

7 Section Seven – Cost Performance Considerations

7.1 Introduction

The National CSO Control Policy requires CSO communities to consider a reasonable range of CSO control alternatives. For example, the plan should evaluate control alternatives that would capture 75-100 percent of wet-weather sewer flows during a typical year or reduce the frequency of sewer overflows to zero to twelve events in a typical year. Continuous simulation, such as modeling a typical year, is generally acknowledged as a superior approach for modeling wet weather controls and water quality effects (EPA, 1999). For these reasons, a continuous simulation approach was used to evaluate the effectiveness of the final control alternatives identified for the Terre Haute combined sewer collection system. This approach was conducted by applying the City’s calibrated collection system and river models for 1978 environmental conditions, which was identified as a typical year of rainfall and river conditions (see Section 2.6.3).

As a result of the analysis of the options described in Section 6, the City, U.S. EPA and IDEM agreed that Alternative 7B (tunnel) and 11 (parallel interceptor and local storage) should be carried forward as final alternatives for a detailed analysis. A third alternative, which is a lower-cost hybrid of Alternative 11 was also developed and carried forward through a detailed analysis. This detailed analysis included cost/performance evaluations and non-monetary analysis at seven levels of control: 1-month (12 overflows/year), 6-weeks (9 overflows/year), 2-month (6 overflows/year), 3-month (4 overflows/year), 6-month (2 overflows/year), 9-month (1 overflow/year) and 1-year (0 overflows/year) storms. Alternative 11 was also analyzed at a storm size corresponding 7 overflows/year. Sewer separation was also evaluated as an alternative. In addition to the capital costs of each option, the annual operation and maintenance costs for each option are also presented so that their impact on the overall implementation can be considered.

The cost/performance analysis included simulating each level of control of each final alternative to predict the water quality improvements in the Wabash River if that alternative was implemented. The water quality benefit results were combined with the associated cost to construct a “knee-of-the curve” graph to identify the most cost-effective level of control for each final alternative. The non-monetary analysis included an assessment of environmental issues, technical issues, implementation issues, and public acceptance.



The detailed analysis is described in this section. More emphasis has been given to the cost-performance analysis than the non-monetary analysis because the cost of each of the final alternatives is unaffordable, even at low levels (e.g. 12 overflows/year) of control.

7.2 Cost Performance Curve Analysis

The final developed alternatives were evaluated using the models to determine performance of each alternative over a typical year (1978). Hourly CSO overflows predicted by the collection system model were input into the river model to simulate resulting water quality improvements relative to the baseline (current) conditions (presented in Section 4.3). The water quality benefit results for each alternative were combined with the associated cost to construct a “knee-of-the curve” graph to identify the most cost-effective level of control. This section presents the development of the cost of each alternative, end-of-pipe and in-stream results from the collection system and river model applications over the typical year, respectively, and the cost-performance analysis for each alternative.

7.2.1 Unit Cost Development

Unit construction cost opinions were developed for the infrastructure components of the various CSO control alternatives. These opinions were based on actual construction costs for similar facilities. The costs were adjusted to current price levels using if necessary based upon the age of the reference material.

The following subsections describe the process utilized for development of unit costs for CSO conveyance systems, CSO storage facilities and other construction items within the alternatives and operation, maintenance, and replacement unit costs for the new systems included in each alternative in order to develop present worth costs for each alternative.

7.2.1.1 Conveyance Unit Costs

Pipeline and tunnel unit costs used to develop conveyance cost opinions were obtained by determining unit quantities for proposed tunnels and sewers at various sizes and depths of installation. Pipeline unit costs were developed from actual bid tabulations and results from various projects including but not limited to the following:

- Past Terre Haute Sanitary District Projects
- City of Indianapolis



- City of Des Moines, Iowa
- Stratford County, Virginia
- King County, Washington
- Other Indiana communities Long Term Control Plans including the Cities of Lafayette and Fort Wayne.

The quantities and unit costs were reviewed against the proposed work of the Terre Haute alternatives and adjustments were made based upon depth of cut, diameter, quantity and size of structures/manholes, etc. Several local contractors also reviewed the proposed sewer locations and costs for further evaluation. Unit cost reference information is included in Appendix 7-1.

7.2.1.2 CSO Storage Facilities

The CSO storage facilities included in the unit construction cost opinions are designed as below grade covered concrete storage tanks with flushing/cleaning systems and in some cases also include floatables control, weir/gate structures, connecting sewer reinforcement and combined sewer consolidation/separation. Covered storage tank costs are based on actual construction costs for underground cast-in-place storage tanks. Each tank includes provisions for cleaning/flushing as well as pumping systems to evacuate the tank. Excavation, sheeting, backfilling, dewatering, concrete and piling quantities are included in the estimation for each tank or structure. The unit costs for floatables control and weir/gate structures include equipment costs from manufacturers and estimated installation costs. The sewer reinforcement and sewer separation costs are based on actual construction project costs within the State of Indiana.

The costs for storage structures were confirmed and verified for accuracy against other similarly constructed facilities in Michigan and Indiana. Based upon similar facilities design, cost estimates were adjusted utilizing a cost per gallon of storage. Research of other facilities and estimations for labor, material and equipment for storage tanks of various sizes yielded an approximate cost of \$5/gallon of CSO flow storage for the various structures included in the alternatives.



7.2.1.3 Operation, Maintenance and Replacement Costs

Annual operating and maintenance costs for power and labor for cleaning and inspection of the CSO control alternative technologies were developed for each alternative. Labor costs were developed from costs provided by the City based on the time and personnel required and actual operation and maintenance costs of similar facilities from other Indiana communities. Table 7.2-1 provides a summary of the annual costs for each alternative and detail on the calculations is included in Appendix 7-2. During cost analysis of operation, maintenance and replacement, a present worth analysis was completed for 25 years. The present worth analysis included an equal series present worth calculated from year 1 to year 25 to estimate the present worth cost needed to operate and maintain the facilities after construction is completed. Table 7.2-2 presents a summary of the capital costs (updated during Phase I design) and Table 7.2-3 shows the present worth value for each alternative.



**Table 7.2-1
Annual Operations and Maintenance Costs for each Alternative¹**

	0 Overflows	1 Overflow	2 Overflows	4 Overflows	6 Overflows	7 Overflows	9 Overflows	12 Overflows
Alternative 7B	\$1,207,700	–	–	–	\$1,283,500	–	\$1,205,900	\$1,152,600
Alternative 11	\$2,544,800	\$1,757,300	\$1,601,000	\$1,345,900	\$1,108,200	\$1,031,300	\$1,020,900	\$966,100
Alternative 11B	–	–	–	–	–	\$948,700	–	–
Hybrid	\$6,307,100	\$4,203,300	\$3,856,800	\$1,794,300	\$1,439,600	–	\$1,167,900	\$895,600

¹ Costs have been updated and revised from 2011 estimates

**Table 7.2-2
Total Project Costs for Each Alternative^{1,3}**

	0 Overflows	1 Overflow	2 Overflows	4 Overflows	6 Overflows	7 Overflows	9 Overflows	12 Overflows
Alternative 7B	\$178,377,600	–	–	–	\$180,181,700	–	\$159,646,700	\$145,552,200
Alternative 11	\$525,956,300	\$316,065,600	\$276,316,100	\$208,829,000	\$150,465,400	\$130,261,000	\$128,941,800	\$114,465,500
Alternative 11B	–	–	–	–	–	\$123,678,400	–	–
Hybrid ²	\$522,925,300	\$354,306,500	\$326,534,000	\$161,221,500	\$132,787,800	–	\$109,593,300	\$87,772,100

¹ Costs include Construction, Contingency and Non-Construction

² The Hybrid Alternative does not include a new main lift station

³ Costs have been updated and revised from 2011 estimates

**Table 7.2-3
Present Worth of Total Project Costs for Each Alternative¹**

	0 Overflows	1 Overflow	2 Overflows	4 Overflows	6 Overflows	7 Overflows	9 Overflows	12 Overflows
Alternative 7B	\$194,577,600	–	–	–	\$197,398,500	–	\$175,822,600	\$161,013,100
Alternative 11	\$560,092,100	\$339,557,400	\$297,791,800	\$226,882,800	\$165,330,700	\$144,094,800	\$142,636,100	\$127,424,700
Alternative 11B	–	–	–	–	–	\$136,404,200	–	–
Hybrid	\$607,528,300	\$410,689,300	\$378,268,800	\$185,290,100	\$152,098,500	–	\$125,259,400	\$99,785,600

¹ All present worth values provided herein are based on updated costs included in revised Tables 7.2-1 and 7.2-2



Replacement costs were also included as an annual expense for short-lived assets such as equipment placed into service which will require replacement prior to the 25 year completion of the CSO LTCP implementation. The replacement costs are based upon the cost of the items and are spread out evenly during the estimated life of each respective item which requires replacement.

7.2.2 Cost for Each Control Alternative

Based upon the infrastructure sizing predicted by the SWMM model for each level of control, various cost estimates were developed using the process and rationale discussed in 7.2.1. Cost estimates for Alternative 11 and the “Hybrid” alternative were developed for the following levels of control: 0, 1, 2, 4, 6, 9 and 12 overflows per year. Costs for Alternative 7B which includes a CSO tunnel were developed for 0, 6 and 12 overflows per year scenarios only. Costs were developed by the City’s design consultant costs for Alternative 11B (the amended selected plan), which includes new High Rate Clarification system, for 7 overflows per year scenario only. Tables 7.2-4A – 7.2-7A provide detailed breakdown of the capital costs for each level of CSO flow control for each of the alternatives.

A summary of the costs for each alternative at the various levels of control is included in Tables 7.2-2 and 7.2-3.



**Table 7.2-4A
Alternative 7B – 12 Overflows**

New Main Lift and Tunnel Option w/IP Storage

Item	Description	Total
I.	Main Lift Tunnel	\$55,589,100.00
II.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
III.	Sitework and Piping ¹	\$2,115,800.00
IV.	Lagoon Modifications ²	\$17,173,000.00
V.	Common Alternatives	\$14,500,000.00
	Subtotal	\$110,058,300.00
	Construction Contingencies (15%)	\$16,508,800.00
	Non-Construction Costs (15%)	\$18,985,100.00
	Main Lift Tunnel Option Total³	\$145,552,200.00

¹ Costs have decreased from the 2011 estimate of \$2,176,100

² Costs have increased from the 2011 estimate of \$6,168,800

³ Costs have increased from the 2011 estimate of \$131,078,800

I. Main Lift Tunnel (Spruce to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	TBM Mobilization	LS	1	\$6,000,000.00	\$6,000,000.00
2	Launching/Receiving Shaft	EA	3	\$300,000.00	\$900,000.00
3	84" Open Cut Tunnel	LF	14,500	\$2,500.00	\$36,250,000.00
4	84" Gravity Sewer - 003 to New Main Lift Station	LF	1,500	\$850.00	\$1,275,000.00
5	Diversion Structures/Outfalls & Piping Reconst.	EA	7	\$750,000.00	\$5,250,000.00
6	Ventilation Duct and Fan	EA	2	\$500,000.00	\$1,000,000.00
7	Odor Control Facilities	EA	2	\$700,000.00	\$1,400,000.00
8	Excess Excavation Spoil Disposal	CY	20,700	\$10.00	\$207,000.00
9	Maintenance of Traffic	LS	1	\$250,000.00	\$250,000.00
10	Geotechnical Controls	LS	1	\$110,000.00	\$110,000.00
11	Erosion Control	LS	1	\$100,000.00	\$100,000.00
12	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
13	General Conditions (NTE 5%)	LS			\$2,647,100.00
	Main Lift Tunnel Subtotal				\$55,589,100.00



II. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Tunnel Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	Main Lift Tunnel Lift Station Subtotal				\$20,680,400.00

III. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
4	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
5	18" Lagoon Drain Piping ¹	LF	300	\$75.00	\$22,500.00
6	Lagoon Drain Flow Control ¹	LS	1	\$10,000.00	\$10,000.00
7	18" Force Main to Lagoon ¹	LF	500	\$75.00	\$37,500.00
8	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
9	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
10	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
11	Erosion Control	LS	1	\$50,000.00	\$50,000.00
12	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
13	General Conditions (NTE 5%) ²	LS			\$100,800.00
	Site Work and Piping Subtotal ³				\$2,115,800.00

¹ Line items were included in 2011 estimate but have been removed since they are included in the revised Lagoon Modifications cost estimate.

² Costs have decreased from the 2011 estimate of \$104,300

³ Costs have decreased from the 2011 estimate of \$2,189,300



IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Floatables Controls at CSO 011/004	EA	1	\$2,000,000.00	\$2,000,000.00
3	Floatables Controls at CSO 009	EA	1	\$2,000,000.00	\$2,000,000.00
4	Floatables Controls at CSO 010	EA	1	\$2,000,000.00	\$2,000,000.00
5	Floatables Controls at CSO 003	EA	1	\$2,000,000.00	\$2,000,000.00
6	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
7	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
8	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
Common Alternatives Subtotal					\$14,500,000.00



**Table 7.2-4B
Alternative 7B – 9 Overflows**

New Main Lift and Tunnel Option w/IP Storage

Item	Description	Total
I.	Main Lift Tunnel	\$66,246,600.00
II.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
III.	Sitework and Piping ¹	\$2,115,800.00
IV.	Lagoon Modifications ²	\$17,173,000.00
V.	Common Alternatives	\$14,500,000.00
	Subtotal	\$120,715,800.00
	Construction Contingencies (15%)	\$18,107,400.00
	Non-Construction Costs (15%)	\$20,823,500.00
	Main Lift Tunnel Option Total³	\$159,646,700.00

¹ Costs have decreased from the 2011 estimate of \$2,176,100

² Costs have increased from the 2011 estimate of \$6,168,800

³ Costs have increased from the 2011 estimate of \$145,173,400

I. Main Lift Tunnel (Spruce to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	TBM Mobilization	LS	1	\$6,000,000.00	\$6,000,000.00
2	Launching/Receiving Shaft	EA	3	\$300,000.00	\$900,000.00
3	Tunnel - 16' Diameter	LF	14,500	\$3,200.00	\$46,400,000.00
4	84" Gravity Sewer - 003 to New Main Lift Station	LF	1,500	\$850.00	\$1,275,000.00
5	Diversion Structures/Outfalls & Piping Reconst.	EA	7	\$750,000.00	\$5,250,000.00
6	Ventilation Duct and Fan	EA	2	\$500,000.00	\$1,000,000.00
7	Odor Control Facilities	EA	2	\$700,000.00	\$1,400,000.00
8	Excess Excavation Spoil Disposal	CY	20,700	\$10.00	\$207,000.00
9	Maintenance of Traffic	LS	1	\$250,000.00	\$250,000.00
10	Geotechnical Controls	LS	1	\$110,000.00	\$110,000.00
11	Erosion Control	LS	1	\$100,000.00	\$100,000.00
12	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
13	General Conditions (NTE 5%)	LS			\$3,154,600.00
	Main Lift Tunnel Subtotal				\$66,246,600.00



II. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Tunnel Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	Main Lift Tunnel Lift Station Subtotal				\$20,680,400.00

III. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
4	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
5	18" Lagoon Drain Piping ¹	LF	300	\$75.00	\$22,500.00
6	Lagoon Drain Flow Control ¹	LS	1	\$10,000.00	\$10,000.00
7	18" Force Main to Lagoon ¹	LF	500	\$75.00	\$37,500.00
8	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
9	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
10	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
11	Erosion Control	LS	1	\$50,000.00	\$50,000.00
12	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
13	General Conditions (NTE 5%) ²	LS			\$100,800.00
	Site Work and Piping Subtotal ³				\$2,115,800.00

¹ Line items were included in 2011 estimate but have been removed since they are included in the revised Lagoon Modifications cost estimate.

