100/1000Base-T (RJ-45) and 2 x 1000base-X (SFP) or 2 x 10/100/1000 Base-T (electrical SFP)
- Management Interface - 1 x 10/100 Base-T (RJ-45)
- Optical SFP Types - Optical 1000Base-LX (1310 nm) or SX (850nm)  
Note: SFP devices must be of industrial grade (-40°C to +85°C)

#### Ethernet Features

- MTU – 9600 Bytes
- Quality of Service
  - o Multiple Classification criteria (VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP)
  - o 8 priority queues
  - o Deep buffering (configurable up to 64 Mbit per queue)
  - o WRED
  - o Hierarchical QoS – high service granularity\*
  - o P-bit marking/remarking
- 4K VLANs
- VLAN add/remove/translate
- Frame Cut Through – controlled latency and PDV for delay sensitive applications
- Header De-Duplication – Capacity boosting by eliminating inefficiency in all layers (L2, MPLS, L3, L4, Tunneling – GTP for LTE, GRE)
- Adaptive Bandwidth Notification (ABN)
- Network Resiliency - G.8032 and Multiple Spanning Tree Protocol (MSTP)\*
- Ethernet OAM – ITU-T Y.1731 FM, ITU-T Y.1731 PM\*

### SYNCHRONIZATION

#### Synchronization Distribution

- Sync Distribution over any traffic interface (GE/FE)
- Sync-E (ITU-T G.8261, G.8262)
- SSM/ESMC Support for ring/mesh applications (ITU-T G.8264)
- Sync-E Regenerator mode, providing PRC grade (ITU-T G.811) performance for smart pipe applications.

#### IEEE-1588

- Optimized Transport for reduced PDV
- IEEE-1588 TC

### STANDARD

#### MEF

- Carrier Ethernet 2.0 (CE 2.0)\*\*

#### Supported Ethernet Standards

- 10/100/1000base-T/X (IEEE 802.3)
- Ethernet VLANs (IEEE 802.3ac)
- Virtual LAN (VLAN, IEEE 802.1Q)
- Class of service (IEEE 802.1p)
- Provider bridges (QinQ – IEEE 802.1ad)
- Link aggregation (IEEE 802.3ad)
- Auto MDI/MDIX for 1000baseT
- RFC 1349: IPv4 TOS
- RFC 2474: IPv4 DSCP
- RFC 2460: IPv6 Traffic Classes

#### Security

- AES 256-bit Encryption
- Secured protocols (HTTPS, SNMPV3, SSH, SFTP)
- Radius authentication and authorization

#### Standards Compliance

- EMC: EN 301 489-1, EN 301 489-4, Class B (Europe), FCC 47 CFR, part 15, class B (US), ICES-003, Class B (Canada), TEC/EMI/TEL-001/01, Class B (India)
- Surge: EN61000-4-5, Class 4 (for PWR and ETH1/PoE ports)
- Safety: EN 60950-1, IEC 60950-1, UL 60950-1, CSA-C22.2 No.60950-1, EN

60950-22, UL 60950-22, CSAC22.2.60950-22

- Ingress Protection: IP66-compliant
- Storage: ETSI EN 300 019-1-1 Class 1.2
- Transportation: ETSI EN 300 019-1-2 Class 2.3

### TECHNICAL SPECIFICATION

#### Mechanical Specifications

- Dimensions: 230mm(H), 233mm(W), 98mm(D), 6.0kg
- Pole Diameter Range (for Remote Mount Installation): 8.89 cm – 11.43 cm

#### Environmental Specifications

- -33°C to +55°C (-45°C to +60°C extended)

#### Power Input Specifications

- Standard Input: -48 VDC
- IDU DC Input range: -40 to -60 VDC

#### Power Consumption Specifications

- Maximum Power Consumption 6-11 GHz: 40W; 13-38 GHz: 35W

#### PoE Injector Mechanical Specifications

- Dimensions – 134mm(H), 190mm(W), 62mm(D), 1 kg

#### PoE Injector Environmental Specifications

- 33°C to +55°C (-45°C to +60°C extended)

#### PoE Injector Power Input Specifications

- Standard Input: -48 or +24 VDC (Optional)
- DC Input range: ±(18/40.5 to 60) VDC (+18VDC extended range is supported as part of the nominal +24VDC support)

#### PoE Injector Interfaces

- GbE Data Port supporting 10/100/1000Base-T
- Power-Over-Ethernet (PoE) Port
- DC Power Port –40V to -60V (a PoE supporting two redundant DC feeds each supporting ±(18-60)V is available)

\* Planned for future release.

\*\* Certification pending.

# Specifications

## TRANSMIT POWER

| Transmit Power (dBm) | Frequency (GHz) |    |    |       |       |    |    |          |    |       |
|----------------------|-----------------|----|----|-------|-------|----|----|----------|----|-------|
|                      | 6               | 7  | 8  | 10-11 | 13-15 | 18 | 23 | 24 UL HP | 26 | 28-38 |
| QPSK                 | 29              | 28 | 28 | 27    | 24    | 22 | 20 | 18       | 21 | 18    |
| 8 PSK                | 29              | 28 | 28 | 27    | 24    | 22 | 20 | 18       | 21 | 18    |
| 16 QAM               | 28              | 27 | 27 | 26    | 23    | 21 | 20 | 18       | 20 | 17    |
| 32 QAM               | 27              | 26 | 26 | 25    | 22    | 20 | 20 | 18       | 19 | 16    |
| 64 QAM               | 27              | 26 | 26 | 25    | 22    | 20 | 20 | 18       | 19 | 16    |
| 128 QAM              | 27              | 26 | 26 | 25    | 22    | 20 | 20 | 18       | 19 | 16    |
| 256 QAM              | 27              | 26 | 24 | 25    | 20    | 20 | 18 | 16       | 17 | 14    |
| 512 QAM              | 25              | 24 | 24 | 24    | 20    | 18 | 18 | 16       | 17 | 14    |
| 1024 QAM             | 25              | 24 | 24 | 23    | 20    | 18 | 17 | 15       | 16 | 13    |
| 2048 QAM             | 23              | 22 | 22 | 21    | 18    | 16 | 16 | 14       | 15 | 12    |

