

# **APPENDIX A:**

TILE IMPROVEMENT PETITION

# DRAINAGE PETITION

TO THE BOARD OF SUPERVISORS OF Kossuth COUNTY, IOWA:

The undersigned ask that a drainage commencing at \_\_\_\_\_

\_\_\_\_\_ Improvement of \_\_\_\_\_

and running thence \_\_\_\_\_ Main Tile in Drainage District 75 \_\_\_\_\_

and terminating at \_\_\_\_\_

be \_\_\_\_\_

Your petitioners further state that the lands situated in \_\_\_\_\_

are subject to overflow (or are too wet for cultivation or subject to erosion or flood danger), and the public benefit, utility, health, convenience and welfare will be promoted by the above mentioned project.

NAMES

NAMES

Roger Vaske  
Dennis McConky  
James E Vaske

KOSSUTH COUNTY, IOWA  
FILED  
JUL 08 2019  
AMBER GARMAN  
COUNTY AUDITOR

## **APPENDIX B:**

TABLE 1: EXISTING MAIN TILE CAPACITY

TABLE 2: PROPOSED MAIN TILE CAPACITY

TABLE 3: EXISTING LATERAL 1 TILE CAPACITY

TABLE 4: PROPOSED LATERAL 1 TILE CAPACITY

**TABLE 1: DRAINAGE TILE ANALYSIS  
DRAINAGE DISTRICT NO. 75 KOSSUTH COUNTY**



EXISTING TILE CAPACITY: DRAINAGE DISTRICT NO. 75 MAIN TILE

STATION	Ex. Size inches	SLOPE (S) ft/ft	3/8" Dc	3/8" Dc	District Q	District Q / Needed Q (%)	Recommended Size inches
			Acres Total	1/2" Dc Needed Q			
<b>MAIN TILE</b>				(CFS)	(CFS)		
<b>OUTLET TO CREEK</b>			355	5.59			
0+00	24	0.0005	<b>1693</b>	<b>33.69</b>	<b>6.09</b>	<b>18.1%</b>	Ditch
			1338	28.10			
<b>GRADE BREAK</b>			334	5.26			
5+00	24	0.001	<b>1672</b>	<b>33.36</b>	<b>8.61</b>	<b>25.8%</b>	Ditch
			1338	28.10			
<b>330TH STREET</b>			290	4.57			
12+37	24	0.001	<b>1628</b>	<b>32.67</b>	<b>8.61</b>	<b>26.4%</b>	42
			1338	28.10			
<b>JCT LAT 1</b>			107	1.69			
29+00	24	0.001	<b>1203</b>	<b>24.70</b>	<b>8.61</b>	<b>34.9%</b>	36
			1096	23.02			
<b>GRADE + SIZE</b>			103	1.62			
30+00	20	0.004	<b>1199</b>	<b>24.64</b>	<b>10.59</b>	<b>43.0%</b>	30
			1096	23.02			
<b>JCT LAT 2</b>			84	1.32			
36+00	20	0.004	<b>1180</b>	<b>24.34</b>	<b>10.59</b>	<b>43.5%</b>	30
			1096	23.02			
<b>GRADE BREAK</b>			22	0.35			
50+00	20	0.001	<b>1118</b>	<b>23.36</b>	<b>5.30</b>	<b>22.7%</b>	Bypass
			1096	23.02			
<b>JCT LAT 3</b>							
53+00	20	0.001	<b>1001</b>	<b>21.02</b>	<b>5.30</b>	<b>25.2%</b>	Bypass
			1001	21.02			
<b>JCT LAT 4</b>							
83+00	20	0.001	<b>883</b>	<b>18.54</b>	<b>5.30</b>	<b>28.6%</b>	30
			883	18.54			
<b>JCT LAT 5</b>							
87+00	20	0.001	<b>788</b>	<b>16.55</b>	<b>5.30</b>	<b>32.0%</b>	30
			788	16.55			
<b>JCT LAT 6</b>							
93+00	15	0.0013	<b>515</b>	<b>10.82</b>	<b>2.80</b>	<b>25.9%</b>	24
			515	10.82			
<b>JCT LAT 7</b>							
101+00	15	0.0013	<b>479</b>	<b>10.06</b>	<b>2.80</b>	<b>27.9%</b>	24
			479	10.06			
<b>JCT LAT 8</b>							
125+00	15	0.0013	<b>352</b>	<b>7.39</b>	<b>2.80</b>	<b>37.9%</b>	24
			352	7.39			
<b>JCT LAT 9</b>							
128+00	10	0.0013	<b>187</b>	<b>3.93</b>	<b>0.86</b>	<b>21.8%</b>	18
			187	3.93			
<b>JCT LAT 10</b>							
145+00	10	0.0013	<b>131</b>	<b>2.75</b>	<b>0.86</b>	<b>31.1%</b>	18
			131	2.75			
<b>SIZE CHANGE</b>							
152+00	8	0.0013	<b>52</b>	<b>1.09</b>	<b>0.47</b>	<b>43.2%</b>	12
			52	1.09			
<b>GRADE BREAK</b>							
155+00	8	0.0083	<b>50</b>	<b>1.05</b>	<b>1.19</b>	<b>113.6%</b>	10
			50	1.05			
<b>END OF TILE</b>							
161+48							