² Costs have decreased from the 2011 estimate of \$104,300

³ Costs have decreased from the 2011 estimate of \$2,189,300



IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
	Lagoon Modifications Subtotal				\$17,173,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Floatables Controls at CSO 011/004	EA	1	\$2,000,000.00	\$2,000,000.00
3	Floatables Controls at CSO 009	EA	1	\$2,000,000.00	\$2,000,000.00
4	Floatables Controls at CSO 010	EA	1	\$2,000,000.00	\$2,000,000.00
5	Floatables Controls at CSO 003	EA	1	\$2,000,000.00	\$2,000,000.00
6	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
7	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
8	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
	Common Alternatives Subtotal				\$14,500,000.00



**Table 7.2-4C
Alternative 7B – 6 Overflows**

New Main Lift and Tunnel Option w/IP Storage

Item	Description	Total
I.	Main Lift Tunnel	\$81,774,000.00
II.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
III.	Sitework and Piping ¹	\$2,115,800.00
IV.	Lagoon Modifications ²	\$17,173,000.00
V.	Common Alternatives	\$14,500,000.00
	Subtotal	\$136,243,200.00
	Construction Contingencies (15%)	\$20,436,500.00
	Non-Construction Costs (15%)	\$23,502,000.00
	Main Lift Tunnel Option Total³	\$180,181,700.00

¹ Costs have decreased from the 2011 estimate of \$2,176,100

² Costs have increased from the 2011 estimate of \$6,168,800

³ Costs have increased from the 2011 estimate of \$165,708,300

I. Main Lift Tunnel (Spruce to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	TBM Mobilization	LS	1	\$11,500,000.00	\$11,500,000.00
2	Launching/Receiving Shaft	EA	3	\$450,000.00	\$1,350,000.00
3	Tunnel - 16' Diameter	LF	14,500	\$3,750.00	\$54,375,000.00
4	84" Gravity Sewer - 003 to New Main Lift Station	LF	1,500	\$850.00	\$1,275,000.00
5	Diversion Structures/Outfalls & Piping Reconst.	EA	7	\$750,000.00	\$5,250,000.00
6	Ventilation Duct and Fan	EA	2	\$500,000.00	\$1,000,000.00
7	Odor Control Facilities	EA	2	\$700,000.00	\$1,400,000.00
8	Excess Excavation Spoil Disposal	CY	107,000	\$10.00	\$1,070,000.00
9	Maintenance of Traffic	LS	1	\$250,000.00	\$250,000.00
10	Geotechnical Controls	LS	1	\$110,000.00	\$110,000.00
11	Erosion Control	LS	1	\$100,000.00	\$100,000.00
12	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
13	General Conditions (NTE 5%)	LS			\$3,894,000.00
	Main Lift Tunnel Subtotal				\$81,774,000.00



II. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Tunnel Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	Main Lift Tunnel Lift Station Subtotal				\$20,680,400.00

III. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
4	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
5	18" Lagoon Drain Piping ¹	LF	300	\$75.00	\$22,500.00
6	Lagoon Drain Flow Control ¹	LS	1	\$10,000.00	\$10,000.00
7	18" Force Main to Lagoon ¹	LF	500	\$75.00	\$37,500.00
8	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
9	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
10	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
11	Erosion Control	LS	1	\$50,000.00	\$50,000.00
12	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
13	General Conditions (NTE 5%) ²	LS			\$100,800.00
	Site Work and Piping Subtotal ³				\$2,115,800.00

¹ Line items were included in 2011 estimate but have been removed since they are included in the revised Lagoon Modifications cost estimate.

² Costs have decreased from the 2011 estimate of \$104,300

³ Costs have decreased from the 2011 estimate of \$2,189,300



IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Floatables Controls at CSO 011/004	EA	1	\$2,000,000.00	\$2,000,000.00
3	Floatables Controls at CSO 009	EA	1	\$2,000,000.00	\$2,000,000.00
4	Floatables Controls at CSO 010	EA	1	\$2,000,000.00	\$2,000,000.00
5	Floatables Controls at CSO 003	EA	1	\$2,000,000.00	\$2,000,000.00
6	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
7	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
8	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
Common Alternatives Subtotal					\$14,500,000.00



Table 7.2-4D
Alternative 7B – 0 Overflows

New Main Lift and Tunnel Option w/IP Storage

Item	Description	Total
I.	Main Lift Tunnel	\$86,409,800.00
II.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
III.	Sitework and Piping ¹	\$2,115,800.00
IV.	Lagoon Modifications ²	\$17,173,000.00
V.	Common Alternatives	\$8,500,000.00
	Subtotal	\$134,879,000.00
	Construction Contingencies (15%)	\$20,231,900.00
	Non-Construction Costs (15%)	\$23,266,700.00
	Main Lift Tunnel Option Total³	\$178,377,600.00

¹ Costs have decreased from the 2011 estimate of \$2,176,100

² Costs have increased from the 2011 estimate of \$6,168,800

³ Costs have increased from the 2011 estimate of \$163,904,200

I. Main Lift Tunnel (Spruce to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	TBM Mobilization	LS	1	\$12,000,000.00	\$12,000,000.00
2	Launching/Receiving Shaft	EA	3	\$500,000.00	\$1,500,000.00
3	Tunnel - 17' Diameter	LF	14,500	\$4,000.00	\$58,000,000.00
4	84" Gravity Sewer - 003 to New Main Lift Station	LF	1,500	\$850.00	\$1,275,000.00
5	Diversion Structures/Outfalls & Piping Reconst.	EA	7	\$750,000.00	\$5,250,000.00
6	Ventilation Duct and Fan	EA	2	\$500,000.00	\$1,000,000.00
7	Odor Control Facilities	EA	2	\$700,000.00	\$1,400,000.00
8	Excess Excavation Spoil Disposal	CY	121,000	\$10.00	\$1,210,000.00
9	Maintenance of Traffic	LS	1	\$250,000.00	\$250,000.00
10	Geotechnical Controls	LS	1	\$110,000.00	\$110,000.00
11	Erosion Control	LS	1	\$100,000.00	\$100,000.00
12	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
13	General Conditions (NTE 5%)	LS			\$4,114,800.00
	Main Lift Tunnel Subtotal				\$86,409,800.00



II. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Tunnel Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	Main Lift Tunnel Lift Station Subtotal				\$20,680,400.00

III. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
4	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
5	18" Lagoon Drain Piping ¹	LF	300	\$75.00	\$22,500.00
6	Lagoon Drain Flow Control ¹	LS	1	\$10,000.00	\$10,000.00
7	18" Force Main to Lagoon ¹	LF	500	\$75.00	\$37,500.00
8	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
9	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
10	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
11	Erosion Control	LS	1	\$50,000.00	\$50,000.00
12	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
13	General Conditions (NTE 5%) ²	LS			\$100,800.00
	Site Work and Piping Subtotal ³				\$2,115,800.00

¹ Line items were included in 2011 estimate but have been removed since they are included in the revised Lagoon Modifications cost estimate.

² Costs have decreased from the 2011 estimate of \$104,300

³ Costs have decreased from the 2011 estimate of \$2,189,300



IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	CSO 003 Closure	LS	1	\$250,000.00	\$250,000.00
3	CSO 004 Closure	LS	1	\$250,000.00	\$250,000.00
4	CSO 005 Closure	LS	1	\$250,000.00	\$250,000.00
5	CSO 006 Closure	LS	1	\$250,000.00	\$250,000.00
6	CSO 007 Closure	LS	1	\$250,000.00	\$250,000.00
7	CSO 008 Closure	LS	1	\$250,000.00	\$250,000.00
8	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
9	CSO 010 Closure	LS	1	\$250,000.00	\$250,000.00
10	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
11	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
12	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
Common Alternatives Subtotal					\$8,500,000.00



**Table 7.2-5A
Alternative 11 – 12 Overflows**

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$17,952,000.00
II.	Parallel Interceptor	\$18,398,600.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
IV.	Sitework and Piping	\$3,848,300.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$8,500,000.00
	Subtotal	\$86,552,300.00
	Construction Contingencies (15%)	\$12,982,900.00
	Non-Construction Costs (15%)	\$14,930,300.00
	Parallel Interceptor Option Total³	\$114,465,500.00

¹ Costs have decreased from the 2011 estimate of \$21,102,300

² Costs have increased from the 2011 estimate of \$6,294,800

³ Costs have increased from the 2011 estimate of \$104,245,300

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer ¹	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	1.5 MG of Storage at 010	Gal	1,500,000	\$5.00	\$7,500,000.00
17	Storage Structure Evacuation Piping	LS	1	\$50,000.00	\$50,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$855,000.00
	North Conveyance/Storage Subtotal ²				\$17,952,000.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$21,102,300

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	96" Gravity Sewer (31-35' dp.)	LF	750	\$1,500.00	\$1,125,000.00
2	96" Gravity Sewer (26-30' dp.)	LF	850	\$1,250.00	\$1,062,500.00
3	96" Gravity Sewer (21-25' dp.)	LF	500	\$1,000.00	\$500,000.00
4	96" Gravity Sewer (11-15' dp.)	LF	600	\$900.00	\$540,000.00
5	96" Gravity Sewer (16-20' dp.)	LF	350	\$850.00	\$297,500.00
6	96" Gravity Sewer (11-15' dp.)	LF	4,000	\$800.00	\$3,200,000.00
7	144" Gravity Sewer (0-10' dp.)	LF	2,950	\$2,000.00	\$5,900,000.00
8	Std. MH, 7' Diameter	EA	17	\$50,000.00	\$850,000.00
9	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$876,100.00
	Parallel Interceptor Subtotal				\$18,398,600.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	New Main Lift Station Subtotal				\$20,680,400.00

IV. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	96" Gravity Sewer (003 to New Main Lift)	LF	1,500	\$1,100.00	\$1,650,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	Erosion Control	LS	1	\$50,000.00	\$50,000.00
10	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
11	General Conditions (NTE 5%)	LS			\$183,300.00
	Site Work and Piping Subtotal				\$3,848,300.00



V. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
	Lagoon Modifications Subtotal				\$17,173,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$8,500,000.00



Table 7.2-5B
Alternative 11 – 9 Overflows

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$20,104,400.00
II.	Parallel Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
IV.	Sitework and Piping	\$5,580,800.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$8,500,000.00
	Subtotal	\$97,498,500.00
	Construction Contingencies (15%)	\$14,624,800.00
	Non-Construction Costs (15%)	\$16,818,500.00
	Parallel Interceptor Option Total³	\$128,941,800.00

¹ Costs have decreased from the 2011 estimate of \$23,254,800² Costs have increased from the 2011 estimate of \$6,294,800³ Costs have increased from the 2011 estimate of \$118,721,700**I. North Conveyance/Storage (Chestnut to Spruce)**

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer ¹	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals ¹	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	1.9 MG of Storage at 010	Gal	1,900,000	\$5.00	\$9,500,000.00
17	Storage Structure Evacuation Piping	LS	1	\$100,000.00	\$100,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$957,400.00
	North Conveyance/Storage Subtotal ²				\$20,104,400.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$23,254,800

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	144" Gravity Sewer (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	New Main Lift Station Subtotal				\$20,680,400.00

IV. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	Erosion Control	LS	1	\$50,000.00	\$50,000.00
10	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
11	General Conditions (NTE 5%)	LS			\$265,800.00
	Site Work and Piping Subtotal				\$5,580,800.00



V. Lagoon Modifications¹

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

¹ The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at CSO 011	LS	1	\$2,000,000.00	\$2,000,000.00
Common Alternatives Subtotal					\$8,500,000.00



**Table 7.2-5C
Alternative 11 – 7 Overflows**

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$20,629,400.00
II.	Parallel Main Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$21,152,900.00
IV.	Sitework and Piping	\$5,580,800.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$8,500,000.00
	Subtotal	\$98,496,000.00
	Construction Contingencies (15%)	\$14,774,400.00
	Non-Construction Costs (15%)	\$16,990,600.00
	Parallel Interceptor Option Total³	\$130,261,000.00

¹ Costs have decreased from the 2011 estimate of \$23,779,800

² Costs have increased from the 2011 estimate of \$6,294,800

³ Costs have increased from the 2011 estimate of \$120,040,900

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$1,300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	2.0 MG of Storage at 010	Gal	2,000,000	\$5.00	\$10,000,000.00
17	Storage Structure Evacuation Piping	LS	1	\$100,000.00	\$100,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$982,400.00
	North Conveyance/Storage Subtotal ²				\$20,629,400.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$23,779,800

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	144" Gravity Sewer (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$13,200,000.00	\$13,200,000.00
2	Tunnel Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$1,007,300.00
	New Main Station Subtotal				\$21,152,900.00

IV. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	Erosion Control	LS	1	\$50,000.00	\$50,000.00
10	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
11	General Conditions (NTE 5%)	LS			\$265,800.00
	Site Work and Piping Subtotal				\$5,580,800.00



V. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at CSO 011	LS	1	\$2,000,000.00	\$2,000,000.00
Common Alternatives Subtotal					\$8,500,000.00



**Table 7.2-5D
Alternative 11 – 6 Overflows**

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$35,854,400.00
II.	Parallel Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$21,205,400.00
IV.	Sitework and Piping	\$5,580,800.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$8,500,000.00
	Subtotal	\$113,773,500.00
	Construction Contingencies (15%)	\$17,066,000.00
	Non-Construction Costs (15%)	\$19,625,900.00
	Parallel Interceptor Option Total³	\$150,465,400.00

¹ Costs have decreased from the 2011 estimate of \$39,004,800

² Costs have increased from the 2011 estimate of \$6,294,800

³ Costs have increased from the 2011 estimate of \$140,245,500

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	4.9 MG of Storage at 010	Gal	4,900,000	\$5.00	\$24,500,000.00
17	Storage Structure Evacuation Piping	LS	1	\$100,000.00	\$100,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$1,707,400.00
	North Conveyance/Storage Subtotal ²				\$35,854,400.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$39,004,800.

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	144" Gravity Sewer (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$13,250,000.00	\$13,250,000.00
2	Tunnel Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$1,009,800.00
	New Main Lift Station Subtotal				\$21,205,400.00

IV. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	Erosion Control	LS	1	\$50,000.00	\$50,000.00
10	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
11	General Conditions (NTE 5%)	LS			\$265,800.00
	Site Work and Piping Subtotal				\$5,580,800.00



V. Lagoon Modifications¹

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
	Lagoon Modifications Subtotal				\$17,173,000.00

¹ The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at CSO 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$8,500,000.00



**Table 7.2-5E
Alternative 11 – 4 Overflows**

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$53,730,600.00
II.	Parallel Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
IV.	Sitework and Piping	\$30,360,800.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$10,500,000.00
	Subtotal	\$157,904,700.00
	Construction Contingencies (15%)	\$23,685,700.00
	Non-Construction Costs (15%)	\$27,238,600.00
	Parallel Interceptor Option Total³	\$208,829,000.00

¹ Costs have decreased from the 2011 estimate of \$56,881,000

² Costs have increased from the 2011 estimate of \$6,294,800

³ Costs have increased from the 2011 estimate of \$198,608,900

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	8.3 MG of Storage at 010	Gal	8,300,000	\$5.00	\$41,500,000.00
17	Storage Structure Evacuation Piping	LS	1	\$125,000.00	\$125,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$2,558,600.00
	North Conveyance/Storage Subtotal ²				\$53,730,600.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$56,881,000.00

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	144" Gravity Sewer (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Tunnel Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	New Main Station Subtotal				\$20,680,400.00

IV. Site Work and Piping (for New Main Lift, Turner Storage & Hulman Storage)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	0.8 MG of Storage at 003	GAL	800,000	\$5.00	\$4,000,000.00
10	3.9 MG of Storage at 011	GAL	3,900,000	\$5.00	\$19,500,000.00
11	Storage Evacuation Piping	LS	1	\$100,000.00	\$100,000.00
12	Erosion Control	LS	1	\$50,000.00	\$50,000.00
13	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
14	General Conditions (NTE 5%)	LS			\$1,445,800.00
	Site Work and Piping Subtotal				\$30,360,800.00



V. Lagoon Modifications¹

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
	Lagoon Modifications Subtotal				\$17,173,000.00

¹ The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
6	Floatables Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$10,500,000.00



**Table 7.2-5F
Alternative 11 – 2 Overflows**

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$72,158,100.00
II.	Parallel Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
IV.	Sitework and Piping	\$62,963,300.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$10,500,000.00
	Subtotal	\$208,934,700.00
	Construction Contingencies (15%)	\$31,340,200.00
	Non-Construction Costs (15%)	\$36,041,200.00
	Parallel Interceptor Option Total³	\$276,316,100.00

¹ Costs have decreased from the 2011 estimate of \$75,308,500

² Costs have increased from the 2011 estimate of \$6,294,800

³ Costs have increased from the 2011 estimate of \$266,096,100

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer ¹	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	11.8 MG of Storage at 010	Gal	11,800,000	\$5.00	\$59,000,000.00
17	Storage Structure Evacuation Piping	LS	1	\$175,000.00	\$175,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$3,436,000.00
	North Conveyance/Storage Subtotal ²				\$72,158,100.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$73,308,500.00

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Twin 144" Gravity Sewers (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	New Main Lift Station Subtotal				\$20,680,400.00

IV. Site Work and Piping (for New Main Lift, Turner Storage & Hulman Storage)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewers	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	0.8 MG of Storage at 003	GAL	800,000	\$5.00	\$4,000,000.00
10	10.1 MG of Storage at 011	GAL	10,100,000	\$5.00	\$50,500,000.00
11	Storage Evacuation Piping	LS	1	\$150,000.00	\$150,000.00
12	Erosion Control	LS	1	\$50,000.00	\$50,000.00
13	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
14	General Conditions (NTE 5%)	LS			\$2,998,300.00
	Site Work and Piping Subtotal				\$62,963,300.00



V. Lagoon Modifications¹

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

¹ The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
6	Floatables Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
Common Alternatives Subtotal					\$10,500,000.00



**Table 7.2-5G
Alternative 11 – 1 Overflow**

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$80,584,400.00
II.	Parallel Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
IV.	Sitework and Piping	\$84,593,300.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$10,500,000.00
	Subtotal	\$238,991,000.00
	Construction Contingencies (15%)	\$35,848,700.00
	Non-Construction Costs (15%)	\$41,225,900.00
	Parallel Interceptor Option Total³	\$316,065,600.00

¹ Costs have decreased from the 2011 estimate of \$83,734,800

² Costs have increased from the 2011 estimate of \$6,294,800

³ Costs have increased from the 2011 estimate of \$305,845,600

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer ¹	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	13.4 MG of Storage at 010	Gal	13,400,000	\$5.00	\$67,000,000.00
17	Storage Structure Evacuation Piping	LS	1	\$200,000.00	\$200,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$3,837,400.00
	North Conveyance/Storage Subtotal ²				\$80,584,400.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$83,734,800.00

