To: James Sherrard, Stromwater Coordinator
Project: Williston Stormwater Options Analysis
Subject: Engineering Economic Analysis and Discussion
Author: John D. Reilly, P.E., Senior Environmental Engineer
Date: May 5, 2017

Background

The Town of Williston requested that Hoyle, Tanner & Associates, prepare a report analyzing the options highlighted in the “option cost comparison 040617” worksheet and described in the “Managers Report”, dated 4/18/2017 with Topic: Stormwater Options. Refer to the References below and Attachment 1 which includes the “Managers Report”, dated 4/18/2017 with Topic: Stormwater Options. This Report defined Options for the Town Selectboard to consider in selecting a method to share the costs of Stormwater Management among three entities, the Stormwater Fund, neighborhoods with expired permits and neighborhoods with valid permits. The Managers Report generally defined the Options as follows:

Option 1 “Stay the Current Path”

Option 2 “Modified Current Path”

Option 3 “All in”

Option 4 “Compromise Option”

Option 5 “The South Burlington Option”

A more detailed description of these 5 options is included in the Option Discussion section below.

Engineering Economic Analysis

An Engineering Economic Analysis for the 20 year Proposed Stormwater Management Program was completed as indicated in Attachment 2 to assist the Town Selectboard in decision making between Options 1-5. Capital improvement costs include the estimated construction contract value cost to modify the existing neighborhood systems to meet current regulatory requirements. Typical annual maintenance costs include inspections, brush hogging and debris removal as further detailed in Attachment 4, prepared by the Town of Williston. Attachment 4 includes a brief narrative and table description of the Proposed Program Annual Maintenance needs. In addition, operational costs include forebay dredging every 5 years and main pond dredging during year 20. It is understood that Options 1 through 4 are intended to include agreement terms that would extend in perpetuity. Option 5 is intended to have an agreement term that would allow for renegotiation of agreement terms after the 20 year planning period. Stormwater management capital, operation and maintenance program costs beyond the 20-year planning period are not considered in this limited analysis of 5 options. It is assumed that this analysis limitation will not significantly affect the analysis results or subsequent decision making. The purpose of this Engineering Economic Analysis is to identify distinctions between the cost sharing options and more specifically the purpose is to assist the Town Selectboard in decision making between the 5 considered options. The purpose of this Engineering Economic Analysis is not to set adequate budget for the proposed management program cost items.

The Engineering Economic Analysis included determination of the Present Worth Cost of the Proposed Stormwater Management Program under consideration. This analysis considers the time value of money for the anticipated costs that will occur during the 20-year management period under consideration. This determination included consideration of Capital Cost needed immediately to upgrade stormwater treatment systems with expired permits to meet current regulatory requirements. It also includes Annual Operating and Maintenance Costs like typical annual maintenance, forebay dredging in years 5, 10, 15 and 20 and pond dredging in year 20.

A summary of the present worth cost items are included in Table 1.

Table 1 – Summary of Present Worth Cost Items	
Present Worth of Capital Cost Improvements	$1,810,000
Present Worth of Routine Operating & Maintenance Costs	$6,000,000
Subtotal	**$7,810,000**
Present Worth of Upgrade in Year 20	$4,690,000
Present Worth of Proposed Stormwater Management Program	**$12,500,000**

Refer to Attachment 3 for a side by side summary of option cost item values, percent share for each of the 4 options and 3 paying entities including the Stormwater Fund, neighborhoods with valid permits and neighborhoods with expired permits. Refer to Attachment 3.1, 3.2, 3.3 and 3.4 for a presentation of cost item values and percent share for each of the 4 options. Option 5 was not included on Attachment 3 to simplify this table, and because it is similar to Option 3. Refer to the Option 5 discussion for additional option clarification.

Uncertainty in the cost and time of the future Upgrade cost

It should be noted that the Present Worth of Upgrade in Year 20 cost item, with an indicated value of $4,690,000 includes significant uncertainty. It is anticipated that future regulatory requirements may trigger the need for future stormwater treatment improvements to remove, for example, chlorides, phosphorous or some other water quality constituent not currently identified. However, the scope of required improvement work, cost and year when this cost may or may not be realized is unknown.

The average of *current* capital improvement costs is $1,804,000 for 18 neighborhoods, or an average of $100,228 per neighborhood. So, the potential improvement costs for 43 neighborhoods would be approximately $4,310,000. As such, this value was utilized as the basis for the future upgrade cost in year 20. This value could be much higher or much lower. In addition, the cost may occur in year 10, 15 or some other year. Essentially, it is assumed for the purposes of this analysis that all 43 neighborhoods will require a regulatory triggered upgrade of similar magnitude as the current needed capital improvements.