**TABLE 2: PROPOSED DRAINAGE TILE ANALYSIS 1/2" Dc  
DRAINAGE DISTRICT NO. 75 KOSSUTH COUNTY**



**PROPOSED TILE CAPACITY: DRAINAGE DISTRICT NO. 75 MAIN TILE**

STATION	Size inches	SLOPE (S) ft/ft	3/8" Dc	3/8" Dc	District Q	Proposed Q /Needed Q (%)
			Acres Total	Needed Q		
			1/2" Dc	1/2" Dc		
<b>MAIN TILE</b>			(CFS)		(CFS)	
<b>OUTLET TO LAT 1</b>						
0+00	42	0.001	290	4.57	<b>38.30</b>	117.2%
			<b>1628</b>	<b>32.67</b>		
<b>LAT 1 TO LAT 2</b>			1338	28.10		
19+18	36	0.001	107	1.69	<b>25.39</b>	102.8%
			<b>1203</b>	<b>24.70</b>		
<b>LAT 2 TO STA 36+20</b>			1096	23.02		
23+00	30	0.0023	<b>1118</b>	<b>23.48</b>	<b>23.68</b>	100.9%
<b>STA 36+20 TO LAT 5</b>						
36+20	30	0.002	<b>1001</b>	<b>21.02</b>	<b>22.08</b>	105.0%
<b>LAT 5 TO LAT 6</b>						
58+00	30	0.0013	<b>788</b>	<b>16.55</b>	<b>17.80</b>	107.6%
<b>LAT 6 TO LAT 9</b>						
64+00	24	0.0016	<b>515</b>	<b>10.82</b>	<b>10.89</b>	100.7%
<b>LAT 9 TO STA 122+00</b>						
98+00	18	0.0013	<b>187</b>	<b>3.93</b>	<b>4.56</b>	116.1%
<b>STA 122+00 TO STA 125+00</b>						
122+00	12	0.001	<b>52</b>	<b>1.09</b>	<b>1.36</b>	124.2%
<b>STA 125+00 TO END</b>						
125+00	10	0.0025	<b>50</b>	<b>1.05</b>	<b>1.19</b>	113.0%
<b>END OF TILE</b>						
133+60						

