

PINE CREEK JOINT SEWER FACILITIES AND MANAGEMENT STUDY

August 10, 2011 (Revision 8/25/11)

This work was funded under a Grant from 3Rivers Wet Weather

Executive Summary:

The municipalities that comprise the Pine Creek sewershed service area (Etna Borough, Ross Township, Shaler Township and Indiana Township) are submitting this report to 3 Rivers Wet Weather (3 Rivers) to document their joint project on how these communities may provide sewer service in the future. These communities operate individual sewer systems that serve a combined population of over 25,000 people. The communities are also the operating partners of the Etna Trunk line and thus share common sewershed concerns with respect to sewer compliance and operation.

Consequently, the municipalities undertook the joint development of a feasibility study as the preferred and cost effective way to determine levels of service and assess alternatives under a watershed wet weather control plan. The joint preliminary feasibility study provides an array of costs and flows for three anticipated levels of service- 2-, 5- and 10-year winter design storms- over three general ranges of CSO control. Capital requirements for the respective municipal system wet weather improvements were estimated based on the ALCOSAN Alternative Costing Tool (ACT).

The ACT estimates of sewer shed wet weather liabilities fell between \$75-85 million on Present Worth basis over range of levels of control and service. A sensitivity analysis revealed that a wide range of costs is bracketed by the ACT input assumptions and the use of standard estimating values.

The second phase of work was directed at the exploration of the associated costs of five consolidation options, given the array of capital improvements and O & M requirements needed to meet regulatory wet weather mandates. The options are:

1. Updating and standardizing the existing multi-municipal agreements
2. Transfer trunk line(s) and wet weather facilities responsibility to ALCOSAN
3. Transfer shared trunk line, wet weather facilities and collection system responsibility to a new authority
4. Operating Committee assumes trunk line
5. Transfer shared trunk line responsibility to an Environmental Improvement Compact (EIC)

The report presents the annual associated debt service and annual cost per account for the upper and lower estimates of system operating costs for the range of Pine Creek Watershed Alternative Combined Costs.

The report also presents the annual cost for each option for each Pine Creek community on a per customer basis. To some extent this analysis is incomplete because the ALCOSAN cannot project rates and its wet weather control implementation schedule at this time. Nevertheless, the relative cost impacts associated with each option can be seen between the four options. From the comparison it is evident that each Pine Creek community has a distinct set of interests that may diverge when costs are weighed. A critical consideration is where the capital and operating requirements reside along the range of costs when considered in tandem with the respective level of control and level of service.

The Pine Creek Consolidation study is product of extended discussions among the Pine Creek engineers regarding wet weather facilities and associated costs. These discussions have included ALCOSAN and its Basin Planning consultants on a continuing basis in order to fulfill ALCOSAN requests for a Preliminary Feasibility study. As can be seen by the position papers submitted, the study has stimulated and benefited from spirited discussions among the participating communities on consolidation options.

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Introduction

The municipalities that comprise the Pine Creek sewershed service area (Etna Borough, Ross Township, Shaler Township and Indiana Township) are submitting this report to 3 Rivers Wet Weather (3 Rivers) to document their joint project on how these communities may provide sewer service in the future. These communities operate individual sewer systems that serve a combined population of over 25,000 people. The communities are also the operating partners of the Etna Trunk line and thus share common sewershed concerns with respect to sewer compliance and operation.

The study has progressed from an assessment of costs and benefits through recent discussions on various proposals and options to systematically address alternatives for future sewer system management on a sewershed basis. Etna Borough as the downstream community has agreed to serve as the lead community in this effort as well as provide project and grant administration.

The scope of work directed at this objective completed a two-phased approach. This included a consensus baseline determination of system liabilities and capital requirements needed to address anticipated wet weather control capacity requirements. Estimating the magnitude of operating requirements provided the other essential cost component in any discussions of consolidation options.

The subsequent second phase of work was directed at the determination of the costs associated with the consolidation of sewer operations to provide for Operation and Maintenance plans and long-term financial viability for wet weather capital improvements. Here the objective was the discussion of how these challenges can be met jointly within the context of Pine Creek sewershed.

Background

The Pine Creek sewershed is comprised of the sewer systems of Etna Borough, Ross Township, Shaler Township and Indiana Township. The sewershed also includes the Bennington Woods development in the Town of McCandless and a minor section of O'Hara Township. The sewershed has an estimated area of 7,337 acres tributary to ALCOSAN Point-of-Connection (POC) A-68. [Plate 1](#) shows the extent and approximate boundaries of the Pine Creek sewershed.

The sewershed is served by two major municipal trunk lines- the Ross-Shaler Trunk line and Shaler Route 8 Trunk line that are, in turn, tributary to Etna Trunk line. The sewer system in the Pine Creek sewer shed developed northward from the Allegheny River following the general pattern of development. Although the Borough of Etna is a combined sewer community, the more recently developed tributary areas to the north are serviced by separate sewer systems.

As areas developed and were added in Pine Creek, service agreements were executed between the municipalities to provide for conveyance capacity. These agreements usually specified sharing arrangements for capital and operating costs. Beginning with the construction of the Etna Trunk line in 1931, there followed a series of agreements with Shaler Township in 1931, then Ross Township in 1957 and finally for the Middle Road section of Indiana Township in 1969. This last agreement created the current maintenance cost sharing arrangement that is in effect for the Etna Trunk line.

As a consequence, there are well-established working relationships as well as contractual relationships among the trunk line partners. In 2009, the partners undertook the third major maintenance project on the Etna trunk line. In an effort to address long-standing problems in Etna, Ross and Shaler funded improvements to the Ross/Shaler line. Etna, Ross and Shaler have also undertaken a number of joint sewer projects. In addition to the history of cooperative sewer management, the municipalities have jointly addressed stormwater management and Act 167 facilities planning among other issues. Pine Creek Communities play an active role in the North Hill Council of Government (NHCOG), ALCOSAN Customer Municipality Advisory Committee, CONNECT and other regional entities.

In Pine Creek sewershed, the fact that upstream separate sewer systems flow into combined sewer areas and joint conveyance facilities creates additional complexity in addressing wet weather problems. By cooperatively working together, the trunk line partners have been able to reconcile the differing requirements imposed under the respective orders (ACO and COA) to provide Preliminary Flow Estimates to ALCOSAN on a joint sewershed basis.

Wet Weather Control Requirements- April 30 Submission to ALCOSAN

The essential first step is to determine the magnitude of operating and capital requirements under the anticipated wet weather control plan. Consequently, the municipalities undertook the joint development of a feasibility study as the preferred and cost effective way to determine levels of service and assess alternatives under a watershed wet weather control plan. The results were periodically shared with ALCOSAN and its Basin Planners through a series of coordinating meetings. Specifically, the ability to develop a watershed based wet weather plan, selecting among alternative solutions and future cost assessments enabled the Pine Creek tributary municipalities to realistically look forward and consider the options that would best meet their needs.

The resulting joint preliminary feasibility study is presented in Appendix A and was submitted to ALCOSAN in response to ALCOSAN's request for a planning level submission regarding the peak flows delivered to A-68, potential long-term construction solutions to remedy the situation, and the construction costs associated with those solutions. This effort represents the first iteration towards integrating the communities' individual solutions into an overall sewershed. Future iterations need to be developed to jointly refine the type and location of facilities to create a more optimized solution to solve the sanitary sewage problems that exist within this sewershed.

The joint preliminary feasibility study with alternative analysis starts with specific reports from the respective municipal engineers using a common strategy, quality control, modeling and cost estimating protocols as is necessary to comply with ACO Section 15.c. (COA Section 14). The objective has been to utilize existing ALCOSAN SWMM models to address specific areas of concern or deficiencies identified by the communities in their sewer systems. Modeling these sewers will provide for a reasonable representation of the existing and proposed system responses while retaining consistency with the ALCOSAN H&H model. The flow estimates from each upstream municipality's facility alternatives are then integrated with facilities alternatives for Etna Borough's combined system and for the Etna-Shaler Trunk line needed to convey sewershed flows to the ALCOSAN Point of Connection A-68. The salient details will be provided to document the results relevant to the consolidation of sewer operations.

Levels of Control/Levels of Service

This section discusses the analyses that have been performed to reconcile the differing requirements imposed under the respective orders (ACO and COA) and to provide Preliminary Facilities Alternative Analysis and Flow Estimates to ALCOSAN on a joint sewershed basis.

The joint preliminary feasibility study provides an array of costs and flows for three anticipated levels of service- 2-, 5- and 10-year winter design storms- over three general ranges of CSO control. As separately sewered communities, Ross, Indiana, and Shaler used the design storms to determine costs associated with various levels of service. On the other hand, Etna evaluated the system conveyance and storage tank improvements required to reduce the number of activations at its permitted overflows and eliminate unpermitted points of overflow from its combined sewer system using the 2003 Typical Year storm events.

Based on the initial evaluation of the alternatives, CSO level of control analysis strongly suggested that solutions based on discreet storms approximate a range rather target a specific control level especially at a preliminary planning level of detail. The actual associated level of control for solutions would need to be verified using continuous simulation under the 2003 typical year, which is outside the scope of a preliminary planning effort. Nevertheless three ranges of CSO control were identified as 0-3 overflows per year, 4-7 overflows per year, and 8-11 overflows per year.

In the Pine Creek sewershed, the fact that upstream separated sewer systems flow into combined sewer areas and joint conveyance facilities create additional complexity in addressing wet weather problems. Ross and Shaler Township will need to convey additional flow to A-68 in addressing their respective sewer issues. The Ross-Shaler and Shaler Route 8 Interceptors also connect to the Etna-Shaler Trunk line. These flows will impact the operation of the Etna combined sewer system by imposing additional loadings on the trunk line. The Borough has formal conveyance

agreements that govern these arrangements and provide the basis for framework to reconcile the differing requirements imposed under the respective orders (ACO and COA).

Initially the upstream contributions were excluded in considering what is required in the Etna combined system to convey or store flow in order to reduce the number of overflows over a range of control options. Conveyance solutions consisted of modifications to Etna’s combined sewer mains, regulators/ connector pipes and trunk line in order to convey a given typical year storm to A-68 with minimal surcharge/manhole flooding and without resulting in an overflow. Conveyance alternatives either upsized the existing trunk line or created a parallel relief sewer. Storage options in combination with conveyance improvements were also examined using the SWMM model.

The modified ALCOSAN SWMM model was then used to size the parallel relief sewer in Etna (E1) to accommodate Ross Township Conveyance (R-1) and Storage (R-2) alternatives when in combination with the Shaler selected alternatives for the Ross-Shaler (S-1) and Route 8 (S-2) Interceptors under 2-, 5- and 10-year design storm levels of service. Model loadings from the Etna combined sewer system to Etna-Shaler Trunk line reflect the three ranges of CSO control: 0-3 overflows per year, 4-7 overflows per year, and 8-11 overflows per year. Routed flow hydrograph files at Ross-Shaler Interceptor MH1 and Route 8 Interceptor were used as model inputs for the 2-, 5- and 10-year design storm loading to the Etna-Shaler Trunk line. Trunk line improvements were therefore sized for 18 separate alternative combinations of level of control/level of service scenarios.

A simple naming convention was constructed in order to identify components of each alternative. For example, Alternative R-1/S-1/S-2/2/E-1/0-3 would consist of the following:

R-1/	S-1/	S-2/	2/	E-1/	0-3
Ross Ross/Shaler Sewer Alternative	Shaler/Indiana Alternative	Shaler Ross/Shaler Sewer Alternative	Design Year Storm	Etna Alternative	Overflow Range

Wet Weather Capital Requirements

Capital requirements for the respective municipal system wet weather improvements were estimated based on the ALCOSAN Alternative Costing Tool (ACT).

Ross Township has costed both Conveyance (R-1) and Storage (R-2) options for the using the ACT. The Present Worth Costs for each alternative is presented in the table below.

Ross Township Alternatives				
Alternative ID	Design Year	Location	Description	Municipal Alternative Cost
R-1	2	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000
R-2	2	Ross/Shaler Sewer - Ross	Storage	\$4,152,000
R-1	5	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000
R-2	5	Ross/Shaler Sewer - Ross	Storage	\$5,231,000
R-1	10	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000
R-2	10	Ross/Shaler Sewer - Ross	Storage	\$5,599,000

The following table presents the total present worth costs associated with the selected storage tank/parallel relief sewer alternative for the Ross-Shaler Interceptor (S-1) and the Route 8 Interceptor (S-2) and each of the 2-, 5-, and 10-year winter storm design events.

Shaler Township/Indiana Township Alternatives				
Alternative ID	Design Year	Location	Description	Municipal Alternative Cost
S-1	2	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$17,524,000
S-2	2	Rte 8 Sewer	Storage/Conveyance Combination	\$17,636,000
S-1	5	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$18,359,000
S-2	5	Rte 8 Sewer	Storage/Conveyance Combination	\$17,742,000
S-1	10	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$18,311,000
S-2	10	Rte 8 Sewer	Storage/Conveyance Combination	\$17,744,000

Wet weather conveyance requires modifications to Etna’s combined sewer system, specifically to sewer mains and regulator connector pipes. Using building footprints and GIS sewer maps, it is estimated that there some 458 upstream contributing connections in Shaler. Consequently Etna Borough improved facilities also accommodated the upstream catchment areas in Shaler Township that are directly connected into the Etna combined sewer system and are conveyed to the Etna-Shaler Trunk line. Because this is a preliminary sewershed level planning analysis, the relative attribution of costs between the two municipalities is not made in this study. The associated cost of the modifications to the Etna Borough system using the ACT is as follows for each level of CSO control.

Etna Borough Alternatives				
Alternative ID	Overflow Activation Range	Location	Description	Municipal Alternative Cost
E-1	0 to 3	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 9	\$1,602,000
E-1	4 to 7	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 10	\$1,247,000
E-1	8 to 11	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 12	\$73,000

The ACT was also used to cost the Etna Trunk line improvements required to accommodate the combined flows from Shaler, Ross, Etna, Indiana and other contributing areas. The analysis of trunk line alternatives demonstrated parallel relief sewers to be the more consistently cost effective approach over the range of levels of service and control. Using the modified SWMM model and the Etna Alternatives 9, 10 and 12 as starting points, parallel relief interceptors were sized. The following table presents the total present worth costs associated with the parallel relief interceptor sizing for the 18 alternative scenarios.

Pine Creek Alternatives				
Alternative ID	Overflow Activation Range	Location	Description	Municipal Alternative Cost
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$43,897,000
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$43,897,000
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$43,897,000
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$42,256,000
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$42,256,000
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$42,256,000
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$40,982,000
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$40,982,000
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$40,982,000
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$40,982,000
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$40,982,000
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$40,982,000
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$38,206,000
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$38,206,000
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$41,731,000
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$38,109,000
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$38,257,000
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$38,502,000

The preceding costs were then compiled to yield a composite cost for the total Pine Creek service area. The table below summarizes the combined ACT costs for the each alternative on a sewershed basis for the 18 alternative scenarios.. The total would reflect the costs of the Ross Township Alternative (R-1 or R-2), the Shaler Township Alternatives (S-1 and S-2), required modifications to Etna’s combined sewer systems sewer mains and regulator connector pipes and the Etna-Shaler Trunk line parallel relief interceptor (E-1).

Pine Creek Sewershed Alternative Combined Costs	
Alternative ID	Combined Costs
R-1/S-1/S-2/2/E-1/0-3	\$81,975,000
R-1/S-1/S-2/5/E-1/0-3	\$82,916,000
R-1/S-1/S-2/10/E-1/0-3	\$82,870,000
R-2/S-1/S-2/2/E-1/0-3	\$83,170,000
R-2/S-1/S-2/5/E-1/0-3	\$85,190,000
R-2/S-1/S-2/10/E-1/0-3	\$85,512,000
R-1/S-1/S-2/2/E-1/4-7	\$78,705,000
R-1/S-1/S-2/5/E-1/4-7	\$79,646,000
R-1/S-1/S-2/10/E-1/4-7	\$79,600,000
R-2/S-1/S-2/2/E-1/4-7	\$81,541,000
R-2/S-1/S-2/5/E-1/4-7	\$83,561,000
R-2/S-1/S-2/10/E-1/4-7	\$83,883,000
R-1/S-1/S-2/2/E-1/8-11	\$74,755,000
R-1/S-1/S-2/5/E-1/8-11	\$75,623,000

Pine Creek Sewershed Alternative Combined Costs	
Alternative ID	Combined Costs
R-1/S-1/S-2/10/E-1/8-11	\$79,175,000
R-2/S-1/S-2/2/E-1/8-11	\$77,494,000
R-2/S-1/S-2/5/E-1/8-11	\$79,662,000
R-2/S-1/S-2/10/E-1/8-11	\$80,229,000

The ACT estimates of sewershed wet weather liabilities fell between \$75-85 million on Present Worth basis over range of levels of control and service. [Figure 1](#) presents the relationship of the cost of the combined sewershed alternatives according to level of service (Design Storm) when graphed against the three ranges of CSO control.

No selection of a preferred facility alternative on sewershed basis can be made at this time without determination of the required levels of service and control. These must be coordinated with ALCOSAN and its proposed plan for wet weather control as well as through discussions with regulatory agencies.