## RECEIVE SENSITIVITY

| Modulation            | Channel Spacing | Frequency (GHz) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------|-----------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                       |                 | 6               | 7     | 8     | 10    | 11    | 13    | 15    | 18    | 23    | 24    | 26    | 28-31 | 32    | 38    |
| QPSK                  | 3.5 & 5 MHz     | -96.5           | -96.0 | -96.0 | -95.5 | -96.5 | -95.5 | -94.5 | -96.0 | -95.0 | -94.5 | -94.5 | -94.5 | -94.0 | -94.0 |
| 16 QAM                |                 | -90.0           | -89.0 | -89.0 | -89.0 | -89.5 | -88.5 | -88.0 | -89.0 | -88.0 | -87.5 | -88.0 | -87.5 | -87.5 | -87.0 |
| 32 QAM                |                 | -86.5           | -85.5 | -85.5 | -85.5 | -86.0 | -85.0 | -84.5 | -85.5 | -84.5 | -84.0 | -84.5 | -84.0 | -84.0 | -83.5 |
| 64 QAM                |                 | -83.0           | -82.5 | -82.5 | -82.0 | -83.0 | -82.0 | -81.0 | -82.5 | -81.5 | -81.0 | -81.0 | -81.0 | -80.5 | -80.5 |
| 128 QAM               |                 | -79.5           | -79.0 | -79.0 | -78.5 | -79.5 | -78.5 | -77.5 | -79.0 | -78.0 | -77.5 | -77.5 | -77.5 | -77.0 | -77.0 |
| 256 QAM               |                 | -76.5           | -75.5 | -75.5 | -75.5 | -76.5 | -75.0 | -74.5 | -75.5 | -75.0 | -74.5 | -74.5 | -74.0 | -74.0 | -73.5 |
| QPSK                  | 7 MHz           | -93.5           | -93.0 | -93.0 | -92.5 | -93.5 | -92.5 | -91.5 | -93.0 | -92.0 | -91.5 | -91.5 | -91.5 | -91.0 | -91.0 |
| 8 PSK                 |                 | -87.5           | -87.0 | -87.0 | -86.5 | -87.5 | -86.5 | -85.5 | -87.0 | -86.0 | -85.5 | -85.5 | -85.5 | -85.0 | -85.0 |
| 16 QAM                |                 | -87.0           | -86.5 | -86.5 | -86.0 | -87.0 | -86.0 | -85.0 | -86.5 | -85.5 | -85.0 | -85.0 | -85.0 | -84.5 | -84.5 |
| 32 QAM                |                 | -83.5           | -83.0 | -83.0 | -82.5 | -83.5 | -82.5 | -81.5 | -83.0 | -82.0 | -81.5 | -81.5 | -81.5 | -81.0 | -81.0 |
| 64 QAM                |                 | -80.5           | -80.0 | -80.0 | -79.5 | -80.5 | -79.5 | -78.5 | -80.0 | -79.0 | -78.5 | -78.5 | -78.5 | -78.0 | -78.0 |
| 128 QAM               |                 | -77.5           | -76.5 | -76.5 | -76.5 | -77.5 | -76.0 | -75.5 | -76.5 | -76.0 | -75.5 | -75.5 | -75.0 | -75.0 | -74.5 |
| 256 QAM               |                 | -74.0           | -73.5 | -73.5 | -73.0 | -74.0 | -73.0 | -72.0 | -73.5 | -72.5 | -72.0 | -72.0 | -72.0 | -71.5 | -71.5 |
| 512 QAM               |                 | -72.0           | -71.5 | -71.5 | -71.0 | -72.0 | -71.0 | -70.0 | -71.5 | -70.5 | -70.0 | -70.0 | -70.0 | -69.5 | -69.5 |
| 1024 QAM (strong FEC) |                 | -68.5           | -68.0 | -68.0 | -67.5 | -68.5 | -67.5 | -66.5 | -68.0 | -67.0 | -66.5 | -66.5 | -66.5 | -66.0 | -66.0 |
| 1024 QAM (light FEC)  |                 | -68.0           | -67.0 | -67.0 | -67.0 | -67.5 | -66.5 | -66.0 | -67.0 | -66.0 | -65.5 | -66.0 | -65.5 | -65.5 | -65.0 |
| QPSK                  | 10 MHz          | -92.0           | -91.5 | -91.5 | -91.0 | -92.0 | -91.0 | -90.0 | -91.5 | -90.5 | -87.0 | -90.0 | -90.0 | -89.5 | -89.0 |
| 8 PSK                 |                 | -87.0           | -86.0 | -86.0 | -86.0 | -87.0 | -85.5 | -85.0 | -86.0 | -85.5 | -81.5 | -85.0 | -84.5 | -84.5 | -84.0 |
| 16 QAM                |                 | -85.5           | -85.0 | -85.0 | -84.5 | -85.5 | -84.5 | -83.5 | -85.0 | -84.0 | -80.5 | -83.5 | -83.5 | -83.0 | -82.5 |
| 32 QAM                |                 | -82.0           | -81.5 | -81.5 | -81.0 | -82.0 | -81.0 | -80.0 | -81.5 | -80.5 | -77.0 | -80.0 | -80.0 | -79.5 | -79.0 |
| 64 QAM                |                 | -79.0           | -78.5 | -78.5 | -78.0 | -79.0 | -77.5 | -77.0 | -78.5 | -77.5 | -74.0 | -77.0 | -77.0 | -76.5 | -76.0 |
| 128 QAM               |                 | -75.5           | -75.0 | -75.0 | -74.5 | -75.5 | -74.5 | -73.5 | -75.0 | -74.0 | -70.5 | -73.5 | -73.5 | -73.0 | -72.5 |
| 256 QAM               |                 | -72.5           | -72.0 | -72.0 | -71.5 | -72.5 | -71.5 | -70.5 | -72.0 | -71.0 | -67.5 | -70.5 | -70.5 | -70.0 | -69.5 |
| 512 QAM               |                 | -70.0           | -69.5 | -69.5 | -69.0 | -70.0 | -68.5 | -68.0 | -69.5 | -68.5 | -65.0 | -68.0 | -68.0 | -67.5 | -67.0 |
| 1024 QAM (strong FEC) |                 | -67.0           | -66.5 | -66.5 | -66.0 | -67.0 | -66.0 | -65.0 | -66.5 | -65.5 | -62.0 | -65.0 | -65.0 | -64.5 | -64.0 |
| 1024 QAM (light FEC)  |                 | -66.5           | -65.5 | -65.5 | -65.5 | -66.5 | -65.0 | -64.5 | -65.5 | -65.0 | -61.0 | -64.5 | -64.0 | -64.0 | -63.5 |
| QPSK                  | 14 MHz          | -90.5           | -90.0 | -90.0 | -89.5 | -90.5 | -89.5 | -88.5 | -90.0 | -89.0 | -88.5 | -88.5 | -88.5 | -88.0 | -88.0 |
| 8 PSK                 |                 | -84.5           | -84.0 | -84.0 | -83.5 | -84.5 | -83.5 | -82.5 | -84.0 | -83.0 | -82.5 | -82.5 | -82.5 | -82.0 | -82.0 |
| 16 QAM                |                 | -83.5           | -83.0 | -83.0 | -82.5 | -83.5 | -82.5 | -81.5 | -83.0 | -82.0 | -81.5 | -81.5 | -81.5 | -81.0 | -81.0 |
| 32 QAM                |                 | -80.5           | -79.5 | -79.5 | -79.5 | -80.5 | -79.0 | -78.5 | -79.5 | -79.0 | -78.5 | -78.5 | -78.0 | -78.0 | -77.5 |
| 64 QAM                |                 | -77.5           | -76.5 | -76.5 | -76.5 | -77.5 | -76.0 | -75.5 | -76.5 | -76.0 | -75.5 | -75.5 | -75.0 | -75.0 | -74.5 |
| 128 QAM               |                 | -74.0           | -73.5 | -73.5 | -73.0 | -74.0 | -73.0 | -72.0 | -73.5 | -72.5 | -72.0 | -72.0 | -72.0 | -71.5 | -71.5 |