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	144" Gravity Sewer (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	New Main Station Subtotal				\$20,680,400.00

IV. Site Work and Piping (for New Main Lift, Turner Storage & Hulman Storage)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	1.3 MG of Storage at 003	GAL	1,300,000	\$5.00	\$6,500,000.00
10	13.7 MG of Storage at 011	GAL	13,700,000	\$5.00	\$68,500,000.00
11	Storage Evacuation Piping	LS	1	\$250,000.00	\$250,000.00
12	Erosion Control	LS	1	\$50,000.00	\$50,000.00
13	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
14	General Conditions (NTE 5%)	LS			\$4,028,300.00
	Site Work and Piping Subtotal				\$84,593,300.00



V. Lagoon Modifications¹

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

¹ The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
6	Floatables Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
Common Alternatives Subtotal					\$10,500,000.00



**Table 7.2-5H
Alternative 11 – 0 Overflows**

Parallel Interceptor, Lagoon and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage ¹	\$138,439,400.00
II.	Parallel Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$20,680,400.00
IV.	Sitework and Piping	\$185,445,800.00
V.	Lagoon Modifications ²	\$17,173,000.00
VI.	Common Alternatives	\$10,500,000.00
	Subtotal	\$397,698,500.00
	Construction Contingencies (15%)	\$59,654,800.00
	Non-Construction Costs (15%)	\$68,603,000.00
	Parallel Interceptor Option Total³	\$525,956,300.00

¹ Costs have decreased from the 2011 estimate of \$141,589,800

² Costs have increased from the 2011 estimate of \$6,294,800

³ Costs have increased from the 2011 estimate of \$515,736,200

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.) ¹	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.) ¹	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.) ¹	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer ¹	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH ¹	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer ¹	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	24.4 MG of Storage at 010	Gal	24,400,000	\$5.00	\$122,000,000.00
17	Storage Structure Evacuation Piping	LS	1	\$300,000.00	\$300,000.00
18	HAC Surface, 1.5" ¹	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2" ¹	Ton	300	\$80.00	\$24,000.00



20	HAC Base, 4" ¹	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6" ¹	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement ¹	LF	800	\$20.00	\$16,000.00
23	Concrete Sidewalk Replacement ¹	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer ¹	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer ¹	LF	250	\$50.00	\$12,500.00
26	Remove Manhole ¹	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer ¹	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping ¹	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill ¹	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%) ¹	LS			\$6,592,400.00
	North Conveyance/Storage Subtotal ²				\$138,439,400.00

¹ The scope of work for the North Conveyance/Storage has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New and existing line items have been adjusted to indicate such changes.

² Costs have decreased from the 2011 estimate of \$141,589,800.00

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	144" Gravity Sewer (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$12,750,000.00	\$12,750,000.00
2	Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$984,800.00
	New Main Lift Station Subtotal				\$20,680,400.00

IV. Site Work and Piping (for New Main Lift, Turner Storage & Hulman Storage)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	4.9 MG of Storage at 003	GAL	4,900,000	\$5.00	\$24,500,000.00
10	29.3 MG of Storage at 011	GAL	29,300,000	\$5.00	\$146,500,000.00
11	Storage Evacuation Piping	LS	1	\$300,000.00	\$300,000.00
12	Erosion Control	LS	1	\$50,000.00	\$50,000.00
13	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
14	General Conditions (NTE 5%)	LS			\$8,830,800.00
	Site Work and Piping Subtotal				\$185,445,800.00



V. Lagoon Modifications¹

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	36" Force Main from Main Lift Station to Storage Tank	LS	1	\$1,362,000.00	\$1,362,000.00
3	27 MG Un aerated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
4	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
5	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
6	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
7	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
8	General Conditions (NTE 5%)	LS	1	\$818,000.00	\$818,000.00
Lagoon Modifications Subtotal					\$17,173,000.00

¹ The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
6	Floatables Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
Common Alternatives Subtotal					\$10,500,000.00



**Table 7.2-6A
Alternative Hybrid – 12 Overflows**

Parallel Main Interceptor, Lagoon Improvements with Lift Option

Item	Description	Total
I.	Parallel Main Interceptor	\$14,797,100.00
II.	Lagoon Lift Station	\$4,488,800.00
III.	Turner Diversion	\$2,532,100.00
IV.	Lagoon Modifications ¹	\$15,531,000.00
V.	Common Alternatives	\$29,000,000.00
	Subtotal	\$66,349,000.00
	Construction Contingencies (15%)	\$9,964,200.00
	Non-Construction Costs (15%)	\$11,458,900.00
	Hybrid Parallel Interceptor Option Total²	\$87,772,100.00

¹ Costs have increased from the 2011 estimate of \$4,856,300

² Costs have increased from the 2011 estimate of \$73,629,200

I. Parallel Main Interceptor (Ohio to Lagoon Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	60" Gravity Sewer (31-35' dp.)	LF	750	\$1,800.00	\$1,350,000.00
2	60" Gravity Sewer (26-30' dp.)	LF	850	\$1,300.00	\$1,105,000.00
3	60" Gravity Sewer (21-25' dp.)	LF	500	\$800.00	\$400,000.00
4	60" Gravity Sewer (16-20' dp.)	LF	350	\$500.00	\$175,000.00
5	60" Gravity Sewer (11-15' dp.)	LF	4,600	\$450.00	\$2,070,000.00
6	60" Gravity Sewer (0-10' dp.)	LF	2,950	\$400.00	\$1,180,000.00
7	Std. MH, 8' Diameter	EA	17	\$45,000.00	\$765,000.00
8	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
9	Crawford Evacuation Lift Station	LS	1	\$3,000,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$704,600.00
	Parallel Main Interceptor Subtotal				\$14,797,100.00



II. New Lagoon Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Influent Screening Channel and Lagoon Channel	LS	1	\$750,000.00	\$750,000.00
2	Self-Cleaning Bar Screens, 2 EA @ 12 MGD	LS	1	\$450,000.00	\$450,000.00
3	Screw Pumps, 3 EA @ 8 MGD	LS	1	\$1,200,000.00	\$1,200,000.00
4	Channel Grinders, 3 EA @ 8 MGD	LS	1	\$200,000.00	\$200,000.00
5	Excavation/Dewatering	LS	1	\$210,000.00	\$210,000.00
6	Equipment Installation	LS	1	\$930,000.00	\$930,000.00
7	Site Piping/Frames/Grates	LS	1	\$200,000.00	\$200,000.00
8	Electrical	LS	1	\$185,000.00	\$185,000.00
9	Site Improvements/Erosion Control	LS	1	\$100,000.00	\$100,000.00
10	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
11	General Conditions (NTE 5%)	LS			\$213,800.00
	Lagoon Lift Station Subtotal				\$4,488,800.00

III. Turner Diversion

Item	Description	Unit	Quantity	Unit Cost	Total
1	36" Gravity Sewer	LF	550	\$250.00	\$137,500.00
2	96" Gravity Sewer (003 to Interceptor)	LF	1,500	\$1,100.00	\$1,650,000.00
3	Turner Diversion	LS	1	\$500,000.00	\$500,000.00
4	Dewatering	LF	550	\$80.00	\$44,000.00
5	By-Pass Pumping	LS	1	\$30,000.00	\$30,000.00
6	Erosion Control	LS	1	\$25,000.00	\$25,000.00
7	Construction Layout/Engineering	LS	1	\$25,000.00	\$25,000.00
8	General Conditions (NTE 5%)	LS			\$120,600.00
	Turner Diversion Subtotal				\$2,532,100.00

IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
3	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
4	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
5	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
7	General Conditions (NTE 5%)	LS	1	\$739,000.00	\$739,000.00
	Lagoon Modifications Subtotal				\$15,531,000.00

1 The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.



V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	15th and Ohio Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
4	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
5	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
6	1.3 MG of Storage at 010	GAL	1,300,000	\$5.00	\$6,500,000.00
7	1.3 MG of Storage at 009	GAL	1,300,000	\$5.00	\$6,500,000.00
8	Floatable Controls at CSO 003	LS	1	\$2,000,000.00	\$2,000,000.00
9	Floatables Controls at CSO 009	LS	1	\$2,000,000.00	\$2,000,000.00
10	Floatables Controls at CSO 010	LS	1	\$2,000,000.00	\$2,000,000.00
11	Floatable Controls at CSO 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$29,000,000.00



Table 7.2-6B
Alternative Hybrid – 9 Overflows

Parallel Main Interceptor, Lagoon Improvements with Lift Option

Item	Description	Total
I.	Parallel Main Interceptor	\$14,797,100.00
II.	Lagoon Lift Station	\$4,488,800.00
III.	Turner Diversion	\$2,532,100.00
IV.	Lagoon Modifications ¹	\$15,531,000.00
V.	Common Alternatives	\$45,500,000.00
	Subtotal	\$82,849,000.00
	Construction Contingencies (15%)	\$12,439,200.00
	Non-Construction Costs (15%)	\$14,305,100.00
	Hybrid Parallel Interceptor Option Total²	\$109,593,300.00

¹ Costs have increased from the 2011 estimate of \$4,856,300

² Costs have increased from the 2011 estimate of \$83,000,400

I. Parallel Main Interceptor (Ohio to Lagoon Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	60" Gravity Sewer (31-35' dp.)	LF	750	\$1,800.00	\$1,350,000.00
2	60" Gravity Sewer (26-30' dp.)	LF	850	\$1,300.00	\$1,105,000.00
3	60" Gravity Sewer (21-25' dp.)	LF	500	\$800.00	\$400,000.00
4	60" Gravity Sewer (16-20' dp.)	LF	350	\$500.00	\$175,000.00
5	60" Gravity Sewer (11-15' dp.)	LF	4,600	\$450.00	\$2,070,000.00
6	60" Gravity Sewer (0-10' dp.)	LF	2,950	\$400.00	\$1,180,000.00
7	Std. MH, 8' Diameter	EA	17	\$45,000.00	\$765,000.00
8	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
9	Crawford Evacuation Lift Station	LS	1	\$3,000,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$704,600.00
	Parallel Main Interceptor Subtotal				\$14,797,100.00



II. New Lagoon Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Influent Screening Channel and Lagoon Channel	LS	1	\$750,000.00	\$750,000.00
2	Self-Cleaning Bar Screens, 2 EA @ 12 MGD	LS	1	\$450,000.00	\$450,000.00
3	Screw Pumps, 3 EA @ 8 MGD	LS	1	\$1,200,000.00	\$1,200,000.00
4	Channel Grinders, 3 EA @ 8 MGD	LS	1	\$200,000.00	\$200,000.00
5	Excavation/Dewatering	LS	1	\$210,000.00	\$210,000.00
6	Equipment Installation	LS	1	\$930,000.00	\$930,000.00
7	Site Piping/Frames/Grates	LS	1	\$200,000.00	\$200,000.00
8	Electrical	LS	1	\$185,000.00	\$185,000.00
9	Site Improvements/Erosion Control	LS	1	\$100,000.00	\$100,000.00
10	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
11	General Conditions (NTE 5%)	LS			\$213,800.00
	Lagoon Lift Station Subtotal				\$4,488,800.00

III. Turner Diversion

Item	Description	Unit	Quantity	Unit Cost	Total
1	36" Gravity Sewer	LF	550	\$250.00	\$137,500.00
2	96" Gravity Sewer (003 to Interceptor)	LF	1,500	\$1,100.00	\$1,650,000.00
3	Turner Diversion	LS	1	\$500,000.00	\$500,000.00
4	Dewatering	LF	550	\$80.00	\$44,000.00
5	By-Pass Pumping	LS	1	\$30,000.00	\$30,000.00
6	Erosion Control	LS	1	\$25,000.00	\$25,000.00
7	Construction Layout/Engineering	LS	1	\$25,000.00	\$25,000.00
8	General Conditions (NTE 5%)	LS			\$120,600.00
	Turner Diversion Subtotal				\$2,532,100.00

IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
3	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
4	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
5	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
7	General Conditions (NTE 5%)	LS	1	\$739,000.00	\$739,000.00
	Lagoon Modifications Subtotal				\$15,531,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.



V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	15th and Ohio Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
4	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
5	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
6	1.0 MG of Storage at 010	GAL	1,000,000	\$5.00	\$5,000,000.00
7	4.9 MG of Storage at 009	GAL	4,900,000	\$5.00	\$24,500,000.00
8	Floatable Controls at CSO 003	LS	1	\$2,000,000.00	\$2,000,000.00
9	Floatables Controls at CSO 009	LS	1	\$2,000,000.00	\$2,000,000.00
10	Floatables Controls at CSO 010	LS	1	\$2,000,000.00	\$2,000,000.00
11	Floatable Controls at CSO 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$45,500,000.00



Table 7.2-6C
Alternative Hybrid – 6 Overflows

Parallel Main Interceptor, Lagoon Improvements with Lift Option

Item	Description	Total
I.	Parallel Main Interceptor	\$16,335,400.00
II.	Lagoon Lift Station	\$4,488,800.00
III.	Turner Diversion	\$2,532,100.00
IV.	Lagoon Modifications ¹	\$15,531,000.00
V.	Common Alternatives	\$61,500,000.00
	Subtotal	\$100,387,300.00
	Construction Contingencies (15%)	\$15,070,000.00
	Non-Construction Costs (15%)	\$17,330,500.00
	Hybrid Parallel Interceptor Option Total²	\$132,787,800.00

¹ Costs have increased from the 2011 estimate of \$4,856,300

² Costs have increased from the 2011 estimate of \$118,644,900

I. Parallel Main Interceptor (Ohio to Lagoon Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	72" Gravity Sewer (31-35' dp.)	LF	750	\$2,000.00	\$1,500,000.00
2	72" Gravity Sewer (26-30' dp.)	LF	850	\$1,500.00	\$1,275,000.00
3	72" Gravity Sewer (21-25' dp.)	LF	500	\$1,000.00	\$500,000.00
4	72" Gravity Sewer (16-20' dp.)	LF	350	\$600.00	\$210,000.00
5	72" Gravity Sewer (11-15' dp.)	LF	4,600	\$550.00	\$2,530,000.00
6	72" Gravity Sewer (0-10' dp.)	LF	2,950	\$500.00	\$1,475,000.00
7	Std. MH, 10' Diameter	EA	17	\$60,000.00	\$1,020,000.00
8	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
9	Crawford Evacuation Lift Station	LS	1	\$3,000,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$777,900.00
	Parallel Main Interceptor Subtotal				\$16,335,400.00



II. New Lagoon Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Influent Screening Channel and Lagoon Channel	LS	1	\$750,000.00	\$750,000.00
2	Self-Cleaning Bar Screens, 2 EA @ 12 MGD	LS	1	\$450,000.00	\$450,000.00
3	Screw Pumps, 3 EA @ 8 MGD	LS	1	\$1,200,000.00	\$1,200,000.00
4	Channel Grinders, 3 EA @ 8 MGD	LS	1	\$200,000.00	\$200,000.00
5	Excavation/Dewatering	LS	1	\$210,000.00	\$210,000.00
6	Equipment Installation	LS	1	\$930,000.00	\$930,000.00
7	Site Piping/Frames/Grates	LS	1	\$200,000.00	\$200,000.00
8	Electrical	LS	1	\$185,000.00	\$185,000.00
9	Site Improvements/Erosion Control	LS	1	\$100,000.00	\$100,000.00
10	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
11	General Conditions (NTE 5%)	LS			\$213,800.00
	Lagoon Lift Station Subtotal				\$4,488,800.00

III. Turner Diversion

Item	Description	Unit	Quantity	Unit Cost	Total
1	36" Gravity Sewer	LF	550	\$250.00	\$137,500.00
2	96" Gravity Sewer (003 to Intereceptor)	LF	1,500	\$1,100.00	\$1,650,000.00
3	Turner Diversion	LS	1	\$500,000.00	\$500,000.00
4	Dewatering	LF	550	\$80.00	\$44,000.00
5	By-Pass Pumping	LS	1	\$30,000.00	\$30,000.00
6	Erosion Control	LS	1	\$25,000.00	\$25,000.00
7	Construction Layout/Engineering	LS	1	\$25,000.00	\$25,000.00
8	General Conditions (NTE 5%)	LS			\$120,600.00
	Turner Diversion Subtotal				\$2,532,100.00

IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
3	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
4	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
5	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
7	General Conditions (NTE 5%)	LS	1	\$739,000.00	\$739,000.00
	Lagoon Modifications Subtotal				\$15,531,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.