Sensitivity Analysis for Capital Costs

During the process of working with the ACT and in reviewing the resultant costs, the Pine Creek municipal engineers observed idiosyncrasies in the ACT. In addition, concern was expressed as to the magnitude of costs and potential effects in weighing alternatives. Review of the ALCOSAN Costing Tool by the 3WW Municipal Costing Subcommittee revealed three distinct tiers of costs when ALCOSAN, PWSA and Local Municipal project costs were compared. [Figure 2](#) is illustrative of this relationship. As can be seen, ALCOSAN ACT costs represent the high end of estimates in the comparison.

While it should be kept in mind that the ACT is intended to provide a consistent basis to compare and differentiate among alternatives, the Pine Creek engineers concluded that use of single point conceptual estimates is a questionable practice when considering potential sewershed liabilities and alternative consolidation options. Consequently it was decided to evaluate the ALCOSAN Costing Tool (ACT) using sensitivity analysis to examine how the variation or uncertainty in the output of the costing model can be attributed to different variables in the inputs of the model. The goal of the analysis was to answer the question “if the cost variables used in the ACT deviate from expectations, what will be the effect on the cost estimates prepared for the various alternatives. A secondary goal of the analysis was to determine if the weighting of alternatives (i.e. storage tanks vs. conveyance) was unbalanced by any specific costing functions in the ACT.

In screening the input factors, it was determined that the following five factors were significant in the resultant ACT cost calculations for the following reasons:

- In comparison to R.S. Means, a construction industry estimating standard, the ACT trench excavation unit cost was substantially higher. For example, the ACT indexed a cost table that set 10’ excavation at \$20/CY while R.S. Means placed that value at \$3.95/CY. The R.S. Means values for various excavation depths were used as a substitute table to calculate segment trench excavation costs.
- The fixed unit cost for rock excavation costs was not directly adjusted, however as this fixed cost was added to the trench excavation cost by the ACT, the adjustment in the latter resulted in an adjustment to rock excavation costs.
- Trench wall support unit cost in the ACT was found to be low in comparison to R.S. Means up to a depth of 15’ at \$0.06/SF, and then increased to \$33/SF for depths greater than 15’. The R.S. Means values for trench wall support at various excavation depths were used as a substitute table to calculate segment trench wall support costs
- A random sampling of the dewatering cost multiplier applied to segments requiring dewater in the ACT (10% increase in the calculated construction value) was found to be substantially higher than

that calculated by using R.S. Means values for the identical segment. The random sampling found that a 1% increase in calculated construction value was a mean average to be applied in the User Defined input for dewatering cost multiplier in the ACT.

- Storage tank facility calculated costs used in the ACT were based on a curve derived from historic Indianapolis IN above ground tanks construction values as supplied in the ACT input tables. Historic data in the ACT tables for above ground tanks constructed in the Pittsburgh region was used to derive an alternate cost curve (Figure 3). Values for tanks in the neighborhood of 100,000 gallons were similarly priced but cost diverged greatly for tanks greater than 1.0 MG.

The second step in the sensitivity analysis was to modify the ACT as described and rerun the cost calculations for the Ross, Shaler, Etna, and Pine Creek (Etna Trunk line) Alternatives using the modified ACT. The revised combined sewershed costs (Combined Costs Cost 1) were then derived from these revised ACT costs. The following table compares the original ACT and modified ACT combined costs:

Pine Creek Watershed Alternative Combined Costs			
Alternative ID	Combined Costs	Combined Costs Cost 1*	Net Difference
R-1/S-1/S-2/2/E-1/0-3	\$81,975,000	\$35,832,000	\$46,143,000
R-1/S-1/S-2/5/E-1/0-3	\$82,916,000	\$36,708,000	\$46,208,000
R-1/S-1/S-2/10/E-1/0-3	\$82,870,000	\$36,747,000	\$46,123,000
R-2/S-1/S-2/2/E-1/0-3	\$83,170,000	\$36,418,000	\$46,752,000
R-2/S-1/S-2/5/E-1/0-3	\$85,190,000	\$37,967,000	\$47,223,000
R-2/S-1/S-2/10/E-1/0-3	\$85,512,000	\$38,133,000	\$47,379,000
R-1/S-1/S-2/2/E-1/4-7	\$78,705,000	\$32,079,000	\$46,626,000
R-1/S-1/S-2/5/E-1/4-7	\$79,646,000	\$32,955,000	\$46,691,000
R-1/S-1/S-2/10/E-1/4-7	\$79,600,000	\$32,994,000	\$46,606,000
R-2/S-1/S-2/2/E-1/4-7	\$81,541,000	\$33,164,000	\$48,377,000
R-2/S-1/S-2/5/E-1/4-7	\$83,561,000	\$34,713,000	\$48,848,000
R-2/S-1/S-2/10/E-1/4-7	\$83,883,000	\$34,879,000	\$49,004,000
R-1/S-1/S-2/2/E-1/8-11	\$74,755,000	\$28,953,000	\$45,802,000
R-1/S-1/S-2/5/E-1/8-11	\$75,623,000	\$29,791,000	\$45,832,000
R-1/S-1/S-2/10/E-1/8-11	\$79,175,000	\$30,078,000	\$49,097,000
R-2/S-1/S-2/2/E-1/8-11	\$77,494,000	\$29,867,000	\$47,627,000
R-2/S-1/S-2/5/E-1/8-11	\$79,662,000	\$31,529,000	\$48,133,000
R-2/S-1/S-2/10/E-1/8-11	\$80,229,000	\$31,807,000	\$48,422,000

*Changes were made to the ACT in the excavation, shoring, dewatering, and storage tanks curves used to calculate the cost of different alternatives.

As can be seen, the revisions result in a significant average reduction of 58.5% in combined sewershed costs associated with the alternatives. The revised ACT estimates of Pine Creek sewershed wet weather liabilities fell between \$29-38 million on Present Worth basis over range of levels of control and service. Thus the sensitivity analysis reveals that a wide range of costs is bracketed by the ACT input assumptions and the use of standard estimating values.

The ACT revisions also change the relationship among combined sewershed alternatives. Figure 4 depicts the revised ACT cost of the combined sewershed alternatives according to level of service (Design Storm) when graphed against the three ranges of CSO control. When Figure 4 is compared to Figure 1, the “knee” in the ACT cost curves and the anomaly in the R1-10yr cost curve for Alternative 17 both disappear with the revised ACT curves. The revised ACT plot also shows a reduced spread between the respective levels of service and a steeper, more linear relationship over the levels of CSO control.

ACT Operating and Maintenance Requirements

Sewer system operating and maintenance (O & M) costs are of interest to any discussion of sewer system consolidation. Collection system maintenance is required to meet requirements under the ACO/COA as well as to maintain system capacity. As such these costs represent a recurring annual burden on municipal budgets that may be reduced or eliminated through sewer system consolidation.

Maintenance for the purposes of this report would include cleaning, monitoring, inspection, rehabilitation and relief. However, this study also considers proposed wet weather facilities. Therefore the additional operating costs for storage and conveyance facilities represent incremental liabilities that need to be costed and considered along with the capital costs for the wet weather facilities themselves.

The ACT generates an estimate of annual operating costs as a component of the total Present Worth Project valuation. Using the tabulated pipe diameter summary for the Pine Creek in [Appendix B](#) an estimate of the annual operating costs for the respective municipal sewer systems was derived.

Pine Creek Sewershed	Est Annual System O&M (ACT)			
	Est Annual System O&M (ACT)	Est. Accts.	Annual O&M / Acct.	Qtrly. O&M / Acct.
MTSA- Bennington	\$ 32,000.00	75	\$ 426.67	\$ 106.67
Ross	\$ 687,000.00	1,628	\$ 421.91	\$ 105.48
Shaler	\$ 3,149,000.00	8,193	\$ 384.35	\$ 96.09
Indiana	\$ 69,000.00	158	\$ 437.65	\$ 109.41
Ohara	\$ 39,000.00	16	\$ 2,511.27	\$ 627.82
Etna	\$ 450,000.00	1,688	\$ 266.54	\$ 66.64
Total	\$ 4,426,000.00	11,758	\$ 376.43	\$ 94.11

The annual operating costs for any storage facilities were also derived using the ACT. These were as follows:

Ross Township Alternatives				
Alternative ID	Design Year	Location	Description	ACT Annual O&M Costs
R-1	2	Ross/Shaler Sewer -Ross	Conveyance - Parallel Pipe	\$0
R-2	2	Ross/Shaler Sewer - Ross	Storage	\$56,000
R-1	5	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$0
R-2	5	Ross/Shaler Sewer - Ross	Storage	\$61,000
R-1	10	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$0
R-2	10	Ross/Shaler Sewer - Ross	Storage	\$61,000

Shaler Township/Indiana Township Alternatives				
Alternative ID	Design Year	Location	Description	ACT Annual O&M Costs
S-1	2	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$11,000
S-2	2	Rt 8 Sewer	Storage/Conveyance Combination	\$12,000
S-1	5	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$11,000
S-2	5	Rt 8 Sewer	Storage/Conveyance Combination	\$11,000
S-1	10	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$12,000
S-2	10	Rt 8 Sewer	Storage/Conveyance Combination	\$12,000

Sensitivity Analysis for O & M Costs

During the process of working with the ACT and in reviewing the resultant costs, the \$ 4.4 million estimate of O & M costs for the Pine Creek municipal systems appeared excessively high when compared to current reported levels of sewer O & M expenditures and the fact that the communities will address their system defects over the near term a mandated under the ACO/COA. Consequently it was decided to evaluate the ALCOSAN Costing Tool (ACT) O & M estimates using a sensitivity analysis.

In the case of O & M costs, the Average and Median sewer system operating costs from the 2003 Water Environment Research Foundation (WERF) Survey (EPA, **Guide For Evaluating Capacity, Management, Operation, And Maintenance (CMOM) Programs At Sanitary Sewer Collection Systems, 2005**). The WERF study presented the results of a nation wide survey of annual sewer system operating costs. Operating costs were comprehensive and included all O & M, Repair and Replacement, and Capital Project Costs. The study found an average annual cost of \$12,500/mi./year; and a median annual cost of \$5000/mi./year. Using the WERF annual costs as a basis for the estimates, Pine Creek Sewershed annual operating cost ranged from \$790,000 to \$1,970,000 on the basis of miles of sewers found in the respective municipal systems. The individual O & M expenditures for each community could also be estimated as well. The table also presents the estimated annual /quarterly O & M cost per account.

WERF Sewer System Operating Costs Survey 2003								
Pine Creek Sewershed	Sewer (LF)	Sewer (Mi.)	Annual Costs			Annual Costs @		
			@ WERF Median Annual	Annual O&M / Acct.	Qtrly. O&M / Acct.	WERF Annual Average	Annual O&M / Acct.	Qtrly. O&M / Acct.
MTSA- Bennington	5,850	1.108	\$ 5,540.00	\$ 73.87	\$ 18.47	\$ 13,850.00	\$ 184.67	\$ 46.17
Ross	127,179	24.087	\$ 120,435.00	\$ 73.96	\$ 18.49	\$ 301,087.50	\$ 184.91	\$ 46.23
Shaler	593,847	112.471	\$ 562,355.00	\$ 68.64	\$ 17.16	\$ 1,405,887.50	\$ 171.59	\$ 42.90
Indiana	12,793	2.423	\$ 12,115.00	\$ 76.84	\$ 19.21	\$ 30,287.50	\$ 192.11	\$ 48.03
Ohara	7,223	1.368	\$ 6,840.00	\$ 440.44	\$ 110.11	\$ 17,100.00	\$ 1,101.09	\$ 275.27
Etna	83,197	15.757	\$ 78,785.00	\$ 46.67	\$ 11.67	\$ 196,962.50	\$ 116.66	\$ 29.17
Total	830,090	157.214	\$ 786,070.00	\$ 66.85	\$ 16.71	\$ 1,965,175.00	\$ 167.14	\$ 41.78

ACT storage O & M costs were also compared to Alternative costs generated using the local cost curve. The following table presents these costs. As can be seen in the table, a relatively narrow range is encompassed by the ACT and Alternative O & M Costs.

Alternative ID	ACT Annual O&M Costs	Alternative Annual O&M Costs
R-1/S-1/S-2/2	\$11,000	\$23,000
R-1/S-1/S-2/5	\$68,000	\$80,000
R-1/S-1/S-2/10	\$11,000	\$23,000
R-2/S-1/S-2/2	\$72,000	\$84,000
R-2/S-1/S-2/5	\$12,000	\$23,000
R-2/S-1/S-2/10	\$73,000	\$84,000

Comparison of Pine Creek Sewer Assets (Replacement Basis) and Liabilities

As seen in [Appendix B](#), the Pine Creek municipal sewer systems represent over 157 miles of sewers. If the ACT is used to value these infrastructure assets, the estimated value of the Pine Creek is \$144.5 million on a replacement value basis. When the modified ACT using Means cost data is used, the total value of the systems is \$88 million. These estimates are presented in [Appendix C \(Appendix C ACT Means Repl Summary Table.pdf\)](#) for each community system as well as for the Pine Creek sewershed. On the other hand, the estimated capital requirements needed for Pine Creek wet weather compliance average \$ 81.9 million using the ACT and \$33.6 million using the Modified ACT inputs from Means, respectively. Therefore depending on the basis of the estimate, wet weather capital requirements are significant: representing 56.0% and 38.2% of the total estimated system valuations for Pine Creek. It is thus understandable that other options need to be considered in addition to the present ownership and operating arrangements by the Pine Creek communities.

Existing Agreements

As areas developed and were added in Pine Creek, service agreements were executed between the municipalities to provide for conveyance capacity. These agreements usually specified sharing arrangements for capital and operating costs. As a consequence, there are well-established contractual relationships among the trunk line partners. The available agreements governing the use and operation of sewers among the Pine Creek communities are presented and described in the Pine Creek Sewershed Intermunicipal Agreements Summary Table in [Appendix D](#).

The critical agreements from the perspective of the Pine Creek Sewershed are the 1921 Agreement between Etna and Shaler to connect the Shaler Trunk line to the Etna Trunk line, the 1957 Agreement between Ross, Shaler and Etna that governs the connection of Ross/Shaler Trunk line to the Etna Trunk line and the 1969 Agreement that connects the Indiana Township sewers in the Middle Road area to the Shale and Etna Trunk lines. Under these agreements, Etna retains ownership of the Etna Trunk line but creates an operating partnership among participants. The Agreements all stipulate that Etna can cause the others to remedy any condition that interferes with the proper and reasonable operation of the Etna Trunk line. The 1969 Agreement amends Paragraph 5 of 1957 Agreement as follows: "...the cost and maintenance, repair, replacement and relocation of said trunk sanitary sewer shall be borne by the parties in the following proportions: Shaler 29%, Ross 29%, Etna 29%, Indiana 13%."

Therefore under current arrangements, each Pine Creek community is responsible for its own system improvements and operating costs as well as a set proportion of the costs associated with the conveyance of sewage by the Etna Trunk line to the ALCOSAN point of connection. Given the magnitude of the estimated capital requirements, it is likely that these wet weather improvements would be financed through PENNVEST, Bonds or other available municipal financial instruments. [Appendix E](#) presents the annual debt service requirements for each municipal alternative for a 20 year loan under three interest rate scenarios of 4%, 6% and 8%. The debt service for both ACT and modified ACT estimated costs are tabulated in order to present a range. As an example, if Etna Borough needed to finance its own system improvements at 6% for a level of CSO control of 4-7 overflows (E-1) per year it would likely incur an annual debt service falling in the range of \$107,207 and \$79,696. [Appendix F](#) presents the same data on a per customer basis. Thus for the Etna example, sewer system improvements at 6% for a level of CSO control of 4-7 overflows (E-1) per year would be expected carry a \$47- \$64 annual cost per customer. Remembering that the Pine Creek Alternatives refer to upgrades to the Etna Trunk line to accommodate upstream contributions as well those from Etna combined system, the per customer costs presented are derived from the estimated 11,758 customers in the Pine Creek sewershed,

Alternative Models to Manage, Operate and Finance Improvements

The second phase of work was directed at the exploration of the associated costs of five consolidation options, given the array of capital improvements and O & M requirements needed to meet regulatory wet weather mandates. Because agreements are in place and provide a fundamentally well-defined relationship among the partner municipalities, it is feasible for this study to explore consolidation options in detail from a financial rather than a legal perspective. Here the objective was the examination of how the five options below would impact each partner municipality within the context of Pine Creek sewershed and provide the basis for discussions. The options are:

1. Updating and standardizing the existing multi-municipal agreements
2. Transfer trunk line(s) and wet weather facilities responsibility to ALCOSAN

3. Transfer shared trunk line, wet weather facilities and collection system responsibility to a new authority
4. Operating Committee assumes trunk line
5. Transfer shared trunk line responsibility to an Environmental Improvement Compact (EIC)

Continued Use of Intergovernmental Agreements

Use of the existing agreements to address wet weather issues is a feasible management option. It carries the advantage of using what is currently in place. The agreements establish downstream control by stipulating the primacy of the operation of the Etna system. However the agreements do not explicitly address wet weather issues such a conveyance of I/I, level of service, etc. In addition, the agreements do not address how future regulatory initiatives would be handled. At present the agreements would only apply to replacement of the existing trunk line with larger pipes. They would not apply to implementing lower cost conveyance alternatives such as parallel relief sewers. There are also concerns about the fairness and equitable in the existing allocations of costs. Refer to Ross Engineer Art Gazdik's letter ([Appendix G](#)) for a discussion of these concerns. For these reasons, it is likely the agreements would have to be modified in order to move forward. Experience elsewhere has shown that amending existing agreements can be a tedious and extended process.

