Section 5
Proposed Contracts and Estimated Project Cost

5.1 Introduction

The successful implementation of any major infrastructure improvements program, such as providing sewer to the Cohas Brook area, relies on the establishment of a comprehensive plan. Separating the project into prioritized contracts will allow construction to be implemented as local, state, and federal funding becomes available, and demonstrates consistent progress, with areas generally of the greatest need receiving service first. This section also provides a summary of the probable project cost estimates for each contract of the Cohas Brook Sewer Project.

5.2 Proposed Contract Areas

Given the scale of the sewer extension program described in Section 4, the implementation of the project was evaluated at three and four contracts. Ultimately, it was determined to break the Cohas Brook Sewer Project into four similarly sized contracts, which reduces the yearly construction costs to minimize the sewer rate impact. The subareas evaluated in Section 4 were generally prioritized based on the areas of highest need.

5.2.1 Proposed Contract 1

Contract 1 (See Figure 5-1) is proposed to extend sewer service to subareas 3, 6, and 7. The Contract 1 area includes approximately 20,500 linear feet of 8 to 12 inch gravity sewer and 1,100 linear feet of pressure sewer. Contract 1 will bring sewer service to just fewer than 200 existing homes that are all located in either the Lake Massabesic or Cohas Brook watersheds. Approximately eleven homes in Contract 1 may require individual grinder pumps. Refer to Appendix D for more information on proposed pipe location, size, type, etc.

Based on the questionnaire responses of the residents in the Contract 1 area, over 17 percent reported that they have problems with their septic systems, 66 percent replied that there septic system was greater than 15 years old, and 78 percent said that they wanted the City to extend gravity sewer to their homes. Also, many of the existing housing lots in the project area are generally too small to support a septic system that would be compliant with NHDES regulations. This situation clearly represents a significant environmental health risk and potential for contamination of the drinking water supply for the City and six surrounding communities, as well as receiving waters that are used for recreational purposes, resulting from septic systems that are overloaded, failing or at the end of their useful life.

Insert Figure 5-1 – Contract 1

5.2.2 Proposed Contract 2

Contract 2 (See Figure 5-2) is proposed to extend sewer service to subareas 1 and 10. The Contract 2 area includes approximately 19,000 linear feet of 8 to 15 inch gravity sewer and 200 linear feet of pressure sewer. Construction of Contract 2 will also eliminate an existing pump station at the end of Aladdin Street. Implementation of this contract will bring sewer service to about 180 existing homes that are all located in either the Lake Massabesic or Cohas Brook watersheds. It is anticipated that only one home in Contract 2 may require a grinder pump. Refer to Appendix D for more information on proposed pipe location, size, type, etc.

Based on the questionnaire responses of the residents in the Contract 2 area, over 13 percent reported that they have problems with their septic systems, 71 percent replied that there septic system was greater than 15 years old, and 70 percent said that they wanted the City to extend gravity sewer to their homes. Additionally, the flow from Eastwind Estates is currently pumped into the City's combined sewer system. Elimination of the Aladdin Street pump station will remove the flow from the combined sewer which overflows to the Merrimack River during heavy rain events. Also, many of the existing housing lots in the project area are generally too small to support a septic system that would be compliant with NHDES regulations. This situation clearly represents a significant environmental health risk and potential for contamination of the drinking water supply for the City and six surrounding communities, as well as receiving waters that are used for recreational purposes, resulting from septic systems that are overloaded, failing or at the end of their useful life.

5.2.3 Proposed Contract 3

Contract 3 (See Figure 5-3) is proposed to extend sewer service to subareas 8, 11, and 12. The Contract 3 area includes approximately 17,500 linear feet of 8 to 24 inch gravity sewer and 500 linear feet of pressure sewer. Construction of Contract 3 will include the next 1,625 linear feet of the 24 inch sewer interceptor that will ultimately provide service to Londonderry and Auburn (originally Phase III of the Cohas Brook Interceptor Project). Implementation will bring sewer service to about 230 existing homes that are all located in the Cohas Brook watershed. Approximately five homes in Contract 3 may require individual grinder pumps. Refer to Appendix D for more information on proposed pipe location, size, type, etc.

Based on the questionnaire responses of the residents in the Contract 3 area, over 6 percent reported that they have problems with their septic systems, 60 percent replied that there septic system was greater than 15 years old, and 70 percent said that they wanted the City to extend gravity sewer to their homes. Also, many of the existing housing lots in the project area are generally too small to support a septic system that would be compliant with NHDES regulations. This situation clearly represents a significant environmental health risk and potential for contamination of the drinking water supply for the City and six surrounding communities, as well as receiving

Insert Figure 5-2 – Contract 2

Insert Figure 5-3 – contract 3

waters that are used for recreational purposes, resulting from septic systems that are overloaded, failing or at the end of their useful life.

5.2.4 Proposed Contract 4

Contract 4 (See Figure 5-4) is proposed to extend sewer service to subarea 9. The Contract 4 area includes approximately 8,200 linear feet of 8 to 24 inch gravity sewer and 200 linear feet of pressure sewer. Construction of Contract 4 will complete the 24 inch sewer interceptor that will provide service to Londonderry and Auburn (originally Phase III of the Cohas Brook Interceptor Project). Implementation will bring sewer service to many residents on Bodwell Road that are all located in the Cohas Brook watershed. Approximately three homes in Contract 4 may require individual grinder pumps. Refer to Appendix D for more information on proposed pipe location, size, type, etc. Due to the number of condominium and apartment buildings in the Contract 4 area, the questionnaire does not accurately display sewer problems or need in this area.

