

APPENDIX L

**LOCATION OPTION 3 OPINION OF PROBABLE CONSTRUCTION AND O, M, & R
COSTS**

**Location Option 3 - Construct New Northwest WWTF
Opinion of Probable Construction Costs
Wastewater Master Plan
De Soto, Kansas**

Description	Quantity	Unit	Unit Cost	Total Cost	Subtotal
Location Option 3 - Construct New Northwest WWTF					
Phase I					
24-inch PVC interceptor from east Manholes	5,250	LF	\$ 90	\$ 472,500	
New Main Pump Station (5 mgd), lower head pumps than going east.	18	EA	\$ 2,500	\$ 45,000	
Liquid Phase Odor Control System, small, with metal building	1	LS	\$ 575,000	\$ 575,000	
16-inch PVC forcemain	6,750	LF	\$ 50,000	\$ 50,000	
Air relief and main valve structures	6	EA	\$ 75	\$ 506,250	
New WWTF, on new favorable site	1	LS	\$ 4,000	\$ 24,000	
Increase Lawhead Pump Station (410,000 gpd)	1	LS	\$ 4,065,163	\$ 4,065,163	
6-inch PVC forcemain (to existing aerial crossing)	400	LF	\$ 40,000	\$ 40,000	
Construction Total					\$ 5,793,913
CESILA (Contingency, Engineering, Survey, Inspection, Legal, Administration)			30%		\$ 1,738,174
TOTAL PHASE I PROJECT COST					\$ 7,532,087
Phase II					
Gravity collection system to eliminate existing pump stations	1	LS	\$ 740,000	\$ 740,000	
Construction Total					\$ 740,000
CESILA (Contingency, Engineering, Survey, Inspection, Legal, Administration)			30%		\$ 222,000
TOTAL PHASE II PROJECT COST					\$ 962,000
Phase III					
30-inch Western System to Serve Western Service Areas	6,400	LF	\$ 100	\$ 640,000	
30-inch PVC interceptor from west Manholes	21	EA	\$ 2,500	\$ 52,500	
Construction Total					\$ 692,500
CESILA (Contingency, Engineering, Survey, Inspection, Legal, Administration)			30%		\$ 207,750
TOTAL PHASE III PROJECT COST					\$ 900,250
TOTAL PROJECT COST					\$ 9,394,337

**Location Option 3 - Construct New Northwest WWTF
Operation, Maintenance, & Replacement Costs
Wastewater Master Plan
De Soto, Kansas**

Category	Item	Quantity	Unit	Unit Cost	Total Cost
Operation & Maint Labor:	70 hr/wk x 52 wk/yr x \$ 20.00 / hr direct + indirect =				\$ 72,800
Electrical Power		1,120,657	kW-hr/ yr	\$ 0.07	\$ 78,446
Potable Water - for wetwell housekeeping	1,000 gal/wk x 6 wk/ yr =	6	1,000 gal	\$ 3.00	\$ 18
Odor control chemicals	365 day / yr x 47 gpd =	17,123	gal	\$ 2.35	\$ 40,239
Equipment Maint & Replacement (see below)		1	LS	\$ 19,992	\$ 19,992
Routine maintenance & misc. parts - grease, electronics, filters, etc.		1	LS	\$ 1,000	\$ 1,000
TOTAL					\$ 212,495
Present worth factor (P/A) for : i = 5.0% , n = 20 years :					12.462
PRESENT WORTH OF O & M COSTS					\$ 2,648,156

Calculations for Power Consumption

Note: Pumps operate on AFDs for 50% time, (1/3 of NHp = eHp)

Power Consumption	eHp	kW	Min / Hr	Hrs / day	Dy / wk	Wk / Yr	No. Units	kW-hr/ yr
New Main PS Pumps	25	18.65	60	18	7	52	1	122,195
Lawhead PS Pumps	5	3.73	60	18	7	52	1	24,439
WWTF Influent PS Pumps	20	14.92	60	18	7	52	1	97,756
WWTF equipment	176	131.30	60	18	7	52	1	860,251
Site lighting	-	2.00	60	10	7	52	1	7,280
Controls	-	1.00	60	24	7	52	1	8,736
Total Power Consumption								1,120,657

Calculations for Equipment Maintenance & Replacement

Note: Assume interest rate i = 5.00%
Assume inflation rate e = 2.5%
City Personnel Labor is not included in costs - only parts and outside labor.
This does not include costs for the existing collection system or existing lift stations.

Category	Item	Costs Estimated as Year 0 dollars					Inflated Cost in Year n										
		Qty	Unit	Unit Cost	Total Cost	Total Cost 0	2	4	6	8	10	12	14	16	18	20	
New Main PS Pumps (75 Hp)	Pump Rebuild	2	EA	\$ 10,000	\$ 20,000	\$ 20,000					\$ 25,602						
	Mech seals (rebuild)	2	EA	\$ 1,600	\$ 3,200	\$ 3,200			\$ 3,711						\$ 4,991		
	Motor Rewind	2	EA	\$ 7,000	\$ 14,000	\$ 14,000					\$ 18,828						
	Wear rings	2	EA	\$ 4,000	\$ 8,000	\$ 8,000	\$ 8,405	\$ 8,831	\$ 9,278	\$ 9,747		\$ 11,304	\$ 11,876	\$ 12,477	\$ 13,109		
Lawhead PS Pumps (5 Hp)	Pump Rebuild	2	EA	\$ 5,000	\$ 10,000	\$ 10,000					\$ 12,801						
	Mech seals	2	EA	\$ 1,200	\$ 2,400	\$ 2,400		\$ 2,649		\$ 2,924				\$ 3,563		\$ 3,933	
	Motor Rewind	2	EA	\$ 5,000	\$ 10,000	\$ 10,000					\$ 13,449						
	Wear rings	2	EA	\$ 2,500	\$ 5,000	\$ 5,000	\$ 5,253	\$ 5,519	\$ 5,798	\$ 6,092		\$ 7,065	\$ 7,423	\$ 7,798	\$ 8,193		

