



Mayor
Donald L. Plusquellic
Service Director
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City of Akron

Akron Water Pollution Control Station No Feasible Alternative (NFA)

Addendum No. 1 Update with Supplement

November 25, 2009



Department of Public Service
Akron Public Utilities Bureau
Water Pollution Control



Department of Public Service
Akron Engineering Bureau
Environmental Division

**SECTION 1
EXECUTIVE SUMMARY**

Add the following.

The following No Feasible Alternative (NFA) Addendum No. 1 Update with Supplement was developed in response to the Consent Decree lodged with the United States District Court For the Northern District of Ohio Eastern Division on November 13, 2009 (referred to as “Consent Decree” in remaining sections).

Replace the last paragraph with the following.

The Conclusions and Recommendations, Section 6, presents the proposed WPCS Improvements to control and treat secondary bypass flows. The proposed plan includes phased improvements to the secondary treatment facility to increase process capacity initially to 130 MGD and then, following evaluation, additional improvements to increase capacity beyond 130 MGD. The cost of improvements to implement the Step Feed alternative in two phases is estimated to be \$76 million. Upon completion and verification of the increased secondary treatment capacity, an additional evaluation of applicable technologies to treat the reduced bypass flows will be completed. The evaluation will consider feasible technologies including additional Step Feed, storage and enhanced high rate clarification (EHRC) systems. It is important to note that the alternatives developed in this report are based upon the current Akron WPCS NPDES permit effluent limits. Any changes to the current Akron WPCS NPDES permit may necessitate re-evaluation of these alternatives.

The Secondary Bypass will continue to be utilized, after first maximizing flow to the secondary treatment system and storm retention tank (SRT), as a conveyance conduit for any flows exceeding the upgraded secondary treatment facility. Upon completion, the improvements will provide for storage and increased treatment of wastewater flow reaching the WPCS. It is the goal of the improvements for combined effluent to meet the current NPDES permit effluent water quality requirements. There is no feasible alternative to continued operation of the Secondary Bypass other than the controls presented herein.

SECTION 4 EVALUATION OF ALTERNATIVES

4.1 Evaluation Factors

Replace the first and fourth bullets with the following.

- Adjusted 1994 typical year data, as identified in the Consent Decree, was utilized.
- WPCS storage and enhanced high-rate clarification (EHRC) alternatives based on the updated annual transport model.

Replace the un-numbered table on Page 4-2 with the following:

	# of Events	# of Hours	Volume (MG)	CBOD ₅ (lbs)
WPCS Secondary Bypass Without Collection System Improvements	26	489	1,211	302,992

Insert the following at the end of Section 4.2.2.

Group 6 Alternatives – Hybrid

Alternatives in this group consider operating the existing aeration basins in an alternative process mode during wet weather events only. The goal is to successfully increase process flow through the existing basins and final settling tanks while maintaining effluent quality at a level that does not violate the plant's NPDES permit effluent limits. During non-wet weather periods the secondary treatment facility would be operated in its current process mode in order to continue discharging at historically high water quality levels.

Alternative 6 – Step Feed

The Step Feed alternative includes the construction of several major modifications to the channels, piping and aeration basins to 1) address current hydraulic limitations, and 2) provide alternative flow pathways and controls for a step feed process. The modified secondary treatment facility would be able to alternatively feed primary effluent directly to Aeration Basin Pass Nos. 2, 3 and 4 in addition to Pass No. 1.

The proposed operational scenario is to operate several hydraulic gates and valves at the onset of wet weather to place the secondary treatment facility in a step feed mode of operation. In step feed mode, portions of the primary effluent would be fed to Aeration Basin Pass Nos. 1, 2, 3 and 4 with the goal of reducing the MLSS Concentration in the final Basin pass. This subsequently results in a lower solids loading rate to the final settling tanks. The ultimate goal of this concept is to process higher flows through the final settling tanks without solids washout or carry-over. The process would be returned to its normal operational mode after the wet weather event subsides.

Full-scale testing of the Step Feed process concept is required to evaluate the relative success achieved and verify the required modifications to infrastructure and operating procedures. It is recommended to construct the Step Feed-related improvements in two phases – the first phase should involve modification of one existing secondary treatment process train that can then be operated for full-scale testing during wet weather at the Akron WPCS. If proven successful, then modifications to the other five process trains can be planned. Full scale operation of the completed first phase Step Feed improvements will provide an indication of the maximum capacity that can be achieved with this process concept. Until that time the upper capacity limits of this process concept, as applied to the Akron WPCS secondary treatment facility, is unknown. However, for the purpose of comparison to other alternatives herein it is proposed to consider a target capacity of 170 MGD (with all six treatment trains converted).

Appendix D contains a list of modifications and estimated costs for a Step Feed process implementation.

Alternative 6A – Step Feed and EHRC

As noted above, the maximum capacity possible with a Step Feed operation would be determined following improvements to one existing process train and full-scale testing. It is possible that the target capacity of 170 MGD may not be attained. In order to provide a comparison of the Step Feed alternative to other alternatives developed in this report it is proposed to include an Alternative 6A which considers improvements for a Step Feed process and the addition of an enhanced high rate clarification (EHRC) process to function in parallel with the upgraded secondary treatment facility.

Replace Table 4-3, 4-8 and 4-12 with the following.

Table 4-3 Secondary Treatment Alternatives Performance Summary ¹						
Secondary Treatment Alternative	Secondary Capacity	Secondary Treatment % CBOD ₅ Removal	Secondary Bypass Annual Estimates			
			Bypass # of Events	Bypass # of Hours	Bypass Volume (MG)	Bypass CBOD ₅ (lbs)
WPCS Secondary Bypass – No Change	110 MGD	90	26	489	1,211	302,992
Alternative 1 – 20 MGD Additional Secondary Treatment	130 MGD	90	15	346	793	198,409
Alternative 2A – 20 MGD Additional FSTs	150 MGD	90	9	259	493	123,349
Alternative 2B – 40 MGD Additional FSTs	170 MGD	90	6	170	260	65,052
Alternative 5A – 170 MGD MBR	170 MGD	95	6	184	272	68,054
Alternative 5B – 210 MGD MBR	210 MGD	95	0	0	0	0
Alternative 5C – 270 MGD MBR	270 MGD	95	0	0	0	0
Alternative 6 – 170 MGD Step Feed	170 MGD	90	6	184	272	68,054

¹ 10 MG SRT volume is included in analysis.

