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# **Beal Slough Relief Trunk Sewer Alignment Study Report**

*Project Costs for Alignment Alternatives*

## **4.0 Project Costs for Alignment Alternatives**

### **4.1 Basis of Project Costs**

Capital costs developed for the sewer alignments were based on opinions of cost for previous Black & Veatch projects as well as cost curves for projects of similar size. All lengths for pipelines and tunnels were scaled from the 1998 aerial photographs obtained from the City's GIS department. All project costs are provided in October 2003 dollars. Additional amounts for contingencies; easement acquisition; and engineering, legal, and administrative costs were added to obtain a total opinion of probable project cost for each alignment.

### **4.2 Construction and Engineering Costs**

Costs were calculated on a linear foot basis for the sewer on each alignment accounting for depth of bury for the pipe. Tunneling beneath railroad crossings and street crossings was evaluated for each location to provide a cost per linear foot of tunnel. Additional costs were included for dewatering, manholes, street repairs, utility relocations, and seeding.

Twenty-five percent of the direct construction cost was added to each alignment alternative as an allowance for unknowns that can be expected at this level of estimating and for project contingencies. Twenty percent of the direct construction cost plus contingencies was allocated for engineering, legal, and administrative costs associated with each alignment.

### **4.3 Easement Acquisition Costs**

Easement acquisition costs were estimated based on a square foot basis for permanent easements and temporary construction easements. A cost of \$1.00 per square

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foot was used for permanent easements and \$0.10 per square foot was used for temporary construction easements.

### **4.4 Total Project Costs**

The opinion of probable project costs for each alternative is listed in Table 4-1. A complete breakdown of the capital costs for each alignment is located in Appendix A. The project cost for each alternative includes capital costs, general requirements, contingencies, and engineering, legal, and administrative costs; and easement acquisition costs.

**Table 4-1. Preliminary Opinions of Probable Project Cost**

<b>Alignment</b>	<b>Cost</b>
Alignment No. 1	\$12,365,000
Alignment No. 2	\$10,005,000
Alignment No. 3	\$11,333,000