

Village of Addison
Purchasing Department
1 Friendship Plaza
Addison, IL 60101

ADDENDUM NO. 1

RFP 22-7-2

COMBINED SEWER SEPARATION, DRAINAGE IMPROVEMENTS AND STORM WATER UPGRADES,
LEAD WATER SERVICE REPLACEMENT AND UPGRADES, AND WASTEWATER TREATMENT PLANT
CONSOLIDATION STUDY

RETURN WITH RFP

August 9, 2022

TO: ALL PROSPECTIVE BIDDERS

FROM: Anna Hendrey, Purchasing Agent

The following items are included in Addendum #1:

- Village of Addison – Wastewater Master Plan – Item 6 - Phasing of Improvements
- Phosphorus Removal Feasibility Study
- Qualifications Evaluation Form

Please sign below and return with your RFP documents.

Signature of Bidder _____

6 PHASING OF IMPROVEMENTS

This chapter outlines the phases of implementation for the various pump station and treatment plant improvements along with future phasing for nutrient removal. A workshop was held with the Village’s public works and treatment plant operations and maintenance staff. The projects were grouped into the following categories:

- Current Budget Items
- Future Budget Items
- Pump Stations
 - Phase 2
- North WWTP
 - OM&R Projects Phase 2
- Nutrient Projects

The findings provided in Task Memoranda 1A, 1B, and 1C and subsequently included in Sections 3, 4 and 5 were used to identify projects and costs in Section 12 and used in the workshop for identifying priorities. Staff ranked projects as ‘Budget’, 1, 2 or 3, with 1 being the highest priority. ‘Budget’ items are items that the Village believes can be financed internally through the Village’s regular OM&R reserves.

6.1 CURRENT BUDGET ITEMS

The items listed in Table 6-1 have our currently been budgeted for replacement.

TABLE 6-1	
Items Currently Budgeted for Replacement – North WWTP	
Description	Fiscal Year
<u>North WWTP</u>	
• Screw Pump Replacement	19/20
• Roof Top HVAC Unit	18/19, 19/20
• Lab Upgrade	20/21
• Belt Press Control Panel	20/21

6.2 FUTURE BUDGET ITEMS

Table 6-2 presents items identified in the Workshop to be included in future OM&R budgets.

TABLE 6-2	
Future Budget Items for Replacement	
Description	Costs
North WWTP	
• Raw Sewage Pump Isolation Valve Replacement	\$149,000
• Primary Tank Scum Baffle and Box	\$125,000
• Aeration Tank Drain Valve Replacement	\$36,000
• Chlorination/Dechlorination Equipment Replacement	\$100,000
• Polymer System Replacement	\$159,000
• Belt Filter Press Controls	\$178,000
TOTAL BUDGET ITEMS	\$747,000

6.3 PHASE 2- OPERATIONS, MAINTENANCE AND REPLACEMENT PROJECTS

The cost associated with the Phase 2 OM&R projects is presented in **Table 6-3**.

TABLE 6-3	
Phase 2- OM&R Projects	
Phase 2- North WWTP	
Replacement of Scum Pumps	\$159,000
Sludge Piping	\$378,000
Heat Exchangers	\$1,383,000
Digester Covers	\$3,847,000
Digester Gas Piping	\$143,000
TOTAL PHASE 2	\$5,910,000

Projects completed in 2021-2022

6.4 PHASE 3- OPERATIONS, MAINTENANCE AND REPLACEMENT PROJECTS

The cost associated with the Phase 2 OM&R projects is presented in Table 6-4.

TABLE 6-4	
Phase 3- OM&R Projects	
Phase 3- North WWTP	
Raw Sewage Pumps Replacement	\$656,000

TABLE 6-4	
Phase 3- OM&R Projects	
Raw Sewage Pump and Influent Gate Controls	\$129,000
Second Turbo Blower	\$378,000
Return Sludge Pump Station Replacement	\$530,000
Intermediate Pump Station Replacement	\$641,000
Intermediate Clarifier Mechanism Replacement	\$1,331,000
Scum Concentrator	\$740,000
GBT Building/ WAS Holding	\$5,043,000
Excess Flow Clarifier Mechanism Replacement	\$362,000
TOTAL PHASE 3	\$9,810,000

6.5 NUTRIENT REMOVAL PROJECTS

6.5.1 INTRODUCTION

In 2016, NPDES permits were issued for the Anthony J. LaRocca Wastewater Treatment Plant, and the North Wastewater Treatment Plant. The Special Conditions of the NPDES permit required that a *Phosphorus Removal Feasibility Study and Discharge Optimization Plan* was submitted to IEPA by January 1, 2018. The study assessed the technical feasibility and costs associated with meeting a 0.5 mg/l and 0.1 mg/l TP limit and must also address the impacts of potential seasonal limits. In addition, the Special Conditions required both the North and the AJL WWTP, to meet a 1 mg/l total phosphorus (TP) limit by June 1, 2026 if chemical phosphorus removal is utilized, or June 1, 2027 if biological phosphorus is utilized.