Table 4-8 Storage Basin Alternatives Benefit Summary						
Alternatives	Annual Estimates					
	Bypass # of Events	Bypass # of Hours	Bypass Volume (MG)	Capture by Volume %	Bypass CBOD (lbs)	Bypass CBOD Reduction (lbs)
WPCS Secondary Bypass – No Change	26	489	1,211	0	302,992	0
Alt. 1 – 130 MGD Capacity	15	346	793	34.5	198,409	104,583
Alt. 1A – 20 MG Storage	7	238	582	51.9	145,616	157,376
Alt. 1B – 40 MG Storage	4	177	466	61.5	116,593	186,399

¹ 10 MG SRT volume included in analysis

Addendum No. 1 Update with Supplement

Table 4-12
WPCS Annual Bypass Volumes Under Various Secondary Treatment Alternatives¹

Secondary Treatment Alternative	Secondary Capacity (MGD)	Existing Storage Volume ³ (MG)	Additional Storage Volume (MG)	Secondary Treatment & Storage Capacity (MG(D))	EHRC Capacity (MGD)	Total Treatment & Storage Capacity (MG(D))	Annual Treated Bypass				Total Secondary Bypass CBOD ₅ Reduction (lbs)
							Bypass # of Events	Bypass # of Hours	Bypass Volume (MG)	Bypass CBOD ₅ ² (lbs)	
"No Change" Alternative: Operate Secondary Treatment at 110 MGD	110	10	0	120	0	120	26	489	1211	302,992	
Alt. 1 Modified "No Change": Increase Secondary Treatment + EHRC	130	10	0	140	140	280	15	346	793	67,459	235,533
Alt. 1A - 20 MG Add. Storage Basin + EHRC	130	10	20	160	120	280	7	238	582	49,510	253,482
Alt. 1B - 40 MG Add. Storage Basin +EHRC	130	10	40	180	100	280	4	177	466	39,642	263,350
Alt. 1C - 60 MG Add. Storage Basin + EHRC	130	10	60	200	80	280	3	148	393	33,432	269,560
Alt. 1D - 80 MG Add. Storage Basin + EHRC	130	10	80	220	60	280	3	129	333	28,328	274,664
Alt. 1E - 100 MG Add. Storage Basin + EHRC	130	10	100	240	40	280	2	104	278	23,648	279,343
Alt. 1F - 140 MG Add. Storage Basin	130	10	140	280	0	280	2	80	198	16,843	286,149
Alt. 2A - 20 MGD FSTs + EHRC	150	10	0	160	120	280	9	259	493	41,939	261,053
Alt. 2B - 40 MGD FSTs + EHRC	170	10	0	180	100	280	6	170	260	22,118	280,874
Alt. 2C - 40 MGD FSTs + 2 MG Add. Storage + EHRC	170	10	2	182	98	280	6	170	260	22,118	280,874
Alt. 2D - 40 MGD FSTs + 10 MG Add. Storage + EHRC	170	10	10	190	90	280	4	148	227	19,310	283,682
Alt. 2E - 40 MGD FSTs + 30 MG Add. Storage + EHRC	170	10	30	210	70	280	3	103	164	13,951	289,041
Alt. 5A - 170 MGD MBR + EHRC	170	10	0	180	100	280	6	184	272	23,138	279,854
Alt. 5B - 210 MGD MBR + EHRC	210	10	0	220	60	280	0	0	0	0	302,992
Alt. 5C - 270 MGD MBR	270	10	0	280	0	280	0	0	0	0	302,992
Alt. 6 – 170 MGD Step Feed	170	10	0	180	0	180	6	184	272	68,054	234,938
Alt. 6A – 170 MGD Step Feed + EHRC	170	10	0	180	100	280	6	184	272	23,138	279,854

¹ All scenarios assume implementation of LTCP Integrated Plan No. 2 in the collection system

² CBOD reduction of 66% of 30 mg/L sec. bypass flow assumed for EHRC treated flow per pilot test results; "No Change" alternative bypass loading is 30 mg/L CBOD concentration. Although shown as "0" for Bypass, a portion of this CBOD loading remains as part of the secondary effluent.

**SECTION 5
ALTERNATIVE SCREENING**

Replace Tables 5-1, 5-2, 5-3 and 5-4 with the following:

Table 5-1 WPCS Secondary Bypass Alternatives Project Costs			
Alternative	Secondary Treatment & Storage Capacity ¹ (MG(D))	EHRC Capacity (MGD)	Total Project Cost
No Change Alternative	120	0	\$27,575,000
Alt. 1 – 130 MGD Secondary Operation + EHRC	140	140	\$70,634,000
Alt. 1A – 20 MG Add. Storage Basins + EHRC	160	120	\$119,177,000
Alt. 1B – 40 MG Add. Storage Basins + EHRC	180	100	\$165,629,000
Alt. 1C – 60 MG Add. Storage Basins + EHRC	200	80	\$203,385,000
Alt. 1D – 80 MG Add. Storage Basins + EHRC	220	60	\$245,075,000
Alt. 1E – 100 MG Add. Storage Basins + EHRC	240	40	\$290,161,000
Alt. 1F – 140 MG Add. Storage Basins	280	0	\$368,705,000
Alt. 2A – 20 MGD FSTs + EHRC	160	120	\$86,712,000
Alt. 2B – 40 MGD FSTs + EHRC	180	100	\$96,093,000
Alt. 2C – 40 MGD FSTs + 2 MG Add. Storage + EHRC	182	98	\$103,828,000
Alt. 2D – 40 MGD FSTs + 10 MG Add. Storage + EHRC	190	90	\$115,733,000
Alt. 2E – 40 MGD FSTs + 30 MG Add. Storage + EHRC	210	70	\$159,466,000
Alt. 5A – 170 MGD MBR Process + EHRC	180	100	\$255,744,000
Alt. 5B – 210 MGD MBR Process + EHRC	220	60	\$267,198,000
Alt. 5C – 270 MGD MBR Process	280	0	\$312,249,000
Alt. 6 – 170 MGD Step Feed	180	0	\$75,675,000
Alt. 6A – 170 MGD Step Feed + EHRC	180	100	\$107,960,000

¹ Volume of flow contained and/or treated in 24-hour period.

Table 5-2
WPCS Secondary Bypass Alternatives Present Worth Cost

Alternative	Total WPCS Capacity ¹ (MG(D))	Total Project Cost ²	2009 Annual O&M Cost	Present Worth Cost
No Change Alternative	120	\$27,575,000	\$132,700	\$26,416,000
Alt. 1 – 130 MGD Secondary Operation + EHRC	280	\$70,635,000	\$658,100	\$79,192,000
Alt. 1A – 20 MG Add. Storage Basins + EHRC	280	\$119,177,000	\$591,800	\$119,690,000
Alt. 1B – 40 MG Add. Storage Basins + EHRC	280	\$165,629,000	\$890,000	\$165,400,000
Alt. 1C – 60 MG Add. Storage Basins + EHRC	280	\$203,385,000	\$726,600	\$193,919,000
Alt. 1D – 80 MG Add. Storage Basins + EHRC	280	\$245,075,000	\$969,800	\$233,692,000
Alt. 1E – 100 MG Add. Storage Basins + EHRC	280	\$290,161,000	\$1,019,700	\$273,326,000
Alt. 1F – 140 MG Add. Storage Basins	280	\$368,705,000	\$611,200	\$331,474,000
Alt. 2A – 20 MGD FSTs + EHRC	280	\$86,712,000	\$580,600	\$92,826,000
Alt. 2B – 40 MGD FSTs + EHRC	280	\$96,093,000	\$886,200	\$107,092,000
Alt. 2C – 40 MGD FSTs + 2 MG Add. Storage + EHRC	280	\$103,828,000	\$708,200	\$103,486,000
Alt. 2D – 40 MGD FSTs + 10 MG Add. Storage + EHRC	280	\$115,733,000	\$821,500	\$121,810,000
Alt. 2E – 40 MGD FSTs + 30 MG Add. Storage + EHRC	280	\$159,466,000	\$603,500	\$90,809,000
Alt. 6 – 170 MGD Step Feed	180	\$75,675,000	\$407,700	\$78,605,000
Alt. 6A – 170 MGD Step Feed + EHRC	280	\$107,960,000	\$861,300	\$119,914,000

¹ Volume of flow able to be contained and/or treated in 24-hour period.

