Executive Summary

EX.1 Background

The Cohas Brook Interceptor was identified in the City's 1979 "Facility Plan" by CLD Consulting Engineers, Inc. (CLD) and was studied further and conceptually laid out in the 1996 "Cohas Brook Interceptor Feasibility Study" also by CLD. Through the construction of several interceptor contracts over the last decade, the City has extended the sanitary sewer system to eastern Manchester, within the Lake Massabesic watershed. The next step for the City is to extend lateral sewers off the interceptor to adjacent unsewered streets. The planning area for this study includes the easternmost portion of the city adjacent to Lake Massabesic and is bounded by Mammoth Road and the Route 93/101 corridor to the west, Hooksett to the north, Auburn to the east, and Londonderry to the south.

The unsewered homes in the Cohas Brook Sewer Master Plan area (project area) either fall in the Lake Massabesic Watershed or the Cohas Brook Watershed. Lake Massabesic is the source of drinking water for Manchester and six surrounding communities and is well protected by Manchester Water Works; therefore elimination of existing onsite septic systems will further protect and enhance the water quality. Cohas Brook winds east to west through Manchester and empties into Pine Island Pond and then flows to the Merrimack River. Pine Island Pond is a manmade pond and is used recreationally for boating, fishing, and occasionally swimming.

Many of the existing house lots in the project area are generally too small to support a septic system that would be compliant with current New Hampshire Department of Environmental Services (NHDES) regulations. Also, more than 66 percent of the septic systems are over 15 years old, 13 percent of the properties have problems with their existing septic system, and the majority of the properties are located within 500 feet of a water body, stream or wetland. This situation clearly represents a significant potential for contamination of Lake Massabesic, Cohas Brook, and Pine Island Pond resulting from septic systems that are overloaded, failing or at the end of their useful life.

EX.2 Purpose

The purpose of the Cohas Brook Sewer Master Plan is to extend sewer service to the Cohas Brook and Lake Massabesic region by identifying the unsewered areas, recommending pipe routing, and potentially eliminating existing pump stations. This sewer master plan also includes identifying permit requirements, geotechnical considerations, funding alternatives, and estimated project costs; all the while in keeping with the themes and goals of the City's recently completed master plan, "Master Plan for the City of Manchester, New Hampshire," which was adopted by the Planning Board on December 10, 2009.

EX.3 Planning Criteria and Sewer Alternatives

There are more than 700 properties in the project area currently using onsite septic systems. Several factors were considered during the preliminary planning of wastewater conveying systems to sewer these properties, including:

- Topography (maximize the use of gravity sewers)
- Future flow estimates (used to size pipelines)
- Subsurface conditions (manage installation cost by minimizing rock excavation based on available soil boring information and investigations completed as part of this study)
- Easements (maximize the use of existing right-of-ways to limit easements),
- Permits (archaeological, wetlands, railroad, state highway, etc.)
- Questionnaire results (define problem areas)

Initially, the project area was broken into twelve smaller subareas that were evaluated separately. Various methods were used to choose locations of proposed sewers and force mains. Conceptual layouts were prepared on topographic maps followed by field investigations performed by CDM staff to help confirm the layout of the sewer pipe, identify properties that may or may not have existed at the time of City's aerial survey, identify properties that cannot be served by gravity in a cost-effective manner, and identify alignments for stream and river crossings.

Where applicable, the conceptual designs of street and cross-country sewers were planned in sufficient detail so that downstream facilities could be installed at elevations deep enough to serve a maximum amount of upstream tributary areas. If certain portions of the system are to be installed by private developers, the City should ensure that sewers are the proper depth, diameter, and slope to serve the entire area contributing to them.

EX.4 Proposed Contracts

The successful implementation of any major infrastructure improvements program, such as providing sewers 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 to demonstrate consistent progress, with areas of the greatest need receiving service first. Given the scale of the sewer extension program, the entire project area was broken into four similarly sized contracts and generally prioritized based on the areas of highest need. The recommended contract areas are shown on Figure EX-1 and are summarized below. Appendix H provides a larger scale drawing showing the recommended contract areas along with the location of the proposed sewer pipes.

Insert Figure EX-1 – Contract areas

Proposed Contract 1

The proposed Contract 1 area includes approximately 20,500 linear feet of 8 to 10 inch gravity sewers and 1,100 linear feet of pressure sewers. Contract 1 will bring sewer service to approximately 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.

Proposed Contract 2

The proposed Contract 2 area includes approximately 19,000 linear feet of 8 to 15 inch gravity sewers and 200 linear feet of pressure sewers. Construction of Contract 2 will also potentially eliminate an existing pump station at the end of Aladdin Street. Implementation of this contract will bring sewer service to 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.

Proposed Contract 3

The proposed Contract 3 area includes approximately 17,500 linear feet of 8 to 24 inch gravity sewers and 500 linear feet of pressure sewers. 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. Implementation will bring sewer service to 230 existing homes that are all located in the Cohas Brook watershed. Approximately five homes in Contract 3 may require individual grinder pumps.

Proposed Contract 4

The proposed Contract 4 area includes approximately 8,200 linear feet of 8 to 24 inch gravity sewers and 200 linear feet of pressure sewers. Construction of Contract 4 will complete the 24 inch sewer interceptor that will provide service to Londonderry and Auburn. 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.

Other Future Sewer Areas

Other future sewer areas were evaluated but considered a lower priority 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.

EX.5 Project Costs

The estimated costs are based on June 2009 cost data and include 45 percent for project contingency and engineering. The estimated total project cost of the proposed Cohas Brook Sewer Project is $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**

No timeline for implementing the contracts has been established to provide the City with more flexibility in moving design and construction forward depending on availability of funding.