6.5.2 MODELING RESULTS

After the waste characterization, and jar testing to determine chemical dosing, three alternatives were evaluated for the North WWTP: AO, A₂O, and chemical precipitation. BIOWIN was used to model the alternatives considering two temperature scenarios: 10 and 15 degrees C. The results of the modeling are provided in **Tables 6-5** and **6-6**. Ranking of the alternatives is also provided, with 1 being the highest or most favorable rank and 5 being the lowest or least favorable rank.

TABLE 6-5							
North Wastewater Treatment Plant Modeling Results Considering a 1.0 mg/l TP Limit							
Constituents		A: AO		B: A2O		C: Chemical Alone	
(mg/l)		10 deg. C	15 deg. C	10 deg. C	15 deg. C	10 deg. C	15 deg. C
TP		0.92	0.93	0.91	0.94	0.93	0.9
FECL3 (gpd), 3:1 Fe/P		110	110	155	155	260	265
Rank Based on FeCl3 Addition	1	1	3	3	5	6	
CAKE (lbs/d)	3,927	3,905	4,019	3,990	4,328	4,321	
CY/yr	3,867	3,845	3,958	3,929	4,261	4,255	
Excess Sludge CY	538	516	629	600	932	926	
	16%	16%	19%	18%	28%	28%	
Rank Based on Excess Sludge Production	2	1	4	3	6	5	

TABLE 6-6						
North Wastewater Treatment Plant Modeling Results Considering a 0.5 mg/l TP Limit						
Constituents (mg/l)	A: AO		B: A2O		C: Chemical Alone	
	10 deg. C	15 deg. C	10 deg. C	15 deg. C	10 deg. C	15 deg. C
TP	0.43	0.44	0.47	0.42	0.44	0.42
FECL3 (gpd), 3:1 Fe/P	150	150	190	195	290	295
Rank Based on FeCl3 Addition	1	1	3	4	5	6
CAKE (lbs/d)	4,223	4,200	4,296	4,300	4,685	4,667
CY/yr	4,158	4,136	4,230	4,234	4,613	4,595
Excess SludgeCY	829	807	901	905	1,284	1,266
	25%	25%	27%	28%	39%	39%
Rank Based on Excess Sludge Production	2	1	3	4	6	5

Capital costs are the construction costs associated with adding infrastructure to meet NPDES permit limits. To meet a 0.5 mg/l TP limit, filters must be provided. As a result, there is a significant difference in capital costs when the 0.5 mg/l TP limits and the 1.0 mg/l TP limit alternatives are compared. A new tertiary filter unit process is estimated to cost \$6.5 million.

The capital costs are presented in **Table 6-7**.

TABLE 6-7			
Capital Costs			
North Wastewater Treatment Plant			
Alternative	A: AO	B: A2O	C: Chemical Alone
1 mg/l TP Limit	\$1.766 M	\$2.060 M	\$0.800 M
0.5 mg/l TP Limit	\$8.266 M	\$8.560 M	\$7.300 M

Table 6-8 presents the annual operations and maintenance costs for each of the modeling scenarios. The operations and maintenance costs include power costs, man-

hours for maintenance of mixers and pumps, chemical costs, and additional sludge disposal costs.

TABLE 6-8						
Annual Operation and Maintenance Costs						
North Wastewater Treatment Plant						
Alternative	A: AO		B: A2O		C: Chemical Alone	
Temperature	10 deg. C	15 deg. C	10 deg. C	15 deg. C	10 deg. C	15 deg. C
1 mg/l TP Limit	\$0.148 M	\$0.148 M	\$0.185 M	\$0.185 M	\$0.116 M	\$0.117 M
0.5 mg/l TP Limit	\$0.168 M	\$0.168 M	\$0.203 M	\$0.205 M	\$0.133 M	\$0.135 M

Net present value is a simple method of determining the true costs of the alternatives in 'today's dollars'. A linear gradient series was used to account for the inflation of operations and maintenance costs which include. The inflation rate was assumed to be 3% and the costs of capital, assuming a bond issue, to be 5%. It was assumed mixers and pumps would be replaced at 15 years. The twenty year net present value was calculated for each temperature conditions and effluent limit. The alternatives with the least Net Present Value are favorable. The total net present value and the total number of pounds of phosphorus removed over 20 years for each alternate was utilized to calculate the cost per pound of phosphorus removed at each facility, refer to **Table 6-9**.