V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	15th and Ohio Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
4	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
5	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
6	1.0 MG of Storage at 010	GAL	1,000,000	\$5.00	\$5,000,000.00
7	8.1 MG of Storage at 011	GAL	8,100,000	\$5.00	\$40,500,000.00
8	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
9	Floatable Controls at 009	LS	1	\$2,000,000.00	\$2,000,000.00
10	Floatables Controls at 010	LS	1	\$2,000,000.00	\$2,000,000.00
11	Floatable Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$61,500,000.00



Table 7.2-6D
Alternative Hybrid – 4 Overflows

Parallel Main Interceptor, Lagoon Improvements with Lift Option

Item	Description	Total
I.	Parallel Main Interceptor	\$16,335,400.00
II.	Lagoon Lift Station	\$4,488,800.00
III.	Turner Diversion	\$2,532,100.00
IV.	Lagoon Modifications ¹	\$15,531,000.00
V.	Common Alternatives	\$83,000,000.00
	Subtotal	\$121,887,300.00
	Construction Contingencies (15%)	\$18,295,000.00
	Non-Construction Costs (15%)	\$21,039,200.00
	Hybrid Parallel Interceptor Option Total²	\$161,221,500.00

¹ Costs have increased from the 2011 estimate of \$4,856,300

² Costs have increased from the 2011 estimate of \$147,078,700

I. Parallel Main Interceptor (Ohio to Lagoon Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	72" Gravity Sewer (31-35' dp.)	LF	750	\$2,000.00	\$1,500,000.00
2	72" Gravity Sewer (26-30' dp.)	LF	850	\$1,500.00	\$1,275,000.00
3	72" Gravity Sewer (21-25' dp.)	LF	500	\$1,000.00	\$500,000.00
4	72" Gravity Sewer (16-20' dp.)	LF	350	\$600.00	\$210,000.00
5	72" Gravity Sewer (11-15' dp.)	LF	4,600	\$550.00	\$2,530,000.00
6	72" Gravity Sewer (0-10' dp.)	LF	2,950	\$500.00	\$1,475,000.00
7	Std. MH, 10' Diameter	EA	17	\$60,000.00	\$1,020,000.00
8	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
9	Crawford Evacuation Lift Station	LS	1	\$3,000,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$777,900.00
	Parallel Main Interceptor Subtotal				\$16,335,400.00



II. New Lagoon Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Influent Screening Channel and Lagoon Channel	LS	1	\$750,000.00	\$750,000.00
2	Self-Cleaning Bar Screens, 2 EA @ 12 MGD	LS	1	\$450,000.00	\$450,000.00
3	Screw Pumps, 3 EA @ 8 MGD	LS	1	\$1,200,000.00	\$1,200,000.00
4	Channel Grinders, 3 EA @ 8 MGD	LS	1	\$200,000.00	\$200,000.00
5	Excavation/Dewatering	LS	1	\$210,000.00	\$210,000.00
6	Equipment Installation	LS	1	\$930,000.00	\$930,000.00
7	Site Piping/Frames/Grates	LS	1	\$200,000.00	\$200,000.00
8	Electrical	LS	1	\$185,000.00	\$185,000.00
9	Site Improvements/Erosion Control	LS	1	\$100,000.00	\$100,000.00
10	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
11	General Conditions (NTE 5%)	LS			\$213,800.00
	Lagoon Lift Station Subtotal				\$4,488,800.00

III. Turner Diversion

Item	Description	Unit	Quantity	Unit Cost	Total
1	36" Gravity Sewer	LF	550	\$250.00	\$137,500.00
2	96" Gravity Sewer (003 to Intereceptor)	LF	1,500	\$1,100.00	\$1,650,000.00
3	Turner Diversion	LS	1	\$500,000.00	\$500,000.00
4	Dewatering	LF	550	\$80.00	\$44,000.00
5	By-Pass Pumping	LS	1	\$30,000.00	\$30,000.00
6	Erosion Control	LS	1	\$25,000.00	\$25,000.00
7	Construction Layout/Engineering	LS	1	\$25,000.00	\$25,000.00
8	General Conditions (NTE 5%)	LS			\$120,600.00
	Turner Diversion Subtotal				\$2,532,100.00

IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
3	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
4	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
5	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
7	General Conditions (NTE 5%)	LS	1	\$739,000.00	\$739,000.00
	Lagoon Modifications Subtotal				\$15,531,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.



V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	15th and Ohio Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
4	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
5	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
6	2.4 MG of Storage at 010	GAL	2,400,000	\$5.00	\$12,000,000.00
7	11 MG of Storage at 009	GAL	11,000,000	\$5.00	\$55,000,000.00
8	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
9	Floatable Controls at 009	LS	1	\$2,000,000.00	\$2,000,000.00
10	Floatables Controls at 010	LS	1	\$2,000,000.00	\$2,000,000.00
11	Floatable Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$83,000,000.00



**Table 7.2-6E
Alternative Hybrid – 2 Overflows**

Parallel Main Interceptor, Lagoon Improvements with Lift Option

Item	Description	Total
I.	Parallel Main Interceptor	\$16,335,400.00
II.	Lagoon Lift Station	\$4,488,800.00
III.	Turner Diversion	\$2,532,100.00
IV.	Lagoon Modifications ¹	\$15,531,000.00
V.	Common Alternatives	\$208,000,000.00
	Subtotal	\$246,887,300.00
	Construction Contingencies (15%)	\$37,045,000.00
	Non-Construction Costs (15%)	\$42,601,700.00
	Hybrid Parallel Interceptor Option Total²	\$326,534,000.00

¹ Costs have increased from the 2011 estimate of \$4,856,300

² Costs have increased from the 2011 estimate of \$312,391,200

I. Parallel Main Interceptor (Ohio to Lagoon Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	72" Gravity Sewer (31-35' dp.)	LF	750	\$2,000.00	\$1,500,000.00
2	72" Gravity Sewer (26-30' dp.)	LF	850	\$1,500.00	\$1,275,000.00
3	72" Gravity Sewer (21-25' dp.)	LF	500	\$1,000.00	\$500,000.00
4	72" Gravity Sewer (16-20' dp.)	LF	350	\$600.00	\$210,000.00
5	72" Gravity Sewer (11-15' dp.)	LF	4,600	\$550.00	\$2,530,000.00
6	72" Gravity Sewer (0-10' dp.)	LF	2,950	\$500.00	\$1,475,000.00
7	Std. MH, 10' Diameter	EA	17	\$60,000.00	\$1,020,000.00
8	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
9	Crawford Evacuation Lift Station	LS	1	\$3,000,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$777,900.00
	Parallel Main Interceptor Subtotal				\$16,335,400.00



II. New Lagoon Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Influent Screening Channel and Lagoon Channel	LS	1	\$750,000.00	\$750,000.00
2	Self-Cleaning Bar Screens, 2 EA @ 12 MGD	LS	1	\$450,000.00	\$450,000.00
3	Screw Pumps, 3 EA @ 8 MGD	LS	1	\$1,200,000.00	\$1,200,000.00
4	Channel Grinders, 3 EA @ 8 MGD	LS	1	\$200,000.00	\$200,000.00
5	Excavation/Dewatering	LS	1	\$210,000.00	\$210,000.00
6	Equipment Installation	LS	1	\$930,000.00	\$930,000.00
7	Site Piping/Frames/Grates	LS	1	\$200,000.00	\$200,000.00
8	Electrical	LS	1	\$185,000.00	\$185,000.00
9	Site Improvements/Erosion Control	LS	1	\$100,000.00	\$100,000.00
10	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
11	General Conditions (NTE 5%)	LS			\$213,800.00
	Lagoon Lift Station Subtotal				\$4,488,800.00

III. Turner Diversion

Item	Description	Unit	Quantity	Unit Cost	Total
1	36" Gravity Sewer	LF	550	\$250.00	\$137,500.00
2	96" Gravity Sewer (003 to Intereceptor)	LF	1,500	\$1,100.00	\$1,650,000.00
3	Turner Diversion	LS	1	\$500,000.00	\$500,000.00
4	Dewatering	LF	550	\$80.00	\$44,000.00
5	By-Pass Pumping	LS	1	\$30,000.00	\$30,000.00
6	Erosion Control	LS	1	\$25,000.00	\$25,000.00
7	Construction Layout/Engineering	LS	1	\$25,000.00	\$25,000.00
8	General Conditions (NTE 5%)	LS			\$120,600.00
	Turner Diversion Subtotal				\$2,532,100.00

IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
3	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
4	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
5	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
7	General Conditions (NTE 5%)	LS	1	\$739,000.00	\$739,000.00
	Lagoon Modifications Subtotal				\$15,531,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.



V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	15th and Ohio Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
4	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
5	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
6	13 MG of Storage at 003	GAL	13,000,000	\$5.00	\$65,000,000.00
7	16.9 MG of Storage at 009	GAL	16,900,000	\$5.00	\$84,500,000.00
8	3.3 MG of Storage at 010	GAL	3,300,000	\$5.00	\$16,500,000.00
9	5.2 MG of Storage at 011	GAL	5,200,000	\$5.00	\$26,000,000.00
10	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
11	Floatable Controls at 009	LS	1	\$2,000,000.00	\$2,000,000.00
12	Floatables Controls at 010	LS	1	\$2,000,000.00	\$2,000,000.00
13	Floatable Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$208,000,000.00



**Table 7.2-6F
Alternative Hybrid – 1 Overflow**

Parallel Main Interceptor, Lagoon Improvements with Lift Option

Item	Description	Total
I.	Parallel Main Interceptor	\$16,335,400.00
II.	Lagoon Lift Station	\$4,488,800.00
III.	Turner Diversion	\$2,532,100.00
IV.	Lagoon Modifications ¹	\$15,531,000.00
V.	Common Alternatives	\$229,000,000.00
	Subtotal	\$267,887,300.00
	Construction Contingencies (15%)	\$40,195,000.00
	Non-Construction Costs (15%)	\$46,224,200.00
	Hybrid Parallel Interceptor Option Total²	\$354,306,500.00

¹ Costs have increased from the 2011 estimate of \$4,856,300

² Costs have increased from the 2011 estimate of \$340,163,700

I. Parallel Main Interceptor (Ohio to Lagoon Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	72" Gravity Sewer (31-35' dp.)	LF	750	\$2,000.00	\$1,500,000.00
2	72" Gravity Sewer (26-30' dp.)	LF	850	\$1,500.00	\$1,275,000.00
3	72" Gravity Sewer (21-25' dp.)	LF	500	\$1,000.00	\$500,000.00
4	72" Gravity Sewer (16-20' dp.)	LF	350	\$600.00	\$210,000.00
5	72" Gravity Sewer (11-15' dp.)	LF	4,600	\$550.00	\$2,530,000.00
6	72" Gravity Sewer (0-10' dp.)	LF	2,950	\$500.00	\$1,475,000.00
7	Std. MH, 10' Diameter	EA	17	\$60,000.00	\$1,020,000.00
8	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
9	Crawford Evacuation Lift Station	LS	1	\$3,000,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$777,900.00
	Parallel Main Interceptor Subtotal				\$16,335,400.00



II. New Lagoon Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Influent Screening Channel and Lagoon Channel	LS	1	\$750,000.00	\$750,000.00
2	Self-Cleaning Bar Screens, 2 EA @ 12 MGD	LS	1	\$450,000.00	\$450,000.00
3	Screw Pumps, 3 EA @ 8 MGD	LS	1	\$1,200,000.00	\$1,200,000.00
4	Channel Grinders, 3 EA @ 8 MGD	LS	1	\$200,000.00	\$200,000.00
5	Excavation/Dewatering	LS	1	\$210,000.00	\$210,000.00
6	Equipment Installation	LS	1	\$930,000.00	\$930,000.00
7	Site Piping/Frames/Grates	LS	1	\$200,000.00	\$200,000.00
8	Electrical	LS	1	\$185,000.00	\$185,000.00
9	Site Improvements/Erosion Control	LS	1	\$100,000.00	\$100,000.00
10	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
11	General Conditions (NTE 5%)	LS			\$213,800.00
	Lagoon Lift Station Subtotal				\$4,488,800.00

III. Turner Diversion

Item	Description	Unit	Quantity	Unit Cost	Total
1	36" Gravity Sewer	LF	550	\$250.00	\$137,500.00
2	96" Gravity Sewer (003 to Intereceptor)	LF	1,500	\$1,100.00	\$1,650,000.00
3	Turner Diversion	LS	1	\$500,000.00	\$500,000.00
4	Dewatering	LF	550	\$80.00	\$44,000.00
5	By-Pass Pumping	LS	1	\$30,000.00	\$30,000.00
6	Erosion Control	LS	1	\$25,000.00	\$25,000.00
7	Construction Layout/Engineering	LS	1	\$25,000.00	\$25,000.00
8	General Conditions (NTE 5%)	LS			\$120,600.00
	Turner Diversion Subtotal				\$2,532,100.00

IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
3	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
4	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
5	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
7	General Conditions (NTE 5%)	LS	1	\$739,000.00	\$739,000.00
	Lagoon Modifications Subtotal				\$15,531,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.



V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	15th and Ohio Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
4	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
5	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
6	13 MG of Storage at 003	GAL	13,000,000	\$5.00	\$65,000,000.00
7	16.9 MG of Storage at 009	GAL	16,900,000	\$5.00	\$84,500,000.00
8	6.5 MG of Storage at 010	GAL	6,500,000	\$5.00	\$32,500,000.00
9	6.2 MG of Storage at 011	GAL	6,200,000	\$5.00	\$31,000,000.00
10	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
11	Floatable Controls at 009	LS	1	\$2,000,000.00	\$2,000,000.00
12	Floatables Controls at 010	LS	1	\$2,000,000.00	\$2,000,000.00
13	Floatable Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$229,000,000.00



Table 7.2-6G
Alternative Hybrid – 0 Overflows

Parallel Main Interceptor, Lagoon Improvements with Lift Option

Item	Description	Total
I.	Parallel Main Interceptor	\$16,335,400.00
II.	Lagoon Lift Station	\$4,488,800.00
III.	Turner Diversion	\$2,532,100.00
IV.	Lagoon Modifications ¹	\$15,531,000.00
V.	Common Alternatives	\$356,500,000.00
	Subtotal	\$395,387,300.00
	Construction Contingencies (15%)	\$59,320,000.00
	Non-Construction Costs (15%)	\$68,218,000.00
	Hybrid Parallel Interceptor Option Total²	\$522,925,300.00

¹ Costs have increased from the 2011 estimate of \$4,856,300

² Costs have increased from the 2011 estimate of \$508,782,400

I. Parallel Main Interceptor (Ohio to Lagoon Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	72" Gravity Sewer (31-35' dp.)	LF	750	\$2,000.00	\$1,500,000.00
2	72" Gravity Sewer (26-30' dp.)	LF	850	\$1,500.00	\$1,275,000.00
3	72" Gravity Sewer (21-25' dp.)	LF	500	\$1,000.00	\$500,000.00
4	72" Gravity Sewer (16-20' dp.)	LF	350	\$600.00	\$210,000.00
5	72" Gravity Sewer (11-15' dp.)	LF	4,600	\$550.00	\$2,530,000.00
6	72" Gravity Sewer (0-10' dp.)	LF	2,950	\$500.00	\$1,475,000.00
7	Std. MH, 10' Diameter	EA	17	\$60,000.00	\$1,020,000.00
8	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
9	Crawford Evacuation Lift Station	LS	1	\$3,000,000.00	\$3,000,000.00
10	24" Force Main	LF	500	\$150.00	\$75,000.00
11	Pavement Replacement	LF	500	\$200.00	\$100,000.00
12	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
13	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
14	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
15	Erosion Control	LS	1	\$250,000.00	\$250,000.00
16	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
17	General Conditions (NTE 5%)	LS			\$777,900.00
	Parallel Main Interceptor Subtotal				\$16,335,400.00



II. New Lagoon Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Influent Screening Channel and Lagoon Channel	LS	1	\$750,000.00	\$750,000.00
2	Self-Cleaning Bar Screens, 2 EA @ 12 MGD	LS	1	\$450,000.00	\$450,000.00
3	Screw Pumps, 3 EA @ 8 MGD	LS	1	\$1,200,000.00	\$1,200,000.00
4	Channel Grinders, 3 EA @ 8 MGD	LS	1	\$200,000.00	\$200,000.00
5	Excavation/Dewatering	LS	1	\$210,000.00	\$210,000.00
6	Equipment Installation	LS	1	\$930,000.00	\$930,000.00
7	Site Piping/Frames/Grates	LS	1	\$200,000.00	\$200,000.00
8	Electrical	LS	1	\$185,000.00	\$185,000.00
9	Site Improvements/Erosion Control	LS	1	\$100,000.00	\$100,000.00
10	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
11	General Conditions (NTE 5%)	LS			\$213,800.00
	Lagoon Lift Station Subtotal				\$4,488,800.00

III. Turner Diversion

Item	Description	Unit	Quantity	Unit Cost	Total
1	36" Gravity Sewer	LF	550	\$250.00	\$137,500.00
2	96" Gravity Sewer (003 to Intereceptor)	LF	1,500	\$1,100.00	\$1,650,000.00
3	Turner Diversion	LS	1	\$500,000.00	\$500,000.00
4	Dewatering	LF	550	\$80.00	\$44,000.00
5	By-Pass Pumping	LS	1	\$30,000.00	\$30,000.00
6	Erosion Control	LS	1	\$25,000.00	\$25,000.00
7	Construction Layout/Engineering	LS	1	\$25,000.00	\$25,000.00
8	General Conditions (NTE 5%)	LS			\$120,600.00
	Turner Diversion Subtotal				\$2,532,100.00

IV. Lagoon Modifications

Item	Description	Unit	Quantity	Unit Cost	Total
1	Site Work	LS	1	\$201,000.00	\$201,000.00
2	27 MG Unacrated, Open Top Concrete Storage Tank w/ Flushing Buckets	LS	1	\$13,220,000.00	\$13,220,000.00
3	24"/30" Drain Pipe and Flow Control Box	LS	1	\$370,000.00	\$370,000.00
4	42"/48" Overflow Pipe and Collection Box	LS	1	\$852,000.00	\$852,000.00
5	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$100,000.00	\$100,000.00
7	General Conditions (NTE 5%)	LS	1	\$739,000.00	\$739,000.00
	Lagoon Modifications Subtotal				\$15,531,000.00

The scope of work for Lagoon Modifications has changed significantly from the 2011 report based on additional "basis of design" studies completed in Phase I. New line items with associated estimated costs are provided.



V. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	15th and Ohio Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
4	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
5	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
6	18.9 MG of Storage at 003	GAL	18,900,000	\$5.00	\$94,500,000.00
7	22.8 MG of Storage at 009	GAL	22,800,000	\$5.00	\$114,000,000.00
8	10.1 MG of Storage at 010	GAL	10,100,000	\$5.00	\$50,500,000.00
9	16.3 MG of Storage at 011	GAL	16,300,000	\$5.00	\$81,500,000.00
10	Floatables Controls at 003	LS	1	\$2,000,000.00	\$2,000,000.00
11	Floatable Controls at 009	LS	1	\$2,000,000.00	\$2,000,000.00
12	Floatables Controls at 010	LS	1	\$2,000,000.00	\$2,000,000.00
13	Floatable Controls at 011	LS	1	\$2,000,000.00	\$2,000,000.00
	Common Alternatives Subtotal				\$356,500,000.00



Table 7.2-7A
Alternative 11b – 7 Overflows

Parallel Interceptor, High Rate Clarification and Main Lift Option

Item	Description	Total
I.	North Conveyance/Storage	\$20,629,400.00
II.	Parallel Main Interceptor	\$25,459,900.00
III.	Main Lift Station Structure, Mechanical, Electrical	\$21,152,900.00
IV.	Sitework and Piping	\$5,580,800.00
V.	High Rate Clarification	\$12,167,000.00
VI.	Common Alternatives	\$8,500,000.00
	Subtotal	\$93,490,000.00
	Construction Contingencies (15%)	\$14,041,100.00
	Non-Construction Costs (15%)	\$16,147,300.00
	Parallel Interceptor Option Total	\$123,678,400.00

I. North Conveyance/Storage (Chestnut to Spruce)

Item	Description	Unit	Quantity	Unit Cost	Total
1	Clearing of Right of Way	LS	1	\$100,000.00	\$100,000.00
2	Common Excavation	LF	11,000	\$25.00	\$275,000.00
3	Building Demolition	LS	1	\$75,000.00	\$75,000.00
4	96" Gravity Sewer (21-25' dp.)	LF	300	\$1,000.00	\$300,000.00
5	72" Gravity Sewer (21-25' dp.)	LF	20	\$1,500.00	\$30,000.00
6	66" Gravity Sewer (21-25' dp.)	LF	400	\$800.00	\$320,000.00
7	Bore and Jack – 96" Gravity Sewer	LF	250	\$4,500.00	\$1,125,000.00
8	Reconnect Existing Laterals	EA	5	\$10,000.00	\$50,000.00
9	Std. MH	EA	1	\$25,000.00	\$25,000.00
10	Std MH, Set Over Existing Sewer	EA	2	\$25,000.00	\$50,000.00
11	Diversion Structures & Piping Construction	EA	2	\$500,000.00	\$1,000,000.00
12	CSO 009 Closure	LS	1	\$250,000.00	\$250,000.00
13	Spruce Diversion and Floatables Structure	LS	1	\$2,000,000.00	\$2,000,000.00
14	Spruce Evacuation Lift Station/Control Bldg	LS	1	\$4,000,000.00	\$4,000,000.00
15	36" Force Main	LF	150	\$200.00	\$30,000.00
16	2.0 MG of Storage at 010	Gal	2,000,000	\$5.00	\$10,000,000.00
17	Storage Structure Evacuation Piping	LS	1	\$100,000.00	\$100,000.00
18	HAC Surface, 1.5"	Ton	225	\$90.00	\$20,250.00
19	HAC Intermediate, 2"	Ton	300	\$80.00	\$24,000.00
20	HAC Base, 4"	Ton	600	\$80.00	\$48,000.00
21	Compacted Aggregate Base, #53, 6"	Ton	600	\$20.00	\$12,000.00
22	Concrete Curb Replacement	LF	800	\$20.00	\$16,000.00



23	Concrete Sidewalk Replacement	LF	150	\$45.00	\$6,750.00
24	Remove Existing 82" Sewer	LF	100	\$200.00	\$20,000.00
25	Remove Existing 15" Sewer	LF	250	\$50.00	\$12,500.00
26	Remove Manhole	EA	2	\$5,000.00	\$10,000.00
27	Plug Existing Sewer	EA	3	\$7,500.00	\$22,500.00
28	Temporary Bypass Pumping	LS	1	\$100,000.00	\$100,000.00
29	Granular Backfill	CY	15,000	\$20.00	\$300,000.00
30	Civil/Architectural Site Improvements	LS	1	\$100,000.00	\$100,000.00
31	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
32	Erosion Control	LS	1	\$50,000.00	\$50,000.00
33	Landscape Restoration	LS	1	\$50,000.00	\$50,000.00
34	Construction Layout/Staking	LS	1	\$100,000.00	\$100,000.00
35	General Conditions (NTE 5%)	LS			\$982,400.00
	North Conveyance/Storage Subtotal				\$20,629,400.00

II. Parallel Interceptor (Ohio to Main Lift)

Item	Description	Unit	Quantity	Unit Cost	Total
1	144" Gravity Sewer (008 to New Main LS)	LF	10,000	\$2,000.00	\$20,000,000.00
2	Sewer Access Structure	EA	4	\$50,000.00	\$200,000.00
3	Diversion Structures/Outfalls & Piping Const.	EA	4	\$750,000.00	\$3,000,000.00
4	24" Force Main	LF	500	\$150.00	\$75,000.00
5	Pavement Replacement	LF	500	\$200.00	\$100,000.00
6	Fence Replacement	LF	1,500	\$15.00	\$22,500.00
7	Existing Storm Repair/Crossing/Replacement	LS	1	\$250,000.00	\$250,000.00
8	Maintenance of Traffic	LS	1	\$150,000.00	\$150,000.00
9	Erosion Control	LS	1	\$250,000.00	\$250,000.00
10	Construction Layout/Staking	LS	1	\$200,000.00	\$200,000.00
11	General Conditions (NTE 5%)	LS			\$1,212,400.00
	Parallel Interceptor Subtotal				\$25,459,900.00



III. New Main Lift Station

Item	Description	Unit	Quantity	Unit Cost	Total
1	Lift Station, Control, Admin and Lab Building	LS	1	\$13,200,000.00	\$13,200,000.00
2	Tunnel Outlet Structure	LS	1	\$1,200,000.00	\$1,200,000.00
3	Grit Removal Facility	LF	1	\$4,900,600.00	\$4,900,600.00
4	Splitter Structures	LS	1	\$150,000.00	\$150,000.00
5	Mechanical/Electrical/Controls	LS	1	\$470,000.00	\$470,000.00
6	Civil/Architectural Site Improvements	LS	1	\$125,000.00	\$125,000.00
7	Erosion Control	LS	1	\$50,000.00	\$50,000.00
8	Construction Layout/Engineering	LS	1	\$50,000.00	\$50,000.00
9	General Conditions (NTE 5%)	LS			\$1,007,300.00
	New Main Station Subtotal				\$21,152,900.00

IV. Site Work and Piping (for New Main Lift and Turner Closure)

Item	Description	Unit	Quantity	Unit Cost	Total
1	66" Gravity Sewer	LF	200	\$400.00	\$80,000.00
2	84" Gravity Sewer	LF	1,200	\$850.00	\$1,020,000.00
3	Twin 96" Gravity Sewers (003 to New Main LS)	LF	1,500	\$2,200.00	\$3,300,000.00
4	120" Gravity Sewer	LF	100	\$1,500.00	\$150,000.00
5	Manhole Structures	EA	4	\$20,000.00	\$80,000.00
6	48" Force Main/Connect to Existing FM	LF	1,300	\$350.00	\$455,000.00
7	Demolition of Existing Main Lift	LS	1	\$100,000.00	\$100,000.00
8	By-Pass Pumping	LS	1	\$50,000.00	\$50,000.00
9	Erosion Control	LS	1	\$50,000.00	\$50,000.00
10	Construction Layout/Engineering	LS	1	\$30,000.00	\$30,000.00
11	General Conditions (NTE 5%)	LS			\$265,800.00
	Site Work and Piping Subtotal				\$5,580,800.00



V. High Rate Clarification¹

Item	Description	Unit	Quantity	Unit Cost	Total
Phase I					
1	Site Work	LS	1	\$801,000.00	\$801,000.00
2	24" Force Main from Main Lift Station to HRC Facility	LS	1	\$530,000.00	\$530,000.00
3	16.25 MGD HRC & UV Disinfection Facility	LS	1	\$5,518,000.00	\$5,518,000.00
4	15"/48" Drain Pipe and Outfall Structures	LS	1	\$317,000.00	\$317,000.00
5	Electrical Work for Overall Site	LS	1	\$400,000.00	\$400,000.00
6	Instrumentation and Control for Overall Site	LS	1	\$125,000.00	\$125,000.00
7	General Conditions (NTE 4%) ²	LS	1	\$308,000.00	\$308,000.00
Phase I Subtotal					\$7,999,000.00
Phase II					
1	Site Work	LS	1	\$77,000.00	\$77,000.00
2	Additional 16.25 MGD HRC Facility	LS	1	\$3,606,000.00	\$3,606,000.00
3	Electrical Work for Overall Site	LS	1	\$250,000.00	\$250,000.00
4	Instrumentation and Control for Overall Site	LS	1	\$75,000.00	\$75,000.00
5	General Conditions (NTE 4%) ²	LS	1	\$160,000.00	\$160,000.00
Phase II Subtotal					\$4,168,000.00
High Rate Clarification Subtotal					\$12,167,000.00

¹ At the request of the City, the HRC facility is projected to be constructed in 2 phases, with a 16.25 MGD HRC train and UV Disinfection facility constructed in Phase I and an additional 16.25 MGD HRC train constructed in Phase II.

² The General Conditions have been revised from the original 5% (as indicated the 2011 estimate) to 4% to match the cost estimate as provided in the Basis of Design.

VI. Common Alternatives

Item	Description	Unit	Quantity	Unit Cost	Total
1	Back-up Structure for Hulman/Idaho Storage	LS	1	\$1,700,000.00	\$1,700,000.00
2	Walnut Diversion Structure	LS	1	\$1,500,000.00	\$1,500,000.00
3	Large Dia Pipe Rehab - North Hulman w/Weir	LS	1	\$2,000,000.00	\$2,000,000.00
4	Large Dia Pipe Rehab - North Walnut	LS	1	\$1,300,000.00	\$1,300,000.00
5	Floatables Controls at CSO 011	LS	1	\$2,000,000.00	\$2,000,000.00
Common Alternatives Subtotal					\$8,500,000.00



7.2.3 Collection System Model Results

The collection system model was applied for the typical year (1978) at several levels of control for each of the final **four** alternatives. Although the controls in each alternative were sized initially using the rainfall from the appropriate design storm, the sizing was adjusted as needed to ensure that the number of overflows in the typical year met the intended number of activations for that level of control. End-of-pipe performance for individual CSOs was evaluated by tallying number of activations (Table 7.2-8), total annual volume (Table 7.2-9) and hours of overflow (Table 7.2-10). Note that the CSOs in the priority area of Fairbanks Park (CSO-008, CSO -007, CSO-006 and CSO-005) have been eliminated in each of the final alternatives. The reduction in volume from CSO-004 and CSO-011 allowed their volume to be combined into a single discharge location at CSO-011 in all of the alternatives so CSO-004 is also indicated as “eliminated” in all of these tables. A similar strategy was used with CSO-009 and CSO-010 in Alternatives 11 **and 11b**, as indicated in the tables.



**Table 7.2-8
Total Number of Overflows in a Typical Year for Each Level of Control of Final Alternatives**

Alternative	CSO Name/ Number Level of Control (OF/yr)	Spruce	Chestnut	Ohio	Walnut	Oak	Crawford	Hulman	Idaho	Turner	Max
		010	009	008	007	006	005	004	011	003	
Baseline	N/A	24	33	37	30	24	31	36	32	24	37
Hybrid	1	1	1	Eliminated					1	1	1
Hybrid	2	2	2						2	1	2
Hybrid	4	3	4						4	3	4
Hybrid	6	6	5						6	5	6
Hybrid	9	9	7						7	6	9
Hybrid	12	11	9						7	7	11
7B	6	3	5	Eliminated					8	6	8
7B	9	7	7						9	8	9
7B	12	7	10						12	11	12
11	1	1	Eliminated					1	1	1	
11	2	2						2	2	2	
11	4	4						4	4	4	
11	6	5						6	Eliminated	6	
11	7	7						7		7	
11	9	9						8		8	
11	12	10						8		8	
11B	7	7	Eliminated					7	Eliminated	7	

**Note: CSO 002 at the main lift station is an emergency overflow only with no overflows predicted in the typical year. CSO 002 is eliminated in all scenarios of Alternative 7B, 11 and 11B.*



**Table 7.2-9
Total Annual Volume (Million Gallons) in a Typical Year for Each Level of Control of
Final Alternatives**

Alternative	CSO Name/ Number Level of Control (OF/yr)	Spruce	Chestnut	Ohio	Walnut	Oak	Crawford	Hulman	Idaho	Turner	Total
		010	009	008	007	006	005	004	011	003	
Baseline	N/A	76.1	76.3	12.6	116.7	7.8	15.4	229.3	137.1	18.6	690
Hybrid	1	2.8	4.9	Eliminated					7.9	4.5	20
Hybrid	2	7.4	5.5						11.7	4.6	29
Hybrid	4	11.4	14.2						19.2	15.9	61
Hybrid	6	17.6	20.7						37.9	63.7	140
Hybrid	9	63.4	8.9						47.8	50.6	171
Hybrid	12	74.6	14.9						52.5	61.7	204
7B	6	0.7	3.7	Eliminated					39.8	14.1	58
7B	9	13.3	17.1						107.9	41.3	179
7B	12	18.7	27.7						86.1	23.9	156
11	1	1.9	Eliminated					1.3	0.5	4	
11	2	12.8						8.9	3.8	26	
11	4	24.0						17.4	7.3	49	
11	6	35.1						70.1	Elimin- ated	105	
11	7	71.6						82.2		154	
11	9	75.8						110.3		186	
11	12	83.9						110.0	194		
11B	7	71.6	Eliminated	82.2	Elimin.	154					

**Note: CSO 002 at the main lift station is an emergency overflow only with no overflows predicted in the typical year. CSO 002 is eliminated in all scenarios of Alternative 7B, 11 and 11B.*



Table 7.2-10
Total Hours of Overflow in a Typical Year for Each Level of Control of Final Alternatives

Alternative	CSO Name/ Number	Spruce	Chestnut	Ohio	Walnut	Oak	Crawford	Hulman	Idaho	Turner	Total
	Level of Control (OF/yr)	010	009	008	007	006	005	004	011	003	
Baseline	N/A	89	224	122	128	73	109	219	164	82	224
Hybrid	1	4	14	Eliminated					8	8	14
Hybrid	2	9	21						11	8	21
Hybrid	4	12	48						22	24	48
Hybrid	6	19	58						25	38	58
Hybrid	9	48	64						30	41	64
Hybrid	12	54	83						32	47	83
7B	6	8	39	Eliminated					31	26	39
7B	9	22	42						54	47	54
7B	12	29	87						62	48	87
11	1	7	Eliminated					8	5	8	
11	2	11						12	10	12	
11	4	25						25	21	25	
11	6	27						31	Eliminated	31	
11	7	43						40		43	
11	9	49						50		50	
11	12	54						51	54		
11B	7	43	Eliminated	40	Elim.	43					

**Note: CSO 002 at the main lift station is an emergency overflow only with no overflows predicted in the typical year. CSO 002 is eliminated in all scenarios of Alternative 7B, 11 and 11B.*

Figure 7.2-1 shows the total overflow volume for the final alternatives at each level of control. The total volume of overflow remaining for each level of control varies by alternative but even at 12 overflows per year, the City is reducing the overflow volume by 72% (690 MG currently down to 194 MG). At seven overflows per year for Alternative 11 and 11B, the volume remaining corresponds to a nearly 80% reduction in overflow volume from current conditions.