|                       |                         | Frequency (GHz) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------|-------------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Modulation            | Channel Spacing         | 6               | 7     | 8     | 10    | 11    | 13    | 15    | 18    | 23    | 24    | 26    | 28-31 | 32    | 38    |
| 256 QAM               | 14 MHz                  | -71.5           | -70.5 | -70.5 | -70.5 | -71.0 | -70.0 | -69.5 | -70.5 | -69.5 | -69.0 | -69.5 | -69.0 | -69.0 | -68.5 |
| 512 QAM               |                         | -68.5           | -68.0 | -68.0 | -67.5 | -68.5 | -67.5 | -66.5 | -68.0 | -67.0 | -66.5 | -66.5 | -66.5 | -66.0 | -66.0 |
| 1024 QAM (strong FEC) |                         | -65.5           | -65.0 | -65.0 | -64.5 | -65.5 | -64.5 | -63.5 | -65.0 | -64.0 | -63.5 | -63.5 | -63.5 | -63.0 | -63.0 |
| 1024 QAM (light FEC)  |                         | -65.0           | -64.0 | -64.0 | -64.0 | -65.0 | -63.5 | -63.0 | -64.0 | -63.5 | -63.0 | -63.0 | -62.5 | -62.5 | -62.0 |
| QPSK                  | 20 MHz                  | -89.0           | -88.5 | -88.5 | -88.0 | -89.0 | -88.0 | -87.0 | -88.5 | -87.5 | -84.0 | -87.0 | -87.0 | -86.5 | -86.0 |
| 8 PSK                 |                         | -84.0           | -83.5 | -83.5 | -83.0 | -84.0 | -83.0 | -82.0 | -83.5 | -82.5 | -79.0 | -82.0 | -82.0 | -81.5 | -81.0 |
| 16 QAM                |                         | -82.5           | -82.0 | -82.0 | -81.5 | -82.5 | -81.0 | -80.5 | -82.0 | -81.0 | -77.5 | -80.5 | -80.5 | -80.0 | -79.5 |
| 32 QAM                |                         | -79.0           | -78.5 | -78.5 | -78.0 | -79.0 | -77.5 | -77.0 | -78.5 | -77.5 | -74.0 | -77.0 | -77.0 | -76.5 | -76.0 |
| 64 QAM                |                         | -76.0           | -75.0 | -75.0 | -75.0 | -76.0 | -74.5 | -74.0 | -75.0 | -74.5 | -70.5 | -74.0 | -73.5 | -73.5 | -73.0 |
| 128 QAM               |                         | -73.0           | -72.0 | -72.0 | -72.0 | -73.0 | -71.5 | -71.0 | -72.0 | -71.5 | -67.5 | -71.0 | -70.5 | -70.5 | -70.0 |
| 256 QAM               |                         | -70.0           | -69.5 | -69.5 | -69.0 | -70.0 | -68.5 | -68.0 | -69.5 | -68.5 | -65.0 | -68.0 | -68.0 | -67.5 | -67.0 |
| 512 QAM               |                         | -67.5           | -66.5 | -66.5 | -66.5 | -67.5 | -66.0 | -65.5 | -66.5 | -66.0 | -62.0 | -65.5 | -65.0 | -65.0 | -64.5 |
| 1024 QAM (strong FEC) |                         | -64.5           | -63.5 | -63.5 | -63.5 | -64.5 | -63.0 | -62.5 | -63.5 | -63.0 | -59.0 | -62.5 | -62.0 | -62.0 | -61.5 |
| 1024 QAM (light FEC)  |                         | -63.5           | -63.0 | -63.0 | -62.5 | -63.5 | -62.5 | -61.5 | -63.0 | -62.0 | -58.5 | -61.5 | -61.5 | -61.0 | -60.5 |
| 2048 QAM              |                         | -60.0           | -59.5 | -59.5 | -59.0 | -60.0 | -59.0 | -58.0 | -59.5 | -58.5 | -55.0 | -58.0 | -58.0 | -57.5 | -57.0 |
| QPSK                  | 25MHz                   | -87.5           | -86.5 | -86.5 | -86.5 | -87.0 | -86.0 | -85.5 | -86.5 | -85.5 | -82.0 | -85.5 | -85.0 | -85.0 | -84.0 |
| 8 PSK                 |                         | -82.5           | -82.0 | -82.0 | -81.5 | -82.5 | -81.5 | -80.5 | -82.0 | -81.0 | -77.5 | -80.5 | -80.5 | -80.0 | -79.5 |
| 16 QAM                |                         | -80.5           | -80.0 | -80.0 | -79.5 | -80.5 | -79.5 | -78.5 | -80.0 | -79.0 | -75.5 | -78.5 | -78.5 | -78.0 | -77.5 |
| 32 QAM                |                         | -77.5           | -77.0 | -77.0 | -76.5 | -77.5 | -76.0 | -75.5 | -77.0 | -76.0 | -72.5 | -75.5 | -75.5 | -75.0 | -74.5 |
| 64 QAM                |                         | -74.5           | -74.0 | -74.0 | -73.5 | -74.5 | -73.5 | -72.5 | -74.0 | -73.0 | -69.5 | -72.5 | -72.5 | -72.0 | -71.5 |
| 128 QAM               |                         | -71.5           | -71.0 | -71.0 | -70.5 | -71.5 | -70.5 | -69.5 | -71.0 | -70.0 | -66.5 | -69.5 | -69.5 | -69.0 | -68.5 |
| 256 QAM               |                         | -68.5           | -67.5 | -67.5 | -67.5 | -68.5 | -67.0 | -66.5 | -67.5 | -67.0 | -63.0 | -66.5 | -66.0 | -66.0 | -65.5 |
| 512 QAM               |                         | -66.0           | -65.0 | -65.0 | -65.0 | -66.0 | -64.5 | -64.0 | -65.0 | -64.5 | -60.5 | -64.0 | -63.5 | -63.5 | -63.0 |
| 1024 QAM (strong FEC) |                         | -63.0           | -62.5 | -62.5 | -62.0 | -63.0 | -61.5 | -61.0 | -62.5 | -61.5 | -58.0 | -61.0 | -61.0 | -60.5 | -60.0 |
| 1024 QAM (light FEC)  |                         | -62.5           | -61.5 | -61.5 | -61.5 | -62.5 | -61.0 | -60.5 | -61.5 | -61.0 | -57.0 | -60.5 | -60.0 | -60.0 | -59.5 |
| 2048 QAM              |                         | -58.5           | -58.0 | -58.0 | -57.5 | -58.5 | -57.0 | -56.5 | -58.0 | -57.0 | -53.5 | -56.5 | -56.5 | -56.0 | -55.5 |
| QPSK                  | 28 MHz ACCP             | -87.5           | -87.0 | -87.0 | -86.5 | -87.5 | -86.5 | -85.5 | -87.0 | -86.0 | -85.5 | -85.5 | -85.5 | -85.0 | -85.0 |
| 8 PSK                 |                         | -83.0           | -82.5 | -82.5 | -82.0 | -83.0 | -82.0 | -81.0 | -82.5 | -81.5 | -81.0 | -81.0 | -81.0 | -80.5 | -80.5 |
| 16 QAM                |                         | -81.0           | -80.5 | -80.5 | -80.0 | -81.0 | -79.5 | -79.0 | -80.5 | -79.5 | -79.0 | -79.0 | -79.0 | -78.5 | -78.0 |
| 32 QAM                |                         | -77.5           | -77.0 | -77.0 | -76.5 | -77.5 | -76.0 | -75.5 | -77.0 | -76.0 | -75.5 | -75.5 | -75.5 | -75.0 | -74.5 |
| 64 QAM                |                         | -74.5           | -74.0 | -74.0 | -73.5 | -74.5 | -73.0 | -72.5 | -74.0 | -73.0 | -72.5 | -72.5 | -72.5 | -72.0 | -71.5 |
| 128 QAM               |                         | -71.5           | -70.5 | -70.5 | -70.5 | -71.0 | -70.0 | -69.5 | -70.5 | -69.5 | -69.0 | -69.5 | -69.0 | -69.0 | -68.5 |
| 256 QAM               |                         | -68.5           | -67.5 | -67.5 | -67.5 | -68.0 | -67.0 | -66.5 | -67.5 | -66.5 | -66.0 | -66.5 | -66.0 | -66.0 | -65.5 |
| 512 QAM               |                         | -66.0           | -65.0 | -65.0 | -65.0 | -66.0 | -64.5 | -64.0 | -65.0 | -64.5 | -64.0 | -64.0 | -63.5 | -63.5 | -63.0 |
| 1024 QAM (strong FEC) |                         | -63.0           | -62.5 | -62.5 | -62.0 | -63.0 | -61.5 | -61.0 | -62.5 | -61.5 | -61.0 | -61.0 | -61.0 | -60.5 | -60.0 |
| 1024 QAM (light FEC)  |                         | -62.0           | -61.5 | -61.5 | -61.0 | -62.0 | -60.5 | -60.0 | -61.5 | -60.5 | -60.0 | -60.0 | -60.0 | -59.5 | -59.0 |
| 2048 QAM              |                         | -58.5           | -58.0 | -58.0 | -57.5 | -58.5 | -57.0 | -56.5 | -58.0 | -57.0 | -56.5 | -56.5 | -56.5 | -56.0 | -55.5 |
| QPSK                  | 30 MHz &<br>28 MHz ACAP | -87.5           | -87.0 | -87.0 | -86.5 | -87.5 | -86.0 | -85.5 | -87.0 | -86.0 | -85.5 | -85.5 | -85.5 | -85.0 | -84.5 |
| 8 PSK                 |                         | -82.5           | -81.5 | -81.5 | -81.5 | -82.5 | -81.0 | -80.5 | -81.5 | -81.0 | -80.5 | -80.5 | -80.0 | -80.0 | -79.0 |
| 16 QAM                |                         | -81.0           | -80.0 | -80.0 | -80.0 | -80.5 | -79.5 | -79.0 | -80.0 | -79.0 | -78.5 | -79.0 | -78.5 | -78.5 | -77.5 |
| 32 QAM                |                         | -77.0           | -76.5 | -76.5 | -76.0 | -77.0 | -76.0 | -75.0 | -76.5 | -75.5 | -75.0 | -75.0 | -75.0 | -74.5 | -74.0 |
| 64 QAM                |                         | -74.5           | -73.5 | -73.5 | -73.5 | -74.0 | -73.0 | -72.5 | -73.5 | -72.5 | -72.0 | -72.5 | -72.0 | -72.0 | -71.0 |
| 128 QAM               |                         | -71.0           | -70.5 | -70.5 | -70.0 | -71.0 | -70.0 | -69.0 | -70.5 | -69.5 | -69.0 | -69.0 | -69.0 | -68.5 | -68.0 |
| 256 QAM               |                         | -68.0           | -67.5 | -67.5 | -67.0 | -68.0 | -67.0 | -66.0 | -67.5 | -66.5 | -66.0 | -66.0 | -66.0 | -65.5 | -65.0 |
| 512 QAM               |                         | -66.0           | -65.5 | -65.5 | -65.0 | -66.0 | -64.5 | -64.0 | -65.5 | -64.5 | -64.0 | -64.0 | -64.0 | -63.5 | -63.0 |
| 1024 QAM (strong FEC) |                         | -63.0           | -62.0 | -62.0 | -62.0 | -62.5 | -61.5 | -61.0 | -62.0 | -61.0 | -60.5 | -61.0 | -60.5 | -60.5 | -59.5 |
| 1024 QAM (light FEC)  |                         | -62.0           | -61.0 | -61.0 | -61.0 | -62.0 | -60.5 | -60.0 | -61.0 | -60.5 | -60.0 | -60.0 | -59.5 | -59.5 | -58.5 |
| 2048 QAM              |                         | -58.0           | -57.5 | -57.5 | -57.0 | -58.0 | -56.5 | -56.0 | -57.5 | -56.5 | -56.0 | -56.0 | -56.0 | -55.5 | -55.0 |