[Appendix H](#) presents the respective municipal costs are based upon current multi-municipal agreement allocation: (Ross 29%, Shaler 29%, Etna 29% & Indiana 13%) plus local costs using the ACT estimates for a 20 year loan under three interest rate scenarios of 4%, 6% and 8%. The costs are expressed as a total annual debt service cost and as an annual cost per customer. [Appendix I](#) presents the respective municipal costs using the Revised ACT costs. Changes were made to the ACT in the excavation, shoring, dewatering, and storage curves used to calculate the cost of different alternatives.

Transfer of Assets to ALCOSAN

Transfer of assets to ALCOSAN has been advocated for some time as a management option. Under this option municipalities tributary to ALCOSAN would request that ALCOSAN take over the ownership and long-term operation and maintenance (O&M) of the critical sewers, existing sanitary sewer facilities, and proposed facilities. Please refer to the white paper submitted by Shaler Manager Tim Rodgers and Engineer Kevin Creagh in [Appendix J](#).

A critical consideration is the extent that ALCOSAN would assume ownership and responsibility. For the purposes of this study, it is assumed that ALCOSAN at a minimum would take over the ownership of the Etna trunk line. Accordingly, the annual debt service burden and per customer charges for each municipality attributable to wet weather mandates under [Appendices H](#) and [I](#) would be limited to the required capital improvements to municipality's sewer system and annual operating costs.

New Joint Authority

Under this option, joint authority would own and operate all of the sanitary sewers and combined sewers that contribute to ALCOSAN. In this instance the Authority would underwrite annual debt and operating costs and invoices either individual municipalities or individual customers. Art Gazdik of Ross Township has submitted a white paper supporting a north area authority. This authority could also be multipurpose: involved in the management of storm sewer, stormwater management and flood management. Refer to [Appendix K](#) for this discussion.

Examination of a regional authority is beyond the scope of this study. Nevertheless, formation of an authority for the Pine Creek sewer shed remains a feasible option that is consistent with the study scope. Based on EPA estimates, a staff of 9 would be needed (EPA 1973). Authority costs would consist of annual debt service (estimated at 5% over fifty years), storage facility O & M, and system operating costs. Start-up costs are not considered under this analysis. [Appendix L](#) presents the estimated annual associated debt service and annual cost per account for the upper and lower estimates of system operating costs for the range of Pine Creek Watershed Alternative Combined Costs.

Operating Committee

This option would assume operation of the Etna Trunk line while the respective communities retain ownership and operation of their respective collection systems. This option would entail revised agreements in order to be established. The existing operating partnership would be turned into an operating committee along the line of the Lowries Joint Operating Committee. The operating committee could underwrite the trunk line improvements and invoice either individual municipalities or individual customers.

Other Options (Environmental Improvement Compacts)

Environmental Improvement Compacts (EICs) have been mentioned as a consolidation option under several 3RWW funded studies. An EIC, when formed under Act 39 of 1972, is a corporate entity empowered to deliver municipal functions involving two or more municipalities. An EIC must be created by referendum in the participating municipalities. The EIC is governed by an elected board with the right of eminent domain and the power to fix and collect property taxes of up to 2 mills. It is our understanding that an EIC has yet to be formed in Pennsylvania. This is understandable in light of the political start up requirements and potentially controversial powers to condemn and assess taxes. Consequently an EIC cannot be currently seen as a likely option for Pine Creek sewer consolidation when compared to other, more feasible options.

Cost Comparison among Options (Alternative R-2/S-1/S-2/2/E-1/4-7)

As stated previously, no selection of a preferred facility alternative on sewershed basis can be made at this time without determination of the required levels of service and control. However cost comparisons among consolidation options can be simplified by the assumption of a level of service and a level of CSO control. The 2-year design storm level of service and a 4-8 overflow/year level of control frequency represent reasonable regional wet weather assumptions for separate and combined systems based on our discussions with ALCOSAN Basin Planners. Consequently Alternative R-2/S-1/S-2/2/E-1/4-7 is used as a reference for comparison purposes.

[Appendix M](#) presents the annual cost for each option for each Pine Creek community on a per customer basis. To some extent this analysis is incomplete because the ALCOSAN cannot project rates and its wet weather control implementation schedule at this time. Moreover the impacts of a regional assumption of main trunk lines on the ALCOSAN rates must remain conjecture at this time. Nevertheless, the relative cost impacts associated with each option can be seen among the four options. From the comparison it is evident that each Pine Creek community has a distinct set of interests that may diverge when the respective costs are weighed. A critical consideration is where the capital and operating requirements reside along the range of costs when considered in tandem with the respective level of control and level of service.

Discussion

The Pine Creek Consolidation study is product of extended discussions among the Pine Creek engineers regarding wet weather facilities and associated costs. These discussions have included ALCOSAN and its Basin Planning consultants on a continuing basis in order to fulfill ALCOSAN requests for a Preliminary Feasibility study. As can be seen by the position papers submitted, the study has stimulated and benefited from spirited discussions among the participating communities on consolidation options.

On July 25, 2011 the managers and engineers for Ross, Shaler, Indiana and Etna met to review the consolidation options and associated costs. Based on the meeting discussions, the following issues emerged as notable topics for discussion:

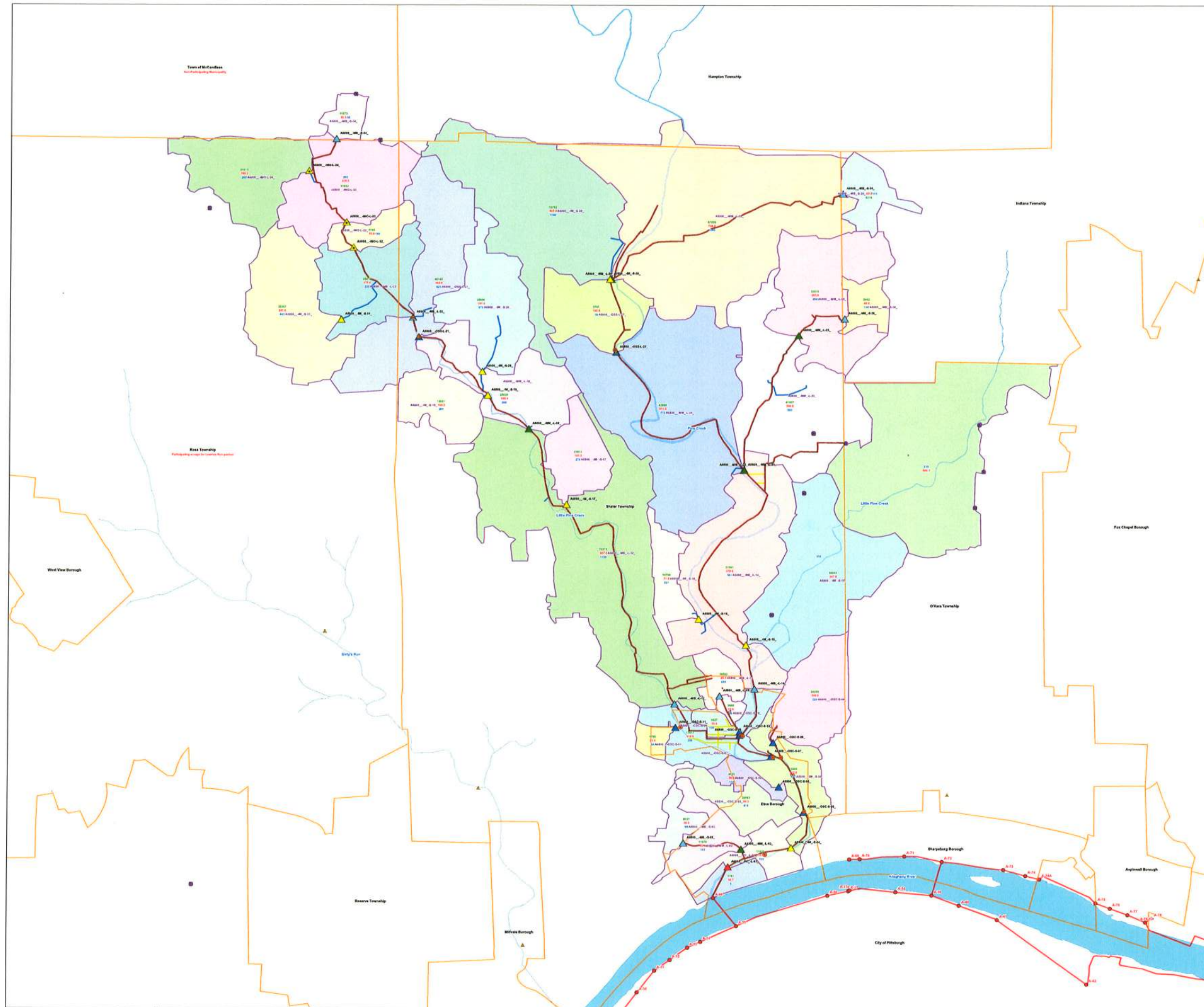
- Source Reduction Efforts: it was argued that source reduction programs would be hindered under options that retained municipal sewer system ownership. It was felt that municipalities were ill equipped to address politically difficult foundation drains.

- **Transfer of Assets to ALCOSAN:** This option entailed a large number of unknowns including the level of ALCOSAN interest in Pine Creek, the implementation schedule, ALCOSAN wet weather control priorities, the impact on ALCOSAN rates of a regional takeover of critical sewer and wet weather facilities, and ALCOSAN maintenance track record for conveyance facilities. Shaler Township reiterated its support for such an option.
- **Sewershed Consolidation:** Certain consolidation options were acceptable on planning basin or regional basis, but not supported on sewershed basis because there did not appear sufficient incentives to do so at this time. Communities in multiple sewer sheds preferred options on a planning basin or regional basis.
- **Fairness and Equity Issues:** Cost proportioning under the existing agreements was controversial. Both Ross and Indiana Townships expressed dissatisfaction with the cost proportioning under the current Etna Trunk line Agreement and questioned the suitability of the agreement as basis on which to move forward on a sewer shed basis unless an equitable cost allocation could be achieved. Indiana Township, in particular, felt the ACO mandated liabilities created a disproportionate burden given the small number of connections it had to the ALCOSAN system. This concern was supported by the cost analysis.
- **Governance Issues:** How representation would be structured under the consolidation options was a concern. Etna Borough supported regional sewer consolidation as a general objective but had questions on how the process of regionalization would proceed with respect to the Pine Creek sewershed. While the Borough was open to a number of consolidation options, it was concerned about the effects of the large number of unknowns would have on the final form and associated costs of sewer consolidation.

The review of results and discussions were limited to the managers and engineers of the four Pine Creek communities and reflect the opinions of the persons involved. They do not necessarily represent the positions of the respective elected governing boards. Nevertheless, the cost figures provide a consensus basis for further discussions with respect to consolidation in the Pine Creek sewershed.

Figure 3-11:

Main Rivers
Monitor Locations
'Pine Creek'



- Legend**
- ▲ Permanent Flow Monitor
 - ▲ Previous Flow Monitor Location
 - ▲ ALCOSAN POC Monitor
 - ▲ CSO/SSO Structure Monitor
 - ▲ Municipal Boundary Monitor
 - ▲ Multi-Municipal Conveyance Monitor
 - ▲ Internal Municipal Sub Area Monitor
 - ▲ Internal Municipal Overflow Monitor
 - ▲ Supplanted Monitor - Prior Data
 - CSO/SSO Structure
 - Pump Location
 - ▭ Municipal Boundary
 - ALCOSAN Structure
 - ALCOSAN Intceptor
 - Multi Municipal Sewer
 - Major Municipal Sewer
 - Basement Backups
 - Manhole Overflows
 - ▭ Delineation Outline

Labels:
 250 = Number of Buildings Within Delineation
 10150 = Length of Pipe Within Delineation
 125 = Acreage of Delineation