**TABLE 4: PROPOSED DRAINAGE TILE ANALYSIS 1/2" Dc  
DRAINAGE DISTRICT NO. 75 KOSSUTH COUNTY**



**PROPOSED TILE CAPACITY: DRAINAGE DISTRICT NO. 75 LATERAL 1 TILE**

STATION	Size inches	SLOPE (S) ft/ft	3/8" Dc	3/8" Dc	District Q	Proposed Q /Needed Q (%)
			Acres Total 1/2" Dc	Needed Q 1/2" Dc		
				(CFS)	(CFS)	
<b>OUTLET TO MAIN TILE</b>						
0+00	24	0.0015	<b>336</b>	<b>7.06</b>	<b>10.55</b>	149.5%
<b>GRADE BREAK</b>						
15+00	18	0.0024	<b>289</b>	<b>6.07</b>	<b>6.19</b>	102.1%
<b>GRADE BREAK + SIZE</b>						
35+00	15	0.0015	<b>141</b>	<b>2.96</b>	<b>3.01</b>	101.7%
<b>JCT LAT1D</b>						
40+00	15	0.001	<b>110</b>	<b>2.31</b>	<b>2.46</b>	106.4%
<b>SIZE CHANGE</b>						
75+00	10	0.001	<b>25</b>	<b>0.53</b>	<b>0.75</b>	143.0%
<b>END OF TILE</b>						
80+00						

**TABLE 3: PROPOSED DRAINAGE TILE ANALYSIS 1/2" Dc  
DRAINAGE DISTRICT NO. 75 KOSSUTH COUNTY**



EXISTING TILE CAPACITY: DRAINAGE DISTRICT NO. 75 LATERAL 1 TILE

STATION	Ex. Size inches	SLOPE (S) ft/ft	Acre <i>s</i>	Needed Q (CFS)	District Q (CFS)	District Q / Needed Q (%)	Recommended Size inches
<b>OUTLET TO MAIN TILE</b>							
0+00	15	0.0048	<b>336</b>	<b>7.06</b>	<b>5.39</b>	<b>76.3%</b>	24
<b>GRADE BREAK</b>							
15+00	15	0.0015	<b>289</b>	<b>6.07</b>	<b>3.01</b>	<b>49.6%</b>	18
<b>GRADE BREAK + SIZE</b>							
35+00	12	0.005	<b>141</b>	<b>2.96</b>	<b>3.03</b>	<b>102.4%</b>	12
<b>JCT LAT1D</b>							
40+00	12	0.005	<b>110</b>	<b>2.31</b>	<b>3.03</b>	<b>131.3%</b>	12
<b>GRADE BREAK</b>							
44+00	10	0.001	<b>92</b>	<b>1.93</b>	<b>0.75</b>	<b>38.9%</b>	12
<b>SIZE CHANGE</b>							
75+00	8	0.001	<b>25</b>	<b>0.53</b>	<b>0.41</b>	<b>78.9%</b>	10
<b>END OF TILE</b>							
81+00							