| Modulation            | Channel Spacing      | Frequency (GHz) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------|----------------------|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                       |                      | 6               | 7     | 8     | 10    | 11    | 13    | 15    | 18    | 23    | 24    | 26    | 28-31 | 32    | 38    |
| QPSK                  | 40 MHz               | -86.0           | -85.5 | -85.5 | -85.0 | -86.0 | -85.0 | -84.0 | -85.5 | -84.5 | -84.0 | -84.0 | -84.0 | -83.5 | -83.5 |
| 8 PSK                 |                      | -81.0           | -80.5 | -80.5 | -80.0 | -81.0 | -79.5 | -79.0 | -80.5 | -79.5 | -79.0 | -79.0 | -79.0 | -78.5 | -78.0 |
| 16 QAM                |                      | -79.5           | -79.0 | -79.0 | -78.5 | -79.5 | -78.0 | -77.5 | -79.0 | -78.0 | -77.5 | -77.5 | -77.5 | -77.0 | -76.5 |
| 32 QAM                |                      | -76.0           | -75.0 | -75.0 | -75.0 | -75.5 | -74.5 | -74.0 | -75.0 | -74.0 | -73.5 | -74.0 | -73.5 | -73.5 | -73.0 |
| 64 QAM                |                      | -73.0           | -72.0 | -72.0 | -72.0 | -73.0 | -71.5 | -71.0 | -72.0 | -71.5 | -71.0 | -71.0 | -70.5 | -70.5 | -70.0 |
| 128 QAM               |                      | -70.0           | -69.0 | -69.0 | -69.0 | -70.0 | -68.5 | -68.0 | -69.0 | -68.5 | -68.0 | -68.0 | -67.5 | -67.5 | -67.0 |
| 256 QAM               |                      | -67.0           | -66.0 | -66.0 | -66.0 | -66.5 | -65.5 | -65.0 | -66.0 | -65.0 | -64.5 | -65.0 | -64.5 | -64.5 | -64.0 |
| 512 QAM               |                      | -64.0           | -63.5 | -63.5 | -63.0 | -64.0 | -62.5 | -62.0 | -63.5 | -62.5 | -62.0 | -62.0 | -62.0 | -61.5 | -61.0 |
| 1024 QAM (strong FEC) |                      | -61.5           | -61.0 | -61.0 | -60.5 | -61.5 | -60.0 | -59.5 | -61.0 | -60.0 | -59.5 | -59.5 | -59.5 | -59.0 | -58.5 |
| 1024 QAM (light FEC)  |                      | -60.5           | -60.0 | -60.0 | -59.5 | -60.5 | -59.5 | -58.5 | -60.0 | -59.0 | -58.5 | -58.5 | -58.5 | -58.0 | -58.0 |
| 2048 QAM              |                      | -58.0           | -57.0 | -57.0 | -57.0 | -58.0 | -56.5 | -56.0 | -57.0 | -56.5 | -56.0 | -56.0 | -55.5 | -55.5 | -55.0 |
| QPSK                  | 50 MHz               | -85.5           | -84.5 | -84.5 | -84.5 | -85.0 | -84.0 | -83.5 | -84.5 | -83.5 | -80.0 | -83.5 | -83.0 | -83.0 | -82.5 |
| 8 PSK                 |                      | -80.0           | -79.5 | -79.5 | -79.0 | -80.0 | -79.0 | -78.0 | -79.5 | -78.5 | -75.0 | -78.0 | -78.0 | -78.0 | -77.5 |
| 16 QAM                |                      | -78.5           | -77.5 | -77.5 | -77.5 | -78.0 | -77.0 | -76.5 | -77.5 | -76.5 | -73.0 | -76.5 | -76.0 | -76.0 | -75.5 |
| 32 QAM                |                      | -74.5           | -74.0 | -74.0 | -73.5 | -74.5 | -73.5 | -72.5 | -74.0 | -73.0 | -69.5 | -72.5 | -72.5 | -72.5 | -72.0 |
| 64 QAM                |                      | -71.5           | -70.5 | -70.5 | -70.5 | -71.5 | -70.0 | -69.5 | -70.5 | -70.0 | -66.0 | -69.5 | -69.0 | -69.0 | -68.5 |
| 128 QAM               |                      | -68.5           | -68.0 | -68.0 | -67.5 | -68.5 | -67.5 | -66.5 | -68.0 | -67.0 | -63.5 | -66.5 | -66.5 | -66.5 | -66.0 |
| 256 QAM               |                      | -66.0           | -65.0 | -65.0 | -65.0 | -66.0 | -64.5 | -64.0 | -65.0 | -64.5 | -60.5 | -64.0 | -63.5 | -63.5 | -63.0 |
| 512 QAM               |                      | -63.5           | -63.0 | -63.0 | -62.5 | -63.5 | -62.0 | -61.5 | -63.0 | -62.0 | -58.5 | -61.5 | -61.5 | -61.5 | -61.0 |
| 1024 QAM (strong FEC) |                      | -60.0           | -59.5 | -59.5 | -59.0 | -60.0 | -58.5 | -58.0 | -59.5 | -58.5 | -55.0 | -58.0 | -58.0 | -58.0 | -57.5 |
| 1024 QAM (light FEC)  |                      | -59.0           | -58.0 | -58.0 | -58.0 | -59.0 | -57.5 | -57.0 | -58.0 | -57.5 | -53.5 | -57.0 | -56.5 | -56.5 | -56.0 |
| 2048 QAM              |                      | -57.0           | -56.0 | -56.0 | -56.0 | -56.5 | -55.5 | -55.0 | -56.0 | -55.0 | -51.5 | -55.0 | -54.5 | -54.5 | -54.0 |
| QPSK                  | 56 MHz ACCP          | -84.0           | -83.5 | -83.5 | -83.0 | -84.0 | -83.0 | -82.0 | -83.5 | -82.5 | -82.0 | -82.0 | -82.0 | -81.5 | -81.5 |
| 8 PSK                 |                      | -80.0           | -79.5 | -79.5 | -79.0 | -80.0 | -79.0 | -78.0 | -79.5 | -78.5 | -78.0 | -78.0 | -78.0 | -77.5 | -77.5 |
| 16 QAM                |                      | -77.5           | -77.0 | -77.0 | -76.5 | -77.5 | -76.5 | -75.5 | -77.0 | -76.0 | -75.5 | -75.5 | -75.5 | -75.0 | -75.0 |
| 32 QAM                |                      | -74.5           | -73.5 | -73.5 | -73.5 | -74.0 | -73.0 | -72.5 | -73.5 | -72.5 | -72.0 | -72.5 | -72.0 | -72.0 | -71.5 |
| 64 QAM                |                      | -71.0           | -70.5 | -70.5 | -70.0 | -71.0 | -70.0 | -69.0 | -70.5 | -69.5 | -69.0 | -69.0 | -69.0 | -68.5 | -68.5 |
| 128 QAM               |                      | -68.5           | -67.5 | -67.5 | -67.5 | -68.0 | -67.0 | -66.5 | -67.5 | -66.5 | -66.0 | -66.5 | -66.0 | -66.0 | -65.5 |
| 256 QAM               |                      | -65.0           | -64.5 | -64.5 | -64.0 | -65.0 | -64.0 | -63.0 | -64.5 | -63.5 | -63.0 | -63.0 | -63.0 | -62.5 | -62.5 |
| 512 QAM               |                      | -63.0           | -62.5 | -62.5 | -62.0 | -63.0 | -61.5 | -61.0 | -62.5 | -61.5 | -61.0 | -61.0 | -61.0 | -60.5 | -60.0 |
| 1024 QAM (strong FEC) |                      | -59.5           | -59.0 | -59.0 | -58.5 | -59.5 | -58.5 | -57.5 | -59.0 | -58.0 | -57.5 | -57.5 | -57.5 | -57.0 | -57.0 |
| 1024 QAM (light FEC)  |                      | -58.5           | -58.0 | -58.0 | -57.5 | -58.5 | -57.5 | -56.5 | -58.0 | -57.0 | -56.5 | -56.5 | -56.5 | -56.0 | -56.0 |
| 2048 QAM              |                      | -54.0           | -53.5 | -53.5 | -53.0 | -54.0 | -53.0 | -52.0 | -53.5 | -52.5 | -52.0 | -52.0 | -52.0 | -51.5 | -51.5 |
| QPSK                  | 60 MHz & 56 MHz ACAP | -84.5           | -84.0 | -84.0 | -83.5 | -84.5 | -83.0 | -82.5 | -84.0 | -83.0 | -82.5 | -82.5 | -82.5 | -82.0 | -81.5 |
| 8 PSK                 |                      | -80.0           | -79.0 | -79.0 | -79.0 | -79.5 | -78.5 | -78.0 | -79.0 | -78.0 | -77.5 | -78.0 | -77.5 | -77.5 | -77.0 |
| 16 QAM                |                      | -77.5           | -77.0 | -77.0 | -76.5 | -77.5 | -76.0 | -75.5 | -77.0 | -76.0 | -75.5 | -75.5 | -75.5 | -75.0 | -74.5 |
| 32 QAM                |                      | -74.0           | -73.0 | -73.0 | -73.0 | -73.5 | -72.5 | -72.0 | -73.0 | -72.0 | -71.5 | -72.0 | -71.5 | -71.5 | -71.0 |
| 64 QAM                |                      | -70.5           | -70.0 | -70.0 | -69.5 | -70.5 | -69.5 | -68.5 | -70.0 | -69.0 | -68.5 | -68.5 | -68.5 | -68.0 | -68.0 |
| 128 QAM               |                      | -68.0           | -67.0 | -67.0 | -67.0 | -67.5 | -66.5 | -66.0 | -67.0 | -66.0 | -65.5 | -66.0 | -65.5 | -65.5 | -65.0 |
| 256 QAM               |                      | -64.5           | -64.0 | -64.0 | -63.5 | -64.5 | -63.5 | -62.5 | -64.0 | -63.0 | -62.5 | -62.5 | -62.5 | -62.0 | -62.0 |
| 512 QAM               |                      | -62.5           | -62.0 | -62.0 | -61.5 | -62.5 | -61.5 | -60.5 | -62.0 | -61.0 | -60.5 | -60.5 | -60.5 | -60.0 | -60.0 |
| 1024 QAM (strong FEC) |                      | -59.0           | -58.5 | -58.5 | -58.0 | -59.0 | -58.0 | -57.0 | -58.5 | -57.5 | -57.0 | -57.0 | -57.0 | -56.5 | -56.5 |
| 1024 QAM (light FEC)  |                      | -58.0           | -57.5 | -57.5 | -57.0 | -58.0 | -57.0 | -56.0 | -57.5 | -56.5 | -56.0 | -56.0 | -56.0 | -55.5 | -55.5 |
| 2048 QAM              |                      | -55.5           | -54.5 | -54.5 | -54.5 | -55.0 | -54.0 | -53.5 | -54.5 | -53.5 | -53.0 | -53.5 | -53.0 | -53.0 | -52.5 |
| QPSK                  | 80 MHz               | N/A             | N/A   | N/A   | N/A   | -83.5 | N/A   | N/A   | -82.5 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 8 PSK                 |                      | N/A             | N/A   | N/A   | N/A   | -78.0 | N/A   | N/A   | -77.5 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 16 QAM                |                      | N/A             | N/A   | N/A   | N/A   | -76.5 | N/A   | N/A   | -76.0 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 32 QAM                |                      | N/A             | N/A   | N/A   | N/A   | -73.0 | N/A   | N/A   | -72.5 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 64 QAM                |                      | N/A             | N/A   | N/A   | N/A   | -70.0 | N/A   | N/A   | -69.5 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 128 QAM               |                      | N/A             | N/A   | N/A   | N/A   | -67.0 | N/A   | N/A   | -66.5 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 256 QAM               |                      | N/A             | N/A   | N/A   | N/A   | -64.5 | N/A   | N/A   | -64.0 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 512 QAM               |                      | N/A             | N/A   | N/A   | N/A   | -61.5 | N/A   | N/A   | -61.0 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |
| 1024 QAM              |                      | N/A             | N/A   | N/A   | N/A   | -58.5 | N/A   | N/A   | -58.0 | N/A   | N/A   | N/A   | N/A   | N/A   | N/A   |