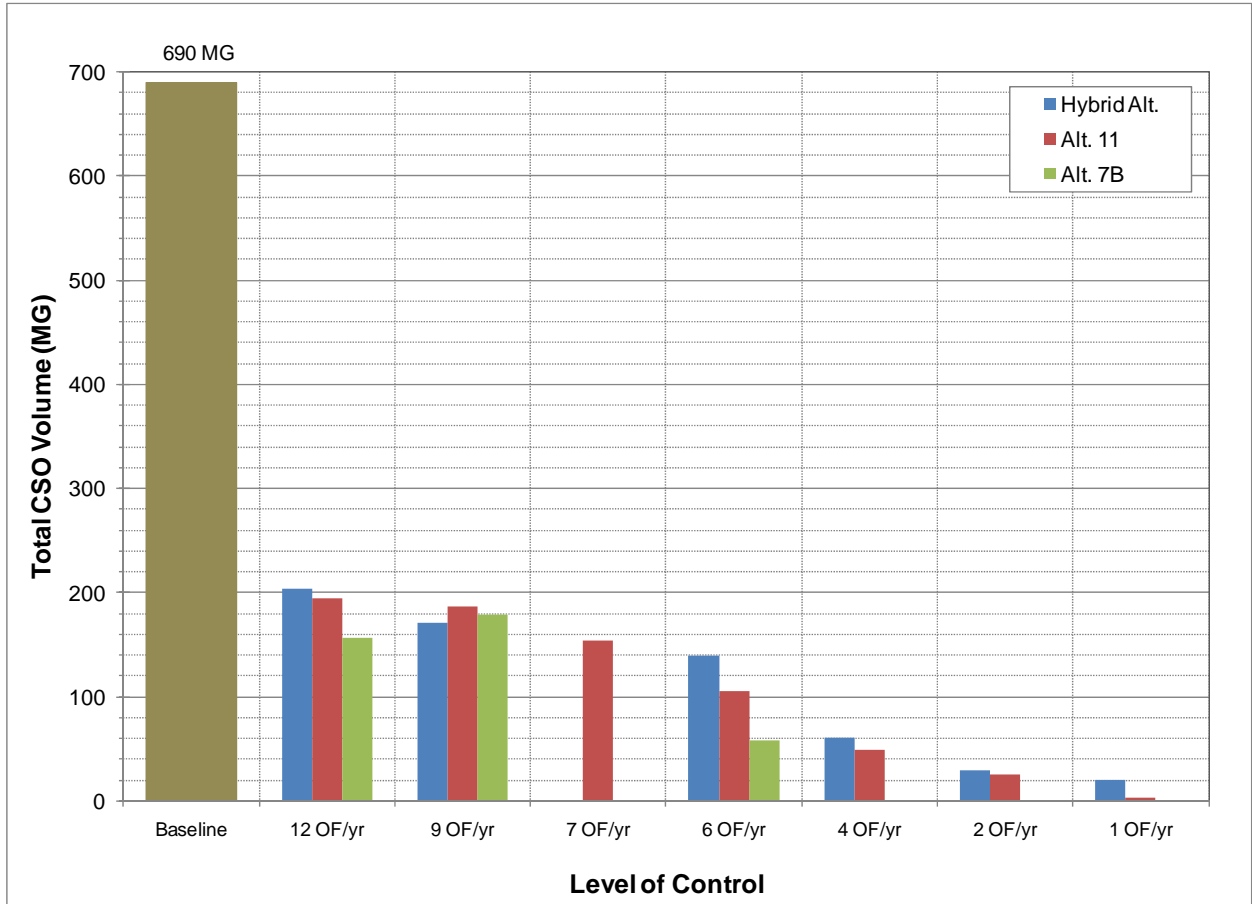


Figure 7.2-1. Total Annual CSO Volume in a Typical Year by Level of Control.

*Alternative 11B, with a level of control of 7 OF/yr, will yield the same total annual CSO Volume as Alternative 11 with a level of control of 7 OF/yr.

These collection system model results were then used to calculate the percent capture for the various levels of control. The percent capture is defined as the volume of combined sewage treated during wet weather on a system wide annual average basis divided by the total volume of the combined sewage collected in the combined sewer system during wet weather on a system wide annual average basis.

$$\% \text{ Capture} = \frac{\text{Total System Volume} - \text{CSO Volume}}{\text{Total System Volume}}$$



7.2.4 River Model Results

The final CSO control alternatives, which included sewer separation, were developed (described in Chapter 6) and their performance was evaluated by applying the collection system model in continuous mode for a “typical” year of rainfall (identified as 1978). The collection system model results were used as input to the river model to evaluate the effectiveness of the alternative in improving water quality relative to current (baseline) conditions. For the sewer separation scenario, the hourly CSO volumes from the baseline simulation were input to the river model with a typical stormwater event mean concentration of 5,000 cfu/100 ml applied to them and resulting impacts were evaluated by tracking these loads in the model using the CSO state variable. The river model results were compared to water quality standards to characterize the performance of each alternative. Cost-performance curves were constructed to identify an appropriate level of control.

In-stream benefits of the final alternatives are presented in terms of reduction in CSO volume (see previous section) and exceedance of Indiana’s 235 cfu/100 ml single sample maximum criterion. The river model results for each CSO control alternative were compared to Indiana water quality standards using the same methodology that was applied for the baseline simulation presented in Section 4.2. Simulated in-stream concentrations due to all sources and to the City of Terre Haute’s CSOs alone were evaluated for the recreation season (April-October) when the State’s E. coli water quality standards are applicable. For comparison to Indiana’s single sample maximum criterion (235 cfu/100 ml), the hourly model results at each key location that exceeded the criterion were tallied as a total count of hours and as a percentage of available hours.

As noted in Section 4, although the State has a 30-day geometric mean criterion (125 cfu/100 ml), compliance with this standard was not evaluated because upstream loads are the primary factor affecting compliance with this standard and when these sources are included in the evaluation, they obscure the improved benefit of increasing CSO control. The effect of the CSO alternatives on water quality are best expressed in terms of total hours of exceedance of the water quality standard or percent of time, and by excluding other sources in comparing the relative benefit to river water quality. (Note that upstream and other sources are expected to cause exceedances, as described in Section 4.2.1).

The results and information described in the previous section were used to develop a recommended plan, which is described in Section 10.



7.2.5 Comparison to Single Sample Maximum Criterion

River model results indicate that the Hybrid and 11 alternatives provide similar water quality benefits for E. coli at the same level of control. At a control level of 12 overflows per year, the City’s CSOs would cause approximately 55 hours of exceedance of the State’s single sample maximum criterion (235 cfu/100 ml) at the WWTP or approximately 1% of the hours in the recreation season. Increasing the level of control to 4 overflows per year would reduce the number of hours of exceedance to approximately 25 hours or less than 0.5% of the hours in the recreation season. The tunnel alternative provided similar hours of exceedance as the other two alternatives for the same level of control (Figure 7.2-2). Note that in this figure, current conditions correspond to the dark blue line, alternative 7b (tunnel) at 12 OF/yr corresponds to the green line, alternative 11 (parallel interceptor and local storage) corresponds to the yellow line and the hybrid alternative corresponds to the light blue line.

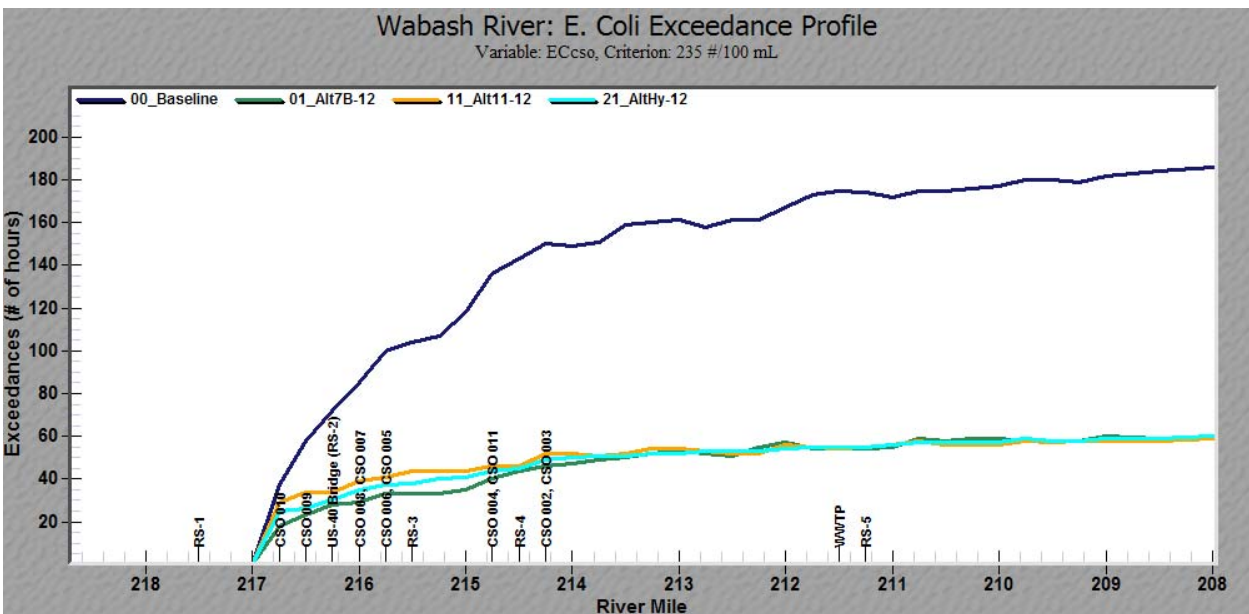


Figure 7.2-2. Comparison of Compliance with Indiana’s Single Sample Maximum E. coli Criterion for Each Final Alternative Sized at 12 Overflows/Year.

Table 7.2-11 presents a summary, in hours of exceedance, of each control alternative to the single sample maximum criterion for the recreation season at the key locations within or downstream of the City’s CSO outfalls.



Table 7.2-11
Total Hours of Exceedances of Indiana’s Single Sample Maximum E. coli Criterion in
the Recreation Season of the Typical Year for Each Level of Control of Final Alternatives

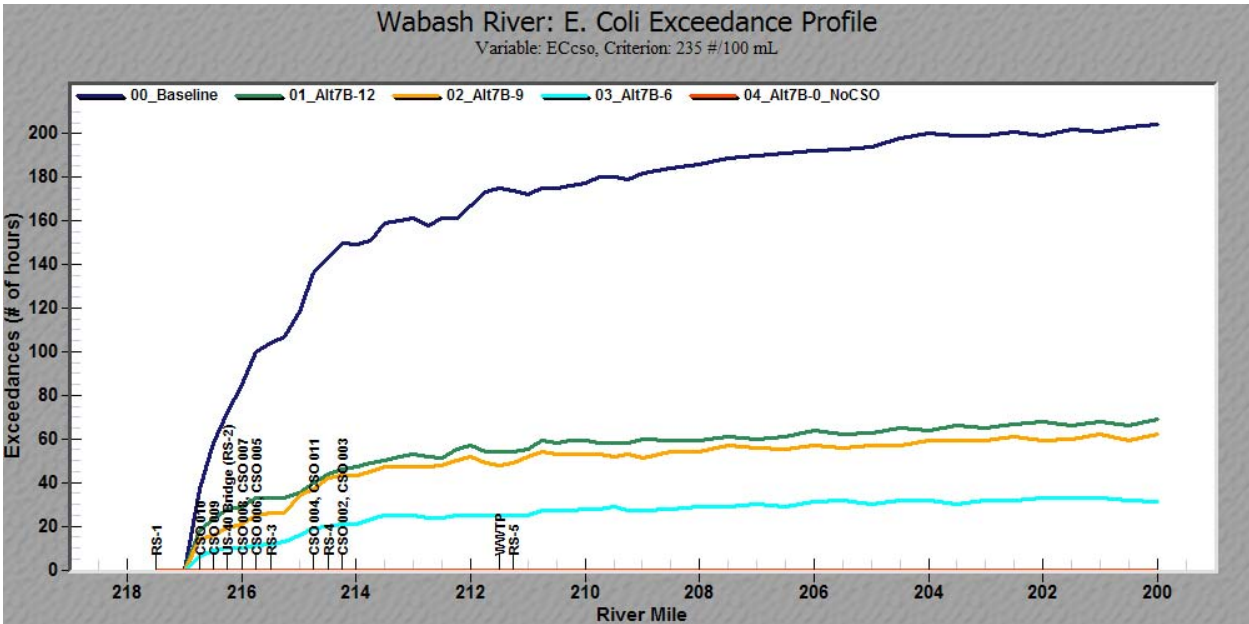
Location	River Mile	Baseline	Sewer Separation	Alt 11								
				12 OF/yr	9 OF/yr	7 OF/yr	6 OF/yr	4 OF/yr	2 OF/yr	1 OF/yr	0 OF/yr	
Upstream of City's CSOs	217.5	0	0	0	0	0	0	0	0	0	0	0
US-40 Bridge	216.3	72	2	34	32	32	17	13	9	3	0	0
Fairbanks Park	215.5	104	4	44	40	36	21	17	10	4	0	0
Downstream of Downtown CSOs	214.5	143	19	46	43	39	24	19	13	6	0	0
Downstream of WWTP	211.3	174	6	55	51	45	31	24	16	6	0	0

Location	River Mile	Baseline	Sewer Separation	Alt Hybrid								
				12 OF/yr	9 OF/yr	7 OF/yr	6 OF/yr	4 OF/yr	2 OF/yr	1 OF/yr	0 OF/yr	
Upstream of City's CSOs	217.5	0	0	0	0	Not evaluated	0	0	0	0	0	0
US-40 Bridge	216.3	72	2	30	32		23	17	12	7	0	0
Fairbanks Park	215.5	104	4	38	39		26	17	14	7	0	0
Downstream of Downtown CSOs	214.5	143	19	45	45		29	22	16	10	0	0
Downstream of WWTP	211.3	174	6	55	52		38	27	18	11	0	0

Location	River Mile	Baseline	Sewer Separation	Alt 7B							
				12 OF/yr	9 OF/yr	7 OF/yr	6 OF/yr	4 OF/yr	2 OF/yr	1 OF/yr	0 OF/yr
Upstream of City's CSOs	217.5	0	0	0	0	Not evaluated	0	Not evaluated	Not evaluated	Not evaluated	0
US-40 Bridge	216.3	72	2	28	19		10				0
Fairbanks Park	215.5	104	4	33	26		12				0
Downstream of Downtown CSOs	214.5	143	19	44	42		20				0
Downstream of WWTP	211.3	174	6	54	49		25				0



For each alternative, the incremental in-stream benefit due to increasing the level of control is shown in Figures 7.2-3, 7.2-4, and 7.2-5 for Alternative 7b, Alternative 11 and the Hybrid Alternative, respectively. Results in these figures are expressed as a count of the available hours (e.g. 5,136 hours) in the recreation season that the State’s standard is exceeded.



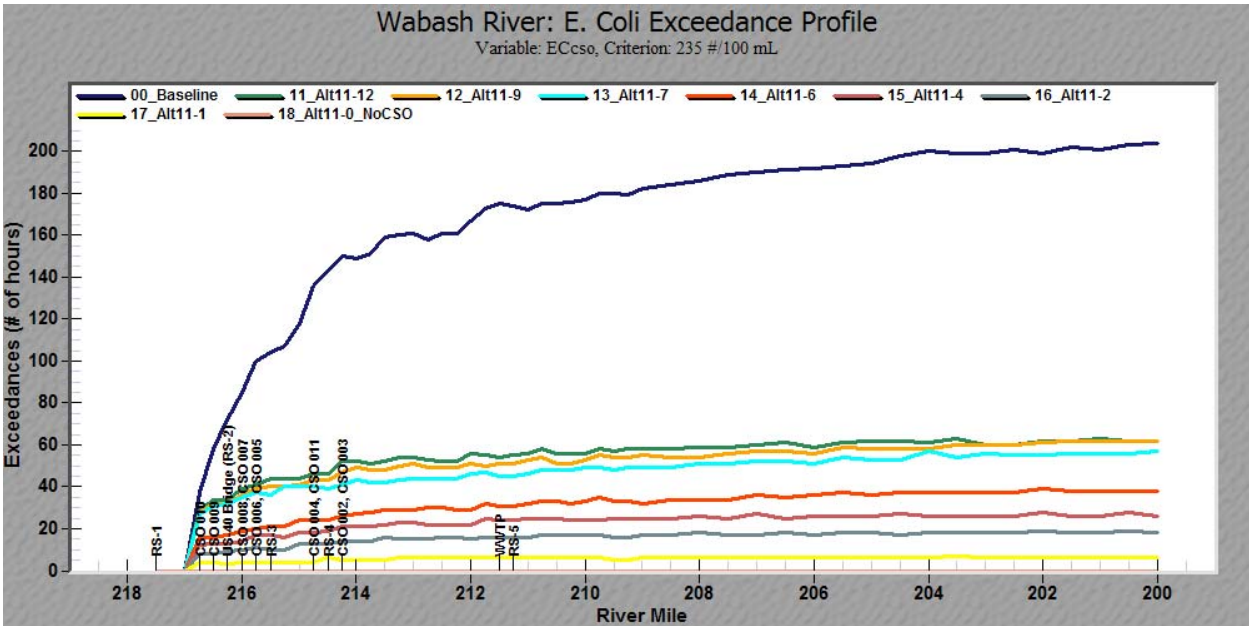
Note: In this figure, the following scenarios are included as follows:

- Dark blue line = current conditions/baseline
- Green line = Alternative 7b at 12 OF/yr
- Gold line = Alternative 7b at 9 OF/yr
- Light blue line = Alternative 7b at 6 OF/yr
- Red line = Alternative 7b at 0 OF/yr (all locations have 0 hours of exceedance)

Results are presented for the exceedances based on CSO loads alone.