6.5.3 NET PRESENT VALUE

TABLE 6-9						
Total Net Present Value, Rank and NPV/lb P Removed						
North WWTP Considering a 1.0 mg/l Effluent TP						
TOTAL NPV	A: AO		B: A2O		C: Chemical Alone	
	10 deg. C	15 deg. C	10 deg. C	15 deg. C	10 deg. C	15 deg. C
	\$4.729 M	\$4.722 M	\$5.831 M	\$5.821 M	\$2.646 M	\$2.67 M
RANK	4	3	6	5	1	2
lbs of P removed in 20 years	1.438 M	1.435 M	1.441 M	1.432 M	1.435 M	1.445 M
NPV \$/lb. of P Removed over 20 years	\$3.29	\$3.29	\$4.05	\$4.07	\$1.84	\$1.85
North WWTP Considering a 0.5 mg/l Effluent TP						
TOTAL NPV	A: AO		B: A2O		C: Chemical Alone	
	10 deg. C	15 deg. C	10 deg. C	15 deg. C	10 deg. C	15 deg. C
	\$11.543 M	\$11.535 M	\$12.611 M	\$12.639 M	\$9.427 M	\$9.447 M
RANK	4	3	5	6	1	2
lbs of P removed in 20 years	1.597 M	1.594 M	1.584 M	1.600 M	1.594 M	1.600 M
NPV \$/lb. of P Removed over 20 years	\$7.23	\$7.24	\$7.96	\$7.90	\$5.92	\$5.90

The impacts of a seasonal limit of 1.0 mg/l in the winter and 0.5 mg/l in the summer was evaluated at both treatment facilities. The 20 year NPV of savings for a 1 mg/l TP for 6 months of the year is approximately \$960,000 at the North Wastewater Treatment Plant.

The special conditions of the NPDES permit also required the evaluation of technologies and costs to meet a 0.1 mg/l TP limit. To meet a 0.1 mg/l TP limit a combination of chemical, physical and biological process must be employed. Three technologies were evaluated: 5 micron filtration, ballasted settling, and filtration through a ferric chloride impregnated sand filter. Of these technologies, the simplest to employ is the 5 micron filter.

The capital costs presented in **Table 6-10** are associated with the construction of a rapid mixing and flocculation tank. It assumed 0.5 mg/l of an anionic polymer will be required to promote floc formation. The total NPV \$/lb over 20 years is the sum of costs associated with the 0.5 mg/l TP alternatives and the costs associated with 0.1 mg/l TP. The increase

in costs, NPV \$/lb over 20 years, to achieve a 0.1 mg/l TP from a 0.5 mg/l TP limit is also presented.

TABLE 6-10		
Total Net Present Value and NPV/lb P Removed Considering a 0.1 mg/l Effluent TP		
	North WWTP	AJL WWTP
Capital	\$ 875,000.00	\$ 556,000.00
Annual O&M Costs		
Power	\$ 1,442	\$ 1,442
Ferric Chloride	\$ 74,661	\$ 45,946
Polymer	\$ 8,067	\$ 4,871
Manpower	\$ 5,232	\$ 5,232
Sludge	\$ 17,266	\$ 10,625
Total Annual OM	\$ 106,668	\$ 68,116
NPV of OM	\$ 1,702,419	\$ 1,087,124
Total NPV	\$ 2,577,419	\$ 1,643,124
Incremental NPV\$/lb Removed	\$ 21.59	\$ 22.79
Total NPV\$/lb Removed over 20 Years	\$ 28.82	\$ 48.06
Increase in NPV \$/lb to Achieve 0.1 mg/l TP	398%	190%

Conclusions were arrived at by evaluating both economic and non-economic criteria. On November 17th, 2017, a Workshop was held with Village Staff. It was concluded that the chemical dosing estimates at North Plant were conservative and as a result the AO process may in fact be more economical.

North WWTP

- 1.0 mg/l TP Limit: AO process
- 0.5 mg/l TP Limit: AO process with Tertiary Filtration
- 0.1 mg/l TP Limit: AO process with rapid mix, flocculation, Tertiary Filtration

Table 6-11 presents the financial impacts. The average NPV of the alternatives is presented along with the NPV per person and the average initial rate increase required to meet the capital and on-going operation and maintenance costs. It is assumed that rates would increase 3% per year for 20 years. The rates per person in **Table 6-11** may be reduced by 1-2% as a result of industrial surcharges.

