
**City of Carnation 2004 Comprehensive Sewer Plan,
Executive Summary**

CITY OF CARNATION



2004 COMPREHENSIVE SEWER PLAN

OCTOBER 2004

**Carnation City Hall
4621 Tolt Avenue / SR-203
Carnation, WA 98014-1238**

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EXECUTIVE SUMMARY

PURPOSE AND NEED OF THE PLAN

Besides meeting the requirements of WAC 173-240-050, the primary purpose of this City of Carnation 2004 Comprehensive Sewer Plan (henceforth, this Plan) is to provide a guidance document for the design, construction, and operation of a new sanitary sewer system to serve the City and, eventually, its entire Potential Annexation Area. A major element of this guidance is the recommendation for a collection system based on vacuum sewer technology, as derived from a cost-effective evaluation of collection system alternatives.

The collected wastewater is proposed to be treated and disposed at a new wastewater treatment facility being designed and constructed by King County.

The primary need for the sewer system (and consequently this Plan) is due to the inadequacy of the existing septic tank and drainfield systems that are currently in use throughout the planning area.

More detailed information concerning the development of the collection system alternatives, analysis of their costs, and the selection of the vacuum sewer alternative may be found in Chapters 5, 6, and 8. Chapter 7 provides details about the King County treatment and disposal facility. Further information specifically relating to the existing wastewater disposal systems may be found in Chapter 3, Section 3.6.

PLAN BACKGROUND

This Plan provides the background information, the development of sanitary sewer collection system alternatives, the selection of a recommended alternative, and an analysis of the financial impacts to the City's future sewer service customers.

Major factors forming the context of this Plan's development are described below:

- The City does not presently have a centralized sewer collection system. All wastewater treatment is provided by on-site septic tank/drainfield systems, many of which are old and, being located on small properties, are not compliant with today's standards for such systems. For example, in 1987 Seattle-King County Public Health changed their code to emphasize not only disposal but also treatment in the design and construction of on-site disposal systems (see Chapter 3).

Replacing individual septic tanks with a centralized wastewater collection system and treatment plant is an important step toward the long-term viability of Carnation. The inadequacy of the existing on-site sewage disposal systems has been recognized for many years as evidenced by a letter dated April 19, 1988 to the City from the Seattle-King County Public Health (see Appendix E). The letter states that the most

important fact concerning the Carnation-area soils is that there is no restrictive layer of soil protecting the ground water resource from sewage (bacterial contamination). The letter cites a recent survey (at that time) of some of the businesses in the City and finding that every one of them had an inadequate on-site disposal system. Amongst the outlined problems it states that residential failures are common and points out that the existing systems are nearing the end of their useful lives. Some 'septic' types of systems are used by businesses and residences close to the City's well. These septic systems discharge sewage directly to the coarse gravels without any treatment. Many residences and businesses have been prevented from expanding or remodeling and the school district would likely be prevented from locating a new high school in Carnation. All of the outlined problems are described as only getting worse. This letter further noted that the Director of the Environmental Health Division had declared a public health hazard in the City on December 2, 1987.

On September 9th, 2003 Seattle-King County Public Health wrote a letter to the City in support of the proposed sewer system and in general reiterating the public health concerns raised in the 1988 letter. The September 9th letter is also in Appendix E.

With this background and as a result of this and of previous planning activities, some of which are described below, the City had already moved beyond the "do-nothing" alternative by the time this Plan was initiated. The major implication of all of this for this Plan is that its primary theme is concerned with the creation of an entire new sewer system and utility rather than an existing infrastructure system as would be typical of most comprehensive sewer plans.