**3 Rivers
Wet Weather
Demonstration Program**

Improving our region's water quality

Prepared By:
Program Management Team

Baker **WADETRIM**

Leonon, Smith, Souder
Engineering, Inc.
Pittsburgh, Pennsylvania

Collective Efforts, LLC
Civil and Environmental Engineers

June 1, 2006

0 500 1,000 2,000 3,000 4,000 Feet

Pine Creek Alternatives Total Cost Per Alternative

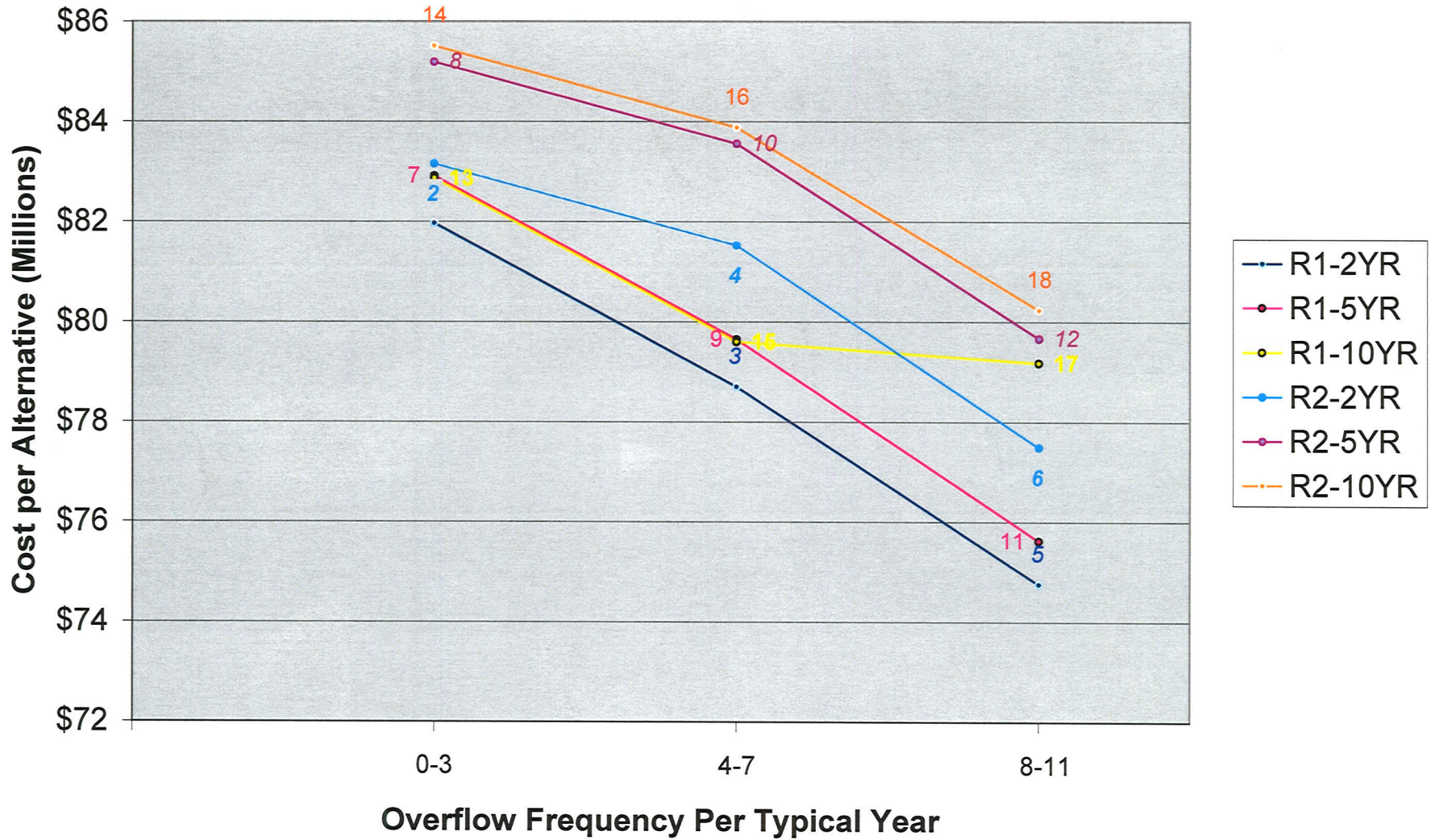


FIGURE 1

3RWW Municipal Costing Subcommittee Open Cut to 12' Deep Unimproved Area

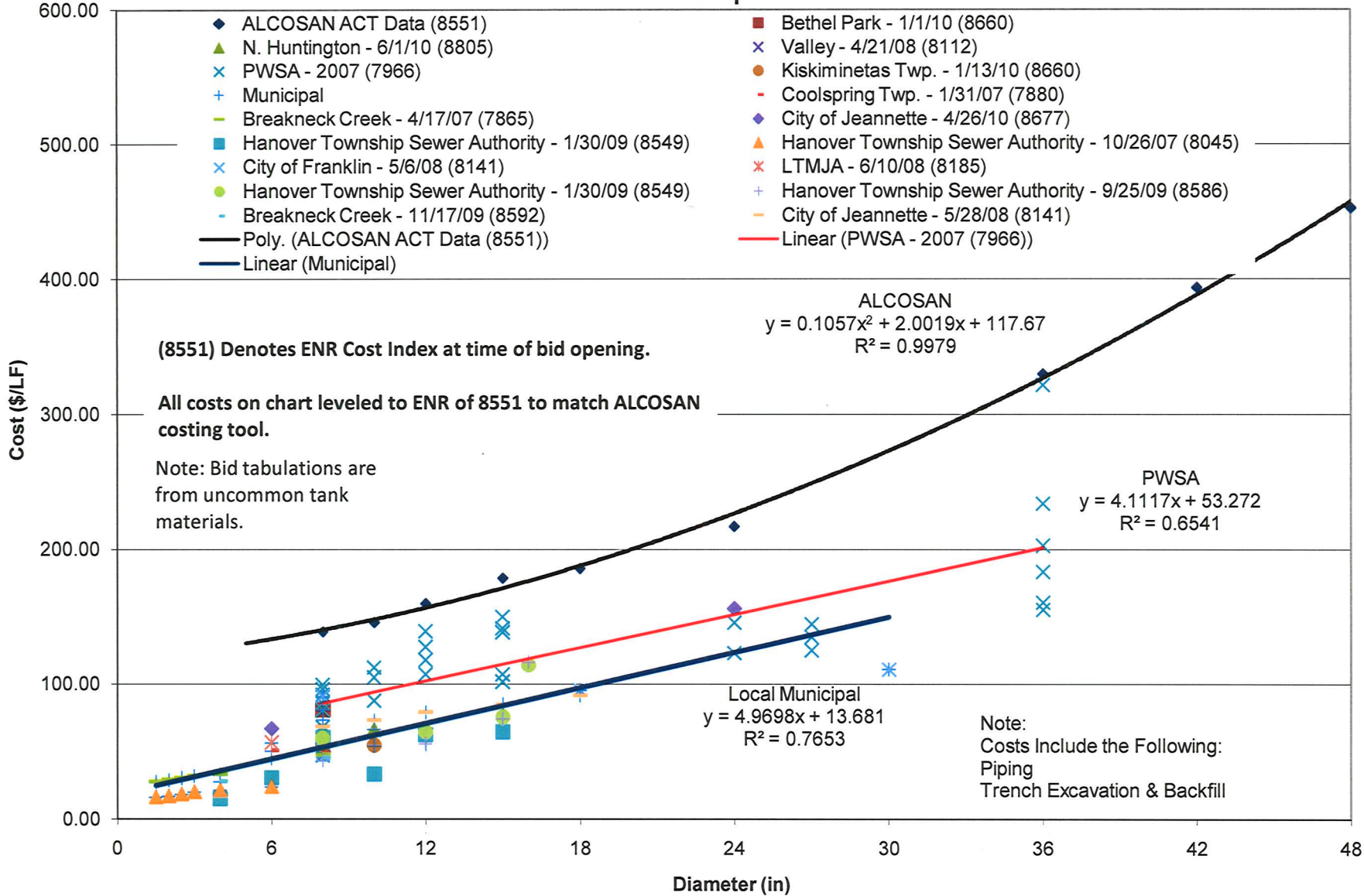


FIGURE 2

Pittsburgh Region Storage Tank Costs

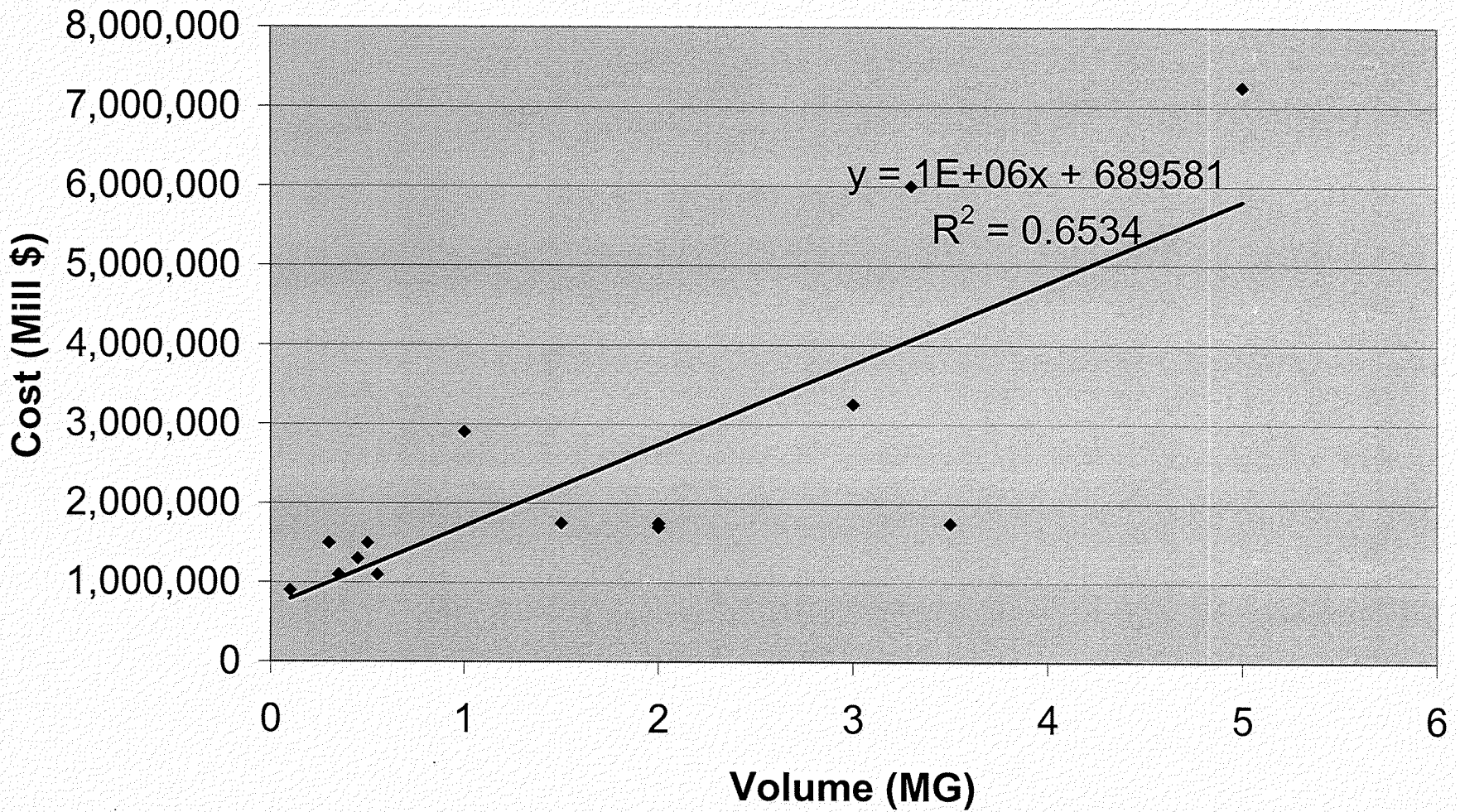


FIGURE 3

Pine Creek Alternatives Total Cost per Alternative (ACT Revision)

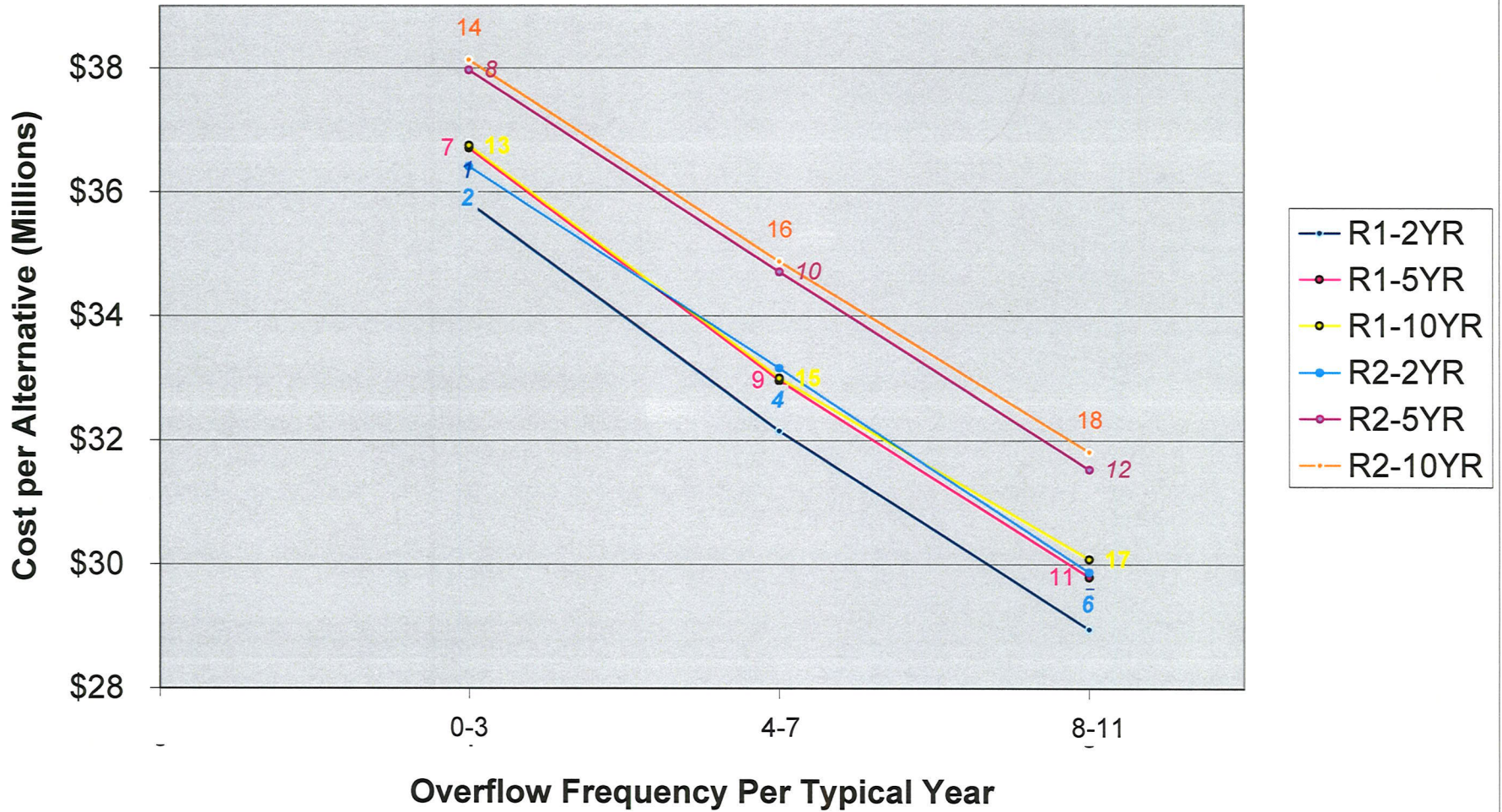


FIGURE 4

Estimated Owner and Pipe Diameter Summary A68				
	Pipe	Pipe	Pipe	Inch
	Diameter	Count	Miles	Miles
Etna				
	<10	156	4.99	39.772
	10	76	2.78	27.797
	12	37	1.125	13.495
	15-17	36	1.192	17.88
	18-23	43	1.314	25.001
	24-35	78	2.936	75.519
	36-59	35	1.393	52.026
	=>60	1	0.027	1.632
		462	15.756	253.121
Indiana				
	<10	25	2.423	19.384
		25	2.423	19.384
McCandless				
	<10	38	1.108	8.862
		38	1.108	8.862
Ohara				
	<10	48	1.368	9.662
		48	1.368	9.662
Ross				
	<10	629	21.32	170.478
	10	37	1.316	13.156
	15-Dec	31	1.451	17.416
		697	24.087	201.05
Shaler				
	<10	3133	101.489	809.706
	10	78	2.691	26.911
	12	16	0.66	7.919
	15	49	2.327	34.91
	18	79	3.625	65.406
	24	38	1.679	40.299
	Shaler Totals	3393	112.471	985.15
Grand Total		4663	157.213	1477.229

Pine Creek Joint Planning Committee
 Estimated System Value by Municipality/Owner
 Means Estimate

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Etna						
	<10	26,347.2	10	143	\$402,905	\$2,139,656
	10	14,678.4	10	84	\$236,672	\$1,480,904
	12	5,940.0	10	34	\$95,796	\$783,308
	15-17	6,293.8	10	36	\$101,431	\$977,547
	18-23	6,937.9	10	39	\$109,883	\$1,196,028
	24-35	15,502.1	10	88	\$247,942	\$2,969,113
	36-59	7,355.0	10	42	\$118,336	\$1,985,861
	=>60	142.6	10	2	\$5,635	\$46,332
Etna Totals per Category		83,197.0			\$1,318,599	\$11,578,749
Etna Grand Total						\$12,897,348

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Indiana						
	<10	12,793.4	8	28	\$67,689	\$1,038,955
Indiana Totals per Category		12,793.4			\$67,689	\$1,038,955
Indiana Grand Total						\$1,038,955

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
McCandless						
	<10	5,850.2	8	42	\$103,380	\$475,098
McCandless Totals per Category		5,850.2			\$103,380	\$475,098
McCandless Grand Total						\$578,478

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Ohara						
	<10	7,223.0	8	53	\$129,963	\$586,583
Ohara Totals per Category		7,223.0			\$129,963	\$586,583
Ohara Grand Total						\$716,546

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Ross						
	<10	112,569.6	8	622	\$1,531,003	\$9,141,777
	10	6,948.5	8	0	-	\$701,032
	12'	7,661.3	8	0	-	\$1,010,293
Ross Totals per Category		127,179.4			\$1,531,003	\$10,853,102
Ross Grand Total						\$12,384,106

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Shaler						
	<10	535,861.9	8	2958	\$7,280,880	\$43,517,347
	10	14,208.5	8	79	\$194,295	\$1,433,494
	12	3,484.8	8	19	\$47,653	\$459,541
	15	12,286.6	8	68	\$168,013	\$1,908,348
	18	19,140.0	8	106	\$261,731	\$3,299,545
	24	8,865.1	8	49	\$121,227	\$1,697,936
Shaler Totals per Category		593,846.9			\$8,073,799	\$52,316,210
Shaler Grand Total						\$60,390,009

2011 Estimated Value of Pine Creek System \$ 88,005,442

**Pine Creek Joint Planning Committee
Estimated System Value by Municipality/Owner**

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Etna						
	<10	26,347.2	10	143	\$1,103,000	\$4,283,000
	10	14,678.4	10	84	\$629,000	\$2,479,000
	12	5,940.0	10	34	\$251,000	\$1,098,000
	15-17	6,293.8	10	36	\$259,000	\$1,308,000
	18-23	6,937.9	10	39	\$281,000	\$1,497,000
	24-35	15,502.1	10	88	\$597,000	\$3,967,000
	36-59	7,355.0	10	42	\$578,000	\$4,324,000
	=>60	142.6	10	2	\$25,000	\$103,000
Etna Totals per Category		83,197.0			\$3,723,000	\$19,059,000
Etna Grand Total					\$22,782,000	

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Indiana						
	<10	12,793.4	8	28	\$177,000	\$1,631,000
Indiana Totals per Category		12,793.4			\$177,000	\$1,631,000
Indiana Grand Total					\$1,631,000	

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
McCandless						
	<10	5,850.2	8	42	\$266,000	\$746,000
McCandless Totals per Category		5,850.2			\$266,000	\$746,000
McCandless Grand Total					\$1,012,000	

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Ohara						
	<10	7,223.0	8	53	\$284,000	\$972,000
Ohara Totals per Category		7,223.0			\$ 284,000	\$ 972,000
Ohara Grand Total					\$ 1,256,000	

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Ross						
	<10	112,569.6	8	622	\$3,933,000	\$14,355,000
	10	6,948.5	8	0	\$241,000	\$939,000
	12'	7,661.3	8	0	\$262,000	\$1,141,000
Ross Totals per Category		127,179.4			\$4,436,000	\$16,435,000
Ross Grand Total					\$20,871,000	

	Pipe Diameter	Pipe length Feet	MH Avg Depth	MH Number	MH Cost	Pipe Cost
Shaler						
	<10	535,861.9	8	2958	\$18,717,000	\$68,322,000
	10	14,208.5	8	79	\$488,000	\$1,921,000
	12	3,484.8	8	19	\$116,000	\$519,000
	15	12,286.6	8	68	\$405,000	\$217,000
	18	19,140.0	8	106	\$632,000	\$3,379,000
	24	8,865.1	8	49	\$277,000	\$1,920,000
Shaler Totals per Category		593,846.9			\$20,635,000	\$76,278,000
Shaler Grand Total					\$ 96,913,000	

2011 Estimated Value of Pine Creek System \$ 144,465,000

PINE CREEK SEWERSHED INTERMUNICIPAL AGREEMENTS SUMMARY TABLE

Date	Parties	Facility /Location	Maintenance	Particulars
12/9/29	Shaler/Sanitary Water Board	Trunk line along Pine Creek	N/A	Design Capacity of 18" line was 5.8 MGD
2/27/31	Etna/Sanitary Water Board	Trunk line from Etna-Shaler Border along Pine Creek to the Allegheny River	N/A	Enabled by Etna Ordinance No.641 (3/25/31)
3/23/21	Etna/Shaler	Shaler Trunk line connections to Etna Trunk line at Etna-Shaler Border along Pine Creek and West Little Pine Creek	Para 11: Twp. Engineer may make inspections of Boro Sewer Systems and have any obstruction removed that interferes with the proper & reasonable operation of the Twp. Sewer. Para 12: Boro Eng. may make inspections of Twp. Sewer System and to cause the Twp. to remove any obstruction or to remedy any condition that interferes with the proper & reasonable operation of the Boro. Sewer.	Enabled by Etna Ordinance No.642 (3/25/31) Disputes resolved by three party arbitration panel.
1/7/36	Etna/Shaler	Seavey Road and Parker St. sewer connection at Etna-Shaler Border/ Washington and Friday Street sewer connection at Etna-Shaler Border	Para 9: Boro Eng. may make inspections of Twp. Sewer System and to cause the Twp. to remove any obstruction or to remedy any condition that interferes with the proper & reasonable operation of the Boro. Sewer. Para 5: Twp. Shall indemnify and hold harmless Boro from all construction and maintenance costs arising from the sewer connections.	Boro extends Butler sewer to connect to the Etna Trunkline. Disputes resolved by three party arbitration panel.
7/8/46	Etna/ALCOSAN	Agreement to Connect the Etna Trunkline to ALCOSAN		Enabled by Etna Ordinance No.741 (7/8/46).
11/12/56	Etna/Shaler	Lehr Ave and Grant Ave. sewer connection at Etna-Shaler Border	Para 4: Twp is pay ½ of the maintenance and repair costs for the Grant Ave. from Lehr Avenue to the Trunk line. Para 5: Twp. will save harmless the Boro from any ALCOSAN assessment based the connection	Enabled by Etna Ordinance No.741 (7/8/46). Limited to 22 Units.