Figure 7.2-3. Comparison of Compliance with Indiana’s Single Sample Maximum E. coli Criterion for Different Levels of Control for Alternative 7b.





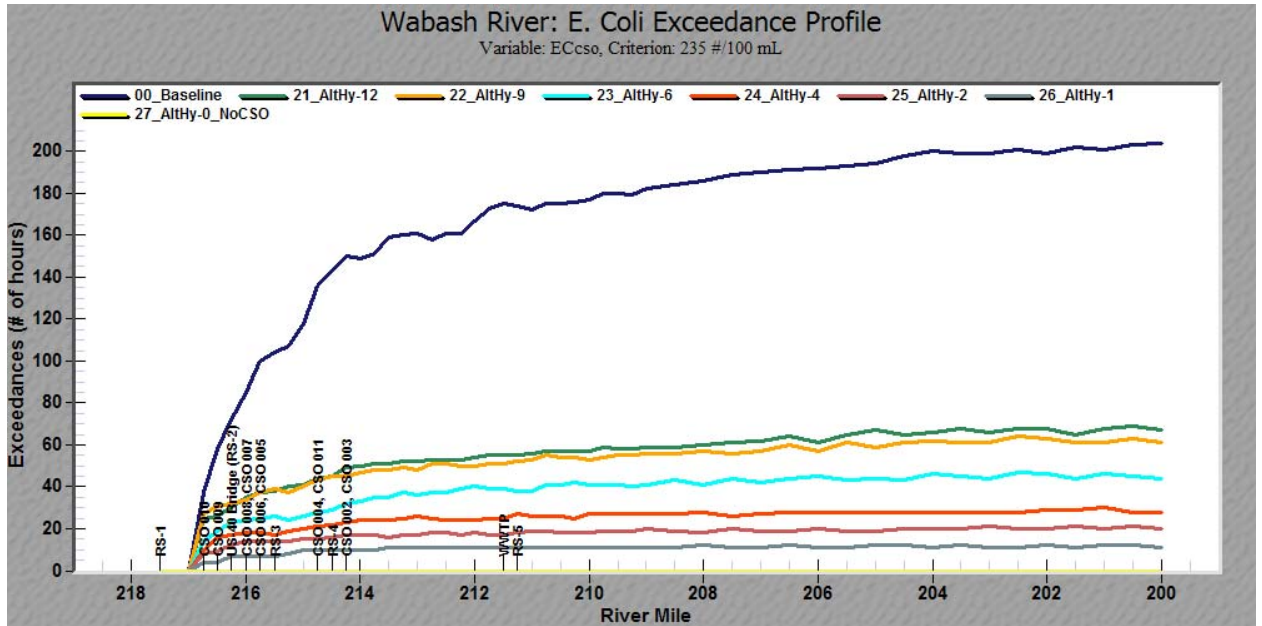
Note: In this figure, the following scenarios are included as follows:

- Dark blue line = current conditions/baseline
- Green line = Alternative 11 at 12 OF/yr
- Gold line = Alternative 11 at 9 OF/yr
- Light blue line = Alternative 11 at 7 OF/yr
- Red line = Alternative 11 at 6 OF/yr
- Brick line = Alternative 11 at 4 OF/yr
- Gray line = Alternative 11 at 2 OF/yr
- Yellow line = Alternative 11 at 1 OF/yr
- Brown line = Alternative 11 at 0 OF/yr (all locations have 0 hours of exceedance)

Results are presented for the exceedances based on CSO loads alone.

Figure 7.2-4. Comparison of Compliance with Indiana’s Single Sample Maximum E. coli Criterion for Different Levels of Control for Alternative 11.





Note: In this figure, the following scenarios are included as follows:

- Dark blue line = current conditions/baseline
- Green line = Hybrid Alternative at 12 OF/yr
- Gold line = Hybrid Alternative at 9 OF/yr
- Light blue line = Hybrid Alternative at 6 OF/yr
- Red line = Hybrid Alternative at 4 OF/yr
- Brick line = Hybrid Alternative at 2 OF/yr
- Gray line = Hybrid Alternative at 1 OF/yr
- Yellow line = Hybrid Alternative at 0 OF/yr (all locations have 0 hours of exceedance)

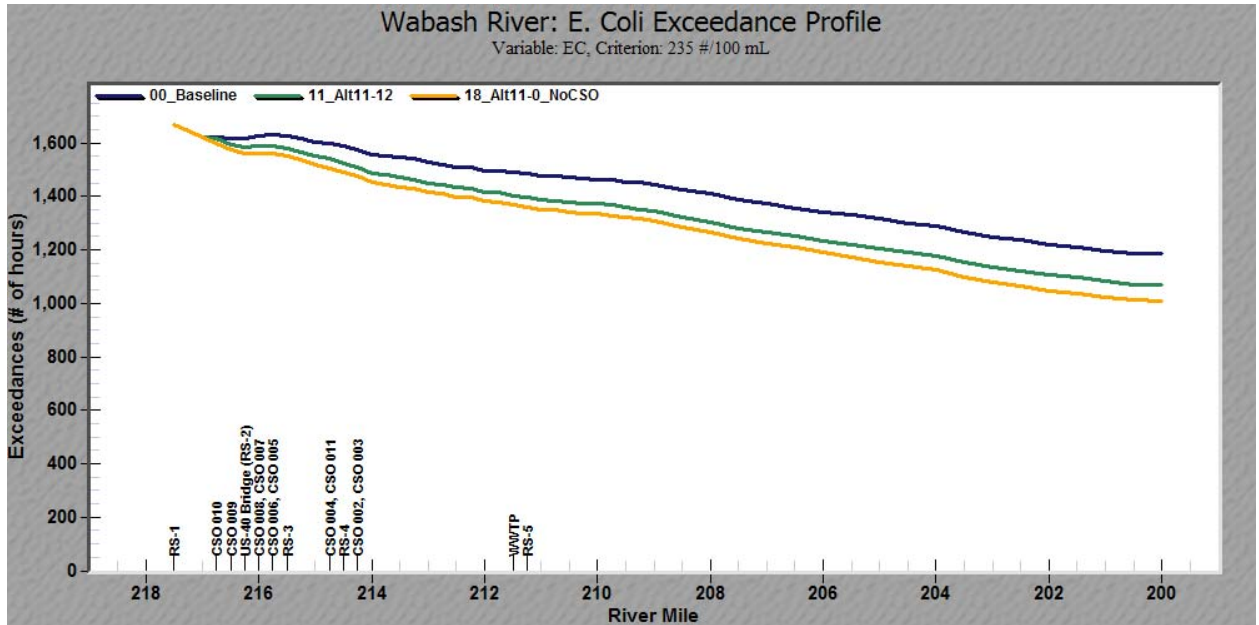
Results are presented for the exceedances based on CSO loads alone.

Figure 7.2-5. Comparison of Compliance with Indiana’s Single Sample Maximum E. coli Criterion for Different Levels of Control for Hybrid Alternative.

Within the City limits, the maximum benefit of Alternative 11 is an additional 60-100 hours of compliance from the approximately 1,600 hours of exceedance simulated during baseline conditions (Figure 7.2-6). Downstream of the City, at the wastewater treatment plant, the benefit is approximately 90-120 additional hours of compliance. This suggests that even if CSOs were completely eliminated, water quality standards will still not be met unless reduction in loads from other sources can be achieved. Section 4.2.1 presented a detailed analysis of the additional benefit of complete CSO elimination (which is unaffordable). As Figure 7.2-6 illustrates, the magnitude of other source loads



diminish the relative benefit of CSO control, as the results show limited reduction in exceedances. Note also that increasing the level of CSO control does not show an appreciable reduction in exceedances.



Note: In this figure, the following scenarios are included as follows:

- Dark blue line = current conditions/baseline
- Green line = Alternative 11 at 12 OF/yr
- Gold line = Alternative 11 at 0 OF/yr

Results are presented for the exceedances based on loads from all sources.

Figure 7.2-6. Comparison of Compliance with Indiana’s Single Sample Maximum E. coli Criterion for Different Levels of Control for Alternative 11 Considering All Bacteria Sources.

7.2.6 Cost Performance Curve

The performance of each control alternative was evaluated by relating the water quality benefit at two key locations within the remaining CSO area to the cost for each level of control. Costs for each alternative and the river model results were presented previously in Section 7. Figure 7.2-7 and Figure 7.2-8 show the cost versus performance at Fairbanks Park (RM 215.5) and near the City’s WWTP (downstream of all CSOs at RM 211.25), respectively.



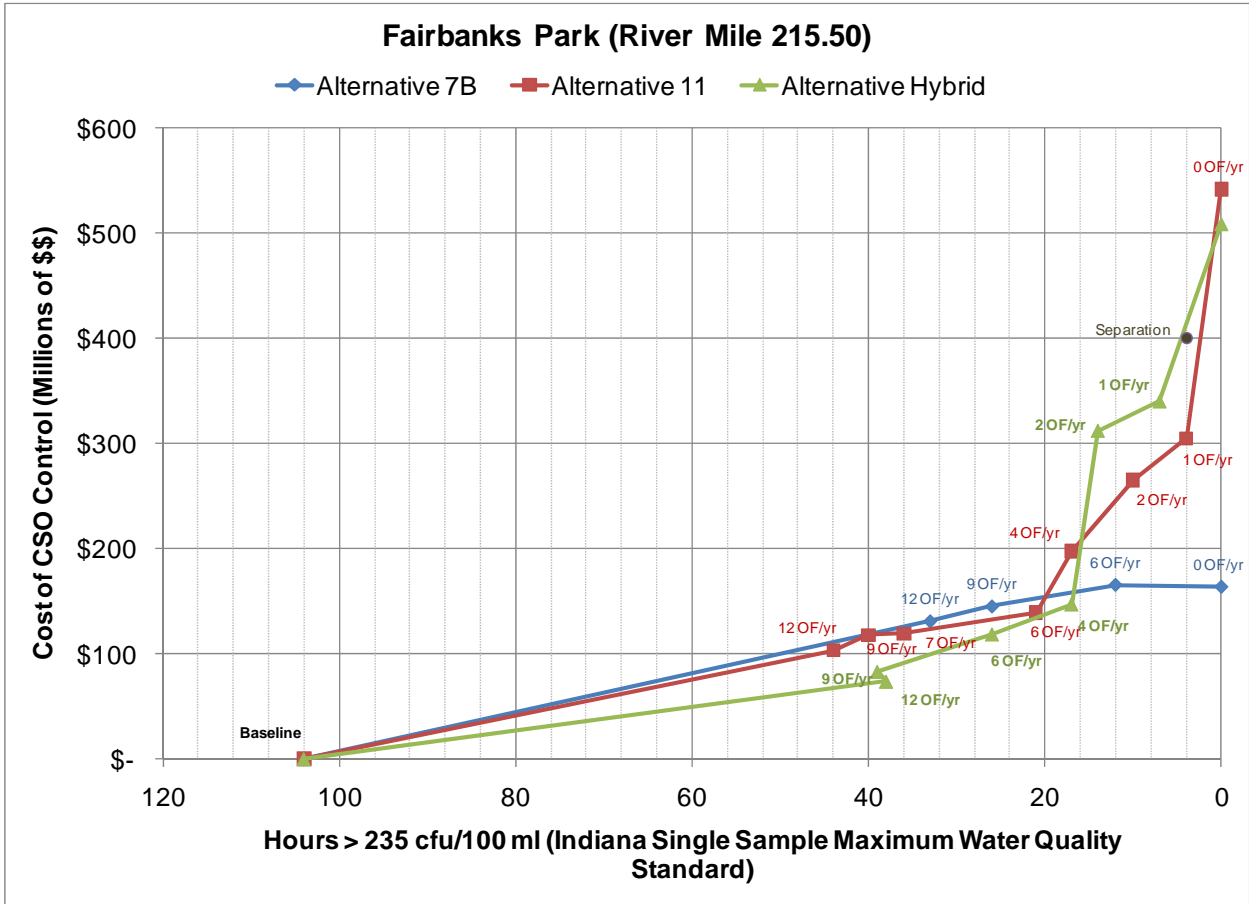


Figure 7.2-7. Cost-Performance Analysis of CSO Control Alternatives Based on Water Quality Benefit at Fairbanks Park.



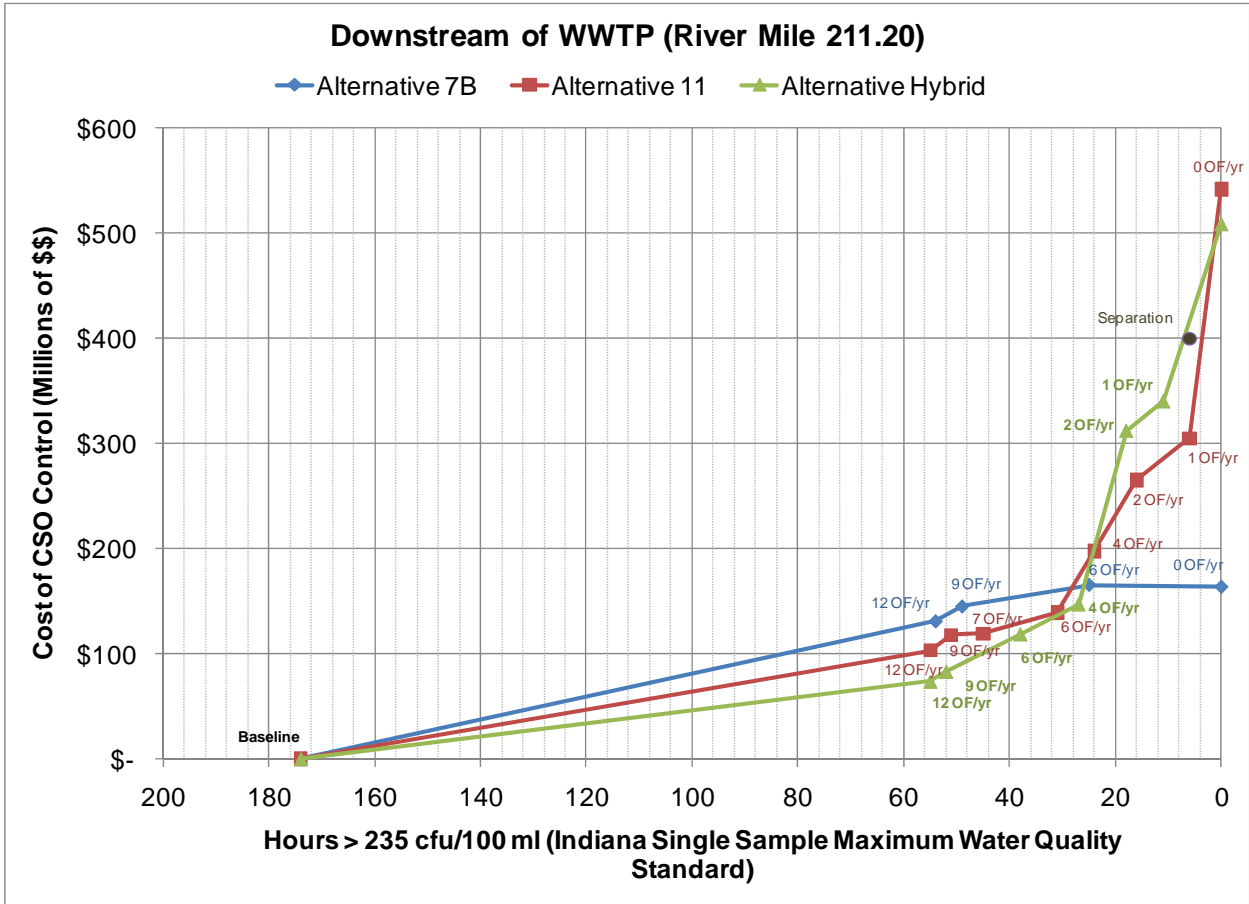


Figure 7.2-8. Cost-Performance Analysis of CSO Control Alternatives Based on Water Quality Benefit Near the Waste Water Treatment Plant.

The cost-performance graphs were used to identify the most cost-effective level of control, which is approximately 4 overflows/year for Alternative 11 and the Hybrid Alternative. The tunnel alternative (7B) did not have a classic knee because the technologies included in each level of control changed at the 0 OF/yr level of control (for example, floatables and solids controls were not included in the 0 OF/yr scenario but were included in the other levels of control), so the total cost of control at 6 and 0 OF/yr was comparable. The “Total Present Worth” was used as the cost basis for the graphs. These costs were summarized in Table 7.2-3. The recreation season model results of hours where the simulated river concentration due to Terre Haute’s CSOs is greater than Indiana’s single sample maximum criterion (235 cfu/100 ml) was used as the performance or benefit basis for the graphs.



The shape of the cost-performance curves are similar for the alternatives 11 and its hybrid, with both showing a “knee” between 6 and 4 overflows per year. Costs for equivalent levels of control are similar. Also of note is that there is very little difference in the shape of the cost-performance curves between key locations.

As will be explained in Section 8, based on affordability, the recommended alternative is not at the knee of the curve. Although the knee is the location of the most cost-effective solution, it is higher than the calculated affordability of the community and is therefore, not the recommended alternative.