5.2.5 Proposed Other Future Sewer Areas

The other future sewer areas (See Figure 5-5) include subareas 2, 4, and 5, the two homes on Corning Road, and the southern end of Lucas Road. The other future sewer areas were chosen because they are sparsely populated, questionnaire results did not show problems with existing septic systems, and/or the estimated cost to sewer the street/area outweighs the benefits of extending the sewer. Therefore, these other future sewer areas are not included in the proposed four contracts of the Cohas Brook Sewer Project. However, provisions have been included in the four contracts, where applicable, for possible future service to these areas should new development or other changes in existing conditions make service necessary and cost-effective.

5.3 Cost Estimate Components

5.3.1 Sewer Cost Development

Estimated construction costs per foot are based on June 2009 cost data that was discussed in Section 3. Furthermore, as an owner contemplating execution of a major infrastructure project, Manchester should be aware that, following a long period of relatively low inflation and low cost volatility within the construction market, construction costs have increased dramatically over the past few years due to increased energy and material prices, an increased global demand for many construction materials and commodities, the impact of natural disasters such as hurricanes Katrina and Rita on the production of basic materials (for example, PVC pipe), and the increased demand for these materials resulting from reconstruction efforts. These cost increases have particularly impacted sewer construction projects, as the price of PVC pipe and asphalt – the major raw materials for a sewer construction project – have essentially doubled since 2001; this is in sharp contrast to the decade of the 1990s, when construction cost escalation remained at a very stable rate of around three percent annually.

Insert Figure 5-4 – Contract 4

Insert Figure 5-5 – Other Future Sewer Areas

We therefore recommend that the cost information presented herein be reviewed as the program proceeds to reflect ongoing changes in the construction market and ensure that future changes in a volatile commodities market are reflected in the cost estimates for each phase of work and the project as a whole.

5.3.2 Cost Contingency Development

The cost analysis presented in this report includes a 45 percent allowance for engineering and contingencies. These additional allowances are included to develop a financial analysis based on total project cost and not construction cost only. For planning purposes, design costs for sewer pipeline projects are generally assumed to be about 10 percent of construction cost (including survey, borings, permitting, etc.) and costs for construction oversight (full-time field inspection, contractor oversight, record drawings, etc.) are generally assumed to be 13 to 15 percent of construction cost. Additionally, a contingency allowance of 20 to 25 percent is generally used at this phase, which is intended to cover unforeseen costs and costs that can not yet be defined (for example, costs for easements, legal, etc.).

The following summary tables show the estimated project cost breakdown for each contract and include a separate line item for engineering and contingency (45 percent). These allowances will be further refined and detailed as the project moves forward, with engineering costs determined in detail on a contract-by-contract basis and contingency allowances generally reduced as the project progresses from conceptual layouts to final design and, ultimately, to construction.

5.4 Project Cost Estimate

Tables 5-1 through 5-4 show the project cost estimates for Contracts 1 through 4 of the Cohas Brook Sewer Project, respectively. Contract costs are shown in more detail in Appendix D. Because unit costs for a particular size of pipe varies depending upon the depth of construction and the fact that some of the proposed pipelines are in cross-country areas and will not require paving, the costs shown in Table 5-1 to Table 5-4 will not directly correlate with the unit costs shown in Table 3-3 (i.e. the costs and quantities shown in Table 5-1 to Table 5-4 represent the total of all pipes installed at various depths and locations). These estimates are based on June 2009 construction prices. In summary, the proposed Cohas Brook Sewer Project would be divided in four contracts with an estimated total project cost of approximately $26.9 million, with breakdown as follows:

Contract 1	$7.3 million
Contract 2	$7.5 million
Contract 3	$6.8 million
Contract 4	$5.3 million
Total	**$26.9 million**

Item	Proposed Sewers	
	Quantity	Cost
8-inch Gravity Sewer	17,060	$3,997,000
10-inch Gravity Sewer	3,130	$792,000
12-inch Gravity Sewer	170	$44,000
1.5- to 2-inch Pressure Sewer	1,110	$227,000
	Subtotal	***$5,060,000***
45% Engineering Services and Project Contingency	-	$2,275,000
	Total	***$7,335,000***

Table 5-1
Estimated Contract 1 Project Costs

Item	Proposed Sewers	
	Quantity	Cost
8-inch Gravity Sewer	14,330	$3,185,000
15-inch Gravity Sewer	2,980	$1,332,000
18-inch Gravity Sewer	1,380	$532,000
1.5-inch Pressure Sewer	220	$39,000
Decommission Pump Station	1	$50,000
	Subtotal	***$5,138,000***
45% Engineering Services and Project Contingency	-	$2,313,000
	Total	***$7,451,000***

Table 5-2
Estimated Contract 2 Project Costs

Item	***Proposed Sewers***	
	Quantity	***Cost***
8-inch Gravity Sewer	12,100	$2,920,000
15-inch Gravity Sewer	3,620	$979,000
24-inch Gravity Sewer	1,625	$542,000
1-5- to 2-inch Pressure Sewer	470	$76,000
Brook Crossing	1	$200,000
	Subtotal	***$4,717,000***
45% Engineering Services and Project Contingency	-	$2,123,000
	Total	***$6,840,000***

Table 5-3
Estimated Contract 3 Project Costs

Item	***Proposed Sewers***	
	Quantity	***Cost***
8-inch Gravity Sewer	1,610	$389,000
24-inch Gravity Sewer	6,620	$3,236,000
1.5-inch Pressure Sewer	200	$46,000
	Subtotal	***$3,671,000***
45% Engineering Services and Project Contingency	-	$1,653,000
	Total	***$5,324,000***

Table 5-4
Estimated Contract 4 Project Costs