## ETHERNET THROUGHPUT

|                       |                 | Ethernet Throughput (Mbps) |                |                         |                        | Ethernet Throughput (Mbps) |                |                         |
|-----------------------|-----------------|----------------------------|----------------|-------------------------|------------------------|----------------------------|----------------|-------------------------|
| Modulation            | Channel Size    | No Compression             | L2 Compression | Multi-Layer Compression | Channel Size           | No Compression             | L2 Compression | Multi-Layer Compression |
| QPSK                  | 3.5 MHz & 5 MHz | 3                          | 3-4            | 4-11                    | 7 MHz                  | 8                          | 8-10           | 9-27                    |
| 8 PSK                 |                 | N/A                        | N/A            | N/A                     |                        | 13                         | 13-14          | 13-40                   |
| 16 QAM                |                 | 8                          | 8-9            | 9-26                    |                        | 18                         | 18-20          | 19-58                   |
| 32 QAM                |                 | 11                         | 11-13          | 12-36                   |                        | 24                         | 24-27          | 25-77                   |
| 64 QAM                |                 | 14                         | 14-16          | 15-45                   |                        | 30                         | 30-34          | 31-95                   |
| 128 QAM               |                 | 17                         | 17-19          | 18-54                   |                        | 36                         | 36-41          | 37-114                  |
| 256 QAM               |                 | 19                         | 20-22          | 20-62                   |                        | 41                         | 41-47          | 43-132                  |
| 512 QAM               |                 | N/A                        | N/A            | N/A                     |                        | 44                         | 44-50          | 46-141                  |
| 1024 QAM (strong FEC) |                 | N/A                        | N/A            | N/A                     |                        | 47                         | 47-54          | 49-151                  |
| 1024 QAM (light FEC)  |                 | N/A                        | N/A            | N/A                     |                        | 50                         | 51-57          | 53-161                  |
| QPSK                  | 10 MHz          | 12                         | 12-14          | 13-40                   | 14 MHz                 | 19                         | 19-22          | 20-62                   |
| 8 PSK                 |                 | 19                         | 19-21          | 20-61                   |                        | 29                         | 29-33          | 30-93                   |
| 16 QAM                |                 | 26                         | 26-30          | 27-83                   |                        | 40                         | 40-45          | 42-128                  |
| 32 QAM                |                 | 34                         | 35-39          | 36-111                  |                        | 53                         | 53-60          | 55-169                  |
| 64 QAM                |                 | 42                         | 43-48          | 45-137                  |                        | 65                         | 65-74          | 68-208                  |
| 128 QAM               |                 | 51                         | 51-58          | 53-164                  |                        | 78                         | 79-89          | 82-251                  |
| 256 QAM               |                 | 58                         | 59-67          | 61-188                  |                        | 89                         | 90-102         | 94-287                  |
| 512 QAM               |                 | 64                         | 65-73          | 67-206                  |                        | 98                         | 99-112         | 103-316                 |
| 1024 QAM (strong FEC) |                 | 67                         | 68-77          | 71-216                  |                        | 104                        | 105-119        | 109-335                 |
| 1024 QAM (light FEC)  |                 | 72                         | 72-82          | 75-230                  |                        | 111                        | 111-126        | 116-355                 |
| QPSK                  | 20 MHz          | 27                         | 28-31          | 29-88                   | 25 MHz                 | 35                         | 35-40          | 37-112                  |
| 8 PSK                 |                 | 41                         | 41-47          | 43-132                  |                        | 52                         | 53-60          | 55-168                  |
| 16 QAM                |                 | 56                         | 57-64          | 59-180                  |                        | 71                         | 72-81          | 75-229                  |
| 32 QAM                |                 | 74                         | 75-85          | 78-238                  |                        | 94                         | 95-107         | 99-302                  |
| 64 QAM                |                 | 91                         | 92-104         | 96-293                  |                        | 116                        | 117-132        | 121-372                 |
| 128 QAM               |                 | 110                        | 111-126        | 116-354                 |                        | 139                        | 141-159        | 147-448                 |
| 256 QAM               |                 | 125                        | 126-142        | 131-401                 |                        | 159                        | 160-181        | 167-511                 |
| 512 QAM               |                 | 136                        | 137-156        | 143-438                 |                        | 175                        | 177-200        | 184-564                 |
| 1024 QAM (strong FEC) |                 | 145                        | 146-165        | 152-466                 |                        | 186                        | 188-213        | 196-599                 |
| 1024 QAM (light FEC)  |                 | 154                        | 155-176        | 162-495                 |                        | 198                        | 199-226        | 208-636                 |
| 2048 QAM              |                 | 164                        | 165-187        | 172-528                 |                        | 212                        | 214-242        | 223-682                 |
| QPSK                  | 28 MHz (ACCP)   | 40                         | 40-45          | 42-127                  | 30 MHz & 28 MHz (ACAP) | 42                         | 42-48          | 44-135                  |
| 8 PSK                 |                 | 59                         | 60-68          | 62-191                  |                        | 61                         | 62-70          | 65-197                  |
| 16 QAM                |                 | 81                         | 82-93          | 85-261                  |                        | 86                         | 87-98          | 90-277                  |
| 32 QAM                |                 | 107                        | 108-122        | 112-344                 |                        | 113                        | 114-129        | 119-364                 |
| 64 QAM                |                 | 132                        | 133-150        | 138-424                 |                        | 139                        | 140-159        | 147-449                 |
| 128 QAM               |                 | 159                        | 160-181        | 166-509                 |                        | 168                        | 169-192        | 176-540                 |
| 256 QAM               |                 | 181                        | 182-206        | 190-580                 |                        | 193                        | 195-220        | 203-621                 |
| 512 QAM               |                 | 199                        | 201-227        | 209-640                 |                        | 206                        | 208-235        | 216-662                 |
| 1024 QAM (strong FEC) |                 | 212                        | 214-242        | 223-681                 |                        | 224                        | 226-259        | 236-722                 |
| 1024 QAM (light FEC)  |                 | 225                        | 227-257        | 236-723                 |                        | 238                        | 240-271        | 250-764                 |
| 2048 QAM              |                 | 241                        | 243--275       | 253-775                 |                        | 260                        | 262-296        | 273-833                 |