7.2.7 Priority Area Assessment

Care was taken during the development of the final CSO control alternatives to reduce or eliminate the CSO volume discharging to the river at or upstream of Fairbanks Park, which had been identified as an area of priority by the Citizens Advisory Committee. In each of the final alternatives, the City eliminated the CSOs in the park itself. Volume from the two most northern or upstream CSOs (CSO-010 and CSO-009) was minimized to the extent practical and feasible in each alternative. As a result, the CSO volume discharged in and upstream of Fairbanks Park was reduced from 304 MG currently to less than 75 MG for all of the final alternatives sized at 9 or fewer overflows per year. This corresponds to a 75% reduction in CSO volume at the park. Compliance with State water quality standards at the park due to the City’s CSOs alone improves approximately threefold, with exceedances dropping from 104 hours currently to approximately 35 hours (based on 7 overflows/year or fewer).

An assessment of the river model results at Fairbanks Park (RM 215.50) for the storm events remaining after implementation of the LTCP indicates that the water quality at this location returns to acceptable bacteria levels (e.g. < 235 cfu/100 ml) within 16 hours after a rain event starts, as shown in Figure 7.2-9. As this figure illustrates, there is often a several hour lag between when the rain starts and when the CSOs start discharging. Once the CSOs start overflowing to the river, bacteria concentrations exceed the water quality standard within the first hour of overflow. Bacteria concentrations return to levels below the water quality standard 6-12 hours after the CSOs start overflowing, depending on the storm event.

This suggests that CSO discharges remaining after the preferred CSO control alternative is implemented will affect Fairbank Parks approximately one day after each event. If the level of



control in the final alternative is 7 overflows, then Fairbanks Park will have unacceptable *E. coli* levels due to the CSOs for 7 days of the year (note however, that some of the remaining events will occur outside of the recreation season and so the in-stream water quality standard criteria are not applicable).

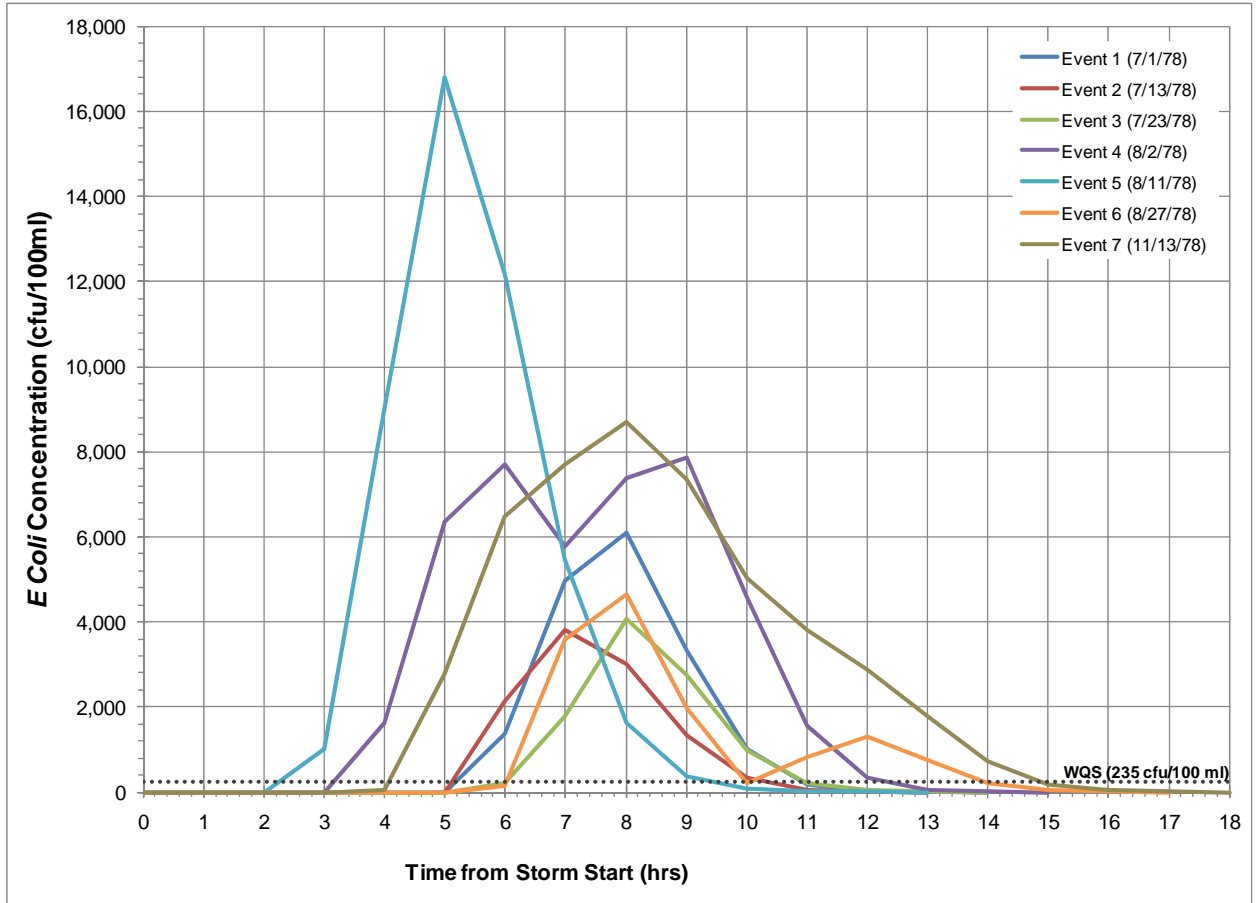


Figure 7.2-9. *E. coli* Concentration Profile at Fairbanks Park During Events Remaining After Implementation of the Long Term Control Plan.

7.3 Summary of Alternative Development

Based upon the cost/performance criteria described in the previous Section, the following three alternatives were evaluated at various levels of control. The following descriptions provide the details of the three final alternatives and the corresponding benefits with respect to cost/performance as well as other factors discussed in more detail in this section.



Alternative 7B

Alternative 7B can eliminate all or most CSO's depending upon the level of control selected. Under the zero overflow scenario, an emergency overflow at the International Paper storage lagoons could be open in the unlikely case that an overflow event occurs during a period when the lagoons are full and the WWTF is operating at peak capacity. Under the lesser levels of control, the alternative 7B eliminates all overflows except 003, 004, 009 and 010. The proposed tunnel ranges in size from 7 feet diameter up to 17 feet diameter and extends from the Spruce outfall south to a new tunnel evacuation lift station located adjacent to the storage lagoons. Details of this option are shown on Figure 6.8-1.

The most significant benefits to this option are that it will eliminate all CSO structures in the park under all levels of control and other CSO's based on tunnel size/level of control, has the lowest capital cost for the best water quality benefit over the long term and eliminates most "at-grade" construction disturbance. Conversely, this option requires a shorter implementation schedule for construction and rate increases due to the type of construction, cannot be feasibly phased over 20 years, and it cannot allow for cost effective implementation of "green" technologies.

Alternative 11

Alternative 11 consolidates CSO's 009/010 into one outfall with a storage tank, eliminates all CSO's in the park via conveyance of flows to CSO 011 or the International Paper lagoons depending upon the level of control, and replaces the existing main lift station with a new facility which conveys flows into the storage lagoons and to the WWTF. The various levels of control affect the size of and need for storage tanks at 010 (Spruce), 004 (Hulman), and 003 (Turner), and the size of relief sewer from Ohio to the Main Lift Station. Details of this option are shown on Figure 6.8-2.

The most significant benefits to this option are that it can be phased over 20 years (both project construction and rate implementation), can be reasonably expanded to gain more CSO control, allows ISU development along the Riverfront by consolidating 009/010, provides for a new main lift station designed to allow for future tunnel connection (if necessary), has lower operational costs than the "Hybrid" alternative, and has lower capital costs than Alternative 7B at most levels of CSO control.

Hybrid Alternative

The "Hybrid" Alternative utilizes very similar technologies and infrastructure as Alternative 11 with a few differences including both CSO 009 and 010 remain open and a storage facility is constructed at



each outfall and the main lift station is not replaced – instead, a new CSO pumping station is constructed to simply convey flows from the relief sewer into the lagoons only. Similar to Alternative 11, the various levels of control affect the size of storage tanks at 009 (Chestnut), 010 (Spruce), 004 (Hulman) and 003 (Turner) as well as the size of the relief sewer extending from Ohio to the Main Lift Station/International Paper lagoon site. Details of this option are shown on Figure 6.8-3.

The most significant benefits to this option as compared to the other two under all levels of control are as follows: lowest capital cost, lowest rate impact, and it can be phased over 20 years (both project construction and rate implementation). Negatively, this alternative has the highest operating costs due primarily to CSO's which remain in service and large storage tanks included in most levels of control, it limits the development potential for ISU along the Riverfront, requires the continued use of a 45 year old main lift station, and offers very limited capacity for expansion for additional future CSO control.

The costs for each level of control within each alternative are represented on Figures 7.2-7 and 7.2-8 as part of the knee-of-the-curve and in Table 7.2-3 referenced previously.

Several factors were taken into consideration when developing and evaluating the final screened CSO control alternatives, such as:

- Cost Effectiveness
- Non-Monetary Factors
- Goals of the CSO Control Plan

The following subsections describe how each of these factors was considered during the evaluation process which ultimately led to the final selected plan discussed in Section 10.

7.4.1 Cost Effectiveness

The cost effectiveness is determined with the cost performance curves shown in Figures 7.2-7 and 7.2-8. The process used for the CSO control alternatives developed demonstrates the improvements to water quality in the Wabash River and shows how much it costs for each increment of water quality improvement. As indicated in the cost performance curve the costs to improve the water quality beyond the “knee” for each alternative begin to increase significantly.



7.4.2 Non-Monetary Factors

The non-monetary factors include environmental issues/impacts, technical issues, implementation issues, and public acceptance.

When the alternatives were evaluated, environmental issues and impacts were taken into consideration. The parallel interceptor that is considered in several alternatives was preliminarily designed on First Street rather than along the river to avoid construction in a floodplain.

During the evaluation of alternatives, construction feasibility, implementation issues such as operability and reliability, and expandability were taken into consideration with the help of the City staff, CAC and the technical committee. The concepts of each alternative were kept as simple as possible with the public in mind and since each alternative was developed in a limited number of remote locations, the technologies should not be complex to construct or operate. To accommodate future changes in CSO control policies, it will be beneficial if the selected control facilities are expandable. Two of the three alternatives are expandable, however, the tunnel alternative 7B cannot be feasibly expanded. The covered concrete storage tank alternatives can also be expanded with the addition of more tank volume in most locations. However, if expansion is likely the associated facilities should be designed initially to facilitate the expansion. Expansion of the storage tank and storage tunnel alternatives may be limited by the capacity of the interceptor downstream of CSO 009. If flows in the collection system remain high due to continuing precipitation, it may not be possible to increase the capacity of the return pumping stations, or it may be necessary to increase the period of return pumping to more than 24 hours.

The control alternatives are to be evaluated on the ability to receive public acceptance. Public acceptance is relative to the level of disruption a CSO project would have on local businesses and neighborhoods during construction and during the operation of the facility. One concern that was addressed was the disruption of too many streets at once. Additionally, the use of the international paper lagoon was a concern to the Riverfront Group particularly with regard to odor. Thus, all alternatives included mitigation measures in the modifications of the lagoons for CSO storage.

During implementation of the selected plan, phasing of the control technologies in the alternative can be achieved as described in Section 10.4.



7.4.3 Meeting the Goals of the CSO Control Plan

The following goals were established during the CAC and technical committee meetings and used to develop the CSO control alternatives during the evaluation process. The summary below indicates how these goals were addressed with respect to the three final screened alternatives:

1. Comply with IDEM requirements

IDEM's Combined Sewer Overflow Long Term Control Plan Use Attainability Analysis Guidance was used during the development of the alternatives. It is presumed that the level of control selected will meet with approval by IDEM in accordance with an approved UAA which will change the designated use of the river during and 4 days after overflow events to the limited CSO use category. IDEM has been heavily involved in the Terre Haute LTCP planning process with multiple meetings and partial plan elements submittals to ensure that the Terre Haute plan complies with IDEM requirements.

2. Reduce in-stream bacteria from CSOs

All alternatives reduce in-stream bacteria from CSOs by reducing the volume and duration of CSO entering the river.

3. Eliminate / reduce CSOs 005, 006, 007 and 008 in Fairbanks Park

Priority area options were specifically developed in each alternative including those screened out to eliminate or reduce CSOs 005, 006, 007 and 008, which are in the priority area, Fairbanks Park.

4. WWTP Improvements

During the LTCP development process, a plan to improve and increase the capacity of the WWTP was approved by the City. The improvements proposed have been incorporated into the design of CSO control elements and the financial analysis of the LTCP implementation. The WWTP improvements are being constructed in three phases between 2011 and 2016 and will be considered the initial phases of the CSO LTCP as discussed in Section 10.

5. Maximize Flow to the WWTP

Given the expansion of the existing treatment facility, maximization of wet weather flows to and through the plant will be implemented once the improvements are complete. The SWMM



model and subsequent CSO control infrastructure have been sized based upon the proposed flow capacities of the expanded plant.

6. Control and eliminate floatables from CSOs in accordance with NPDES permit requirements

Floatables controls have been incorporated in each alternative for every outfall which would be proposed to remain. The outfalls to remain vary within each of the three screened alternatives and with the level of control within the alternatives.

7. Provide Protection Within Wellhead Protection Zone

After concern was addressed at a CAC meeting during the original LTCP development in 2001 regarding exfiltration of the combined sewers in the wellhead protection zone, lining of the combined sewers in the protection zone was a priority. The rehabilitation of several large diameter combined sewers was completed as an “early action” type project and funded with a Sanitary District bond issue in 2006-2007 since any CSO LTCP recommendation would include the use of some in-line storage of CSO flows in some of the existing oversized sewers. During this project, additional rehabilitation measures including thicker grout in the lower half of the pipeline were incorporated in combined sewers in the wellhead protection area.

8. Reasonable Rate Increase based on total project cost with consideration given to phasing the proposed work

During the development of the LTCP, reasonable rate impacts were considered, particularly after the approval of the WWTP project which has an estimated cost of approximately \$120 million. The final three alternatives were evaluated and cost estimates developed for various levels of control to allow for cost considerations in the UAA. Additionally, the alternatives were evaluated with respect to their ability to allow phasing of construction and subsequent rate impacts.

9. Review of Odor Control at WWTP

Odor control is a major element of the improvement’s project at the WWTP and will be incorporated into the construction of each phase of the project.



7.5 Preferred Alternative (2011)

Based upon the information presented in this section, the technical team completed an evaluation of the final three screened alternatives at several levels of CSO control each. This process produced a recommended final selected plan which would include Alternative 11 sized at the level of control which would produce on average 7 overflows per year. The selection of this alternative, and particularly this level of control, was based upon several factors all of which were discussed within this section including the following:

- Cost/Rate Impact vs. Performance – Alternative 11 at 7 overflows per year allowed for a lower capital cost option and subsequent rate impact than Alternative 7B which was important given the additional burden imposed on user rates by the City’s Wastewater Treatment Facility project. (The capital cost for this option was higher than the “hybrid”, however, Alternative 11 replaces the main lift station which was a priority to the technical team *which allows 002 to be eliminated*.) The option allows a level of control below 10, and a small incremental increase in cost allows an increased level of control from 9 to 7 overflows. As shown on the cost/performance curve, the incremental costs increase significantly for this option for higher levels of control.
- Ability to Phase Project –The infrastructure included in Alternative 11 allows for easy phasing of the project’s construction which allows for a phased financing/rate impact. Additionally, the phasing allows for the utilization of “green” technologies which can reduce the size of infrastructure of subsequent phases based on CSO control performance.
- Regulatory Acceptance –Given the meetings the City and technical team has had with IDEM throughout the planning process and the UAA document presented in Section 9, it is presumed that the alternative selected will meet with regulatory acceptance from IDEM and EPA.
- Consideration of Public Concerns – This alternative, as do all of the final screened alternatives, utilizes the International Paper lagoons for CSO flow storage. However, while incorporating these basins, which allows for significant flow storage at a very low cost, provisions for mitigating the basins operational affect on the surrounding properties’ development have been incorporated. Additionally, this alternative consolidates outfalls 009 and 010 with 009 being eliminated and a small storage tank constructed below grade at 010. Thus, impact to expansion/development plans proposed by ISU can be mitigated.



7.6 Preferred Alternative (2014)

Based on additional information provided in a Basis of Design Report prepared by the City's Design Consultant in 2012/2013 (which is included in Appendix 6-5), the preferred alternative is Alternative 11B. Alternative 11B is a variation of Alternative 11, with the major difference being that the International Paper lagoons will not be utilized for off-line storage. Rather, a High Rate Clarification (HRC) system with UV disinfection is to be installed at the IP site to provide primary treatment and disinfection to all flows greater than the capacity of the City's Main Lift Station. The treated water will directly discharge to the river.

Alternative 11B will provide the same level of control as the previously preferred Alternative 11 (7 overflows per year in a typical year); however, it will do so with a lower capital cost than the revised Alternative 11 cost. Additionally, it will allow the City to utilize the IP site in the Riverscape long-term plan.

Section 10 will present the selected plan in greater detail along with the proposed schedule including cost/construction phasing proposed review and approval.