Options Discussion

<u>Option 1: "Stay the Current Path"</u>

- Improvement Costs
  - ✓ Neighborhood's Share: 100% of improvement costs
  - ✓ Stormwater Fund Share: None
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods

Refer to Attachment 3.1

Advantages

1. Option 1 has the lowest Present Worth Cost of Capital, Operation and Routine Maintenance Costs for the Stormwater Fund.
2. In general, HOA members, typically have little or no expertise in stormwater treatment, operation, maintenance and capital improvement. In contrast, the Town and Stormwater Fund have dedicated staff with expertise in stormwater treatment, operation, maintenance and capital improvement. In general, Option 1 which includes the lowest Stormwater Fund Share costs for Capital, Operations and Routine Maintenance has the lowest near term cost risk in the future for the Stormwater Fund if expired permit neighborhood HOA's lacking expertise results in higher than anticipated future costs. And so, if expired permit neighborhood HOA's lacking expertise results in higher than anticipated future costs, these higher than anticipated future costs would affect neighborhoods with expired permits and not the Stormwater Fund.

Disadvantages

1. In general, HOA members, typically have little or no expertise in stormwater treatment, operation, maintenance and capital improvement. In contrast, the Town and Stormwater Fund have dedicated staff with expertise in stormwater treatment, operation, maintenance and capital improvement. In general, Option 1 which includes lower Stormwater Fund Share costs and responsibility for stormwater management has higher potential for higher

future cost risk if expired permit neighborhood HOA's lacking expertise results in higher than anticipated future costs.
2. For Option 1 where the Stormwater Fund Share is low compared to Option 3 and Option 4, and where a large long term Routine, Major Maintenance or Upgrade agreement is less likely to be executed, there is higher potential for cost risk due to lacking economy of scale.

<u>Option 2: "Modified Current Path"</u>

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by neighborhoods
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods

Advantages

1. Option 2 has the least Total Share Value of Proposed Stormwater Management Program Present Worth for the Stormwater Fund.
2. Option 2 has the least Present Worth Cost of Future Upgrades because the Stormwater Fund Share is 0%.

Disadvantages

1. In general, HOA members, typically have little or no expertise in stormwater treatment, operation, maintenance and capital improvement. In contrast, the Town and Stormwater Fund have dedicated staff with expertise in stormwater treatment, operation, maintenance and capital improvement. In general, Option 2 which includes lower Stormwater Fund Share costs and responsibility for stormwater management has higher potential for higher future cost risk in the future if expired permit neighborhood HOA's lacking expertise results in higher than anticipated future costs.
2. For Option 2 where the Stormwater Fund Share is low compared to Option 3 and Option 4, and where a large long term Routine, Major Maintenance or Upgrade agreement is less likely to be executed, there is higher potential for cost risk for the Stormwater Fund due to lacking economy of scale.

<u>Option 3: "All in"</u>

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost
- Routine Maintenance

- ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
- ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund

- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund

Advantages

1. Option 3 has good potential compared to Options 1, 2 and 4 for realizing future costs that are less than estimated, if a large long term maintenance contract(s) can be executed, thereby improving economy of scale.
2. The Town and Stormwater Fund have dedicated staff with expertise in stormwater treatment, operation, maintenance and capital improvement. In contrast, HOA members, typically have little or no expertise in stormwater treatment, operation, maintenance and capital improvement. In general, Option 3 which includes the highest Stormwater Fund Share percentage of the four options has the most potential for lower future cost risk for the Stormwater Fund if higher Town Staff involvement results in lower than anticipated future costs.

Disadvantages

1. Option 3 has the highest Total Share Value of Proposed Stormwater Management Program Present Worth for the Stormwater Fund.
2. Option 3 has the highest Present Worth Cost of Future Upgrades because the Stormwater Fund Share is 100%.
3. Option 3 has the highest Present Worth Cost of Routine Maintenance because the Stormwater Fund Share is 100%.

Option 4: "Compromise Option"

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost, but capped at average cost (or some other number)
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: Costs Shared
  - ✓ Neighborhoods with Valid Permits: Costs Shared

Advantages

1. For the Stormwater Fund, Option 4 has the lowest Present Worth Cost of near term Capital Improvements Costs of $350,000.

2. For the Stormwater Fund, Option 4 has good potential compared to the other three options for realizing future costs that are less than estimated, if a large long term maintenance contract(s) can be executed, thereby improving economy of scale.