PINE CREEK SEWERSHED INTERMUNICIPAL AGREEMENTS SUMMARY TABLE

Date	Parties	Facility /Location	Maintenance	Particulars
8/9/57	Etna/Ross/Shaler	Ross/Shaler Trunk line from the Etna-Shaler Border on W. Little Pine Creek to the Etna Trunkline on Pine	Maintenance shared equally between Shaler and Ross. Maintenance on the Etna Trunk line to be shared equally between Etna, Shaler and Ross. Para 9: Twp. Engineers may make inspections of Boro Sewer Systems and have any obstruction removed that interferes with the proper & reasonable operation of the Twp. Sewer. Para 10: Boro Eng. may make inspections of Twps. Sewer System and to cause the Twps. to remove any obstruction or to remedy any condition that interferes with the proper & reasonable operation of the Etna Trunk line.	Enabled by Etna Ordinance No.865 (8/9/57). Ross shall not permit any surface water drainage to enter sewer.
8/9/57	Shaler/Ross	Extension of Shaler sewer from Vilsack Rd. to Shaler-Ross Border	Maintenance shared equally between Shaler and Ross	
11/5/69	Etna/Shaler/Ross/Indiana	Connection of Indiana Sewers in the Middle Rd area to the Shaler & Etna Trunklines	Amends Para 5 of 1957 Agrmt. as follows: ...the cost and maintenance, repair, replacement and relocation of said trunk sanitary sewer shall be borne by the parties in the following proportions: Shaler 29%, Ross 29%, Etna 29%, Indiana 13%.	Indiana shall not permit any surface water drainage to enter sewer. Disputes resolved by four party arbitration panel.
10/1/70	Indiana/ ALCOSAN	Agreement to add the Middle Road Sewer District to ALCOSAN Service Area	ALCOSAN has right to maintain sewers on Twp. Property at no cost to Twp.	Sanitary sewage only. Max. peak flow of 0.200 mgd with max. daily ave. of 0.120 mgd.
9/9/74	Etna/Shaler	Shaler Seavy Rd. sewer connects to Etna's Bridge St. sewer	Etna and Shaler share equally in maintaining the Bridge Street sewer.	
1/17/95	Etna/Bennington Woods	Etna/Shaler Trunkline	\$250,000 to be used for repairs, maintenance, improvements, etc. on the Etna Trunkline	Covers 65-70 homes in McCandless Twp.
9/27/95	McCandless/ALCOSAN	Agreement to add the Bennington Woods Plan to ALCOSAN Service Area		Flow not exceed 0.024 mgd

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Comparison of Original ACT Values and Revised ACT

Ross Township Alternatives											
Alternative ID	Design Year	Location	Description	Municipal Alternative Cost	Annual Debt Service for 20 Yr. Loan			Municipal Alternative Cost 1*	Annual Debt Service for 20 Yr. Loan		
					4%	6%	8%		4%	6%	8%
R-1	2	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000	\$95,696	\$113,139	\$132,091	\$1,169,000	\$85,007	\$100,501	\$117,336
R-2	2	Ross/Shaler Sewer - Ross	Storage	\$4,152,000	\$301,924	\$356,955	\$416,748	\$2,254,000	\$163,906	\$193,780	\$226,240
R-1	5	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000	\$95,696	\$113,139	\$132,091	\$1,169,000	\$85,007	\$100,501	\$117,336
R-2	5	Ross/Shaler Sewer - Ross	Storage	\$5,231,000	\$380,386	\$449,718	\$525,050	\$2,927,000	\$212,845	\$251,639	\$293,791
R-1	10	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000	\$95,696	\$113,139	\$132,091	\$1,169,000	\$85,007	\$100,501	\$117,336
R-2	10	Ross/Shaler Sewer - Ross	Storage	\$5,599,000	\$407,146	\$481,356	\$561,987	\$3,054,000	\$222,080	\$262,558	\$306,539

Shaler Township/Indiana Township Alternatives											
Alternative ID	Design Year	Location	Description	Municipal Alternative Cost	Annual Debt Service for 20 Yr. Loan			Municipal Alternative Cost 1*	Annual Debt Service for 20 Yr. Loan		
					4%	6%	8%		4%	6%	8%
S-1	2	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$17,524,000	\$1,274,304	\$1,506,569	\$1,758,933	\$10,695,000	\$777,715	\$919,468	\$1,073,487
S-2	2	Rt 8 Sewer	Storage/Conveyance Combination	\$17,636,000	\$1,282,448	\$1,515,197	\$1,770,175	\$11,937,000	\$868,030	\$1,026,245	\$1,198,150
S-1	5	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$18,359,000	\$1,335,023	\$1,578,355	\$1,842,744	\$11,467,000	\$833,853	\$985,838	\$1,150,975
S-2	5	Rt 8 Sewer	Storage/Conveyance Combination	\$17,742,000	\$1,290,156	\$1,525,310	\$1,780,814	\$12,041,000	\$875,593	\$1,035,186	\$1,208,589
S-1	10	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$18,311,000	\$1,331,533	\$1,574,228	\$1,837,926	\$11,505,000	\$836,616	\$989,105	\$1,154,789
S-2	10	Rt 8 Sewer	Storage/Conveyance Combination	\$17,744,000	\$1,290,302	\$1,525,482	\$1,781,015	\$12,042,000	\$875,666	\$1,035,272	\$1,208,689

Etna Borough Alternatives											
Alternative ID	Overflow Activation Range	Location	Description	Municipal Alternative Cost	Annual Debt Service for 20 Yr. Loan			Municipal Alternative Cost 1*	Annual Debt Service for 20 Yr. Loan		
					4%	6%	8%		4%	6%	8%
E-1	0 to 3	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 9	\$1,602,000	\$116,494	\$137,727	\$160,797	\$1,282,000	\$93,224	\$110,216	\$128,678
E-1	4 to 7	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 10	\$1,247,000	\$90,679	\$107,207	\$125,165	\$927,000	\$67,409	\$79,696	\$93,046
E-1	8 to 11	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 12	\$73,000	\$5,308	\$6,276	\$7,327	\$38,000	\$2,763	\$3,267	\$3,814

Pine Creek Alternatives											
Alternative ID	Overflow Activation Range	Location	Description	Municipal Alternative Cost	Annual Debt Service for 20 Yr. Loan			Municipal Alternative Cost 1*	Annual Debt Service for 20 Yr. Loan		
					4%	6%	8%		4%	6%	8%
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$43,897,000	\$3,192,086	\$3,773,901	\$4,406,065	\$10,749,000	\$781,642	\$924,110	\$1,078,907
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$43,897,000	\$3,192,086	\$3,773,901	\$4,406,065	\$10,749,000	\$781,642	\$924,110	\$1,078,907
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$43,897,000	\$3,192,086	\$3,773,901	\$4,406,065	\$10,749,000	\$781,642	\$924,110	\$1,078,907
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$42,256,000	\$3,072,757	\$3,632,821	\$4,241,353	\$10,250,000	\$745,356	\$881,210	\$1,028,821
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$42,256,000	\$3,072,757	\$3,632,821	\$4,241,353	\$10,250,000	\$745,356	\$881,210	\$1,028,821
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$42,256,000	\$3,072,757	\$3,632,821	\$4,241,353	\$10,250,000	\$745,356	\$881,210	\$1,028,821
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$40,982,000	\$3,072,757	\$3,632,821	\$4,241,353	\$7,351,000	\$745,356	\$881,210	\$1,028,821
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$40,982,000	\$2,980,114	\$3,523,293	\$4,113,478	\$7,351,000	\$534,547	\$631,978	\$737,841
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$40,982,000	\$2,980,114	\$3,523,293	\$4,113,478	\$7,351,000	\$534,547	\$631,978	\$737,841
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$40,982,000	\$2,980,114	\$3,523,293	\$4,113,478	\$7,351,000	\$534,547	\$631,978	\$737,841
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$40,982,000	\$2,980,114	\$3,523,293	\$4,113,478	\$7,351,000	\$534,547	\$631,978	\$737,841
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$40,982,000	\$2,980,114	\$3,523,293	\$4,113,478	\$7,351,000	\$534,547	\$631,978	\$737,841
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$38,206,000	\$2,778,250	\$3,284,636	\$3,834,844	\$5,114,000	\$371,878	\$439,659	\$513,307
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$38,206,000	\$2,778,250	\$3,284,636	\$3,834,844	\$5,114,000	\$371,878	\$439,659	\$513,307
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$41,731,000	\$3,034,580	\$3,587,686	\$4,188,658	\$5,324,000	\$387,149	\$457,713	\$534,385
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$38,109,000	\$2,771,197	\$3,276,297	\$3,825,107	\$4,943,000	\$359,443	\$424,958	\$496,143
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$38,257,000	\$2,781,959	\$3,289,020	\$3,839,963	\$5,056,000	\$367,660	\$434,673	\$507,485
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$38,502,000	\$2,799,775	\$3,310,083	\$3,864,554	\$5,168,000	\$375,805	\$444,302	\$518,727

*Changes were made to the ACT in the shoring, dewatering, and storage curves used to calculate the cost of different alternatives.

Pine Creek Alternatives Analysis Matrix
Municipal Costs Per Account
Comparison of Original ACT Values and Revised ACT

Ross Township Alternatives					Annual Per Customer Cost for 20 Yr. Loan**			Annual Per Customer Cost for 20 Yr. Loan**			
Alternative ID	Design Year	Location	Description	Municipal Alternative Cost	4%	6%	8%	Municipal Alternative Cost 1*	4%	6%	8%
R-1	2	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000	\$59	\$69	\$81	\$1,169,000	\$52	\$62	\$72
R-2	2	Ross/Shaler Sewer - Ross	Storage	\$4,152,000	\$185	\$219	\$256	\$2,254,000	\$101	\$119	\$139
R-1	5	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000	\$59	\$69	\$81	\$1,169,000	\$52	\$62	\$72
R-2	5	Ross/Shaler Sewer - Ross	Storage	\$5,231,000	\$234	\$276	\$323	\$2,927,000	\$131	\$155	\$180
R-1	10	Ross/Shaler Sewer - Ross	Conveyance - Parallel Pipe	\$1,316,000	\$59	\$69	\$81	\$1,169,000	\$52	\$62	\$72
R-2	10	Ross/Shaler Sewer - Ross	Storage	\$5,599,000	\$250	\$296	\$345	\$3,054,000	\$136	\$161	\$188

** Based on estimated 1628 Ross Customers

Shaler Township/Indiana Township Alternatives					Annual Per Customer Cost for 20 Yr. Loan**			Annual Per Customer Cost for 20 Yr. Loan**			
Alternative ID	Design Year	Location	Description	Municipal Alternative Cost	4%	6%	8%	Municipal Alternative Cost 1*	4%	6%	8%
S-1	2	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$17,524,000	\$156	\$184	\$215	\$10,695,000	\$95	\$112	\$131
S-2	2	Rt 8 Sewer	Storage/Conveyance Combination	\$17,636,000	\$157	\$185	\$216	\$11,937,000	\$106	\$125	\$146
S-1	5	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$18,359,000	\$163	\$193	\$225	\$11,467,000	\$102	\$120	\$140
S-2	5	Rt 8 Sewer	Storage/Conveyance Combination	\$17,742,000	\$157	\$186	\$217	\$12,041,000	\$107	\$126	\$148
S-1	10	Ross/Shaler Sewer - Shaler	Storage/Conveyance Combination	\$18,311,000	\$163	\$192	\$224	\$11,505,000	\$102	\$121	\$141
S-2	10	Rt 8 Sewer	Storage/Conveyance Combination	\$17,744,000	\$157	\$186	\$217	\$12,042,000	\$107	\$126	\$148

** Based on estimated 8193 Shaler Customers

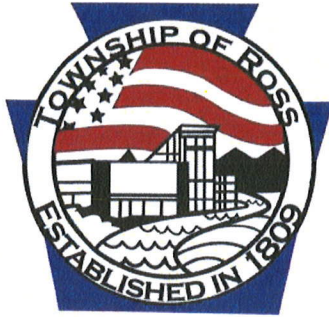
Etna Borough Alternatives					Annual Per Customer Cost for 20 Yr. Loan**			Annual Per Customer Cost for 20 Yr. Loan**			
Alternative ID	Overflow Activation Range	Location	Description	Municipal Alternative Cost	4%	6%	8%	Municipal Alternative Cost 1*	4%	6%	8%
E-1	0 to 3	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 9	\$1,602,000	\$69	\$82	\$95	\$1,282,000	\$55	\$65	\$76
E-1	4 to 7	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 10	\$1,247,000	\$54	\$64	\$74	\$927,000	\$40	\$47	\$55
E-1	8 to 11	Etna Combined Sewer-Tribs	Conveyance - Parallel Pipe Alt. 12	\$73,000	\$3	\$4	\$4	\$38,000	\$2	\$2	\$2

** Based on estimated 1688 Etna Customers

Pine Creek Alternatives					Annual Per Customer Cost for 20 Yr. Loan**			Annual Per Customer Cost for 20 Yr. Loan**			
Alternative ID	Overflow Activation Range	Location	Description	Municipal Alternative Cost	4%	6%	8%	Municipal Alternative Cost 1*	4%	6%	8%
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$43,897,000	\$271	\$321	\$375	\$10,749,000	\$66	\$79	\$92
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$43,897,000	\$271	\$321	\$375	\$10,749,000	\$66	\$79	\$92
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$43,897,000	\$271	\$321	\$375	\$10,749,000	\$66	\$79	\$92
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$42,256,000	\$261	\$309	\$361	\$10,250,000	\$63	\$75	\$87
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$42,256,000	\$261	\$309	\$361	\$10,250,000	\$63	\$75	\$87
E-1	0 to 3	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$42,256,000	\$261	\$309	\$361	\$10,250,000	\$63	\$75	\$87
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$40,982,000	\$261	\$309	\$361	\$7,351,000	\$63	\$75	\$87
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
E-1	4 to 7	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-1	\$38,206,000	\$236	\$279	\$326	\$5,114,000	\$32	\$37	\$44
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-1	\$38,206,000	\$236	\$279	\$326	\$5,114,000	\$32	\$37	\$44
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-1	\$41,731,000	\$258	\$305	\$356	\$5,324,000	\$33	\$39	\$45
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 2-yr R-2	\$38,109,000	\$236	\$279	\$325	\$4,943,000	\$31	\$36	\$42
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 5-yr R-2	\$38,257,000	\$237	\$280	\$327	\$5,056,000	\$31	\$37	\$43
E-1	8 to 11	Etna Combined Sewer	Conveyance - Parallel Pipe 10-yr R-2	\$38,502,000	\$238	\$282	\$329	\$5,168,000	\$32	\$38	\$44

*Changes were made to the ACT in the shoring, dewatering, and storage curves used to calculate the cost of different alternatives.