## **APPENDIX C:**

OPTION 1: MAIN TILE & LATERAL 1 TILE IMPROVEMENT COST  
ESTIMATE

OPTION 2: MAIN TILE & LATERAL 1 TILE IMPROVEMENT WITH  
WETLAND COST ESTIMATE

WETLAND COST SAVINGS SUMMARY



TILE IMPROVEMENT  
DRAINAGE DISTRICT 75 KOSSUTH COUNTY  
ENGINEER'S ESTIMATE OF PROBABLE COSTS

ISG

PRELIMINARY LETTER REPORT - 5/12/2020

PROJECT NUMBER: 19-23359

**DD75 PROPOSED MAIN TILE IMPROVEMENTS-HDPE**

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1.	Mobilization	1	JOB	35,860.00	\$35,860.00
2.	Open Ditch Excavation	3,829	CY	2.80	\$10,721.20
3.	Spoil Bank Leveling (Two Sides)	14.41	STA	140.00	\$2,017.40
4.	Clearing & Grubbing	1	JOB	1,500.00	\$1,500.00
5.	Furnish & Install Corrugated Metal Surface Pipe, 18" Dia.	80	LF	36.00	\$2,880.00
6.	Furnish & Install Corrugated Metal Tile Ext. Pipe, 12" Dia.	60	LF	27.00	\$1,620.00
7.	Furnish & Install Corrugated Metal Tile Ext. Pipe, 48" Dia.	20	LF	67.00	\$1,340.00
8.	HDPE Pipe, Dual Wall Pipe, 10" Dia.	870	LF	15.00	\$13,050.00
9.	HDPE Pipe, Dual Wall Pipe, 12" Dia.	900	LF	20.00	\$18,000.00
10.	HDPE Pipe, Dual Wall Pipe, 18" Dia.	2,334	LF	25.00	\$58,350.00
11.	HDPE Pipe, Dual Wall Pipe, 24" Dia.	3,400	LF	30.00	\$102,000.00
12.	HDPE Pipe, Dual Wall Pipe, 30" Dia.	2,268	LF	37.00	\$83,916.00
13.	RCP, Class 3 (2000D), 30" Dia.	1,634	LF	50.00	\$81,700.00
14.	HDPE Pipe, Non-Perf Dual Wall Pipe, 36" Dia.	380	LF	49.00	\$18,620.00
15.	HDPE Pipe, Non-Perf Dual Wall Pipe, 42" Dia.	1,800	LF	65.00	\$117,000.00
16.	Surface Intakes	2	EA	500.00	\$1,000.00
17.	Grade Stabilization Structure	1	EA	20,000.00	\$20,000.00
18.	Alignment Turns (Fabrication Only)	8	EA	500.00	\$4,000.00
19.	Junction Structures	3	EA	6,500.00	\$19,500.00
20.	Misc. Drain Tile Repairs & Connections	38	EA	415.00	\$15,770.00
21.	District Tile Connections	7	EA	600.00	\$4,200.00
22.	Crush & Bury Existing Tile	14,648	LF	5.00	\$73,240.00
23.	Fence Cuts	4	STA	120.00	\$480.00
24.	Topsoil Strip, Stockpile, Respread	14,811	LF	3.00	\$44,433.00
25.	Tile Trench Stabilization and Cradling Rock	325	TN	35.00	\$11,375.00
26.	Spot Tile Exploration	16	HR	170.00	\$2,720.00
27.	Furnish & Install Riprap	25	TN	48.00	\$1,200.00
28.	Furnish & Install Silt Fence	1	JOB	5,000.00	\$5,000.00
29.	Open Ditch Fertilizing & Seeding	14.41	STA	100.00	\$1,441.00
<b>CONSTRUCTION COST SUBTOTAL</b>					<b>\$753,000.00</b>
<b>NON-CONSTRUCTION COSTS</b>					
Engineering Services:					\$150,600.00
Legal & Auditor Services					\$1,500.00
Geotechnical Investigation					\$5,500.00
Damages (35.5 AC @ \$600/AC)					\$21,300.00
Contingencies					\$75,300.00
<b>IMPROVEMENT PROJECT COST SUBTOTAL</b>					<b>\$1,007,200.00</b>
<b>OTHER DISTRICT COSTS</b>					
Right-of-Way					
Engineering					\$5,000.00
Taken ROW (1.06 AC)					\$8,160.00
Easement ROW (2.25 AC)					\$1,350.00
Annexation					\$5,000.00
Reclassification (3,036 AC @ \$6.00/AC)					\$18,216.00
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$1,045,000.00</b>
<b>NON-DISTRICT COSTS</b>					
Surface Intakes					\$2,000.00
Jack & Bore 48" Casing Pipe 330th St.					\$50,000.00
Open Cut 6'x8" RCB 330th St.					\$80,000.00
HDPE Pipe, Dual Wall Pipe, 30" Dia.					\$13,200.00
RCP, Class 3 (2000D), 30" Dia.					\$6,600.00
HDPE Pipe, Dual Wall Pipe, 18" Dia.					\$4,950.00
<b>TOTAL NON-DISTRICT COSTS</b>					<b>\$156,750.00</b>