- The City is not located in close proximity to another sewer system purveyor and previous studies determined it was not cost effective to convey the sewer that distance. Therefore, a wastewater treatment and disposal system to serve the City directly is required (see below). The new treatment system will help Carnation meet the needs of its residents, schools, and businesses while protecting public health and the environment.
- A draft comprehensive sewer plan was previously prepared by American Engineering Corporation (dated November 2000). This plan was never adopted but every effort has been made herein to make use of and reference the information developed in this earlier plan. Therefore, the chapter organization of the AEC plan has been followed in this Plan and much of the background information has been incorporated by reference. The findings and recommendations of this Plan, however, are significantly different. The AEC plan is included as Appendix A in this Plan. (This Plan should be read section by section and then if a section of AEC 2000 is specifically incorporated by reference, that section of AEC 2000, along with any related figures and tables, should be read sequentially as a part of this Plan. If a section of AEC 2000 is not referenced in this Plan, then that section of AEC 2000 is not a part of the official 2004 Comprehensive Sewer Plan, even though it still appears in Appendix A.)

- In 2002, Roth Hill Engineering Partners, LLC prepared an engineering report. The report analyzed the alternative collection system options available to the City and recommended the use of a vacuum sewer system as the core conveyance methodology for the City. In May 2002 the Carnation City Council accepted this recommendation. The analysis of alternatives (see Chapters 5 & 6) and the recommendations of the 2002 engineering report (see Chapter 8) have been incorporated directly into this Plan.
- In June 2002, the City approved the entering into an interlocal agreement with King County for the County to provide the design, construction, and operation of a local treatment plant. King County Ordinance (No. 14582) authorizing the agreement was signed by the King County Executive on March 13, 2003, and the agreement was signed by the County on June 16, 2003. This subject is discussed in more detail in Chapter 7 but otherwise the wastewater treatment plant and disposal system are not a subject of technical analysis in this Plan. The treatment plant has a target completion date of 2007.
- King County recently completed a siting study for the treatment plant in July 2003. Two alternative treatment plant sites were selected for further study in an Environmental Impact Statement (EIS). The siting study was conducted under an extensive public involvement process with the convening of a citizens advisory committee and with several public meetings. Three discharge options were also selected to undergo further study in the EIS including a river outfall, wetlands enhancement and upland infiltration. The siting process will be documented in the draft EIS and draft Facilities Plan for the treatment plant, both scheduled for completion in February 2004.
- The treatment plant will include fine screenings, grit removal, biological nutrient removal, a membrane bioreactor, sludge thickening and ultra-violet disinfection. Solids will be hauled to the King County South Treatment Plant in Renton and incorporated in the County's biosolids program (silvicultural and land application). Specifics on the treatment plant, and the selection of individual treatment processes, will be included in the draft Facilities Plan for the treatment plant.

PLAN DEVELOPMENT

Under the Growth Management Act (GMA), urban levels of service are to be provided in urban areas. Sewer service is generally considered an urban level of service for addressing wastewater needs, while onsite systems are generally considered a rural level of service. The City made a decision to become an urban area, accepting urban levels of responsibility for accommodating growth in the region under the Countywide Planning Policies. The City also requested the ability to expand its City limits by pursuing an annexation area defined by the Urban Growth Boundary (UGB). The Urban Growth Boundary is shown on Figure 3-1. This Plan shows a recommended concept for providing sewer service within this area based on a centralized vacuum sewer system but also to include grinder pump stations and force

mains to serve some of the peripheral areas. The City initially intends to make sewer service available to all developed properties within the City limits with extensions to the other areas inside the UGB to follow in the future.

The service area has been divided into 19 (sewer drainage) Basins designated by the letters A through S. These are described in Section 4.3 of Chapter 4 and shown on Figure 4-1. Included in Chapter 4 are population and employment projections at intermediate years up to the year 2030. Table 4.5 shows the total ultimate population and employment for all Basins inside the Urban Growth Boundary as 3,871 and 2,825 respectively. The ultimate population is predicted to be reached in the year 2022 (+/-) but ultimate employment level will likely occur after 2030. These projections are for the areas within the City limits and the Urban Growth Area only.

Also described in Chapter 4 is the development of flow criteria for residential and commercial areas. Separate flow criteria are further developed for the Tolt MacDonald Park and Campground, the Tolt Middle School, the Carnation Elementary School, and Remlinger Farms. The possibility of a new high school to begin operation in the 2007-2008 school-year has also been taken into account. Using the flow criteria and the population and employment projections, the peak flow rate is predicted to be 819 gallons per minute (gpm) inside the City limits and 318 gpm outside for 2023. Ultimate peak flow inside the City limits is predicted to be 852 gpm and 318 gpm outside. See Table 4.6.