Disadvantage

1. For the Stormwater Fund, Option 4 has a high Present Worth Cost of Capital + Operation & Maintainence Cost.
2. Option 4 has a high Total Share Value of Proposed Stormwater Management Program Present Worth.

Option 5: "South Burlington Option"

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs of upgrades paid by Stormwater fund for 20 years; For major repairs, 100% of costs paid by neighborhoods.
  - ✓ Neighborhoods with Valid Permits: 100% of costs of upgrades paid by Stormwater fund for 20 years; For major repairs, 100% of costs paid by neighborhoods.

The Town has developed this so-called Option 5, which is the same as the Option 3 – "All in" option, except that Option 5 would have an agreement term that would allow for renegotiation of agreement terms after the 20-year planning period. This provision would serve to reduce the overall cost risk to the Town. For example, if there were a new state law proposed to take effect in planning period year 21 requiring additional treatment for, say, chlorides, or some other water quality parameter, then this provision would allow the Town to renegotiate its cost share for this upgrade under Option 5.

The Stormwater Upgrade Feasiblity Analysis (SUFA), dated October 18, 2011, prepared by the South Burlington Stormwater Utility indicates that in lieu of installation of required stormwater treatment practices, property owners may elect to pay a stormwater mitigation fee utilizing the following formula:

Stormwater mitigation Fee = Impervious Area (acres) x $70,000/acre

In addition, the SUFA also provides for the flexibility for property owners to meet the requirement through a "Combination Stormwater Treatment Practice (STP)/Fee Method", whereby a property owner could install an STP for a portion of the site and pay a stormwater mitigation fee for the remaining portion of the site.

Other

1. The “Managers Report”, dated 4/18/2017 with Topic: Stormwater Options, page 2, defines the Option element “Upgrades and Major Repairs” within the same cost category. This includes both major repair cost items which are typically considered as a maintenance cost, and upgrade cost items to meet future new regulatory requirements, which are typically considered as a capital cost. It is suggested that this cost item be clarified to include maintenance cost items separately from capital cost items.

Topic: Stormwater Options
Date: April 18, 2017

INTRODUCTION

Given the Boards interest in examining various proposals, staff has identified 5 options using the 4 elements outlined below. There are several important points that have been articulated in the past but bear repeating:

- There is no right or wrong option. In the end, each option varies in how much of the cost of improvements, routine maintenance and risk for future major repairs and/or upgrades is borne by rate payers versus individual neighborhoods;
- Staff will support whichever option the Selectboard chooses; and
- There are potentially many more options that can be identified by creating various combinations of the 4 identified elements. In fact, there could be as many as 54 different combinations or more.
- Options 2, 4, and 5 will require a re-negotiation of the existing Stormwater Agreements between the Town and affected neighborhoods and/or the establishment of new agreements.

Once the list of options is agreed upon, staff can evaluate each option as to cost to the Stormwater fund, cost to neighborhoods, advantages, disadvantages and other considerations.

OPTION ELEMENTS

1. **Improvement Costs:** Defined as the cost of bringing a neighborhood stormwater system up to state standards. The cost for each neighborhood with an expired permit is based on estimate as provided as part of the Engineering Feasibility Analysis. The portion to be charged, where applicable, to the Stormwater fund is calculated based on impervious surface represented by the road surfaces.
2. **Neighborhoods Covered:** Some neighborhoods have state stormwater permits that expired. Others are valid. There are currently 18 neighborhoods with expired permits and about 25 with currently valid permits for a total of 43 residential stormwater permits.
3. **Routine Maintenance:** Responsibility for the cost of this work, depending on the approach taken, can be borne exclusively by the neighborhood or funded through the Town Stormwater Fund or a combination of both. Routine maintenance may be defined as the on-going needs of the treatment system to maintain permit requirements. Anticipated routine maintenance activities include: annual inspections; fore bay and main pond dredging; intermittent brush hogging/brush clearing; inlet/outlet cleaning and removal of obstructions and debris.

4. **Upgrades and Major Repairs:** Periodically each neighborhood stormwater system is likely to require major repairs either caused by an unforeseen natural event or because of the passage of time. In addition, changes in state law or requirements might require major modifications to each system. Responsibility for the cost of this work, depending on the approach taken, can be borne exclusively by the neighborhood or funded through the Town Stormwater Fund or a combination of both. Potential upgrades or major repairs may include: re-establishment of significant bank failure, replacement of an undermined inlet/outlet pipe, washouts of spillways or banks, and upgrades according to a changing permitting landscape such as channel protection, phosphorus or chloride mitigation needs.