² Includes \$100,000 for future NFA updates.

5.2 Alternatives Analysis

Table 5-3
WPCS Secondary Bypass Alternatives Water Quality Benefits

Alternative	Total WPCS Capacity ¹ (MG(D))	Bypass # of Events	Bypass # of Hours	Treated Bypass Volume (MG)	Bypass CBOD ₅ (lbs)
No Change Alternative	120	26	489	1,211	302,992
Alt. 1 – 130 MGD Secondary Operation + EHRC	280	15	346	793	67,459
Alt. 1A – 20 MG Add. Storage Basins + EHRC	280	7	238	582	49,510
Alt. 1B – 40 MG Add. Storage Basins + EHRC	280	4	177	466	39,642
Alt. 6 – 170 MGD Step Feed	180	6	184	272	68,054
Alt. 6A – 170 MGD Step Feed + EHRC	280	6	184	272	23,138

¹ Volume of flow able to be contained and/or treated in 24-hour period.

Table 5-4
WPCS Secondary Bypass Alternatives CBOD₅ and Volume Removed Costs

Alternative	Total WPCS Capacity ¹ (MG(D))	Treated Bypass CBOD ₅ (lbs)	CBOD ₅ Removed (lbs)	Bypass Volume (MG)	Volume Removed ² (MG)	Present Worth Cost (\$ K)	\$/lb CBOD ₅ Removed	\$/MG Volume Removed
No Change Alternative	120	302,992	0	1,211	0	\$26,416	N/A	N/A
Alt. 1 – 130 MGD Secondary Operation + EHRC	280	67,459	235,533	793	418	\$79,192	\$336	\$189,455
Alt. 1A – 20 MG Add. Storage Basins + EHRC	280	49,510	253,482	582	629	\$119,690	\$472	\$190,286
Alt. 1B – 40 MG Add. Storage Basins + EHRC	280	39,642	263,350	466	745	\$165,400	\$628	\$222,013
Al. 6 – 170 MGD Step Feed	180	68,054	234,938	272	939	\$78,605	\$335	\$83,711
Al. 6A – 170 MGD Step Feed + EHRC	280	23,138	279,854	272	939	\$119,914	\$428	\$127,704

¹ Volume of flow able to be contained and/or treated in 24-hour period.

² Untreated Bypass Volume reduction.

Replace the last two paragraphs of Section 5.2.2 with the following.

As shown, the cost-benefit relationships range from \$335/lb. CBOD to \$628/lb. CBOD removed, with the storage basin alternatives being most costly. The cost-benefit relationship for volume removed ranges from \$83,711 to \$222,013 per million gallons removed (untreated bypass volume reduced). Again, the storage basin alternatives are more costly per million gallons removed/treated. Based on this cost-benefit analysis, it is recommended to screen the storage basin alternatives. For Alternatives 1 and 6A, an EHRC process provides perpetual removal abilities, i.e. can be operated 24/7 for extended periods of time. A storage basin, once filled, provides no further benefit – if back to back storms occur there is no capture of the secondary bypass flow.

Alternative 6 is more cost effective then the other alternatives for both CBOD removal and volume removed. Alternative 6 also provides the same reduction in the number of Secondary Bypass events and Bypass volume as Alternative 6A and the CBOD₅ removal is 84% of Alternative 6A removal. To achieve removal of the additional 16% of CBOD₅ would require a 43% larger capital investment, or approximately \$32 million. As shown above, the cost per pound of CBOD₅ removed increases from \$335/lb to \$428/lb.

Improvements to the secondary treatment facility to enable Step Feed operation up to 170 MGD are superior in cost-benefit to the Storage Basin/EHRC alternatives. Alternative 6 includes improvements to increase the base flow treatment capacity to provide the greatest comparative benefit of the alternatives presented. Full-scale testing of the Step Feed process concept will be required.

Replace Section 5.3 with the following.

5.3. Summary of Recommended Alternative

Based on an evaluation of cost and non-cost issues, found in Sections 4 and 5 of this Report, and based on a cost-benefit analysis, the following WPCS improvements are recommended.

1. Modify the existing secondary treatment system in two phases to operate in Step Feed mode at a peak day flow greater than 130 MGD. The first phase goal is to increase capacity to 130 MGD. (For the basis of alternative evaluation a target capacity of 170 MGD was considered for the second phase goal.)
2. Construct improvements to the Secondary Treatment Aeration Influent Flume and channels; modify mixed liquor piping, channels and junction chambers and secondary effluent channels; modify the existing final settling tanks with new covered launders after removing the domes.
3. Replace the existing 10 MG SRT.
4. If needed following construction and full-scale operational testing of the Step Feed process, construct additional process improvements. Depending on the success of the Step Feed process, additional improvements may be identified to augment or supplement the secondary process. The capacity and type of improvements will be determined by an evaluation of feasible technology at that time.
5. Continue operation of the Secondary Bypass Conduit on a limited and controlled basis after first maximizing flow through secondary treatment and the SRT.

Based on Alternative 6, the total opinion of probable project cost for these improvements is \$76 million. The estimated additional, annual O&M cost is \$407,700.

Implementation of this alternative will significantly reduce utilization of the Akron WPCS secondary bypass conduit. The number of bypass events are estimated to be reduced from 26 to six annually. However, the goal is for the combined effluent to meet the Akron WPCS current 7-day average NPDES permit limit parameters. The Secondary Bypass Conduit must remain in service to convey primary effluent quality wastewater that exceeds the upgraded Secondary Treatment capacity. Because the secondary treatment process has a limited capacity with respect to peak wet weather plant flows, there remains a need for a bypass conduit to protect existing secondary treatment facilities from biomass washout, and physical damage due to hydraulic surges. There is no feasible alternative to continued, but significantly reduced, operation of the secondary bypass conduit.

SECTION 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Proposed Plan

Replace the 2nd and 3rd paragraphs with the following.

Based on the benefit analysis for the WPCS alternatives, it is proposed to modify the existing secondary treatment system in two phases to operate in Step Feed mode during wet weather periods at a peak day flow of 130 MGD after the first phase construction and, if successful, operate at a targeted peak day flow of 170 MGD following a second phase of improvements. The existing 10 MG Storm Retention Tank (SRT) will be replaced. The total opinion of probable project cost for these improvements is \$76 million.

Depending on the actual performance of the Step Feed improvements, other facility improvements may be necessary. Upon completion and verification of the increased secondary treatment capacity, an additional evaluation of applicable technologies to treat the reduced bypass flows will be completed. The evaluation will consider feasible technologies including additional Step Feed, storage and enhanced high rate clarification (EHRC) systems.

Replace Section 6.2 with the following.

6.2 Benefits

The proposed LTCP Integrated Alternative #2 controls will provide a water quality benefit throughout the collection system (watershed) and result in maximizing flows to the Akron WPCS for treatment. The WPCS improvements proposed herein will provide further water quality benefit reducing the Secondary Bypass CBOD₅ from 302,992 to 68,054 lbs CBOD₅ annually. The combined storage and treatment capacity of the improved secondary treatment facility and replaced SRT will capture or treat flows to a quality meeting the Akron WPCS current NPDES Permit. The annual number of secondary bypass events are estimated to be reduced from 26 to six annually.