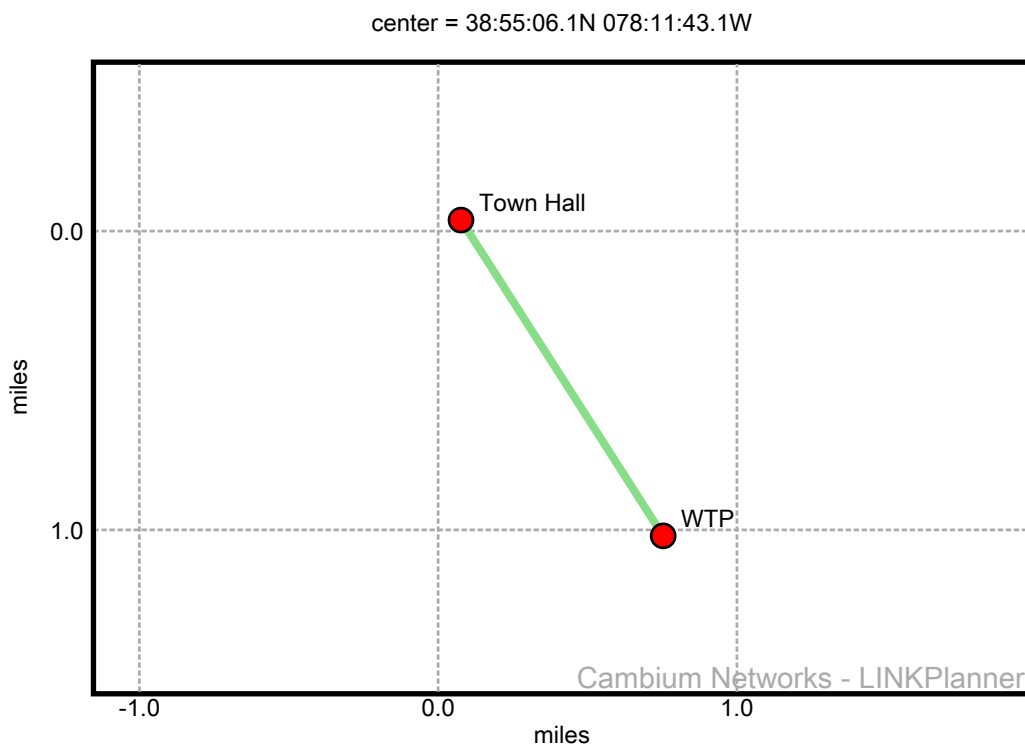
## PTP 820S SPECIFICATION SHEET

| Modulation            | Channel Size  | No Compression | L2 Compression | Multi-Layer Compression | Channel Size           | No Compression | L2 Compression | Multi-Layer Compression |
|-----------------------|---------------|----------------|----------------|-------------------------|------------------------|----------------|----------------|-------------------------|
| QPSK                  | 40 MHz        | 57             | 57-65          | 60-183                  | 50 MHz                 | 69             | 70-79          | 73-223                  |
| 8 PSK                 |               | 85             | 86-97          | 89-273                  |                        | 108            | 108-123        | 113-346                 |
| 16 QAM                |               | 116            | 117-132        | 121-372                 |                        | 146            | 147-166        | 153-469                 |
| 32 QAM                |               | 152            | 154-174        | 160-490                 |                        | 183            | 185-209        | 193-589                 |
| 64 QAM                |               | 187            | 189-214        | 197-602                 |                        | 237            | 239-270        | 249-761                 |
| 128 QAM               |               | 226            | 228-258        | 238-728                 |                        | 276            | 278-315        | 290-833                 |
| 256 QAM               |               | 243            | 245-278        | 256-782                 |                        | 327            | 330-374        | 344-833                 |
| 512 QAM               |               | 267            | 269-304        | 280-833                 |                        | 355            | 358-405        | 373-833                 |
| 1024 QAM (strong FEC) |               | 302            | 305-345        | 318-833                 |                        | 387            | 390-441        | 406-833                 |
| 1024 QAM (light FEC)  |               | 321            | 324-366        | 337-833                 |                        | 411            | 414-468        | 431-833                 |
| 2048 QAM              |               | 347            | 350-396        | 365-833                 |                        | 443            | 446-505        | 465-833                 |
| QPSK                  | 56 MHz (ACCP) | 81             | 82-93          | 86-262                  | 60 MHz & 56 MHz (ACAP) | 86             | 86-98          | 90-276                  |
| 8 PSK                 |               | 121            | 122-138        | 127-390                 |                        | 125            | 126-143        | 131-402                 |
| 16 QAM                |               | 165            | 166-188        | 173-531                 |                        | 174            | 175-198        | 182-558                 |
| 32 QAM                |               | 217            | 219-248        | 228-699                 |                        | 229            | 230-261        | 240-734                 |
| 64 QAM                |               | 267            | 269-304        | 280-833                 |                        | 281            | 283-320        | 295-833                 |
| 128 QAM               |               | 323            | 325-368        | 339-833                 |                        | 339            | 342-387        | 356-833                 |
| 256 QAM               |               | 369            | 372-421        | 388-833                 |                        | 391            | 394-447        | 411-833                 |
| 512 QAM               |               | 401            | 404-457        | 421-833                 |                        | 421            | 424-480        | 442-833                 |
| 1024 QAM (strong FEC) |               | 436            | 439-497        | 458-833                 |                        | 458            | 461-522        | 481-833                 |
| 1024 QAM (light FEC)  |               | 462            | 466-528        | 486-833                 |                        | 486            | 490-555        | 511-833                 |
| 2048 QAM              |               | 502            | 505-572        | 527-833                 |                        | 527            | 531-601        | 553-833                 |
| QPSK                  | 80 MHz        | 113            | 114-129        | 119-363                 |                        |                |                |                         |
| 8 PSK                 |               | 160            | 161-183        | 168-515                 |                        |                |                |                         |
| 16 QAM                |               | 228            | 230-260        | 240-733                 |                        |                |                |                         |
| 32 QAM                |               | 300            | 302-342        | 315-833                 |                        |                |                |                         |
| 64 QAM                |               | 367            | 369-418        | 385-833                 |                        |                |                |                         |
| 128 QAM               |               | 433            | 436-494        | 455-833                 |                        |                |                |                         |
| 256 QAM               |               | 499            | 503-569        | 524-833                 |                        |                |                |                         |
| 512 QAM               |               | 548            | 552-625        | 576-833                 |                        |                |                |                         |
| 1024 QAM              |               | 596            | 601-680        | 626-833                 |                        |                |                |                         |



# Project Front Royal preliminary WTP to Town Hall LINKPlanner PTP Proposal Report 02 October 2018

Gerry Boyd  
Organization: Teltronic, Inc.  
Phone: 301-575-3950  
Email: gerry.boyd@teltronic.com



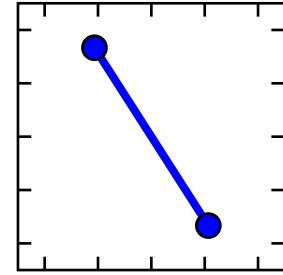
# Project Summary

**Project:** Front Royal preliminary

| General Information |                     |
|---------------------|---------------------|
| Customer Name       | Town of Front Royal |
| Company Name        |                     |
| Address             |                     |
| Phone               |                     |
| Cell Phone          |                     |
| Email               |                     |