TABLE 6-11			
Financial Impacts			
NPV COSTS for SELECTED ALTERNATIVE			
Limit	1.0 mg/l TP	0.5 mg/l TP	0.1 mg/l TP
NORTH PLANT	\$4,726,000	\$11,539,000	\$14,116,000
AVERAGE NPV / CAPITA			
Limit	1.0 mg/l TP	0.5 mg/l TP	0.1 mg/l TP
NORTH PLANT	\$129.00	\$313.00	\$383.00
Total	\$294.00	\$1,063.00	\$1,177.00
AVERAGE INITIAL INCREASE IN ANNUAL BILL/HOUSEHOLD ⁽¹⁾			
Limit	1.0 mg/l TP	0.5 mg/l TP	0.1 mg/l TP
Increase in Annual Bill ⁽²⁾	\$45.42	\$164.23	\$181.85
%	8.6%	30.9%	34.2%

⁽¹⁾ Assuming Annual Average Bill is \$577/household Followed by 3% annual increases thereafter

⁽²⁾ Refer to Phosphorous Removal Feasibility Study, average annual increase in annual bill/household also includes cost associated with modifications to the AJL WWTP.

TABLE-9-14 Financial Impacts			
NPV COSTS for SELECTED ALTERNATIVE			
Limit	1.0 mg/l TP	0.5 mg/l TP	0.1 mg/l TP
NORTH PLANT	\$4,726,000	\$11,539,000	\$14,116,000
AJL	\$6,069,000	\$27,657,000	\$29,300,000
AVERAGE NPV / CAPITA			
Limit	1.0 mg/l TP	0.5 mg/l TP	0.1 mg/l TP
NORTH PLANT	\$129.00	\$313.00	\$383.00
AJL	\$165.00	\$750.00	\$794.00
Total	\$294.00	\$1,063.00	\$1,177.00
AVERAGE INITIAL INCREASE IN ANNUAL BILL/HOUSEHOLD ⁽¹⁾			
Limit	1.0 mg/l TP	0.5 mg/l TP	0.1 mg/l TP
Increase in Annual Bill	\$45.42	\$164.23	\$181.85
%	8.6%	30.9%	34.2%

⁽¹⁾ Assuming Annual Average Bill is \$577/household Followed by 3% annual increases thereafter

QUALIFICATIONS EVALUATION

This form was extracted from the Qualifications-Based Selection Guide pamphlet and Modified.

CONSULTANT'S NAME: _____

PROJECT NAME: _____

REVIEWERS NAME: _____

NOTE TO REVIEWER: When filling this form, the Weight (1 to 10) column varies per each Item of Work in the order of its' importance to you but the number assigned should be entered the same for all the Consultants. In this way, a uniform and comparable Total will be achieved for all Consultants. For example, if you assign 2 on this for Item 4 on one Consultant, then the rest of the Consultants should also be 2 for Item 4. If you think that Item 5 is merited for 10, enter 10 on the appropriate line per Consultant but it should also be the same for all Consultants and so on. Only the Rating (1 to 5) column varies per Consultant pursuant to your review of the Consultants Proposal.

	Rating (1 to 5)	x	Weight (1 to 10)	=	Total
1. Firm's history and resource capability to perform required services		x		=	0
2. Evaluation of assigned personnel (Are key personnel moving all the time)		x		=	0
3. Related experience in performing studies and designs		x		=	0
4. Time and planned schedule for this project (Availability and Dedication)		x		=	0
5. Familiarity with the local area geography and facilities or N/A (This is up to the Reviewer as he sees fit)		x		=	0
6. Ability to relate to project requirements		x		=	0
7. Analysis of subjective statements (refer to their transmittal letter) applicable to the project above and beyond the RFP		x		=	0
8. Reference Check (Reviewer's preference to call those listed or N/A)		x		=	0
9. Technical approach to the project (in conjunction with Item 7 or N/A)		x		=	0
10. Management Approach for the project (in conjunction with item 7 or N/A)		x		=	0
11. Issues of Special Concern (in conjunction with Item 7 or N/A) Electronic Submission and Use of new Technologies)		x		=	0
12. Use of Consultants that may work on this project (In-house or Outside)		x		=	0
13. Other additives as the Reviewer sees fit (please list so that when the applicant call, we have an idea) <u>Presentation of Proposal</u>		x		=	0

<h2>GRAND TOTAL (Rounded)</h2>	<p>(Note: You need Excel to perform electronic calculation. Just punch in your numbers at the Rating Column and the Weight Column (but remember the Weight column should be the same for all Consultants per each Item of Work as mentioned above) and it will calculate the Total and Grand Total automatically. Thank you for participating in this exercise).</p>	<h1>0</h1>
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PROCEED TO THE NEXT SHEET FOR THE NEXT CONSULTANT