** Based on estimated 11,758 Pine Creek Sewershed Customers



July 8, 2011

Re: Pine Creek Sewer Study

Donald Newman
Buchart Horn, Inc.
Liberty Technology Center
2200 Liberty Avenue, Suite 300, Pittsburgh, PA 15222-4502

ROSS TOWNSHIP

Ross Township
Municipal Building
1000 Ross Municipal Drive
Pittsburgh, PA 15237-2725
Phone: 412-931-7055
Fax: 412-931-7062
www.ross.pa.us

OFFICERS

PRESIDENT

Daniel P. Kinross

VICE PRESIDENT

Grant Montgomery

TREASURER

Donna Carey
Phone: 412-931-4200

SOLICITOR

Bonnie Brimmeier, Esq.

MANAGER

Wayne B. Jones, C.P.A.

ENGINEER

Art Gazdik, P.E.

COMMISSIONERS

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Daniel P. Kinross
Lana A. Mazur
Grace E. Stanko
David J. Mikec, Sr.
Gerald R. O'Brien
Peter A. Ferraro
Grant Montgomery

Dear Don:

As per our phone conversation about how to develop an equitable share of potential wetweather costs in the Pine Creek Watershed, I have used the 3Rivers Webmap and the modeled flow information in the FFE to develop statistics related to connections, total pipe, pipe inch miles and a rough estimate of modeled wetweather total inflow for the 2 and 10 year winter events. Please review these statistics and revise them as needed for use in the study.

Also, in my opinion, the analysis of cost sharing in the report should acknowledge that these, and other statistics to be developed, may be used by the municipalities to determine and equitable agreement related to future cost sharing for wetweather flow projects.

Existing agreements for maintenance, repair, replacement and relocation of the trunk sewer did not contemplate the CSO and SSO wetweather issues we now face.

Please call me if you have any questions or if we can be of any assistance.

Respectfully yours,

Art Gazdik, P.E.
Ross Township Engineer

Email Cc: W. Jones, M.E. Ramage, T. Rogers, K. Creagh



JUL 12 2011

Buchart Horn, Inc.

	Bldg Count	vLat Miles	Pipe Miles	Pipe Inch Miles	% Bldg Count	% vLat Miles	% Pipe Miles	% Pipe Inch Miles
Etna	1442	9.843	15.687	253.1	12.7%	8.4%	10.0%	17.1%
Ross	1450	15.531	24.087	200.8	12.7%	13.2%	15.3%	13.6%
Shaler	8157	87.736	112.471	987.4	71.7%	74.7%	71.6%	66.7%
Indiana	209	3.137	2.423	19.4	1.8%	2.7%	1.5%	1.3%
Ohara	56	0.575	1.368	10.6	0.5%	0.5%	0.9%	0.7%
McCandless	62	0.65	1.108	8.9	0.5%	0.6%	0.7%	0.6%
Total	11376	117.472	157.144	1480.2				

A-68

Total Flow & Loses

Winter Rainfall Event

	2 YR	10 YR	%	%
	Total Inflow (mgd)		2 YR	10 YR
Ross	4.3	5.2	8%	9%
Shaler	24.6	27.2	44%	45%
Etna	27.1	28.6	48%	47%
Total	56	61		

Note: Indiana, O'Hara & McCandless not included

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Original ACT Values

Pine Creek Watershed Alternative Combined Costs - ACT Costs

Municipal costs are based upon current multi-municipal agreement allocation (Ross 29%, Shaler 29%, Etna 29% & Indiana 13%) + local costs

Ross Township Cost Share

Alternative ID	Combined Costs	Ross Share Annual Combined Costs Debt Service for 20 yrs.			Ross Share Annual Combined Costs Per Customer *		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$81,975,000	\$1,021,401	\$1,207,570	\$1,409,850	\$627	\$742	\$866
R-1/S-1/S-2/5/E-1/0-3	\$82,916,000	\$1,021,401	\$1,207,570	\$1,409,850	\$627	\$742	\$866
R-1/S-1/S-2/10/E-1/0-3	\$82,870,000	\$1,021,401	\$1,207,570	\$1,409,850	\$627	\$742	\$866
R-2/S-1/S-2/2/E-1/0-3	\$83,170,000	\$1,193,024	\$1,451,386	\$1,694,507	\$733	\$892	\$1,041
R-2/S-1/S-2/5/E-1/0-3	\$85,190,000	\$1,271,486	\$1,544,149	\$1,802,809	\$781	\$948	\$1,107
R-2/S-1/S-2/10/E-1/0-3	\$85,512,000	\$1,298,246	\$1,575,787	\$1,839,746	\$797	\$968	\$1,130
R-1/S-1/S-2/2/E-1/4-7	\$78,705,000	\$986,796	\$1,166,657	\$1,362,083	\$606	\$717	\$837
R-1/S-1/S-2/5/E-1/4-7	\$79,646,000	\$959,929	\$1,134,894	\$1,325,000	\$590	\$697	\$814
R-1/S-1/S-2/10/E-1/4-7	\$79,600,000	\$959,929	\$1,134,894	\$1,325,000	\$590	\$697	\$814
R-2/S-1/S-2/2/E-1/4-7	\$81,541,000	\$1,166,157	\$1,410,473	\$1,646,740	\$716	\$866	\$1,012
R-2/S-1/S-2/5/E-1/4-7	\$83,561,000	\$1,244,619	\$1,471,473	\$1,717,959	\$765	\$904	\$1,055
R-2/S-1/S-2/10/E-1/4-7	\$83,883,000	\$1,271,379	\$1,503,111	\$1,754,896	\$781	\$923	\$1,078
R-1/S-1/S-2/2/E-1/8-11	\$74,755,000	\$901,389	\$1,065,683	\$1,244,196	\$554	\$655	\$764
R-1/S-1/S-2/5/E-1/8-11	\$75,623,000	\$901,389	\$1,065,683	\$1,244,196	\$554	\$655	\$764
R-1/S-1/S-2/10/E-1/8-11	\$79,175,000	\$975,724	\$1,153,568	\$1,346,802	\$599	\$709	\$827
R-2/S-1/S-2/2/E-1/8-11	\$77,494,000	\$1,105,571	\$1,307,081	\$1,526,029	\$679	\$803	\$937
R-2/S-1/S-2/5/E-1/8-11	\$79,662,000	\$1,187,154	\$1,403,534	\$1,638,639	\$729	\$862	\$1,007
R-2/S-1/S-2/10/E-1/8-11	\$80,229,000	\$1,219,081	\$1,441,280	\$1,682,708	\$749	\$885	\$1,034

* Based on estimated 1628 Ross Customers

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Original ACT Values

Shaler Township Cost Share

Alternative ID	Combined Costs	Shaler Share Annual Combined Costs Debt Service for 20 yrs.			Shaler Share Annual Combined Costs Per Customer *		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$81,975,000	\$3,482,457	\$4,116,197	\$4,806,867	\$425	\$502	\$587
R-1/S-1/S-2/5/E-1/0-3	\$82,916,000	\$3,550,884	\$4,198,096	\$4,901,317	\$433	\$512	\$598
R-1/S-1/S-2/10/E-1/0-3	\$82,870,000	\$3,547,540	\$4,194,141	\$4,896,700	\$433	\$512	\$598
R-2/S-1/S-2/2/E-1/0-3	\$83,170,000	\$3,447,852	\$4,075,284	\$4,759,100	\$421	\$497	\$581
R-2/S-1/S-2/5/E-1/0-3	\$85,190,000	\$3,516,279	\$4,157,183	\$4,853,550	\$429	\$507	\$592
R-2/S-1/S-2/10/E-1/0-3	\$85,512,000	\$3,512,935	\$4,153,228	\$4,848,933	\$429	\$507	\$592
R-1/S-1/S-2/2/E-1/4-7	\$78,705,000	\$3,447,852	\$4,075,284	\$4,759,100	\$421	\$497	\$581
R-1/S-1/S-2/5/E-1/4-7	\$79,646,000	\$3,489,412	\$4,125,420	\$4,816,467	\$426	\$504	\$588
R-1/S-1/S-2/10/E-1/4-7	\$79,600,000	\$3,486,068	\$4,121,465	\$4,811,850	\$425	\$503	\$587
R-2/S-1/S-2/2/E-1/4-7	\$81,541,000	\$3,420,985	\$4,043,521	\$4,722,017	\$418	\$494	\$576
R-2/S-1/S-2/5/E-1/4-7	\$83,561,000	\$3,489,412	\$4,125,420	\$4,816,467	\$426	\$504	\$588
R-2/S-1/S-2/10/E-1/4-7	\$83,883,000	\$3,486,068	\$4,121,465	\$4,811,850	\$425	\$503	\$587
R-1/S-1/S-2/2/E-1/8-11	\$74,755,000	\$3,362,445	\$3,974,310	\$4,641,213	\$410	\$485	\$566
R-1/S-1/S-2/5/E-1/8-11	\$75,623,000	\$3,430,872	\$4,056,209	\$4,735,663	\$419	\$495	\$578
R-1/S-1/S-2/10/E-1/8-11	\$79,175,000	\$3,501,863	\$4,140,139	\$4,833,652	\$427	\$505	\$590
R-2/S-1/S-2/2/E-1/8-11	\$77,494,000	\$3,360,399	\$3,971,892	\$4,638,389	\$410	\$485	\$566
R-2/S-1/S-2/5/E-1/8-11	\$79,662,000	\$3,431,947	\$4,057,481	\$4,737,147	\$419	\$495	\$578
R-2/S-1/S-2/10/E-1/8-11	\$80,229,000	\$3,433,770	\$4,059,634	\$4,739,662	\$419	\$496	\$579

* Based on estimated 8193 Shaler Customers

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Original ACT Values

Indiana Township Cost Share*

Alternative ID	Combined Costs	Indiana Share Annual Combined Costs Debt Service for 20 yrs.			Indiana Share Annual Combined Costs Per Customer *		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$81,975,000	\$414,971	\$490,607	\$572,788	\$2,626	\$3,105	\$3,625
R-1/S-1/S-2/5/E-1/0-3	\$82,916,000	\$414,971	\$490,607	\$572,788	\$2,626	\$3,105	\$3,625
R-1/S-1/S-2/10/E-1/0-3	\$82,870,000	\$414,971	\$490,607	\$572,788	\$2,626	\$3,105	\$3,625
R-2/S-1/S-2/2/E-1/0-3	\$83,170,000	\$399,458	\$472,267	\$551,376	\$2,528	\$2,989	\$3,490
R-2/S-1/S-2/5/E-1/0-3	\$85,190,000	\$399,458	\$472,267	\$551,376	\$2,528	\$2,989	\$3,490
R-2/S-1/S-2/10/E-1/0-3	\$85,512,000	\$399,458	\$472,267	\$551,376	\$2,528	\$2,989	\$3,490
R-1/S-1/S-2/2/E-1/4-7	\$78,705,000	\$399,458	\$472,267	\$551,376	\$2,528	\$2,989	\$3,490
R-1/S-1/S-2/5/E-1/4-7	\$79,646,000	\$387,415	\$458,028	\$534,752	\$2,452	\$2,899	\$3,385
R-1/S-1/S-2/10/E-1/4-7	\$79,600,000	\$387,415	\$458,028	\$534,752	\$2,452	\$2,899	\$3,385
R-2/S-1/S-2/2/E-1/4-7	\$81,541,000	\$387,415	\$458,028	\$534,752	\$2,452	\$2,899	\$3,385
R-2/S-1/S-2/5/E-1/4-7	\$83,561,000	\$387,415	\$458,028	\$534,752	\$2,452	\$2,899	\$3,385
R-2/S-1/S-2/10/E-1/4-7	\$83,883,000	\$387,415	\$458,028	\$534,752	\$2,452	\$2,899	\$3,385
R-1/S-1/S-2/2/E-1/8-11	\$74,755,000	\$361,173	\$427,003	\$498,530	\$2,286	\$2,703	\$3,155
R-1/S-1/S-2/5/E-1/8-11	\$75,623,000	\$361,173	\$427,003	\$498,530	\$2,286	\$2,703	\$3,155
R-1/S-1/S-2/10/E-1/8-11	\$79,175,000	\$394,495	\$466,399	\$544,526	\$2,497	\$2,952	\$3,446
R-2/S-1/S-2/2/E-1/8-11	\$77,494,000	\$360,256	\$425,919	\$497,264	\$2,280	\$2,696	\$3,147
R-2/S-1/S-2/5/E-1/8-11	\$79,662,000	\$361,655	\$427,573	\$499,195	\$2,289	\$2,706	\$3,159
R-2/S-1/S-2/10/E-1/8-11	\$80,229,000	\$363,971	\$430,311	\$502,392	\$2,304	\$2,723	\$3,180

* Assumes Indiana does not cost share in Shaler System Improvements

* Based on estimated 158 Indiana Customers

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Original ACT Values

Etna Borough Cost Share

Alternative ID	Combined Costs	Etna Share Annual Combined Costs Debt Service for 20 yrs.			Etna Share Annual Combined Costs Per Customer *		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$81,975,000	\$1,042,199	\$1,232,158	\$1,438,556	\$617	\$730	\$852
R-1/S-1/S-2/5/E-1/0-3	\$82,916,000	\$1,042,199	\$1,232,158	\$1,438,556	\$617	\$730	\$852
R-1/S-1/S-2/10/E-1/0-3	\$82,870,000	\$1,042,199	\$1,232,158	\$1,438,556	\$617	\$730	\$852
R-2/S-1/S-2/2/E-1/0-3	\$83,170,000	\$1,007,594	\$1,191,245	\$1,390,789	\$597	\$706	\$824
R-2/S-1/S-2/5/E-1/0-3	\$85,190,000	\$1,007,594	\$1,191,245	\$1,390,789	\$597	\$706	\$824
R-2/S-1/S-2/10/E-1/0-3	\$85,512,000	\$1,007,594	\$1,191,245	\$1,390,789	\$597	\$706	\$824
R-1/S-1/S-2/2/E-1/4-7	\$78,705,000	\$981,779	\$1,160,725	\$1,355,157	\$582	\$688	\$803
R-1/S-1/S-2/5/E-1/4-7	\$79,646,000	\$980,727	\$1,159,482	\$1,353,706	\$581	\$687	\$802
R-1/S-1/S-2/10/E-1/4-7	\$79,600,000	\$980,727	\$1,159,482	\$1,353,706	\$581	\$687	\$802
R-2/S-1/S-2/2/E-1/4-7	\$81,541,000	\$980,727	\$1,159,482	\$1,353,706	\$581	\$687	\$802
R-2/S-1/S-2/5/E-1/4-7	\$83,561,000	\$980,727	\$1,159,482	\$1,353,706	\$581	\$687	\$802
R-2/S-1/S-2/10/E-1/4-7	\$83,883,000	\$980,727	\$1,159,482	\$1,353,706	\$581	\$687	\$802
R-1/S-1/S-2/2/E-1/8-11	\$74,755,000	\$896,372	\$1,059,751	\$1,237,270	\$531	\$628	\$733
R-1/S-1/S-2/5/E-1/8-11	\$75,623,000	\$896,372	\$1,059,751	\$1,237,270	\$531	\$628	\$733
R-1/S-1/S-2/10/E-1/8-11	\$79,175,000	\$970,707	\$1,147,636	\$1,339,876	\$575	\$680	\$794
R-2/S-1/S-2/2/E-1/8-11	\$77,494,000	\$894,326	\$1,057,333	\$1,234,446	\$530	\$626	\$731
R-2/S-1/S-2/5/E-1/8-11	\$79,662,000	\$897,447	\$1,061,023	\$1,238,754	\$532	\$629	\$734
R-2/S-1/S-2/10/E-1/8-11	\$80,229,000	\$902,614	\$1,067,131	\$1,245,886	\$535	\$632	\$738

* Based on estimated 1688 Etna Customers

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Revised ACT Values

Pine Creek Watershed Alternative Combined Costs - Alternative Costs

Municipal costs are based upon current multi-municipal agreement allocation (Ross 29%, Shaler 29%, Etna 29% & Indiana 13%) + local costs

Changes were made to the ACT in the shoring, dewatering, and storage curves used to calculate the cost of different alternatives.