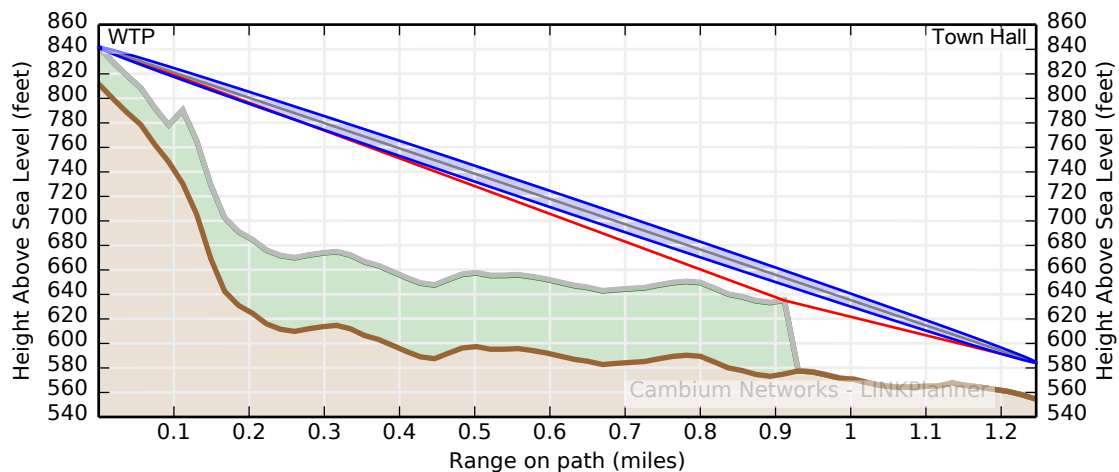
## WTP to Town Hall



Equipment: Cambium Networks PTP23820S - 1+0

Cambium Networks 1ft Single Pol (Global)  
N230082D021 - Direct @ 30 ft

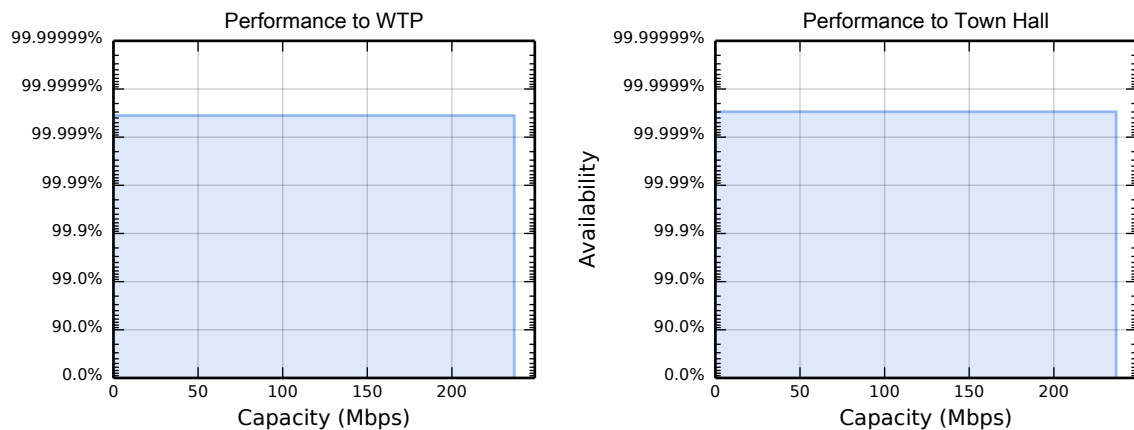
Cambium Networks 1ft Single Pol (Global)  
N230082D021 - Direct @ 30 ft



|                 | Performance to WTP      | Performance to Town Hall |
|-----------------|-------------------------|--------------------------|
| Mean IP         | 236.8 Mbps              | 236.8 Mbps               |
| IP Availability | 99.9996 % for 10.0 Mbps | 99.9997 % for 10.0 Mbps  |

| Link Summary    |           |                            |               |
|-----------------|-----------|----------------------------|---------------|
| Link Length     | 1.247 mi. | System Gain Margin         | 26.06 dB      |
| Band            | 23 GHz    | Mean Aggregate Data Rate   | 473.6 Mbps    |
| Regulation      | FCC       | Annual Link Availability   | 99.9996 %     |
| Modulation      | 4 - 64QAM | Annual Link Unavailability | 1.9 mins/year |
| Bandwidth       | 50 MHz    | Frame Size                 | 1518 Bytes    |
| Total Path Loss | 125.93 dB | Prediction Model           | ITU-R         |
| System Gain     | 152.00 dB |                            |               |

### Performance Charts



### Climatic Factors, Losses and Standards

|                                     |                    |                             |                              |
|-------------------------------------|--------------------|-----------------------------|------------------------------|
| dN/dH not exceeded for 1% of time   | -255.18 N units/km | Excess Path Loss            | 0.00 dB                      |
| Area roughness 110x110km            | 174.07 metre       | Annual 2-way Availability   | 100.0000 %                   |
| Geoclimatic factor                  | 8.40e-05           | Annual 2-way Unavailability | 0 secs/year                  |
| Fade Occurrence Factor (P0)         | 7.99e-07           | Rain Availability           | 99.9996 %                    |
| Path inclination                    | 39.09 mr           | Rain Unavailability         | 1.9 mins/year                |
| Value of K Exceeded for 99.99% (ke) | 0.40               | Atmospheric Gasses          | ITU-R P.676-7, ITU-R P.835-4 |
| Excess Path Loss at ke              | 0.00 dB            | Diffraction Loss            | ITU-R P.526-10               |
| 0.01% Rain rate                     | 48.16 mm/hr        | Propagation                 | ITU-R P.530-12               |
| Free Space Path Loss                | 125.50 dB          | Rain Rate                   | ITU-R P.837-5                |
| Gaseous Absorption Loss             | 0.43 dB            | Refractivity Index          | ITU-R P.453-9                |
| Profile Type                        | Line-of-Sight      |                             |                              |

### Bill of Materials

| Part Number | Qty | Description                                                                               |
|-------------|-----|-------------------------------------------------------------------------------------------|
| C000000L033 | 4   | Gigabit Surge Suppressor (56V)                                                            |
| C230082B003 | 1   | PTP 820S Radio 23GHz, TR1200/1232, ChLow, Hi, 22400-23020MHz. Stock item, short lead time |
| C230082B004 | 1   | PTP 820S Radio 23GHz, TR1200/1232, ChLow, Lo, 21200-21800MHz. Stock item, short lead time |
| N000065L001 | 2   | AC Power Injector 56V                                                                     |
| N000065L003 | 2   | US Line Cord Fig 8                                                                        |
| N000082L014 | 2   | PTP 820 Glands_x5_KIT                                                                     |
| N000082L016 | 1   | PTP 820 CAT5E Outdoor 100m drum                                                           |



| Bill of Materials (continued) |     |                                                                                                                       |
|-------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------|
| Part Number                   | Qty | Description                                                                                                           |
| N000082L017                   | 4   | PTP 820 Grounding Kit for CAT5e F/UTP 8mm cable.<br>Add 2 additional kits per PoE Injector that is installed outdoors |
| N000082L073                   | 2   | PTP 820 GBE_Connector_kit                                                                                             |
| N000082L116                   | 2   | PTP 820 GROUND CABLE FOR IDU and ODU                                                                                  |
| N000082L129                   | 2   | PTP 820S Act.Key - Capacity 300M with ACM Enabled, per Tx Chan                                                        |
| N000082S081                   | 2   | PTP 820S (End Only) Extended Warranty, 2 Yr, include first year                                                       |
| N230082D021                   | 2   | PTP 820 1' ANT,SP,23GHz,RFU-C TYPE&Std UBR220 - Andrew.<br>Available in all regions                                   |

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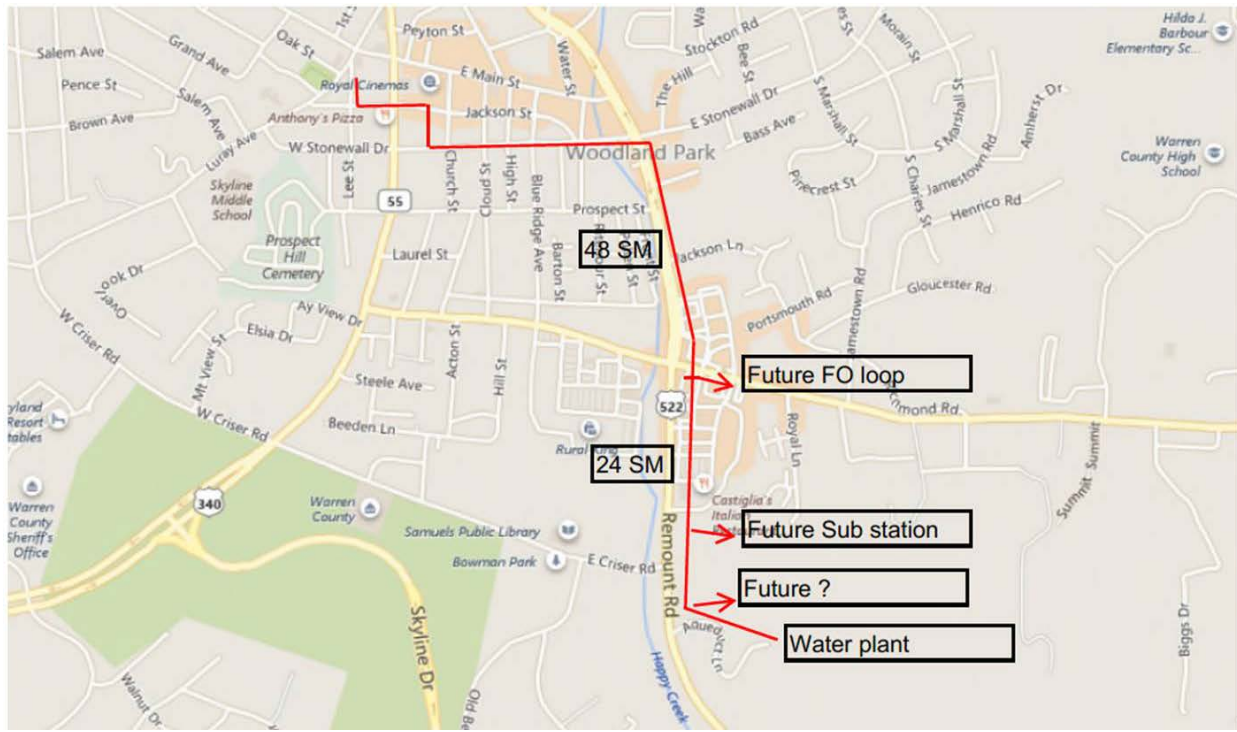
**All product or service names are the property of their respective owners. © Cambium Networks. 2018**