SECTION 7
BIBLIOGRAPHY

Add the following:

17. City of Akron, Contact Stabilization/Step Feed Alternative for the City of Akron Water Pollution Control Station Letter Report, November 25, 2009, by CH2MHill, Columbus, Ohio.

Add the following supplemental information.

Appendix D

City of Akron, Ohio

**Contact Stabilization/Step Feed Alternative for
the City of Akron Water Pollution Control Station Letter Report**

November 25, 2009



CH2M HILL
1103 Schrock Road
Suite 400
Columbus, OH
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Tel 614.888.3100
Fax 614.888.0043

VIA ELECTRONIC & REGULAR U.S. MAIL

November 25, 2009

Mr. Lawrence R. Liebesman, Partner
Holland & Knight
2099 Pennsylvania Avenue, N.W.
Suite 100
Washington, D.C. 20006

Re: City of Akron, Ohio
Contact Stabilization/Step Feed Alternative for the
City of Akron Water Pollution Control Station

Dear Mr. Liebesman:

Pursuant to our July 9, 2009 agreement, CH2M HILL met with the City of Akron and the City's No Feasible Alternative Report consultant (Arcadis) on July 14 and 15 to discuss the viability of contact stabilization/step feed alternative as a cost effective and beneficial alternative for the Akron Water Pollution Control Station (WPCS). As a result of our meetings and follow-up work, CH2M Hill is confident that Contact Stabilization would ultimately achieve biological secondary treatment for 170 MGD or greater storm mode capacity; however, testing is required to evaluate the ability to reliably and consistently meet the NPDES permit requirements and provide the City with a workable and user-friendly operation. CH2M HILL's approach is cost effective because the existing tankage is fully utilized through optimization, i.e., this alternative requires no new major tankage to be constructed. Reuse and upgrade of the existing tankage will also minimize greenhouse gas emissions compared to the construction of new tankage.

The following summarizes the Scope of Services, Project Schedule, and Project Costs for a phased approach to efficiently and cost-effectively upgrade the WPCS to ultimately meet full secondary treatment. This phased approach generally provides for the upgrade of Treatment Train No. 6 (Phase 1) to provide 130 MGD or greater storm mode capacity followed by an upgrade to the remaining Treatment Trains Nos. 1 to 5 (Phase 2) to provide greater than 130 MGD storm mode capacity at the WPCS. A demonstration period to adequately test and evaluate the performance of Phase 1 may allow significant cost savings by allowing optimization of Train No. 6 prior to completing Phase 2 upgrades. The Scope of Services herein for Phase 2 should be evaluated and updated as appropriate as Phase 1 work is completed.

Scope of Services

- A. Phase 1 - Modifications for 130 MGD or greater peak storm mode capacity (Refer to Site Plan Exhibit 3). Increase peak capacity of Secondary Treatment Train No. 6 to 30 MGD or greater. Secondary Treatment Trains Nos. 1 to 5 will be increased to 20 MGD peak flow.

1. Modify Aeration Basin Splitter to minimize hydraulic restriction by removing morning glories (42-inch flares) feeding the North Channel Aeration Basins Nos. 5 and 6.
2. Modify the inlet channel to Aeration Basin No. 6 to minimize hydraulic restrictions. Provide additional primary effluent step feed to Passes 2 and 4.
3. Modify mixed liquor suspended solids (MLSS) channel to Final Settling Tanks (FST) Nos. 6A, 6B and 6C. Remove flow control butterfly valve (hydraulic restriction), raise/provide new concrete channel walls, and add new weir gates to each associated FSTs.
4. Blower Building:
 - a. Install a new turbo-type blower dedicated to Aeration Basin No. 6 and connect to existing air piping. Provide new isolation valve on air header to isolate Aeration Basin No. 6 from other basins.
 - b. Install three new return activated sludge (RAS) centrifugal pumps and associated suction/discharge piping and valves for Train No. 6.
 - c. Install a new magnetic flowmeter at RAS pump header.
 - d. Provide Return Sludge Well drain piping from sludge wells to drainage well.
5. Install a new RAS line from upstream of RAS screw pumps to RAS wet well.
6. Final Settling Tanks Nos. 6A, 6B, and 6C:
 - a. Remove existing weirs and provide new peripheral weir and baffles.
 - b. Provide algae sweeping system.
7. Final Settling Tanks:
 - a. Remove domes on all FSTs (eighteen total) to allow maintenance and cleaning of weirs.
8. Provide instrumentation for testing and evaluating storm mode for Secondary Treatment Train No. 6.
9. Following construction of Phase 1 Upgrades, complete testing and evaluation services to assess secondary treatment plant performance. Train No. 6 will be the primary focus of these services; however, the total secondary plant performance will be assessed as necessary to monitor overall plant performance and develop Phase 2 Upgrades.
 - a. Develop, test, and evaluate operational strategies to assess original design operational strategies implemented by Phase 1 Contractor per the design documents.
 - b. Determine an efficient storm mode operation including control requirements to transition from dry weather to storm mode and return back to dry mode.
 - c. Develop protocols and requirements for sampling to be completed by the City. Contractor will make necessary initial control upgrades in the WPCS's SCADA system. City will provide a "call-back" programmer to update the SCADA system to change process controls as necessary during the testing and evaluation period.
 - d. Meet with the City on a monthly basis to review secondary operation.
 - e. Provide a monthly report that summarizes secondary operation.

- B. Phase 2 – Assuming the modifications for 170 MGD peak storm mode capacity (Refer to Exhibit 4). As determined by Phase 1 testing and evaluation, provide upgrades to Secondary Treatment to further increase peak flows during storm flow conditions. Final upgrades will, therefore, be determined in the future. Upgrades included herein (and included in the project costs for Phase 2) are conservative; i.e., optimization may allow much of the scope to be reduced as appropriate to minimize future costs.

The following modifications are currently included:

1. Remove the remaining hydraulic restrictions at Aeration Basin Splitter including all remaining morning glories, gates and walls.
2. Modify/raise inlet channels to Aeration Basins Nos. 1 to 5 to allow a free discharge of primary effluent to aeration pass.
3. Construct new inlet channels for passes 1 to 4 on Aeration Basins No. 1 to 5 and provide new control stations (weir gates) feeding primary effluent to each pass. Note: Phase 1 evaluation may demonstrate that all passes may not be required.
4. Replace three remaining existing positive displacement blowers with new turbo-type blowers. Provide new piping and valves to connect to existing air header feeding aeration basins.
5. Provide new flow control stations (flow splitting via weir gates) in Pass 4 of Aeration Basins No. 1 to 5. Outlet to flow control stations. Modify mixed liquor junction boxes to minimize hydraulic restrictions that feed Final Settling Tanks Nos. 1 to 5 (A, B, and C). Note: Phase 1 evaluation may demonstrate that flow splitting to each FST may not be required; rather, elimination of hydraulic restrictions to closely split flows to each FST may be sufficient to provide acceptable clarifier performance.
6. Remove hydraulic restrictions on all Final Settling Tank effluent structures and outfall piping to headwall.
7. Provide instrumentation for testing and evaluating storm mode on Aeration Basins No. 1 to 5.