OPTIONS

Option 1: "Stay the Current Path"

- Improvement Costs
  - ✓ Neighborhood's Share: 100% of improvement costs
  - ✓ Stormwater Fund Share: None
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods

Option 2: "Modified Current Path"

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by neighborhoods
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by neighborhoods

Option 3: "All in"

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund

Option 4: "Compromise Option"

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost, but capped at average cost (or some other number)
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: Costs Shared
  - ✓ Neighborhoods with Valid Permits: Costs Shared

Option 5: "South Burlington Option"

- Improvement Costs
  - ✓ Neighborhood's Share: About 60% of cost
  - ✓ Stormwater Fund Share: About 40% of cost
- Routine Maintenance
  - ✓ Neighborhoods with Expired Permits: 100% of costs paid by Stormwater fund
  - ✓ Neighborhoods with Valid Permits: 100% of costs paid by Stormwater fund
- Major Repairs and Upgrades:
  - ✓ Neighborhoods with Expired Permits: 100% of costs of upgrades paid by Stormwater fund for 20 years; For major repairs, 100% of costs paid by neighborhoods.
  - ✓ Neighborhoods with Valid Permits: 100% of costs of upgrades paid by Stormwater fund for 20 years; For major repairs, 100% of costs paid by neighborhoods.

DEFINITIONS

1. **Shared:** The term "shared cost" is used to describe a process of paying for the cost of improving, building or completing major upgrades or repairs to a neighborhood stormwater system. A portion of the cost attributable to the Stormwater fund can be calculated based on the amount of impervious surface represented by the public road surfaces in the neighborhood expressed as a percentage of the total amount of impervious surface in the neighborhood including driveways, roof tops, patios, and public road surfaces. For example, a neighborhood with a total estimated cost of $75,000 and road surfaces representing 38% of the total would have a shared cost calculated to be about $28,500. Since the public road surfaces represent a different percentage for each neighborhood, the percentage share paid by the Stormwater Fund would vary using this formula.

2. **Cap:** If the Town agrees to share in the costs of repairing or building a neighborhood system based on impervious surface, the cost to Stormwater fund rate payers over time is about $600,000. As a possible compromise position, it is possible to cap the portion to be paid by rate payers based on an average cost for repairs. This will result in a few

neighborhoods paying more than if the rate payers covered 100% of the share based on impervious surface. On the other hand, placing a cap partially addresses one equity concern about rate payers paying for improvements of neighborhood systems that were not properly maintained or in one case never built.

Depending on how the average is calculated the cap could range from $30,000 up to $50,000. For neighborhoods with the Stormwater fund share calculated below the cap would receive 100% of the share. Those neighborhoods with the Stormwater fund share above the cap would receive the amount of set by the cap. For example, a neighborhood with the Stormwater fund share calculated at $14,000 would receive $14,000 towards their system improvements. Another neighborhood with a share calculated at $55,000 would receive the value set by the cap.

The cap can be calculated by a straight average based on the estimates. Using this approach, the average is $45,668 and if rounded up is $50,000. The cost to Stormwater fund rate payers is about $350,000. Another approach is to calculate an average by eliminating the lowest and highest system costs. This calculation results in a cap of $30,000. The cost of using this cap is about $280,000.

3. **Neighborhood:** The term neighborhood refers to the homes within the defined boundaries of the development. In most cases, homeowner’s associations have been established and are responsible for maintenance of common facilities on private property including pools, septic systems, tennis courts, stormwater systems etc.

4. **Stormwater Fund:** This term refers to the money paid by properties in Williston with impervious surface into the Stormwater Fund based on a rate set by the Selectboard each year.