Ross Township Cost Share

Alternative ID	Combined Costs Cost 1	Ross Share Annual Combined Costs Debt Service for 20 yrs.			Ross Share Annual Combined Costs Per Customer *		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$35,832,000	\$311,683	\$368,493	\$430,219	\$191	\$226	\$264
R-1/S-1/S-2/5/E-1/0-3	\$36,708,000	\$311,683	\$368,493	\$430,219	\$191	\$226	\$264
R-1/S-1/S-2/10/E-1/0-3	\$36,747,000	\$311,683	\$368,493	\$430,219	\$191	\$226	\$264
R-2/S-1/S-2/2/E-1/0-3	\$36,418,000	\$380,059	\$449,331	\$524,598	\$233	\$276	\$322
R-2/S-1/S-2/5/E-1/0-3	\$37,967,000	\$428,998	\$507,190	\$592,149	\$264	\$312	\$364
R-2/S-1/S-2/10/E-1/0-3	\$38,133,000	\$438,233	\$518,109	\$604,897	\$269	\$318	\$372
R-1/S-1/S-2/2/E-1/4-7	\$32,079,000	\$301,160	\$356,052	\$415,694	\$185	\$219	\$255
R-1/S-1/S-2/5/E-1/4-7	\$32,955,000	\$240,026	\$283,775	\$331,310	\$147	\$174	\$204
R-1/S-1/S-2/10/E-1/4-7	\$32,994,000	\$240,026	\$283,775	\$331,310	\$147	\$174	\$204
R-2/S-1/S-2/2/E-1/4-7	\$33,164,000	\$318,925	\$377,054	\$440,214	\$196	\$232	\$270
R-2/S-1/S-2/5/E-1/4-7	\$34,713,000	\$367,864	\$434,913	\$507,765	\$226	\$267	\$312
R-2/S-1/S-2/10/E-1/4-7	\$34,879,000	\$377,099	\$445,832	\$520,513	\$232	\$274	\$320
R-1/S-1/S-2/2/E-1/8-11	\$28,953,000	\$192,852	\$228,002	\$266,195	\$118	\$140	\$164
R-1/S-1/S-2/5/E-1/8-11	\$29,791,000	\$192,852	\$228,002	\$266,195	\$118	\$140	\$164
R-1/S-1/S-2/10/E-1/8-11	\$30,078,000	\$197,280	\$233,238	\$272,308	\$121	\$143	\$167
R-2/S-1/S-2/2/E-1/8-11	\$29,867,000	\$268,144	\$317,018	\$370,121	\$165	\$195	\$227
R-2/S-1/S-2/5/E-1/8-11	\$31,529,000	\$319,466	\$377,694	\$440,962	\$196	\$232	\$271
R-2/S-1/S-2/10/E-1/8-11	\$31,807,000	\$331,063	\$391,406	\$456,970	\$203	\$240	\$281

* Based on estimated 1628 Ross Customers

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Revised ACT Values

Shaler Township Cost Share

Alternative ID	Combined Costs Cost 1	Shaler Share Annual Combined Costs Debt Service for 20 yrs.			Shaler Share Annual Combined Costs Per Customer*		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$35,832,000	\$1,872,421	\$2,213,705	\$2,584,520	\$229	\$270	\$315
R-1/S-1/S-2/5/E-1/0-3	\$36,708,000	\$1,936,122	\$2,289,016	\$2,672,447	\$236	\$279	\$326
R-1/S-1/S-2/10/E-1/0-3	\$36,747,000	\$1,938,958	\$2,292,369	\$2,676,361	\$237	\$280	\$327
R-2/S-1/S-2/2/E-1/0-3	\$36,418,000	\$1,861,898	\$2,201,264	\$2,569,995	\$227	\$269	\$314
R-2/S-1/S-2/5/E-1/0-3	\$37,967,000	\$1,925,599	\$2,276,575	\$2,657,922	\$235	\$278	\$324
R-2/S-1/S-2/10/E-1/0-3	\$38,133,000	\$1,928,435	\$2,279,928	\$2,661,836	\$235	\$278	\$325
R-1/S-1/S-2/2/E-1/4-7	\$32,079,000	\$1,861,898	\$2,201,264	\$2,569,995	\$227	\$269	\$314
R-1/S-1/S-2/5/E-1/4-7	\$32,955,000	\$1,864,465	\$2,204,298	\$2,573,538	\$228	\$269	\$314
R-1/S-1/S-2/10/E-1/4-7	\$32,994,000	\$1,867,301	\$2,207,651	\$2,577,452	\$228	\$269	\$315
R-2/S-1/S-2/2/E-1/4-7	\$33,164,000	\$1,800,764	\$2,128,987	\$2,485,611	\$220	\$260	\$303
R-2/S-1/S-2/5/E-1/4-7	\$34,713,000	\$1,864,465	\$2,204,298	\$2,573,538	\$228	\$269	\$314
R-2/S-1/S-2/10/E-1/4-7	\$34,879,000	\$1,867,301	\$2,207,651	\$2,577,452	\$228	\$269	\$315
R-1/S-1/S-2/2/E-1/8-11	\$28,953,000	\$1,753,590	\$2,073,214	\$2,420,496	\$214	\$253	\$295
R-1/S-1/S-2/5/E-1/8-11	\$29,791,000	\$1,817,291	\$2,148,525	\$2,508,423	\$222	\$262	\$306
R-1/S-1/S-2/10/E-1/8-11	\$30,078,000	\$1,824,555	\$2,157,114	\$2,518,450	\$223	\$263	\$307
R-2/S-1/S-2/2/E-1/8-11	\$29,867,000	\$1,749,983	\$2,068,951	\$2,415,518	\$214	\$253	\$295
R-2/S-1/S-2/5/E-1/8-11	\$31,529,000	\$1,816,067	\$2,147,079	\$2,506,735	\$222	\$262	\$306
R-2/S-1/S-2/10/E-1/8-11	\$31,807,000	\$1,821,265	\$2,153,225	\$2,513,909	\$222	\$263	\$307

* Based on estimated 8193 Shaler Customers

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Revised ACT Values

Indiana Township Cost Share*

Alternative ID	Combined Costs Cost 1	Indiana Share Annual Combined Costs Debt Service for 20 yrs.			Indiana Share Annual Combined Costs Per Customer*		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$35,832,000	\$101,613	\$120,134	\$140,258	\$643	\$760	\$888
R-1/S-1/S-2/5/E-1/0-3	\$36,708,000	\$101,613	\$120,134	\$140,258	\$643	\$760	\$888
R-1/S-1/S-2/10/E-1/0-3	\$36,747,000	\$101,613	\$120,134	\$140,258	\$643	\$760	\$888
R-2/S-1/S-2/2/E-1/0-3	\$36,418,000	\$96,896	\$114,557	\$133,747	\$613	\$725	\$846
R-2/S-1/S-2/5/E-1/0-3	\$37,967,000	\$96,896	\$114,557	\$133,747	\$613	\$725	\$846
R-2/S-1/S-2/10/E-1/0-3	\$38,133,000	\$96,896	\$114,557	\$133,747	\$613	\$725	\$846
R-1/S-1/S-2/2/E-1/4-7	\$32,079,000	\$96,896	\$114,557	\$133,747	\$613	\$725	\$846
R-1/S-1/S-2/5/E-1/4-7	\$32,955,000	\$69,491	\$82,157	\$95,919	\$440	\$520	\$607
R-1/S-1/S-2/10/E-1/4-7	\$32,994,000	\$69,491	\$82,157	\$95,919	\$440	\$520	\$607
R-2/S-1/S-2/2/E-1/4-7	\$33,164,000	\$69,491	\$82,157	\$95,919	\$440	\$520	\$607
R-2/S-1/S-2/5/E-1/4-7	\$34,713,000	\$69,491	\$82,157	\$95,919	\$440	\$520	\$607
R-2/S-1/S-2/10/E-1/4-7	\$34,879,000	\$69,491	\$82,157	\$95,919	\$440	\$520	\$607
R-1/S-1/S-2/2/E-1/8-11	\$28,953,000	\$48,344	\$57,156	\$66,730	\$306	\$362	\$422
R-1/S-1/S-2/5/E-1/8-11	\$29,791,000	\$48,344	\$57,156	\$66,730	\$306	\$362	\$422
R-1/S-1/S-2/10/E-1/8-11	\$30,078,000	\$50,329	\$59,503	\$69,470	\$319	\$377	\$440
R-2/S-1/S-2/2/E-1/8-11	\$29,867,000	\$46,728	\$55,245	\$64,499	\$296	\$350	\$408
R-2/S-1/S-2/5/E-1/8-11	\$31,529,000	\$47,796	\$56,507	\$65,973	\$303	\$358	\$418
R-2/S-1/S-2/10/E-1/8-11	\$31,807,000	\$48,855	\$57,759	\$67,435	\$309	\$366	\$427

* Assumes Indiana does not cost share in Shaler System Improvements

* Based on estimated 158 Indiana Customers

Pine Creek Alternatives Analysis Matrix
Municipal Costs
Revised ACT Values

Etna Borough Cost Share

Alternative ID	Combined Costs Cost 1	Etna Share Annual Combined Costs Debt Service for 20 yrs.			Etna Share Annual Combined Costs Per Customer*		
		4%	6%	8%	4%	6%	8%
R-1/S-1/S-2/2/E-1/0-3	\$35,832,000	\$319,900	\$378,208	\$441,561	\$190	\$224	\$262
R-1/S-1/S-2/5/E-1/0-3	\$36,708,000	\$319,900	\$378,208	\$441,561	\$190	\$224	\$262
R-1/S-1/S-2/10/E-1/0-3	\$36,747,000	\$319,900	\$378,208	\$441,561	\$190	\$224	\$262
R-2/S-1/S-2/2/E-1/0-3	\$36,418,000	\$309,377	\$365,767	\$427,036	\$183	\$217	\$253
R-2/S-1/S-2/5/E-1/0-3	\$37,967,000	\$309,377	\$365,767	\$427,036	\$183	\$217	\$253
R-2/S-1/S-2/10/E-1/0-3	\$38,133,000	\$309,377	\$365,767	\$427,036	\$183	\$217	\$253
R-1/S-1/S-2/2/E-1/4-7	\$32,079,000	\$283,562	\$335,247	\$391,404	\$168	\$199	\$232
R-1/S-1/S-2/5/E-1/4-7	\$32,955,000	\$248,243	\$293,490	\$342,652	\$147	\$174	\$203
R-1/S-1/S-2/10/E-1/4-7	\$32,994,000	\$248,243	\$293,490	\$342,652	\$147	\$174	\$203
R-2/S-1/S-2/2/E-1/4-7	\$33,164,000	\$248,243	\$293,490	\$342,652	\$147	\$174	\$203
R-2/S-1/S-2/5/E-1/4-7	\$34,713,000	\$248,243	\$293,490	\$342,652	\$147	\$174	\$203
R-2/S-1/S-2/10/E-1/4-7	\$34,879,000	\$248,243	\$293,490	\$342,652	\$147	\$174	\$203
R-1/S-1/S-2/2/E-1/8-11	\$28,953,000	\$175,254	\$207,197	\$241,905	\$104	\$123	\$143
R-1/S-1/S-2/5/E-1/8-11	\$29,791,000	\$175,254	\$207,197	\$241,905	\$104	\$123	\$143
R-1/S-1/S-2/10/E-1/8-11	\$30,078,000	\$179,682	\$212,433	\$248,018	\$106	\$126	\$147
R-2/S-1/S-2/2/E-1/8-11	\$29,867,000	\$171,647	\$202,934	\$236,927	\$102	\$120	\$140
R-2/S-1/S-2/5/E-1/8-11	\$31,529,000	\$174,030	\$205,751	\$240,217	\$103	\$122	\$142
R-2/S-1/S-2/10/E-1/8-11	\$31,807,000	\$176,392	\$208,544	\$243,477	\$104	\$124	\$144

* Based on estimated 1688 Etna Customers

ALCOSAN'S ASSUMPTION OF OPERATION AND MAINTENANCE FOR CRITICAL SEWERS, EXISTING FACILITIES, AND PROPOSED FACILITIES

By Timothy J. Rogers, Esq. and Kevin M. Creagh, P.E.

With the endgame coming into focus on the short-term horizon, many communities are starting to question the economic equality of the long-term operation and maintenance for the potential facilities and their existing infrastructure.

What I am proposing is that municipalities tributary to ALCOSAN request that ALCOSAN take over the ownership and long-term operation and maintenance (O&M) of the critical sewers, existing sanitary sewer facilities, and proposed facilities. Allow me to define those terms:

- Critical sewers – any sanitary sewer equal to or greater than 10" in diameter for a sanitary-only system or equal to or greater than 24" in diameter for a combined sewer system.
- Existing sanitary sewer facility – any facility in the ground and operational as of October 2010, ranging from detention tanks, pump stations, swirl concentrators, or any other appurtenance that does not include a sanitary sewer treatment plant.
- Proposed facility – any facility that either the municipality in their Long Term Control Plan or Feasibility Study is proposing to construct **or** any facility that ALCOSAN through their Basin Planners is proposing to construct in a municipality

By eliminating the long-term concerns of providing O&M to these critical sewers and facilities, the municipalities can re-allocate their own O&M dollars to the collector systems that are tributary to these sewers and facilities. Please note that municipalities are not absolved from spending monies on O&M; these funds can not be used to balance other aspects of the municipality's operations. Rather, this proposition is a way of ensuring that municipalities continue to adequately fund their own internal O&M of the collection system. If anything good has come from the Administrative Consent Order/Consent Order of Agreements, it is that local municipalities have learned to be better stewards of the sewer systems.

Although ALCOSAN would take long-term possession of these critical sewers, the local municipality would still be responsible for any direct tap into that critical sewer. What local municipalities can provide at a higher level than ALCOSAN is immediate customer service. So if there is a backup at the grocery store tied into the interceptor, the local municipality would have a better response time to assess the problem and rectify the situation. Municipalities would not want to burden ALCOSAN with the associated customer service calls that occur with a typical collection system's operations.

I would also like to stress that ALCOSAN "do the right thing" when it comes to siting their proposed facilities. If it makes good engineering and economic sense to site a proposed retention tank in a commercial area, then that is where the facility should be located. For the greater good of the region, we must accept that there is some give and take on both sides of the equation and stop looking for the elegant solution.

Draft
Flow Estimates
Ross-Shaler Interceptor
Flows into ALCOSAN A-68 in the Pine Creek Watershed

Prepared by

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April 25, 2011

Regional Management Solutions

It is the opinion of Ross Township that all of the sewersheds in the North Hills served by ALCOSAN would be best served by a new Regional Sewer Authority. The proposed North Area Sewer Authority (NASA) would own and operate all of the sanitary sewers and combined sewers that contribute to ALCOSAN. It would also be recommended that NASA would also be involved in the management of storm sewer, stormwater management and flood reduction efforts in the North Hills.

The benefits of this approach are many.

- NASA would be able to manage all sewer and stormwater issues in a comprehensive and cost effective manner.
- NASA would be able to devote the time and professional efforts needed to develop a comprehensive cooperative and integrated approach to managing the costs associated with the ALCOSAN Wetweather Planning process.
- The size of NASA would allow the authority to lobby for funding and grants in a more effective way.
- NASA would continue the culture of cooperation and fairness that exists in the North Hills and be able to plan and negotiate with ALCOSAN and DEP.
- NASA could be formed such that representation on its board would reflect that area it represents.
- NASA would own and operate all of the pipe and facilities in the contributing sewersheds.
- In order to best develop a comprehensive approach to source control, NASA would need to own and operate all sewers in the region and be opened to developing a plan to reduce RDII coming from private property such as foundation drains.
- NASA would be able to manage Municipal Separate Storm Sewer (MS4) permitting. This process will become increasingly more difficult in the future as Total Maximum Daily Loads (TMDLs) become finalized for the streams in the North Hills.

An alternate plan to transfer ownership of our interceptor sewers to ALCOSAN is not supported for the following reasons.

- The North Hills area, and all areas outside of the City of Pittsburgh are underrepresented on the ALCOSAN Board.
- Transferring ownership of our truck sewers to ALCOSAN would eliminate the pressure for municipalities to transfer their remaining sewers to a regional authority.
- It would further subdivide the ownership of the sanitary sewer systems.
- ALCOSAN would not facilitate the management and planning needed to coordinate efforts related to better manage Stormwater Management and Flood Control issues in the North Hills.

- ALCOSAN would not facilitate the management and planning needed to coordinate efforts related to Separate Storm Sewer (MS4) permitting in the North Hills.
- Off loading our main trunk sewers to ALCOSAN would separate the issue of source control in the remaining municipality owned systems from wetweather facilities design. The sizing of future storage, conveyance and treatment needs to include a linked effort of source reduction.
- To date, ALCOSAN has not focused on source control to reduce the RDII needed to control wetweather flows into the sewer system. Without real source control efforts, costs of storage tanks and treatment; and their associated O&M costs, will continually increase over time. Without dealing with source control we are just “chasing our tail” with respect to the wetweather problem.