Projected Costs

Phase 1 – Modifications for 130 MDG Capacity (See Exhibit 1)		Estimated Cost
Construction Cost		\$7,300,000
Non-Construction Cost (30%)		\$2,200,000
Testing & Evaluation Services		\$1,000,000
Total Projected Phase 1 Cost		\$10,500,000
Phase 2 – Modifications for 170 MGD Capacity (See Exhibit 2)		Estimated Cost
Construction Cost		\$29,700,000
Non-Construction Cost (30% of construction costs plus \$100,000 to update NFA)		\$9,000,000
Total Projected Phase 2 Cost		\$38,700,000

Mr. Lawrence R. Liebesman
November 25, 2009

City of Akron, Ohio
Contact Stabilization/Step Feed Alternative

Phase 2 Project Costs can potentially be decreased up to nearly \$10M if Phase 1 demonstrates that some step feed locations can be omitted and flow splitting to final settling tanks is not required.

The Contact Stabilization Alternative presented herein may potentially provide cost savings for increasing the storm mode capacity compared to other alternatives included in the latest No Feasible Alternative report. CH2M HILL recommends that the City consider and implement this alternative in a phased approach as outlined herein to potentially save capital and operating costs and potentially provide a workable and acceptable means to operate Akron's WPCS during storm mode operation. Contact Stabilization operation will also allow the City to operate in the same current dry weather operation mode that has proven to be very effective.

Please do not hesitate to contact us if you have questions or require additional information. Thank you for the opportunity to assist you on this project.

Respectfully submitted,

CH2M HILL, Inc.



Dennis Tinkler, P.E.
Vice President

cc Richard A. Merolla, City of Akron, Director of Public Service
Michael L. McGlinchy, P.E., City of Akron, Public Utilities Bureau Manager
Patrick D. Gsellman, P.E., City of Akron, Manager, Environmental Division
Terrance S. Finn, Roetzel & Andress
Glen Daigger, CH2M HILL

Enclosures - Exhibit 1: Phase 1 Projected Cost
Exhibit 2: Phase 2 Projected Cost
Exhibit 3: Phase 1 – Modifications for 130 MGD
Exhibit 4: Phase 2 – Modifications for 170 MGD

EXHIBIT 1

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 1 - 130 MGD CONTACT STABILIZATION UPGRADE FOR SECONDARY TRAIN NO. 6
PROBABLE COSTS NOVEMBER 25, 2009**

Specification Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 1	GENERAL REQUIREMENTS							
	General Requirements 14%	1	LS			\$ 548,023	\$ 548,023	
Total For Division 1								\$ 548,023
	SITE WORK							
204	Cut aeration tank walls	144	LF		\$ 110.00	\$ 110.00	\$ 15,840	
205	Cut channel walls East gallery	80	LF		\$ 110.00	\$ 110.00	\$ 8,800	
206	Cut channel walls West gallery	50	LF		\$ 110.00	\$ 110.00	\$ 5,500	
207	Remove pipe, fittings & valves West gallery	1	LS		\$ 10,000.00	\$ 10,000.00	\$ 10,000	
208	Remove pipe, fittings & valves East gallery	1	LS		\$ 10,000.00	\$ 10,000.00	\$ 10,000	
	Shorten 24" rein. ftg & wall ftg. E gallery	1	LS		\$ 7,000.00	\$ 7,000.00	\$ 7,000	
	Relocate 10" Air Line	1	LS		\$ 7,000.00	\$ 7,000.00	\$ 7,000	
	Remove/relocate 36" pipe & valves West	1	LS		\$ 7,000.00	\$ 7,000.00	\$ 7,000	
	Remove & relocate 36" & 30" Blind flange	1	LS		\$ 3,500.00	\$ 3,500.00	\$ 3,500	
209	Demo pipe 6A	1	LS		\$ 5,000	\$ 5,000.00	\$ 5,000	
210	Demo pipe 6B	1	LS		\$ 5,000	\$ 5,000.00	\$ 5,000	
211	Demo pipe 6C	1	LS		\$ 5,000	\$ 5,000.00	\$ 5,000	
212	Demo butterfly MLSS channel	1	EA		\$ 3,000	\$ 3,000.00	\$ 3,000	
213	18 Clarifier FRP Covers & Appurtenances/4 day/Clar.	72	DAY		\$ 7,500	\$ 7,500.00	\$ 540,000	
214	Effluent Trough/Weirs/Scum Baffle/Scum Hopper/Supports B21C Crew/2.5 per/clar.	45	DAY		\$ 3,841	\$ 3,841.00	\$ 172,845	
215	Demo sluice gate East gallery	1	LS		\$ 5,000	\$ 5,000.00	\$ 5,000	
216	Demo settled sewage wall	1	LS		\$ 15,000	\$ 15,000.00	\$ 15,000	
217	Remove morning glory/aeration basin 5	1	LS		\$ 7,000	\$ 7,000.00	\$ 7,000	
217	Remove morning glory/aeration basin 5	1	LS		\$ 7,000	\$ 7,000.00	\$ 7,000	
218	Temporary Pumping	1	LS		\$ 5,000	\$ 5,000.00	\$ 5,000	
	Load, Haul & Dump Debris	1	LS		\$ 20,000.00	\$ 20,000.00	\$ 20,000	
Total For Division 2								\$ 864,485

EXHIBIT 1

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 1 - 130 MGD CONTACT STABILIZATION UPGRADE FOR SECONDARY TRAIN NO. 6
PROBABLE COSTS NOVEMBER 25, 2009**

Specification Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 3	CONCRETE							
301	Dowel in reinforcing 1 channels	1	LS			\$ 3,000.00	\$ 3,000	
	Dowel in reinforcing 2 channels	1	LS			\$ 6,000.00	\$ 6,000	
	Patch walls East gallery	1	LS			\$ 5,000.00	\$ 5,000	
	Patch walls West gallery	1	LS			\$ 2,500.00	\$ 2,500	
302	Influent channel bottom slab West gallery	6	CY			\$ 875.00	\$ 5,250	
303	Influent channel walls West gallery	8	CY			\$ 600.00	\$ 4,800	
304 & 307	Influent channel walls East gallery	12	CY			\$ 600.00	\$ 7,200	
305 & 308	Influent channel bottom slab East gallery	8	CY			\$ 875.00	\$ 7,000	
306	Weir wall in settled	1	CY			\$ 600.00	\$ 600	
309	Raise MLSS channel walls	30	CY			\$ 700.00	\$ 21,000	
310	6A Control Structure							
311	New wall	3	CY			\$ 700.00	\$ 2,100	
312	New weir wall	1.5	CY			\$ 700.00	\$ 1,050	
313	Raise side walls	2.2	CY			\$ 700.00	\$ 1,540	
314	6B Control Structure							
315	New wall	3	CY			\$ 700.00	\$ 2,100	
316	New weir wall	1.5	CY			\$ 700.00	\$ 1,050	
317	Raise side walls	2.2	CY			\$ 700.00	\$ 1,540	
318	6C Control Structure							
319	New weir wall	1.5	CY			\$ 600.00	\$ 900	
320	Ras valve vault 6x6x20	1	EA			\$ 20,000.00	\$ 20,000	
321	8' Weir wall	2	CY			\$ 700.00	\$ 1,400	
Total For Division 3								\$ 94,030
DIVISION 4	MASONRY (Not Used)							
Total For Division 4								\$ -

EXHIBIT 1

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 1 - 130 MGD CONTACT STABILIZATION UPGRADE FOR SECONDARY TRAIN NO. 6
PROBABLE COSTS NOVEMBER 25, 2009**