Hoyle, Tanner & Associates, Inc.			Town of Williston, VT	Project No.:	114902
125 College St., 4th Floor			Stormwater Options Engineering Economic Analysis	Project Name:	Preliminary Engineering
Burlington, VT 05401			**Proposed Stormwater Management Program**	By:	JDR
802-860-1331			**Attachment 2**	CK By:	DFE
ITEM NO.	**APPROX. QUANT.**	**UNIT**	**DESCRIPTION OF ITEMS**	**UNIT COST DOLLAR**	**AMOUNT DOLLAR**
Capital Cost					
	1	LS	Improvements (anticpated Construction Contract value)[2]	$1,804,062	$1,810,000
			Capital Cost		**$1,810,000**
Routine Operating & Maintenance Costs					
	1	LS	Typical Annual Maintenance Cost including labor and material[3]	$82,936	$83,000
	49	EA	Present Forebay Dredge Total Cost[4]	$10,000	$490,000
	49	EA	Present Pond Dredge Total Cost[5]	$20,000	$980,000
Present Worth Analysis of Routine Operating & Maintenance Costs					
			ENR CCI escalation (2007-2017) = (10338-7996)/7996 =2.929%[1]	2.929%	
			PW of Routine (P/A) Annual Maintenance Cost, 20 year term		$2,760,000
			Nominal interest rate on T-notes and Bonds (5 Year)[6]	1.700%	
			FW of (P/F) Forebay Dredge during Year 5		$570,000
			PW of (F/P) Forebay Dredge during Year 5		$530,000
			Nominal interest rate on T-notes and Bonds (10 Year)[6]	2.100%	
			FW of (P/F) Forebay Dredge during Year 10		$660,000
			PW of (F/P) Forebay Dredge during Year 10		$540,000
			Nominal interest rate on T-notes and Bonds (15 Year)[6]	2.300%	
			FW of (P/F) Forebay Dredge during Year 15		$760,000
			PW of (F/P) Forebay Dredge during Year 15		$550,000
			Nominal interest rate on T-notes and Bonds (20 Year)[6]	2.500%	
			FW of (P/F) Forebay Dredge during Year 20		$880,000
			PW of (F/P) Forebay Dredge during Year 20		$540,000
			FW of (P/F) Main Pond Dredge during Year 20		$1,750,000
			PW of (F/P) Main Pond Dredge during Year 20		$1,070,000
			Present Worth Analysis of Routine Operating & Maintenance Costs		**$6,000,000**
			Subtotal of Present Worth of Capital + O&M Costs		**$7,810,000**
			Total # ERU's in Town of Williston[8]	14,600	
			Annual cost (A/P) of Capital + O&M (Capital Recovery, 20 yr term)		$522,000
			Annual Share Cost per ERU of Capital, O&M costs, 20 yr term		$35.75
Future Upgrade and Major Repair					
	1	LS	Present day value of Upgrade and Major Repair[7]	$4,310,000	$4,310,000
			FW of (P/F) Upgrade during Year 20		$7,680,000
			PW of (F/P) Upgrade and Major Repair during Year 20		**$4,690,000**
			Present Worth of Proposed Stormwater Management Program		**$12,500,000**

Notes	\
1	Engineering News Record Contruction Cost Index during the period from 2007-2017.
2	As per the Engineering Feasibility Analysis construction contract cost estimate for stormwater system improvements indicated in the 4/28/2017 email from James Sherrard to John Reilly. Does not include engineering, administration, legal or other incidential project costs. Hoyle, Tanner was not provided nor requested to review the Engineering Feasibilty Analyisis construction contract cost estimate or other related information.
3	As per the Excel spreadsheet with file name: Long Term Cost Estimate, last modified 4/6/2017, prepared by the Town of Williston. This cost value is the sum of the Annual Maintenance Costs indicated in Column K.
4	As per the Excel spreadsheet with file name: Long Term Cost Estimate, last modified 4/6/2017, prepared by the Town of Williston, note 4 and 5. Neighborhoods with expired permits have 24 ponds. Neighborhoods with valid permits have 25 ponds for a total of 49 ponds. As per James Sherrard during 5/3/2017 telephone discussion with John Reilly
5	As per the Excel spreadsheet with file name: Long Term Cost Estimate, last modified 4/6/2017, prepared by the Town of Williston, note 5. Neighborhoods with expired permits have 24 ponds. Neighborhoods with valid permits have 25 ponds for a total of 49 ponds. As per James Sherrard during 5/3/2017 telephone discussion with John Reilly
6	2017 Nominal interest rates as per OMB Circular No. A-94, 12/12/2016, Executive Office of the President.
7	As per 5/4/2017 meeting with Town Staff and telephone discussion with James Sherrard and John Reilly. The average of current improvement costs of $1,804,100 divided by 18 neighborhoods equals $100,228 per neighborhood. The improvement costs for 43 neighborhoods would be $4,309,804.
8	As provided by Town Staff during 5/4/2017 meeting Mike Schramm and John Reilly.
9	Based upon the conceptual cost information provided by the Town and reviewed by Hoyle, Tanner & Associates, Hoyle, Tanner & Associates has no basis for taking exception to this estimated conceptual cost information provided by the Town and used for the purposes of this Engineering Economic Analysis.