In Chapter 6, the three basic alternative collection systems are presented: a gravity system (Figure 6-1), a vacuum system (Figure 6-2), and a grinder pump system (Figure 6-3). It should be noted that both the gravity and vacuum system alternatives require the use of grinder pumps and force mains for some areas. Table 6.1 summarizes the total project cost projections for the three alternatives as follows:

Gravity system	\$16,375,000
Vacuum system	\$13,973,000
Grinder pump system	\$14,764,000

Tables 6.2, 6.3, and 6.4 present these costs in detail. The above cost projections apply to the entire service area including those areas outside of the City limits that will not be constructed initially.

The interlocal agreement with the County includes a cost recovery plan for the City to pay for the capital and operations and maintenance for the treatment plant. This agreement limits the maximum cost to the City for the treatment plant of \$10,600,000. The treatment plant will be designed to accommodate the flows as stipulated in this Plan.

PLAN RECOMMENDATIONS AND FINANCIAL PROGRAM

In Chapter 8, the selection of the vacuum sewer system alternative is described. As noted previously, the City Council adopted this alternative in May 2002. The initial portion of the sewer system to be constructed will be for the Basins inside the City limits.

The Capital Improvement Program is presented in Table 8.1. The table lists by project the estimated costs, the expected year of completion, and the funding sources. The two major projects are the wastewater treatment plant with an estimated cost of \$10 million to be completed in 2007 and the collection facilities inside the City limits for \$8.9 million to be completed in 2006.

Funding the proposed Capital Improvement Program will be a mixture of grants, PWTF loans, monthly sewer rates, and a surcharge on water rates. These and other possible sources of funding are discussed in Chapter 9. At this time (October 2003), the City has retained FSC Group of Redmond to assist with the development of a financial plan. A formal rate study is scheduled to be completed in 2004.

Subject to the future completion of the rate study, and assuming no grant funding is obtained, the total monthly payments for a typical single family residence are presently estimated to be \$155 as shown in Table 9.2 and which is reproduced below. This includes an estimated Monthly Sewer Rate of \$66 for the capital costs of the treatment plant and the operating costs for the plant and conveyance system. Also included, is the Local Facilities charge of \$70 for the capital costs associated with collection and conveyance facilities. The remaining \$19 of the monthly rate is the mandatory King County Connection Charge and is the only element of the estimated rate that is a known fixed cost at this time.

Included in the \$155 per month estimate (as part of the \$70 Local Facilities charge) are the costs for the individual side sewer connections, which are assumed to be privately financed. Although this cost will vary from connection to connection it is expected to average approximately \$3,162.

SFR Sewer Rate – With No Grant Funding for Local Facilities					
Monthly Sewer Rate	Property Tax (est.)	Assessment (Average Cost)		King County Connection Charge	Total Monthly Payments
		Local Facilities	Side Sewer		
\$ 66	\$ -	\$ 50	\$ 20	\$ 19	\$ 155
			The Side Sewer charge, as explained below, will likely be privately financed. \$20 represents the estimated typical monthly equivalent charge if financed over 20 years.		



The single-family residential rate schedule shown in the table further assumes the City will receive no grant money to help finance the new system. Tables 9.3 and 9.4 present the impacts of receiving 25% and 50% grant funding on the Local Facilities' portion of the monthly rate and thereby lowering it from \$70 to \$59 and \$46 respectively. Rates for non-residential customers will be partially based on sewage volume generated and partially based on the Local Facilities required.

On page 9-9 a number of policy objectives is recommended to be included as part of or in conjunction with the rate study scheduled in 2004. The foremost recommendation, however, is to aggressively pursue grant funding opportunities to offset the unavoidably high costs of the sewer system. At this time, the City is aggressively pursuing this objective.