Specification Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 5	METALS							
501	Aluminum Railing 1 1/2" Dia.	600	LF	\$ 30.00	\$ 9.53	\$ 39.53	\$ 23,718	
502	1 3/4"x3/16" Steel Grating	1800	SF	\$ 12.00	\$ 10.50	\$ 22.50	\$ 40,500	
503	Pipe supports	1	LS			\$ 7,000.00	\$ 7,000	
504	RAS Wet well 304 SS 1/2" plate	102	SF			\$ 40	\$ 4,080	
505	Access door 3x3 at RAS vault	1	EA			\$ 1,000	\$ 1,000	
Total For Division 5								\$ 76,298
DIVISION 6	WOOD AND PLASTIC (Not Used)							
Total For Division 6								\$ -
DIVISION 7	THERMAL & MOISTURE PROTECTION							
Total For Division 7								\$ -
DIVISION 8	DOORS AND WINDOWS							
	Misc. gallery doors & windows	1	LS			\$ 25,000.00	\$ 25,000	
Total For Division 8								\$ 25,000
DIVISION 9	FINISHES (Not Used)							
Total For Division 9								\$ -

EXHIBIT 1

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
 PHASE 1 - 130 MGD CONTACT STABILIZATION UPGRADE FOR SECONDARY TRAIN NO. 6
 PROBABLE COSTS NOVEMBER 25, 2009**

Specification Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 10	SPECIALTIES (Not Used)							
Total For Division 10								\$ -
DIVISION 11	EQUIPMENT							
1101	Turbo Blower (20,000) scfm	1	EA	\$ 200,000	\$ 22,500	\$ 222,500.00	\$ 222,500	
1102	RAS Centrifugal Pumps 3 MGD	3	EA	\$ 25,000	\$ 7,500	\$ 32,500.00	\$ 97,500	
1103	Wall mounted weirs - FRP 5655 lf	3	EA			\$ 207,000.00	\$ 621,000	
1104	Wall mounted baffle Included above							
1105	Sample pumps	4	EA	\$ 5,000	\$ 1,500	\$ 6,500.00	\$ 26,000	
1106	Automatic composite sampler	4	EA	\$ 7,500	\$ 2,250	\$ 9,750.00	\$ 39,000	
1107	Algae Sweeps	3	EA	\$ 18,000	\$ 3,000	\$ 21,000.00	\$ 63,000	
Total For Division 11								\$ 1,069,000
DIVISION 12	FURNISHINGS (Not Used)							
Total For Division 12								\$ -
DIVISION 13	SPECIAL CONSTRUCTION (Not Used)							
Total For Division 13								\$ -
DIVISION 14	HOISTING EQUIPMENT (Not Used)							
Total For Division 14								\$ -

EXHIBIT 1

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 1 - 130 MGD CONTACT STABILIZATION UPGRADE FOR SECONDARY TRAIN NO. 6
PROBABLE COSTS NOVEMBER 25, 2009**

Specification Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 15	MECHANICAL							
1501	36" Ductile Iron Pipe	10	LF	1,100.00	350.00	\$ 1,450.00	\$ 14,500	
1502	20" DIP RAS Line & Fittings 29' Dp.	200	LF			\$ 325.00	\$ 65,000	
1503	18" Ductile Iron Pipe	100	LF	325.00	100.00	\$ 425.00	\$ 42,500	
1504	12" Ductile Iron Pipe Flg.	40	LF	90.00	35.00	\$ 125.00	\$ 5,000	
1505	10" 304 SS Air pipe	40	LF	110.00	46.00	\$ 156.00	\$ 6,240	
1506	2" Sch 80 Pipe	500	LF	8.00	11.00	\$ 19.00	\$ 9,500	
1507	30x36 DIP Reducer	1	EA	7,500.00	1,500.00	\$ 9,000.00	\$ 9,000	
1508	36" 90 Degree elbow	1	EA	6,000.00	1,000.00	\$ 7,000.00	\$ 7,000	
1509	18" 90 Degree elbows	7	EA	1,800.00	550.00	\$ 2,350.00	\$ 16,450	
1510	18" 45 Degree elbow	1	EA	1,500.00	450.00	\$ 1,950.00	\$ 1,950	
1511	18" Tees	2	EA	3,000.00	900.00	\$ 3,900.00	\$ 7,800	
1512	18x12 Eccentric reducer	3	EA	2,000.00	600.00	\$ 2,600.00	\$ 7,800	
1513	12x6 Eccentric reducer	3	EA	750.00	250.00	\$ 1,000.00	\$ 3,000	
1514	12" 90 Degree elbow	2	EA	500.00	150.00	\$ 650.00	\$ 1,300	
1515	12x12x12 Tee	3	EA	844.00	255.00	\$ 1,099.00	\$ 3,297	
1516	10" 304 SS 90 Degree elbow	4	EA	1,300.00	800.00	\$ 2,100.00	\$ 8,400	
1517	Allowance for channel aeration	1	LS			\$ 35,000	\$ 35,000	
1518	20" Plug Valve	1	EA	10,000.00	5,000.00	\$ 15,000.00	\$ 15,000	
1519A	20" Plug valves	3	EA	7,500.00	2,250.00	\$ 9,750.00	\$ 29,250	
1519	18" Plug valves	5	EA	5,500.00	1,650.00	\$ 7,150.00	\$ 35,750	
1520	18" Check valves	3	EA	12,000.00	3,000.00	\$ 15,000.00	\$ 45,000	
1521	12" Plug valves	4	EA	2,500.00	750.00	\$ 3,250.00	\$ 13,000	
1522	6x6 Weir gate SS 10' hi East gallery	7	EA	18,600.00	5,600.00	\$ 24,200.00	\$ 169,400	
1523	8x6 Motor/actuated weir gate SS 10' hi We	1	EA	23,000.00	7,000.00	\$ 30,000.00	\$ 30,000	
1524	20" Sluice gate	1	EA	18,000.00	5,500.00	\$ 23,500.00	\$ 23,500	
Total For Division 15								\$ 604,637

EXHIBIT 1

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 1 - 130 MGD CONTACT STABILIZATION UPGRADE FOR SECONDARY TRAIN NO. 6
PROBABLE COSTS NOVEMBER 25, 2009**

Specification Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 16	ELECTRICAL							
	Electrical - Sub	1	LS			\$ 925,000	\$ 925,000	
16901	ORP Probe	4	EA	\$ 4,000	\$ 1,500	\$ 5,500.00	\$ 22,000	
16902	TSS Probe	3	EA	\$ 3,500	\$ 1,500	\$ 5,000.00	\$ 15,000	
16903	Turbidity Probe	4	EA	\$ 4,000	\$ 1,500	\$ 5,500.00	\$ 22,000	
16904	pH/Temp Probes	1	EA	\$ 4,000	\$ 1,500	\$ 5,500.00	\$ 5,500	
16905	Level Sensor - Ultrasonic	8	EA	\$ 7,500	\$ 3,500	\$ 11,000.00	\$ 88,000	
16906	ChemScan Unit	1	EA	\$ 40,000	\$ 2,500	\$ 42,500.00	\$ 42,500	
16907	Magnetic Flowmeter - 18"	3	EA	\$ 6,000	\$ 2,000	\$ 8,000.00	\$ 24,000	
16908	MGD Meter channel	1	EA	\$ 35,000	\$ 2,000	\$ 37,000.00	\$ 37,000	
Total For Division 16								\$ 1,181,000
Bare Cost Total								\$ 4,462,473
Overhead & Profit 15%								\$ 669,371
Subtotal								\$ 5,131,844
Bonds, Permits, Insurance, Mobilization And Demobilization 6%								\$ 307,911
Subtotal								\$ 5,439,755
Contingency 20%								\$ 1,087,951
Total Construction Without Escalation								\$ 6,527,706
Escalation during Construction 12%								\$ 783,325
Total Construction With Escalation								\$ 7,311,030
Non-Construction Costs 30%								\$ 2,193,309
Total Project Cost								\$ 9,504,339
Total Project Cost Rounded								\$ 9,500,000