Attachment 3 - Summary of Cost Values and Percent Shares for each of the 4 Stormwater

			Option 1 - "Stay the Current Path"			Option 2 - "Modified Current Path"			Option 3 - "All in"			Option 4 - "Compromise Option"		
		Proposed Program Cost Value	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits
1	**Improvement Costs Share**		0.0%	100.0%	0.0%	40.0%	60.0%	0.0%	40.0%	60.0%	0.0%	19.3%	80.7%	0.0%
2	Improvements (Capital Construction	$1,810,000	$0	$1,810,000	$0	$724,000	$1,086,000	$0	$724,000	$1,086,000	$0	$350,000	$1,460,000	$0
3	Contract value)													
4	**Routine Maintenance Share**		42%	0%	58%	42%	0%	58%	100%	0%	0%	100%	0%	0%
5	PW of Routine (A/P) Annual	$6,000,000	$2,520,000	$0	$3,490,000	$2,520,000	$0	$3,490,000	$6,000,000	$0	$0	$6,000,000	$0	$0
6	Maintenance Cost													
7	**Subtotal of Present Worth of Capital + O&M Costs**	**$7,810,000**	**$2,520,000**	**$1,810,000**	**$3,490,000**	**$3,244,000**	**$1,086,000**	**$3,490,000**	**$6,724,000**	**$1,086,000**	**$0**	**$6,350,000**	**$1,460,000**	**$0**
8														
9	Total # ERU's=14,600		14,600			14,600			14,600			14,600		
10	Annual cost of Capital + O&M over 20 years (capital recovery)	$522,000	$169,000			$217,000			$449,000			$425,000		
11	Annual Share Cost per ERU of Capital + O&M costs over 20 years	$35.75	$11.58			$14.86			$30.75			$29.11		
12	Annual Tax Impact[2]	$130,310	$31,581			$39,860			$79,719			$75,733		
13	**Upgrade and Major Repair Share**[1]		42%	0%	58%	0%	42%	58%	100%	0%	0%	40%	25%	35%
14	Present day cost of Upgrade and Major Repair during Year 20 (user entry)[1]	$4,310,000												
15	PW of (F/P) Upgrade during Year 20	$4,690,000	$1,970,000	$0	$2,730,000	$0	$1,970,000	$2,730,000	$4,690,000	$0	$0	$1,880,000	$1,180,000	$1,640,000
16	**Present Worth of Proposed**	**$12,500,000**												
17	**Stormwater Management Program**													
18	Total Share Value of Proposed Stormwater Management Program Present Worth		**$4,490,000**	**$1,810,000**	**$6,220,000**	**$3,250,000**	**$3,060,000**	**$6,220,000**	**$11,420,000**	**$1,090,000**	**$0**	**$8,230,000**	**$2,640,000**	**$1,640,000**
19			36%	14%	50%	26%	24%	50%	91%	9%	0%	66%	21%	13%

Notes

1. As per 5/4/2017 meeting with Town Staff and telephone discussion with James Sherrard and John Reilly. The average of current improvement costs of $1,804,100 divided by 18 neighborhoods equals $100,228 per neighborhood. The improvement costs for 43 neighborhoods would be $4,309,804.

2. Annual Tax Impact values indicated in this row as per the Town of Williston in "SW Analysis Comments_050517". These values are presented in this row in this table due to it's relevency with regard to other cost items displayed in this table. However,these values are not included in the summation of values shown on this table. These values represent current cost, but not Present Worth value.

Attachment 3.1

			Option 1 - "Stay the Current Path"		
		Proposed Program Cost Value	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits
1	**Improvement Costs Share**		0.0%	100.0%	0.0%
2	Improvements (Capital Construction Contract value)	$1,810,000	$0	$1,810,000	$0
3					
4	**Routine Maintenance Share**		42%	0%	58%
5	PW of Routine (A/P) Annual Maintenance Cost	$6,000,000	$2,520,000	$0	$3,490,000
6					
7	**Subtotal of Present Worth of Capital + O&M Costs**	**$7,810,000**	**$2,520,000**	**$1,810,000**	**$3,490,000**
8					
9	Total # ERU's=14,600		14,600		
10	Annual cost of Capital + O&M over 20 years (capital recovery)	$522,000	$169,000		
11	Annual Share Cost per ERU of Capital + O&M costs over 20 years	$35.75	$11.58		
12	Annual Tax Impact[2]	$130,310	$31,581		
13	**Upgrade and Major Repair Share**[1]		42%	0%	58%
14	Present day cost of Upgrade and Major Repair during Year 20 (user entry)[1]	$4,310,000			
15	PW of (F/P) Upgrade during Year 20	$4,690,000	$1,970,000	$0	$2,730,000
16	**Present Worth of Proposed Stormwater Management Program**	**$12,500,000**			
17					
18	Total Share Value of Proposed Stormwater Management Program Present Worth		**$4,490,000**	**$1,810,000**	**$6,220,000**
19			36%	14%	50%

Notes

1. As per 5/4/2017 meeting with Town Staff and telephone discussion with James Sherrard and John Reilly. The average of current improvement costs of $1,804,100 divided by 18 neighborhoods equals $100,228 per neighborhood. The improvement costs for 43 neighborhoods would be $4,309,804.