EX.6 Major Additional Considerations

Project Financing

The construction of the Cohas Brook Sewer Project will require a significant commitment of financial resources by the City. In order to implement the project, a varied funding approach may be necessary. This approach provides the opportunity to acquire available funding from the NHDES through the State Aid Grant (SAG) Program and the State Revolving Fund (SRF). However, SAG has not been available since the fall of 2008 and is not in the budget for fiscal years 2010 and 2011. It is in the City's best interest to apply for the SAG in hopes of reinstatement and potential back payment for eligible projects. Federal money may also be available for the Cohas Brook Sewer Project through the American Recovery and Reinvestment Act of 2009 and the State and Tribal Assistance Grant (STAG) program.

The entire Cohas Brook Sewer Project should qualify for SAG and SRF from NHDES based on the need to protect the Lake Massabesic and Cohas Brook watersheds. Therefore, the City could obtain a 20 percent grant for eligible project costs and an SRF loan on the remaining balance of the project. Currently, however, the State has deferred any payments, including previous commitments, under the SAG.

The City of Manchester has a variety of options available to provide financing for the construction costs of the Cohas Brook Sewer Project. In many other communities in New England, such sewer additions are paid for by the revenue generated from betterment fees. The rationale behind such fees is that the direct beneficiaries of the new sewer system also should pay the majority of the costs. Partial subsidies to lower the cost burden on the connecting new sewer users may be provided from the general fund if the community deems this to be appropriate.

However, more than 90 percent of the entire service area of the City is already sewered, and historically all capital improvements have been paid for by revenues generated from sewer user fees. In other words, all sewer users have collectively paid for capital projects through their sewer usage bills. It seems reasonable to continue this practice and also apply the same concept to the Cohas Brook Sewer Project. All residents theoretically benefit from a well maintained and operated sewer system and consequently it is appropriate to recover all additional capital and operating costs associated with the new system from the entire customer base. By following this practice, the City would be consistent in its revenue and cost collection policies and also provide fairness and equity to its system of user fees and charges.

Permitting

Various environmental permits and approvals are required whenever proposed work may affect certain environmentally sensitive resources including waterways, wetland resources areas, habitats of rare or endangered species, and historic/archaeological sites. Permits and approvals will be required during implementation of the Cohas Brook Sewer Project. The anticipated permitting for each contract is discussed in Section 7.2.3.

The long-term impact of the project will be positive, resulting in the protection of Manchester's drinking water supply, Lake Massabesic, from contamination due to failing septic systems. Additionally Cohas Brook empties into Pine Island Pond that is used for recreation and should be protected from contamination. There will be some short-term adverse impacts during construction, many of which are unavoidable, but some of which can be reduced by implementing various mitigation measures.

There are several brook crossings and multiple cross-country sewer routes that may impact wetlands upon implementation of the proposed Cohas Brook Sewer Project. Measures will be required to minimize construction impacts that these crossings may have on existing water bodies and/or wetland areas.

Also, as part of this study, a Phase IA archaeological survey was completed for the entire project area. The results found areas that are moderately and highly sensitive archaeological resources that were recommended to be evaluated further during the design phase with a Phase IB archaeological survey.

Easements

Easements are proposed at several locations within the proposed Cohas Brook Sewer Project for mainline sewers that are proposed to be constructed cross-country (i.e., off the existing right-of-way) or in "paper" streets (i.e., streets that are not accepted by the City) to allow for gravity sewer pipe installation. These anticipated easement locations are shown on Figures 5-1 through 5-5. In total, it is estimated that approximately 7,750 linear feet of cross-country sewers may be constructed that will impact/require easements from about 40 different parcels. There are also about 2,510 linear feet of sewers that are proposed to be constructed on unaccepted streets that

will impact/require easements from approximately 14 additional parcels. The anticipated easements required for each contract is discussed in Section 7.2.14.

At this time, ownership of the properties where cross-country sewers are proposed has not been determined. Private parties may partially or wholly own these lands. During final design, ownership and acquisition of the properties should be further investigated. The two options typically evaluated for obtaining easements for similar projects are eminent domain and negotiation. In the past, the City has negotiated all easements with individual property owners. It is assumed that this approach will continue for this project. However, if the City is unsuccessful in negotiating some or all of the easements required for the project, use of eminent domain may need to be considered.

Impact and Use of Private Utilities

Manchester has a number of private utilities that have been created within the City. These systems include sewers that were constructed according to City standards and policies and, in some cases, pumping stations developed under similar rules. Generally, customers of these private utilities receive two bills: a City bill where they are charged the current City rate given the amount of water consumed and then they also pay a separate charge to the private utilities responsible for developing, operating, and maintaining the sewer system serving them.

It may be beneficial to the residents served by those private utilities and to the City if the City were to acquire the private utilities. Eastwind Estates represents the first need and potential opportunity to test this policy and general approach. The infrastructure in the Eastwind Estates neighborhood is currently owned through a homeowner's association. Individual homeowners pay an association fee to cover the current operation and maintenance costs for the sewer system and also pay the full City sewer rate for the transport and ultimate disposal. There do not appear to be any outstanding debt obligations for the infrastructure that are being amortized through the association fee. Based on the analysis in this report, the City's total costs for the project would fall by over $700,000 if the City acquires the Eastwind Estates system and uses it to support sewer development in the Cohas Brook area. It would also be advantageous to the property owners since it would reduce their sewer costs by the amount of the association fees as well as the unknown liability of emergency repairs and some future rehabilitation of the system. Thus, it appears to be a "win-win" case for both parties and should be pursued. The impact and use of private utilities is discussed in more detail in Section 7.2.15.