TILE IMPROVEMENT  
DRAINAGE DISTRICT 75 KOSSUTH COUNTY  
ENGINEER'S ESTIMATE OF PROBABLE COSTS



PRELIMINARY LETTER REPORT - 5/12/2020

PROJECT NUMBER: 19-23359

**DD75 PROPOSED LATERAL 1 TILE IMPROVEMENTS-HDPE**

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1.	Mobilization	1	JOB	13,680.00	\$13,680.00
2.	HDPE Pipe, Dual Wall Pipe, 10" Dia.	500	LF	15.00	\$7,500.00
3.	HDPE Pipe, Dual Wall Pipe, 15" Dia.	3,934	LF	23.00	\$90,482.00
4.	HDPE Pipe, Non-Perf Dual Wall Pipe, 18" Dia.	2,000	LF	25.00	\$50,000.00
5.	HDPE Pipe, Non-Perf Dual Wall Pipe, 24" Dia.	1,500	LF	30.00	\$45,000.00
6.	Alignment Turns (Fabrication Only)	4	EA	400.00	\$1,600.00
7.	Misc. Drain Tile Repairs & Connections	20	EA	250.00	\$5,000.00
8.	District Tile Connections	3	EA	500.00	\$1,500.00
9.	Crush & Bury Existing Tile	8,100	LF	5.00	\$40,500.00
10.	Fence Cuts	3	STA	120.00	\$360.00
11.	Topsoil Strip, Stockpile, Respread	8,000	LF	3.00	\$24,000.00
12.	Tile Trench Stabilization and Cradling Rock	175	TN	35.00	\$6,125.00
13.	Spot Tile Exploration	8	HR	170.00	\$1,360.00
<b>CONSTRUCTION COST SUBTOTAL</b>					<b>\$287,200.00</b>
<b>NON-CONSTRUCTION COSTS</b>					
Engineering Services:					\$48,824.00
Damages (18.5 AC @ \$600/AC)					\$11,100.00
Contingencies					\$28,800.00
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$376,000.00</b>
<b>NON-DISTRICT COSTS</b>					
Surface Intakes					\$1,000.00
HDPE Pipe, Dual Wall Pipe, 15" Dia.					\$4,950.00
<b>TOTAL NON-DISTRICT COSTS</b>					<b>\$5,950.00</b>