2. Annual Tax Impact values indicated in this row as per the Town of Williston in "SW Analysis Comments_050517". These values are presented in this row in this table due to it's relevency with regard to other cost items displayed in this table. However,these values are not included in the summation of values shown on this table. These values represent current cost, but not Present Worth value.

Attachment 3.2

			Option 2 - "Modified Current Path"		
		Proposed Program Cost Value	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits
1	**Improvement Costs Share**		40.0%	60.0%	0.0%
2	Improvements (Capital Construction Contract value)	$1,810,000	$724,000	$1,086,000	$0
3					
4	**Routine Maintenance Share**		42%	0%	58%
5	PW of Routine (A/P) Annual Maintenance Cost	$6,000,000	$2,520,000	$0	$3,490,000
6					
7	**Subtotal of Present Worth of Capital + O&M Costs**	**$7,810,000**	**$3,244,000**	**$1,086,000**	**$3,490,000**
8					
9	Total # ERU's=14,600		14,600		
10	Annual cost of Capital + O&M over 20 years (capital recovery)	$522,000	$217,000		
11	Annual Share Cost per ERU of Capital + O&M costs over 20 years	$35.75	$14.86		
12	Annual Tax Impact[2]	$130,310	$39,860		
13	**Upgrade and Major Repair Share**[1]		0%	42%	58%
14	Present day cost of Upgrade and Major Repair during Year 20 (user entry)[1]	$4,310,000			
15	PW of (F/P) Upgrade during Year 20	$4,690,000	$0	$1,970,000	$2,730,000
16	**Present Worth of Proposed Stormwater Management Program**	**$12,500,000**			
17					
18	Total Share Value of Proposed Stormwater Management Program Present Worth		**$3,250,000**	**$3,060,000**	**$6,220,000**
19			26%	24%	50%

Notes

1. As per 5/4/2017 meeting with Town Staff and telephone discussion with James Sherrard and John Reilly. The average of current improvement costs of $1,804,100 divided by 18 neighborhoods equals $100,228 per neighborhood. The improvement costs for 43 neighborhoods would be $4,309,804.

2. Annual Tax Impact values indicated in this row as per the Town of Williston in "SW Analysis Comments_050517". These values are presented in this row in this table due to it's relevency with regard to other cost items displayed in this table. However,these values are not included in the summation of values shown on this table. These values represent current cost, but not Present Worth value.

Attachment 3.3

			Option 3 - "All in"		
		Proposed Program Cost Value	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits
1	**Improvement Costs Share**		40.0%	60.0%	0.0%
2	Improvements (Capital Construction Contract value)	$1,810,000	$724,000	$1,086,000	$0
3					
4	**Routine Maintenance Share**		100%	0%	0%
5	PW of Routine (A/P) Annual Maintenance Cost	$6,000,000	$6,000,000	$0	$0
6					
7	**Subtotal of Present Worth of Capital + O&M Costs**	**$7,810,000**	**$6,724,000**	**$1,086,000**	**$0**
8					
9	Total # ERU's=14,600		14,600		
10	Annual cost of Capital + O&M over 20 years (capital recovery)	$522,000	$449,000		
11	Annual Share Cost per ERU of Capital + O&M costs over 20 years	$35.75	$30.75		
12	Annual Tax Impact[2]	$130,310	$79,719		
13	**Upgrade and Major Repair Share[1]**		100%	0%	0%
14	Present day cost of Upgrade and Major Repair during Year 20 (user entry)[1]	$4,310,000			
15	PW of (F/P) Upgrade during Year 20	$4,690,000	$4,690,000	$0	$0
16	**Present Worth of Proposed Stormwater Management Program**	**$12,500,000**			
17					
18	Total Share Value of Proposed Stormwater Management Program Present Worth		**$11,420,000**	**$1,090,000**	**$0**
19			91%	9%	0%

Notes

1. As per 5/4/2017 meeting with Town Staff and telephone discussion with James Sherrard and John Reilly. The average of current improvement costs of $1,804,100 divided by 18 neighborhoods equals $100,228 per neighborhood. The improvement costs for 43 neighborhoods would be $4,309,804.