EXHIBIT 2

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 2 - 170 MGD CONTACT STABILIZATION UPGRADE (FULL PLANT)
PROBABLE COSTS NOVEMBER 25, 2009**

Specification								
Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 1	GENERAL REQUIREMENTS							
	General Requirements 14%	1	LS			\$ 2,227,569	\$ 2,227,569	
Total For Division 1								
								\$ 2,227,569
	SITE WORK							
201	Remove morning glories	6	EA			\$ 1,000.00	\$ 6,000	
202	Remove sluice gates	6	EA			\$ 2,000.00	\$ 12,000	
203	Remove channel wall	675	CF			\$ 30.00	\$ 20,250	
204	Remove stairs	1	LS			\$ 6,000.00	\$ 6,000	
205	Remove handrail	130	LF			\$ 15.00	\$ 1,950	
206	Remove walkway	1	LS			\$ 2,000.00	\$ 2,000	
207	Remove floorstands	6	EA			\$ 500.00	\$ 3,000	
208	Demo weir gates	5	EA			\$ 5,000.00	\$ 25,000	
	Remove Piping to clarifiers	1	LS			\$ 75,000	\$ 75,000	
Total For Division 2								
								\$ 151,200

EXHIBIT 2

**CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 2 - 170 MGD CONTACT STABILIZATION UPGRADE (FULL PLANT)
PROBABLE COSTS NOVEMBER 25, 2009**

Specification								
Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 3	CONCRETE							
301	Raise channel wall (N)	50	CY			\$ 700	\$ 35,000	
302	Raise channel wall (S)	50	CY			\$ 700	\$ 35,000	
303	Raise channel wall (Center)	80	CY			\$ 700	\$ 56,000	
304	Raise channel wall (AB-6)	112	CY			\$ 700	\$ 78,400	
305	Raise channel wall (AB-5)	80	CY			\$ 700	\$ 56,000	
306	Raise channel wall (AB-1/2)	80	CY			\$ 700	\$ 56,000	
307	Extend (S) channel	132	CY			\$ 800	\$ 105,600	
308	Build New inlet channels (1-3)	119	CY			\$ 800	\$ 95,200	
309	Build New inlet channels (2-4)	60	CY			\$ 800	\$ 48,000	
310	Build new weir walls (3)	4	CY			\$ 800	\$ 3,200	
311	Raise partition walls (2/3)	69	CY			\$ 800	\$ 55,200	
312	Concrete fillet pass (2/3)	174	CY			\$ 250	\$ 43,500	
313	Hole cut wall, 48" Dia.	1	LS			\$ 5,000	\$ 5,000	
	Splitter box including gates	6	EA			\$ 50,000	\$ 300,000	
	Raise aeration tank walls	1	LS			\$ 200,000	\$ 200,000	
Total For Division 3								\$ 1,172,100
DIVISION 4	MASONRY (Not Used)							
Total For Division 4								\$ -
DIVISION 5	METALS							
501	Relocate Air Lines, 8" SS	1	LS			\$ 5,000.00	\$ 5,000	
502	Supports for grating	1	LS			\$ 5,000.00	\$ 5,000	
502	1 3/4"x3/16" Steel Grating	1000	SF	\$ 12.00	\$ 10.50	\$ 22.50	\$ 22,500	
501	Aluminum Railing 1 1/2" Dia.	2000	LF	\$ 30.00	\$ 9.53	\$ 39.53	\$ 79,060	
Total For Division 5								\$ 111,560

EXHIBIT 2

CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 2 - 170 MGD CONTACT STABILIZATION UPGRADE (FULL PLANT)
PROBABLE COSTS NOVEMBER 25, 2009

Specification								
Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 6	WOOD AND PLASTIC (Not Used)							
Total For Division 6								\$ -
DIVISION 7	THERMAL & MOISTURE PROTECTION							
Total For Division 7								\$ -
DIVISION 8	DOORS AND WINDOWS (Not Used)							
Total For Division 8								\$ -
DIVISION 9	FINISHES (Not Used)							
Total For Division 9								\$ -
DIVISION 10	SPECIALTIES (Not Used)							
Total For Division 10								\$ -
DIVISION 11	EQUIPMENT							
1101	Turbo Blower (20,000) scfm	3	EA	\$ 200,000	\$ 22,500	\$ 222,500.00	\$ 667,500	
1103	Wall mounted weirs - FRP 5655 lf	15	EA			\$ 207,000.00	\$ 3,105,000	
1104	Wall mounted baffle Included above							
1105	Sample pumps	20	EA	\$ 5,000		\$ 5,000.00	\$ 100,000	
1106	Automatic composite sampler	20	EA	\$ 7,500		\$ 7,500.00	\$ 150,000	
1107	Algae Sweeps	15	EA	\$ 18,000		\$ 18,000.00	\$ 270,000	
Total For Division 11								\$ 4,292,500

EXHIBIT 2

CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION
PHASE 2 - 170 MGD CONTACT STABILIZATION UPGRADE (FULL PLANT)
PROBABLE COSTS NOVEMBER 25, 2009

Specification								
Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 12	FURNISHINGS (Not Used)							
Total For Division 12								\$ -
DIVISION 13	SPECIAL CONSTRUCTION (Not Used)							
Total For Division 13								\$ -
DIVISION 14	HOISTING EQUIPMENT (Not Used)							
Total For Division 14								\$ -
DIVISION 15	MECHANICAL							
1501	42" Ductile Iron Pipe, Pass 3	100	LF			\$ 1,506.00	\$ 150,600	
1502	42x42 DIP 90 degree elbow, Pass 3	5	EA			\$ 8,000.00	\$ 40,000	
1503	New weir gates 6x3	20	LF			\$ 18,000.00	\$ 360,000	
	48" DIP Buried	4000				\$ 1,196.00	\$ 4,784,000	
	60" DIP Buried	1000				\$ 1,495.00	\$ 1,495,000	
	60" DIP Buried	150				\$ 1,495.00	\$ 224,250	
Total For Division 15								\$ 7,053,850

EXHIBIT 2

CITY OF AKRON, OHIO WATER POLLUTION CONTROL STATION PHASE 2 - 170 MGD CONTACT STABILIZATION UPGRADE (FULL PLANT) PROBABLE COSTS NOVEMBER 25, 2009