From: bob@syntaxcomm.com  
To: Todd C. Jones  
Subject: Water department estimate  
Date: Sunday, September 30, 2018 1:21:25 PM

Todd,

Happy Sunday .....

The very rough estimate to place fiber to the water department would be about \$95,000.00.



Thanks,  
Bob Williams  
Syntaxcomm.com  
540-622-3609



# Quote

Date: 10/2/2018  
Expiration Date:  
11/2/2018

Town of Front Royal  
102 E. Main Street  
Front Royal, VA 22630

| Salesperson  | Job                                             |
|--------------|-------------------------------------------------|
| Debbie Jones | 4 Strands Dark Fiber to Front Royal Water Plant |

| Description                                     | Monthly Total |
|-------------------------------------------------|---------------|
| 4 Strands - 1 year term                         | \$1,695.00    |
| 4 Strands - 3 year term                         | \$995.00      |
| 4 Strands - 5 year term                         | \$750.00      |
|                                                 |               |
| -Terms do not include renewals                  |               |
| -Contingent on signature of Franchise Agreement |               |
|                                                 |               |
|                                                 |               |
|                                                 |               |
|                                                 |               |
|                                                 |               |
|                                                 |               |

*Thank you for the opportunity to grow our partnership!*

500 SHENTEL WAY • P.O. BOX 459 • EDINBURG, VIRGINIA 22824-0459,  
Debbie.Jones@emp.shentel.com / 540-984-5171

6



## Work Session Agenda Form

Item # 6

DATE: October 15, 2018

### AGENDA ITEM: Fund Balance Discussion

**SUMMARY:** Council had previously requested options for financing of the police radio system and the possibility of entering into an internal loan from an enterprise fund balance. The Town recently received the necessary actuarial reports in order to calculate the projected fund balances. A breakdown of unassigned fund balances are shown on the pages following this cover sheet.

There are two separate fund balances shown for the general fund. One shows the unassigned General Fund balance after the Other Post-Employment Benefits Liability has been deducted, which shows the balance below the 3-month reserve level. The other balance shows the General Fund balance without deducting the OPEB Liability.

The OPEB liability has been discussed over the years and has been shown in the annual budget for the last several years (page 71 of the FY19 Budget), which is why the Town elected to change health and dental coverages to retirees effective July 1, 2015. The change in coverages for retirees will help decrease the Town's future OPEB liability.

OPEB liability for the Governmental Funds is much more than the OPEB liability for the enterprise funds due to the Governmental Funds having more employees and having the additional liability for the Line of Duty Act relating to the Police Department. Accounting for the Governmental Funds related to the OPEB liability is also different from the accounting in the enterprise funds. Whereas accounting entries are processed for the full OPEB Liability on the Enterprise Funds, but the Governmental Fund only requires notes in the financial reports for the OPEB liability.

The Governmental Accounting Standards Board Pronouncement 45 does not require the Town's Governmental Fund to actually fund the OPEB liability, but the liability is reported on the Town's Comprehensive Annual Financial Report.

### BUDGET/FUNDING:

N/A

### STAFF RECOMMENDATION:

Staff recommends not to use General Fund Balance to fund projects until the Town's OPEB Liability decreases.

Work Session

**Town of Front Royal, Virginia**  
**Summary of General Fund Unassigned Fund Balance**  
**06.30.2018**

---

|                                                                    |                    |
|--------------------------------------------------------------------|--------------------|
| <b>General Fund Unassigned Fund Balance FYE 06.30.18</b>           | <b>9,544,892</b>   |
| Obligations to reflect for GASB 34 conversion                      |                    |
| Less: VA Retirement System                                         | (4,382,656)        |
| VA Group Life Ins.                                                 | (402,323)          |
| VA LODA                                                            | (511,000)          |
| Retirement Employee Health Ins.                                    | (2,337,621)        |
|                                                                    |                    |
| <b>Projected General Fund Unassigned Fund Balance FYE 06.30.18</b> | <b>1,911,292</b>   |
|                                                                    |                    |
| 3 Month Reserve                                                    | (3,470,068)        |
| Carry-over Purchase Orders                                         | (1,832,682)        |
|                                                                    |                    |
| <b>Projected General Fund Unassigned Fund Balance</b>              |                    |
| <b>Below Fund Reserve taking OPEB Liability into account</b>       | <b>(3,391,457)</b> |

|                                                          |                  |
|----------------------------------------------------------|------------------|
| <b>General Fund Unassigned Fund Balance FYE 06.30.18</b> | <b>9,544,892</b> |
|                                                          |                  |
| 3 Month Reserve                                          | (3,470,068)      |
| Carry-over Purchase Orders                               | (1,832,682)      |
|                                                          |                  |
| <b>Projected General Fund Unassigned Fund Balance</b>    |                  |
| <b>Above Fund Reserve without OPEB Liability</b>         | <b>4,242,143</b> |

**Town of Front Royal, Virginia**  
**Summary of Electric Fund Unrestricted Fund Balance**  
**06.30.2018**

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|                                                                       |                    |
|-----------------------------------------------------------------------|--------------------|
| <b>Projected Electric Fund Unrestricted Fund Balance FYE 06.30.18</b> | <b>3,851,179</b>   |
|                                                                       |                    |
| 3 Month Reserve                                                       | (5,009,110)        |
| Carry-over Purchase Orders                                            | (539,113)          |
|                                                                       |                    |
| <b>Projected Electric Amount Below Fund Reserve Balance</b>           | <b>(1,697,044)</b> |

**Town of Front Royal, Virginia**  
**Summary of Water Fund Unrestricted Fund Balance**  
**06.30.2018**

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|                                                             |                         |
|-------------------------------------------------------------|-------------------------|
| Projected Water Fund Unrestricted Fund Balance FYE 06.30.18 | <u><u>9,754,614</u></u> |
| 3 Month Reserve                                             | (1,276,546)             |
| Carry-over Purchase Orders                                  | (3,147,458)             |
| <b>Projected Water Amount Above Fund Reserve Balance</b>    | <b>5,330,609</b>        |

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**Town of Front Royal, Virginia**  
**Summary of Sewer Fund Unrestricted Fund Balance**  
**06.30.2018**

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|                                                             |                          |
|-------------------------------------------------------------|--------------------------|
| Projected Sewer Fund Unrestricted Fund Balance FYE 06.30.18 | <u><u>15,777,250</u></u> |
| 3 Month Reserve                                             | (1,470,748)              |
| Carry-over Purchase Orders                                  | (7,247,676)              |
| <b>Projected Sewer Amount Above Fund Reserve Balance</b>    | <b>7,058,827</b>         |

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**Town of Front Royal, Virginia**  
**Summary of Solid Waste Fund Unrestricted Fund Balance**  
**06.30.2018**

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|                                                                |                        |
|----------------------------------------------------------------|------------------------|
| Projected Refuse Fund Unrestricted Fund Balance FYE 06.30.18   | <u><u>(99,963)</u></u> |
| 3 Month Reserve                                                | (275,118)              |
| Carry-over Purchase Orders                                     | (28,908)               |
| <b>Projected Solid Waste Amount Above Fund Reserve Balance</b> | <b>(403,988)</b>       |

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|                                                                                 |                  |
|---------------------------------------------------------------------------------|------------------|
| <b>Projected Total All Funds Above 3 Month Reserve including OPEB Liability</b> | <b>6,896,947</b> |
|---------------------------------------------------------------------------------|------------------|