2. Annual Tax Impact values indicated in this row as per the Town of Williston in "SW Analysis Comments_050517". These values are presented in this row in this table due to it's relevency with regard to other cost items displayed in this table. However,these values are not included in the summation of values shown on this table. These values represent current cost, but not Present Worth value.

Attachment 3.4

			Option 4 - "Compromise Option"		
		Proposed Program Cost Value	Stormwater Fund Share	Neighbor-hoods with Expired Permits	Neighbor-hoods with Valid Permits
1	**Improvement Costs Share**		19.3%	80.7%	0.0%
2	Improvements (Capital Construction Contract value)	$1,810,000	$350,000	$1,460,000	$0
3					
4	**Routine Maintenance Share**		100%	0%	0%
5	PW of Routine (A/P) Annual Maintenance Cost	$6,000,000	$6,000,000	$0	$0
6					
7	**Subtotal of Present Worth of Capital + O&M Costs**	**$7,810,000**	**$6,350,000**	**$1,460,000**	**$0**
8					
9	Total # ERU's=14,600		14,600		
10	Annual cost of Capital + O&M over 20 years (capital recovery)	$522,000	$425,000		
11	Annual Share Cost per ERU of Capital + O&M costs over 20 years	$35.75	$29.11		
12	Annual Tax Impact[2]	$130,310	$75,733		
13	**Upgrade and Major Repair Share**[1]		40%	25%	35%
14	Present day cost of Upgrade and Major Repair during Year 20 (user entry)[1]	$4,310,000			
15	PW of (F/P) Upgrade during Year 20	$4,690,000	$1,880,000	$1,180,000	$1,640,000
16	**Present Worth of Proposed Stormwater Management Program**	**$12,500,000**			
17					
18	Total Share Value of Proposed Stormwater Management Program Present Worth		**$8,230,000**	**$2,640,000**	**$1,640,000**
19			66%	21%	13%

Notes

1. As per 5/4/2017 meeting with Town Staff and telephone discussion with James Sherrard and John Reilly. The average of current improvement costs of $1,804,100 divided by 18 neighborhoods equals $100,228 per neighborhood. The improvement costs for 43 neighborhoods would be $4,309,804.

2. Annual Tax Impact values indicated in this row as per the Town of Williston in "SW Analysis Comments_050517". These values are presented in this row in this table due to it's relevency with regard to other cost items displayed in this table. However,these values are not included in the summation of values shown on this table. These values represent current cost, but not Present Worth value.

Attachment 4

Long Term Maintenance Cost Tasks and Estimated Hours

- Inspections
  - Scheduled Inspections (2 hr): 2 inspections per year taking place in early spring and late fall.
  - Proactive Inspections (5 hr): Inspections prior to large storm events (assume 10 large storms per year at 0.5 hr per inspection) to confirm:
    - catch basins immediately upgradient of pond are unobstructed,
    - pond is at normal levels,
    - no erosion or slumping is visible,
    - no inlet or outlet pipe obstructions are visible.
  - Reactive Inspections (5 hr): Inspections following large storm events to confirm:
    - catch basins did not become block during storm event,
    - pond is draining at normal rates,
    - pond has not overtopped the emergency spillway,
    - no erosion or slumping is visible,
    - no inlet or outlet pipe obstructions are visible.
- Brush Hogging
  - Bi-Annual brush hogging and clearing of debris from inner pond slide slopes (16 hr)
- Debris Removal/Re-establishing Vegetation/Outlet and Inlet Obstruction Removal (1 hr)
- Dredging
  - Forebay (1.5): Dredging forebay every 5 years assumed to take 8 hr per dredge. Annualized to approximately 1.5 hr/year.
  - Main Pond: (1.5): Dredging main pond every 20 years assumed to take 16/24 hr per dredge. Annualized to approximately 1.5 hr/year.
- Total (40 hr): With a 20% margin of error (8 hr) which incorporates an assumption of more maintenance in early years this totals 40 hours of maintenance per pond per year.

Annual Pond Maintenance Requirements

Maintenance Item		**Hours**
Inspections		
	Scheduled	2
	Proactive	5
	Reactive	5
Brush Hogging		
	Bi-Annually	16
Debris/Obstruction Removal , Re-Establishment		
	As-Needed	1
Dredging		
	Forebay	1.5
	Main Pond	1.5
20% Margin of Error		8
	Total	**40**