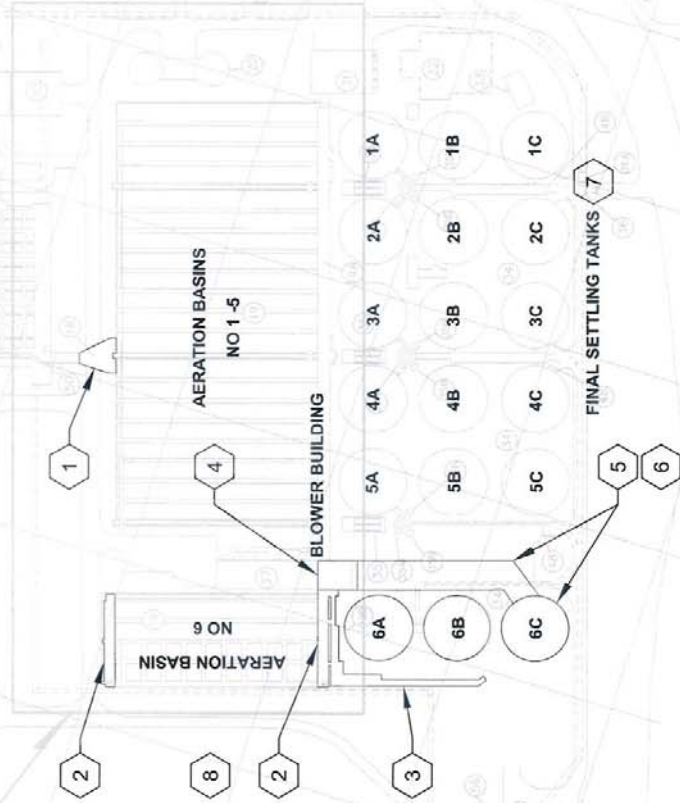
Specification Section	Description	Quantity	Unit	Material	Labor	Unit Total	Extension	Division Subtotal
DIVISION 16	ELECTRICAL (not Used)							
	Electrical - Sub	1	LS			\$ 1,800,000	\$ 1,800,000	
16901	ORP Probe	20	EA	\$ 4,000	\$ 1,500	\$ 5,500.00	\$ 110,000	
16902	TSS Probe	15	EA	\$ 3,500	\$ 1,500	\$ 5,000.00	\$ 75,000	
16903	Turbidity Probe	20	EA	\$ 4,000	\$ 1,500	\$ 5,500.00	\$ 110,000	
16904	pH/Temp Probes	5	EA	\$ 4,000	\$ 1,500	\$ 5,500.00	\$ 27,500	
16905	Level Sensor - Ultrasonic	40	EA	\$ 7,500	\$ 3,500	\$ 11,000.00	\$ 440,000	
16906	ChemScan Unit	5	EA	\$ 40,000	\$ 2,500	\$ 42,500.00	\$ 212,500	
16907	Magnetic Flowmeter - 18"	15	EA	\$ 10,000	\$ 2,000	\$ 12,000.00	\$ 180,000	
16908	MGD Meter channel	5	EA	\$ 35,000		\$ 35,000.00	\$ 175,000	
Total For Division 16								\$ 3,130,000
Bare Cost Total								\$ 18,138,779
Overhead & Profit 15%								\$ 2,720,817
Subtotal								\$ 20,859,596
Bonds, Permits, Insurance, Mobilization And Demobilization 6%								\$ 1,251,576
Subtotal								\$ 22,111,172
Contingency 20%								\$ 4,422,234
Total Construction Without Escalation								\$ 26,533,407
Escalation during Construction 12%								\$ 3,184,009
Total Construction With Escalation								\$ 29,717,415
Non-Construction Costs 30%								\$ 8,915,225
Total Project Cost								\$ 38,632,640
Total Project Cost Rounded								\$ 38,600,000

PHASE 1 SCOPE OF WORK

1. REMOVE ASSOCIATED MORNING GLORIES FEEDING NORTH CHANNEL AERATION BASINS NOS. 5 AND 6.
2. MODIFY INLET CHANNEL TO AERATION BASIN NO. 6.
3. MODIFY MLSS CHANNEL TO FINAL SETTLING TANK (FST) NOS. 6A, 6B AND 6C.
4. INSTALL NEW BLOWER AND (3) NEW RAS PUMPS FOR TRAIN 6.
5. INSTALL NEW RAS LINE FROM FST NO. 6C TO RAS WET WELL.
6. REMOVE EXISTING WEIRS AND BAFFLES AND PROVIDE NEW WEIRS ON FST NOS. 6A, 6B AND 6C. PROVIDE ALGAE SWEEPING SYSTEM ON FST NOS. 6A, 6B, AND 6C.
7. REMOVE DOMES ON ALL FST'S (18 TOTAL).
8. INSTALL INSTRUMENTATION FOR TESTING AND EVALUATING STORM MODE FOR TRAIN 6.



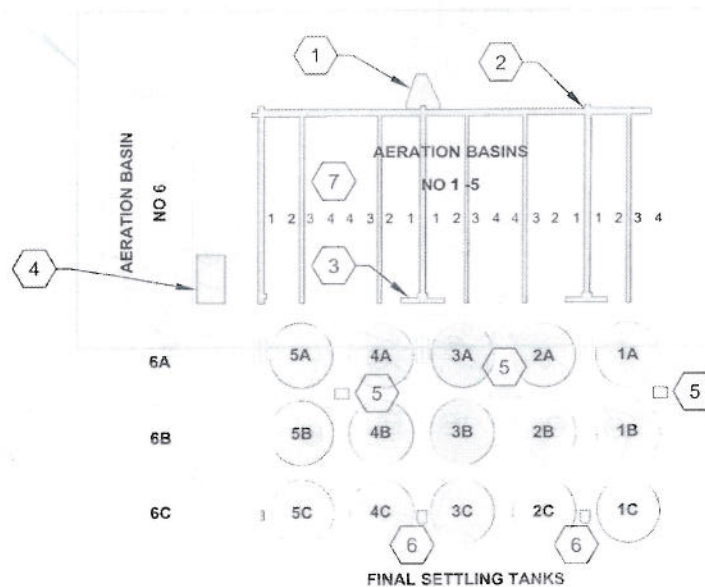
FOR PROPOSED ACTIVATED
TREATMENT IMPROVEMENTS
SEE SHT. 6-A



CITY OF AKRON
WATER POLLUTION CONTROL STATION
VIABILITY OF CONTRACT
STABILIZATION ALTERNATIVES
EXHIBIT 3 - PHASE 1
MODIFICATIONS FOR 130 MGD CAPACITY

PHASE 2 SCOPE OF WORK

1. REMOVE HYDRAULIC RESTRICTIONS AT AERATION BASIN SPLITTER.
2. MODIFY INLET CHANNELS TO AERATION BASINS NOS. 1-5.
3. CONSTRUCT NEW INLET CHANNELS FOR PASSES 1-4 ON AERATION BASIN NOS. 1-5.
4. REPLACE BLOWERS.
5. MODIFY JUNCTION BOXES THAT FEED FINAL SETTLING TANK (FST) NOS. 1-5 (A, B, & C).
6. REMOVE HYDRAULIC RESTRICTIONS ON ALL FST EFFLUENT STRUCTURES.
7. INSTALL INSTRUMENTATION FOR TESTING AND EVALUATING STORM MODE FOR AERATION BASINS NOS. 1-5.



CITY OF AKRON
 WATER POLLUTION CONTROL STATION
 VIABILITY OF CONTRACT
 STABILIZATION ALTERNATIVES
 EXHIBIT 4 - PHASE 2
 MODIFICATIONS FOR 170 MGD OR
 GREATER CAPACITY