PRELIMINARY LETTER REPORT - 5/12/2020

PROJECT NUMBER: 19-23359

**DD75 PROPOSED TILE IMPROVEMENTS W/ WETLAND-HDPE**

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1.	Mobilization	1	JOB	29,520.00	\$29,520.00
2.	Open Ditch Excavation	2,880	CY	2.80	\$8,064.00
3.	Spoil Bank Leveling (Two Sides)	12.86	STA	140.00	\$1,800.40
4.	Clearing & Grubbing	1	JOB	1,500.00	\$1,500.00
5.	Furnish & Install Corrugated Metal Surface Pipe, 18" Dia.	80	LF	36.00	\$2,880.00
6.	Furnish & Install Corrugated Metal Tile Ext. Pipe, 12" Dia.	60	LF	27.00	\$1,620.00
7.	HDPE Pipe, Dual Wall Pipe, 10" Dia.	870	LF	15.00	\$13,050.00
8.	HDPE Pipe, Dual Wall Pipe, 12" Dia.	300	LF	20.00	\$6,000.00
9.	HDPE Pipe, Dual Wall Pipe, 18" Dia.	2,334	LF	25.00	\$58,350.00
10.	HDPE Pipe, Dual Wall Pipe, 24" Dia.	3,400	LF	30.00	\$102,000.00
11.	HDPE Pipe, Dual Wall Pipe, 30" Dia.	2,268	LF	37.00	\$83,916.00
12.	RCP, Class 3 (2000D), 30" Dia.	1,634	LF	50.00	\$81,700.00
13.	HDPE Pipe, Non-Perf Dual Wall Pipe, 48" Dia.	750	LF	80.00	\$60,000.00
14.	Surface Intakes	2	EA	500.00	\$1,000.00
15.	Alignment Turns (Fabrication Only)	8	EA	500.00	\$4,000.00
16.	Junction Structures	2	EA	6,000.00	\$12,000.00
17.	Misc. Drain Tile Repairs & Connections	35	EA	415.00	\$14,525.00
18.	District Tile Connections	7	EA	600.00	\$4,200.00
19.	Crush & Bury Existing Tile	14,948	LF	5.00	\$74,740.00
20.	Fence Cuts	4	STA	120.00	\$480.00
21.	Topsoil Strip, Stockpile, Respread	12,842	LF	3.00	\$38,526.00
22.	Tile Trench Stabilization and Cradling Rock	300	TN	35.00	\$10,500.00
23.	Spot Tile Exploration	12	HR	170.00	\$2,040.00
24.	Furnish & Install Riprap	25	TN	48.00	\$1,200.00
25.	Furnish & Install Silt Fence	1	JOB	5,000.00	\$5,000.00
26.	Open Ditch Fertilizing & Seeding	12.86	STA	100.00	\$1,286.00
<b>CONSTRUCTION COST SUBTOTAL</b>					<b>\$619,900.00</b>
<b>NON-CONSTRUCTION COSTS</b>					
	Engineering Services:				\$150,600.00
	Legal & Auditor Services				\$1,500.00
	Geotechnical Investigation				\$5,500.00
	Damages (28.0 AC @ \$600/AC)				\$16,800.00
	Contingencies				\$62,000.00
<b>IMPROVEMENT PROJECT COST SUBTOTAL</b>					<b>\$856,300.00</b>
<b>OTHER DISTRICT COSTS</b>					
	Right-of-Way				
	Engineering				\$5,000.00
	Taken ROW (0.94 AC)				\$7,280.00
	Easement ROW (2.01 AC)				\$1,210.00
	Annexation				\$5,000.00
	Reclassification (3036 AC @ \$6.00/AC)				\$18,216.00
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$893,100.00</b>
<b>NON-DISTRICT COSTS</b>					
	Surface Intakes	4	EA	500.00	\$2,000.00
	Open Cut 6'x8' RCB 330th St.	100	LF	800.00	\$80,000.00
	HDPE Pipe, Dual Wall Pipe, 30" Dia.	132	LF	100.00	\$13,200.00
	RCP, Class 3 (2000D), 30" Dia.	66	LF	100.00	\$6,600.00
	HDPE Pipe, Dual Wall Pipe, 18" Dia.	66	LF	75.00	\$4,950.00
<b>TOTAL NON-DISTRICT COSTS</b>					<b>\$106,750.00</b>