Pine Creek Alternatives Analysis
Estimated Annual Authority Costs

Pine Creek Watershed Alternative Combined Costs												
Alternative ID	Combined Costs	Annual Debt Service	Storage O & M	System Operating Costs	Total Annual	Annual / Acct.	Combined Costs Cost 1	Annual Debt Service	Storage O & M	System Operating Costs	Total Annual	Annual / Acct.
R-1/S-1/S-2/2/E-1/0-3	\$ 81,975,000	\$ 4,490,323	\$ 11,000	\$ 786,070	\$ 5,287,393	\$ 449.69	\$ 35,832,000	\$ 1,962,760	\$ 11,000	\$ 786,070	\$ 2,759,830	\$ 234.72
R-1/S-1/S-2/5/E-1/0-3	\$ 82,916,000	\$ 4,541,868	\$ 68,000	\$ 786,070	\$ 5,395,938	\$ 458.92	\$ 36,708,000	\$ 2,010,744	\$ 68,000	\$ 786,070	\$ 2,864,814	\$ 243.65
R-1/S-1/S-2/10/E-1/0-3	\$ 82,870,000	\$ 4,539,348	\$ 11,000	\$ 786,070	\$ 5,336,418	\$ 453.86	\$ 36,747,000	\$ 2,012,881	\$ 11,000	\$ 786,070	\$ 2,809,951	\$ 238.98
R-2/S-1/S-2/2/E-1/0-3	\$ 83,170,000	\$ 4,555,781	\$ 72,000	\$ 786,070	\$ 5,413,851	\$ 460.44	\$ 36,418,000	\$ 1,994,859	\$ 72,000	\$ 786,070	\$ 2,852,929	\$ 242.64
R-2/S-1/S-2/5/E-1/0-3	\$ 85,190,000	\$ 4,666,430	\$ 12,000	\$ 786,070	\$ 5,464,500	\$ 464.75	\$ 37,967,000	\$ 2,079,708	\$ 12,000	\$ 786,070	\$ 2,877,778	\$ 244.75
R-2/S-1/S-2/10/E-1/0-3	\$ 85,512,000	\$ 4,684,068	\$ 73,000	\$ 786,070	\$ 5,543,138	\$ 471.44	\$ 38,133,000	\$ 2,088,801	\$ 73,000	\$ 786,070	\$ 2,947,871	\$ 250.71
R-1/S-1/S-2/2/E-1/4-7	\$ 78,705,000	\$ 4,311,203	\$ 11,000	\$ 786,070	\$ 5,108,273	\$ 434.45	\$ 32,079,000	\$ 1,757,183	\$ 11,000	\$ 786,070	\$ 2,554,253	\$ 217.24
R-1/S-1/S-2/5/E-1/4-7	\$ 79,646,000	\$ 4,362,748	\$ 68,000	\$ 786,070	\$ 5,216,818	\$ 443.68	\$ 32,955,000	\$ 1,805,167	\$ 68,000	\$ 786,070	\$ 2,659,237	\$ 226.17
R-1/S-1/S-2/10/E-1/4-7	\$ 79,600,000	\$ 4,360,228	\$ 11,000	\$ 786,070	\$ 5,157,298	\$ 438.62	\$ 32,994,000	\$ 1,807,304	\$ 11,000	\$ 786,070	\$ 2,604,374	\$ 221.50
R-2/S-1/S-2/2/E-1/4-7	\$ 81,541,000	\$ 4,466,550	\$ 72,000	\$ 786,070	\$ 5,324,620	\$ 452.85	\$ 33,164,000	\$ 1,816,616	\$ 72,000	\$ 786,070	\$ 2,674,686	\$ 227.48
R-2/S-1/S-2/5/E-1/4-7	\$ 83,561,000	\$ 4,577,199	\$ 12,000	\$ 786,070	\$ 5,375,269	\$ 457.16	\$ 34,713,000	\$ 1,901,465	\$ 12,000	\$ 786,070	\$ 2,699,535	\$ 229.59
R-2/S-1/S-2/10/E-1/4-7	\$ 83,883,000	\$ 4,594,837	\$ 73,000	\$ 786,070	\$ 5,453,907	\$ 463.85	\$ 34,879,000	\$ 1,910,558	\$ 73,000	\$ 786,070	\$ 2,769,628	\$ 235.55
R-1/S-1/S-2/2/E-1/8-11	\$ 74,755,000	\$ 4,094,835	\$ 11,000	\$ 786,070	\$ 4,891,905	\$ 416.05	\$ 28,953,000	\$ 1,585,951	\$ 11,000	\$ 786,070	\$ 2,383,021	\$ 202.67
R-1/S-1/S-2/5/E-1/8-11	\$ 75,623,000	\$ 4,142,381	\$ 68,000	\$ 786,070	\$ 4,996,451	\$ 424.94	\$ 29,791,000	\$ 1,631,854	\$ 68,000	\$ 786,070	\$ 2,485,924	\$ 211.42
R-1/S-1/S-2/10/E-1/8-11	\$ 79,175,000	\$ 4,336,948	\$ 11,000	\$ 786,070	\$ 5,134,018	\$ 436.64	\$ 30,078,000	\$ 1,647,575	\$ 11,000	\$ 786,070	\$ 2,444,645	\$ 207.91
R-2/S-1/S-2/2/E-1/8-11	\$ 77,494,000	\$ 4,244,868	\$ 72,000	\$ 786,070	\$ 5,102,938	\$ 434.00	\$ 29,867,000	\$ 1,636,017	\$ 72,000	\$ 786,070	\$ 2,494,087	\$ 212.12
R-2/S-1/S-2/5/E-1/8-11	\$ 79,662,000	\$ 4,363,624	\$ 12,000	\$ 786,070	\$ 5,161,694	\$ 439.00	\$ 31,529,000	\$ 1,727,056	\$ 12,000	\$ 786,070	\$ 2,525,126	\$ 214.76
R-2/S-1/S-2/10/E-1/8-11	\$ 80,229,000	\$ 4,394,683	\$ 73,000	\$ 786,070	\$ 5,253,753	\$ 446.83	\$ 31,807,000	\$ 1,742,284	\$ 73,000	\$ 786,070	\$ 2,601,354	\$ 221.24

Changes were made to the ACT in the shoring, dewatering, and storage curves used to calculate the cost of different alternatives.

Max	\$	4,684,068	\$	471	\$	2,088,801	\$	251
Ave	\$	4,429,329	\$	447	\$	1,839,932	\$	227
Min	\$	4,094,835	\$	416	\$	1,585,951	\$	203

Pine Creek Watershed Alternative Combined Costs												
Alternative ID	Combined Costs	Annual Debt Service	Storage O & M	System Operating Costs	Total Annual	Annual / Acct.	Combined Costs Cost 1	Annual Debt Service	Storage O & M	System Operating Costs	Total Annual	Annual / Acct.
R-1/S-1/S-2/2/E-1/0-3	\$ 81,975,000	\$ 4,490,323	\$ 11,000	\$ 1,965,175	\$ 6,466,498	\$ 549.97	\$ 35,832,000	\$ 1,962,760	\$ 11,000	\$ 1,965,175	\$ 3,938,935	\$ 335.00
R-1/S-1/S-2/5/E-1/0-3	\$ 82,916,000	\$ 4,541,868	\$ 68,000	\$ 1,965,175	\$ 6,575,043	\$ 559.20	\$ 36,708,000	\$ 2,010,744	\$ 68,000	\$ 1,965,175	\$ 4,043,919	\$ 343.93
R-1/S-1/S-2/10/E-1/0-3	\$ 82,870,000	\$ 4,539,348	\$ 11,000	\$ 1,965,175	\$ 6,515,523	\$ 554.14	\$ 36,747,000	\$ 2,012,881	\$ 11,000	\$ 1,965,175	\$ 3,989,056	\$ 339.26
R-2/S-1/S-2/2/E-1/0-3	\$ 83,170,000	\$ 4,555,781	\$ 72,000	\$ 1,965,175	\$ 6,592,956	\$ 560.72	\$ 36,418,000	\$ 1,994,859	\$ 72,000	\$ 1,965,175	\$ 4,032,034	\$ 342.92
R-2/S-1/S-2/5/E-1/0-3	\$ 85,190,000	\$ 4,666,430	\$ 12,000	\$ 1,965,175	\$ 6,643,605	\$ 565.03	\$ 37,967,000	\$ 2,079,708	\$ 12,000	\$ 1,965,175	\$ 4,056,883	\$ 345.03
R-2/S-1/S-2/10/E-1/0-3	\$ 85,512,000	\$ 4,684,068	\$ 73,000	\$ 1,965,175	\$ 6,722,243	\$ 571.72	\$ 38,133,000	\$ 2,088,801	\$ 73,000	\$ 1,965,175	\$ 4,126,976	\$ 350.99
R-1/S-1/S-2/2/E-1/4-7	\$ 78,705,000	\$ 4,311,203	\$ 11,000	\$ 1,965,175	\$ 6,287,378	\$ 534.73	\$ 32,079,000	\$ 1,757,183	\$ 11,000	\$ 1,965,175	\$ 3,733,358	\$ 317.52
R-1/S-1/S-2/5/E-1/4-7	\$ 79,646,000	\$ 4,362,748	\$ 68,000	\$ 1,965,175	\$ 6,395,923	\$ 543.97	\$ 32,955,000	\$ 1,805,167	\$ 68,000	\$ 1,965,175	\$ 3,838,342	\$ 326.45
R-1/S-1/S-2/10/E-1/4-7	\$ 79,600,000	\$ 4,360,228	\$ 11,000	\$ 1,965,175	\$ 6,336,403	\$ 538.90	\$ 32,994,000	\$ 1,807,304	\$ 11,000	\$ 1,965,175	\$ 3,783,479	\$ 321.78
R-2/S-1/S-2/2/E-1/4-7	\$ 81,541,000	\$ 4,466,550	\$ 72,000	\$ 1,965,175	\$ 6,503,725	\$ 553.13	\$ 33,164,000	\$ 1,816,616	\$ 72,000	\$ 1,965,175	\$ 3,853,791	\$ 327.76
R-2/S-1/S-2/5/E-1/4-7	\$ 83,561,000	\$ 4,577,199	\$ 12,000	\$ 1,965,175	\$ 6,554,374	\$ 557.44	\$ 34,713,000	\$ 1,901,465	\$ 12,000	\$ 1,965,175	\$ 3,878,640	\$ 329.87
R-2/S-1/S-2/10/E-1/4-7	\$ 83,883,000	\$ 4,594,837	\$ 73,000	\$ 1,965,175	\$ 6,633,012	\$ 564.13	\$ 34,879,000	\$ 1,910,558	\$ 73,000	\$ 1,965,175	\$ 3,948,733	\$ 335.84
R-1/S-1/S-2/2/E-1/8-11	\$ 74,755,000	\$ 4,094,835	\$ 11,000	\$ 1,965,175	\$ 6,071,010	\$ 516.33	\$ 28,953,000	\$ 1,585,951	\$ 11,000	\$ 1,965,175	\$ 3,562,126	\$ 302.95
R-1/S-1/S-2/5/E-1/8-11	\$ 75,623,000	\$ 4,142,381	\$ 68,000	\$ 1,965,175	\$ 6,175,556	\$ 525.22	\$ 29,791,000	\$ 1,631,854	\$ 68,000	\$ 1,965,175	\$ 3,665,029	\$ 311.71
R-1/S-1/S-2/10/E-1/8-11	\$ 79,175,000	\$ 4,336,948	\$ 11,000	\$ 1,965,175	\$ 6,313,123	\$ 536.92	\$ 30,078,000	\$ 1,647,575	\$ 11,000	\$ 1,965,175	\$ 3,623,750	\$ 308.20
R-2/S-1/S-2/2/E-1/8-11	\$ 77,494,000	\$ 4,244,868	\$ 72,000	\$ 1,965,175	\$ 6,282,043	\$ 534.28	\$ 29,867,000	\$ 1,636,017	\$ 72,000	\$ 1,965,175	\$ 3,673,192	\$ 312.40
R-2/S-1/S-2/5/E-1/8-11	\$ 79,662,000	\$ 4,363,624	\$ 12,000	\$ 1,965,175	\$ 6,340,799	\$ 539.28	\$ 31,529,000	\$ 1,727,056	\$ 12,000	\$ 1,965,175	\$ 3,704,231	\$ 315.04
R-2/S-1/S-2/10/E-1/8-11	\$ 80,229,000	\$ 4,394,683	\$ 73,000	\$ 1,965,175	\$ 6,432,858	\$ 547.11	\$ 31,807,000	\$ 1,742,284	\$ 73,000	\$ 1,965,175	\$ 3,780,459	\$ 321.52

Max	\$	4,684,068	\$	572	\$	2,088,801	\$	351
Ave	\$	4,431,367	\$	547	\$	1,845,676	\$	327
Min	\$	4,094,835	\$	516	\$	1,585,951	\$	303

Pine Creek Consolidation Options
Cost Comparison Summary
Option R-2/S-1/S-2/2/E-1/4-7

Ross Township Cost Share

Exist Agreements

Alternative ID	Combined Costs	Ross Share Annual Cost Per Customer *		
		4%	6%	8%
R-2/S-1/S-2/2/E-1/4-7(ACT)	\$81,541,000	\$716	\$866	\$1,012
R-2/S-1/S-2/2/E-1/4-7(ACT Alt Cost 1)	\$33,164,000	\$196	\$232	\$270

Transfer of Trunkline to ALCOSAN

R-2 (ACT)	\$4,152,000	\$185	\$219	\$256
R-2 (ACT Alt Cost 1)	\$2,254,000	\$101	\$119	\$139

Sewershed Authority

Total Annual Operating	Modif ACT Per Acct.	ACT Per Acct.
WERF Median	\$227	\$453
WERF Average	\$330	\$557

Includes Debt Service @5% over 50 yrs, Annual system Operating Costs

Operating Committee

Description	Municipal Alternative Cost	Annual Debt Service Per Acct.			Municipal Alternative Cost 1*	Annual Debt Service Per Acct.		
		4%	6%	8%		4%	6%	8%
R-2	\$4,152,000	\$185	\$219	\$256	\$2,254,000	\$101	\$119	\$139
E-1 4 to 7*	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
Total Per Acct:		\$439	\$519	\$606		\$146	\$173	\$202

Trunkline Costs shared on an Acct. Basis

Shaler Township Cost Share

Exist Agreements

Alternative ID	Combined Costs	Shaler Share Annual Cost Per Customer *		
		4%	6%	8%
R-2/S-1/S-2/2/E-1/4-7(ACT)	\$81,541,000	\$418	\$494	\$576
R-2/S-1/S-2/2/E-1/4-7(ACT Alt Cost 1)	\$33,164,000	\$220	\$260	\$303

Transfer of Trunkline to ALCOSAN

S-1/S-2 (ACT)	\$35,160,000	\$312	\$369	\$431
S-1/S-2(ACT Alt Cost 1)	\$22,632,000	\$201	\$237	\$277

Sewershed Authority

Total Annual Operating	Modif ACT Per Acct.	ACT Per Acct.
WERF Median	\$227	\$453
WERF Average	\$330	\$557

Includes Debt Service @5% over 50 yrs, Annual system Operating Costs

Operating Committee

Description	Municipal Alternative Cost	Annual Debt Service Per Acct.			Municipal Alternative Cost 1*	Annual Debt Service Per Acct.		
		4%	6%	8%		4%	6%	8%
S-1/S-2	\$35,160,000	\$312	\$369	\$431	\$33,164,000	\$201	\$237	\$277
E-1 4 to 7*	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
Total Per Acct:		\$566	\$668	\$781		\$246	\$291	\$340

Trunkline Costs shared on an Acct. Basis

Pine Creek Consolidation Options
 Cost Comparison Summary
 Option R-2/S-1/S-2/2/E-1/4-7

Indiana Township Cost Share

Exist Agreements

Alternative ID	Combined Costs	Indiana Share Annual Cost Per Customer *		
		4%	6%	8%
R-2/S-1/S-2/2/E-1/4-7(ACT)	\$81,541,000	\$2,452	\$2,899	\$3,385
R-2/S-1/S-2/2/E-1/4-7(ACT Alt Cost 1)	\$33,164,000	\$440	\$520	\$607

Transfer of Trunkline to ALCOSAN

No Local Improvements Req'd.	\$0	\$0	\$0	\$0
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Sewershed Authority

Total Annual Operating	Modif ACT Per Acct.	ACT Per Acct.
WERF Median	\$227	\$453
WERF Average	\$330	\$557

Includes Debt Service @5% over 50 yrs, Annual system Operating Costs

Operating Committee

Description	Municipal Alternative Cost	Annual Debt Service Per Acct.			Municipal Alternative Cost 1*	Annual Debt Service Per Acct.		
		4%	6%	8%		4%	6%	8%
E-1 4 to 7*	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
Total Per Acct:		\$253	\$300	\$350		\$45	\$54	\$63

Trunkline Costs shared on an Acct. Basis

Etna Borough Cost Share

Exist Agreements

Alternative ID	Combined Costs	Etna Share Annual Cost Per Customer *		
		4%	6%	8%
R-2/S-1/S-2/2/E-1/4-7(ACT)	\$81,541,000	\$581	\$687	\$802
R-2/S-1/S-2/2/E-1/4-7(ACT Alt Cost 1)	\$33,164,000	\$147	\$174	\$203

Transfer of Trunkline to ALCOSAN

E-1 (ACT)	\$1,247,000	\$54	\$64	\$74
E-1(ACT Alt Cost 1)	\$927,000	\$40	\$47	\$55

Sewershed Authority

Total Annual Operating	Modif ACT Per Acct.	ACT Per Acct.
WERF Median	\$227	\$453
WERF Average	\$330	\$557

Includes Debt Service @5% over 50 yrs, Annual system Operating Costs

Operating Committee

Description	Municipal Alternative Cost	Annual Debt Service Per Acct.			Municipal Alternative Cost 1*	Annual Debt Service Per Acct.		
		4%	6%	8%		4%	6%	8%
E-1	\$1,247,000	\$54	\$64	\$74	\$927,000	\$40	\$47	\$55
E-1 4 to 7*	\$40,982,000	\$253	\$300	\$350	\$7,351,000	\$45	\$54	\$63
Total Per Acct:		\$307	\$363	\$424		\$85	\$101	\$118

Trunkline Costs shared on an Acct. Basis