TILE IMPROVEMENT  
DRAINAGE DISTRICT 75 KOSSUTH COUNTY  
ENGINEER'S ESTIMATE OF PROBABLE COSTS



**PRELIMINARY LETTER REPORT - 5/12/2020**

PROJECT NUMBER: 19-23359

**DD75 PROPOSED LATERAL 1 TILE IMPROVEMENTS W/ WETLAND-HDPE**

ITEM	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1.	Mobilization	1	JOB	12,960.00	\$12,960.00
2.	HDPE Pipe, Dual Wall Pipe, 10" Dia.	500	LF	15.00	\$7,500.00
3.	HDPE Pipe, Dual Wall Pipe, 15" Dia.	3,934	LF	23.00	\$90,482.00
4.	HDPE Pipe, Non Perf Dual Wall Pipe, 18" Dia.	2,000	LF	25.00	\$50,000.00
5.	HDPE Pipe, Non Perf Dual Wall Pipe, 24" Dia.	1,000	LF	30.00	\$30,000.00
6.	Alignment Turns (Fabrication Only)	4	EA	400.00	\$1,600.00
7.	Misc. Drain Tile Repairs & Connections	20	EA	250.00	\$5,000.00
8.	District Tile Connections	3	EA	500.00	\$1,500.00
9.	Crush & Bury Existing Tile	8,100	LF	5.00	\$40,500.00
10.	Fence Cuts	3	STA	120.00	\$360.00
11.	Topsoil Strip, Stockpile, Respread	9,880	CY	2.50	\$24,700.00
12.	Tile Trench Stabilization and Cradling Rock	175	TN	35.00	\$6,125.00
13.	Spot Tile Exploration	8	HR	170.00	\$1,360.00
<b>CONSTRUCTION COST SUBTOTAL</b>					<b>\$272,100.00</b>
<b>NON-CONSTRUCTION COSTS</b>					
Engineering Services:					\$46,257.00
Damages (18.5 AC @ \$600/AC)					\$11,100.00
Contingencies					\$27,300.00
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$356,800.00</b>
<b>NON-DISTRICT COSTS</b>					
Surface Intakes					\$1,000.00
HDPE Pipe, Dual Wall Pipe, 15" Dia.					\$4,950.00
<b>TOTAL NON-DISTRICT COSTS</b>					<b>\$5,950.00</b>



**PRELIMINARY LETTER REPORT - 5/12/2020**

PROJECT NUMBER: 19-23359

<b>ISG Proposed Replacement Main Cost Estimate</b>		
District Tile Improvements	\$	1,045,000.00
Interest Over 20 Years (5% interest, semi-annual payment)	\$	620,154.55
<b>Total Cost over 20 Years</b>	<b>\$</b>	<b>1,665,154.55</b>
<b>ISG Proposed Replacement Main Cost Estimate W/ Alternate Wetland</b>		
District Tile Improvements	\$	893,100.00
Interest Over 20 Years (1% interest, semi-annual payment)	\$	94,508.51
<b>Total Cost over 20 Years</b>	<b>\$</b>	<b>987,608.51</b>
<b>Potential Cost Savings</b>		
District Facility Construction Costs Savings	\$	151,900.00
District Interest Cost Savings	\$	525,646.04
<b>Total Potential Savings</b>	<b>\$</b>	<b>677,546.04</b>
<b>Drainage District Wetland Expense</b>		
Easement Acquisition (65 Acres)	\$ 8,900.00	\$ 578,500.00
Wetland Construction & Engineering (LS Est)		\$ 300,000.00
<b>Total Wetland Cost</b>		<b>\$ 878,500.00</b>
% of Potential Savings Spent on Wetland Construction		25%
Drainage District Wetland Construction Cost	\$	169,386.51
Interest Over 20 Years (1% interest, semi-annual payment)	\$	17,924.61
<b>Total District Wetland Cost over 20 years</b>	<b>\$</b>	<b>187,311.12</b>
<b>Actual Savings Summary</b>		
Total District Cost without Wetland	\$	1,665,154.55
Total District Cost with Wetland	\$	1,174,919.62
<b>Actual District Savings</b>	<b>\$</b>	<b>490,234.92</b>
Actual District Savings per Watershed Acre (1693 AC)	\$	<b>289.57</b>
Actual District Savings per Assessed Acre (1543 AC)	\$	<b>317.72</b>
<b>Yearly Cost Per Assessed Acre (20 Year Waiver)</b>		
Total District Cost Per Acre without Wetland	\$	53.96
Total District Cost Per Acre with Wetland	\$	38.07
<b>Yearly Savings Per Acre</b>	<b>\$</b>	<b>15.89</b>

**APPENDIX D:**  
PRELIMINARY IMPROVEMENT PLANS