



Crystal Environmental



***A FINANCIAL APPROACH TO
CHOOSING
SYSTEMS & EQUIPMENT...***

HOW TO MAKE SENSE OF IT ALL...





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Initial Costs for SMALL SYSTEMS to Consider:



- *Engineering / Planning*
- *Permitting*
- *Financing / Funding*





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Plant Operational Costs to Consider:

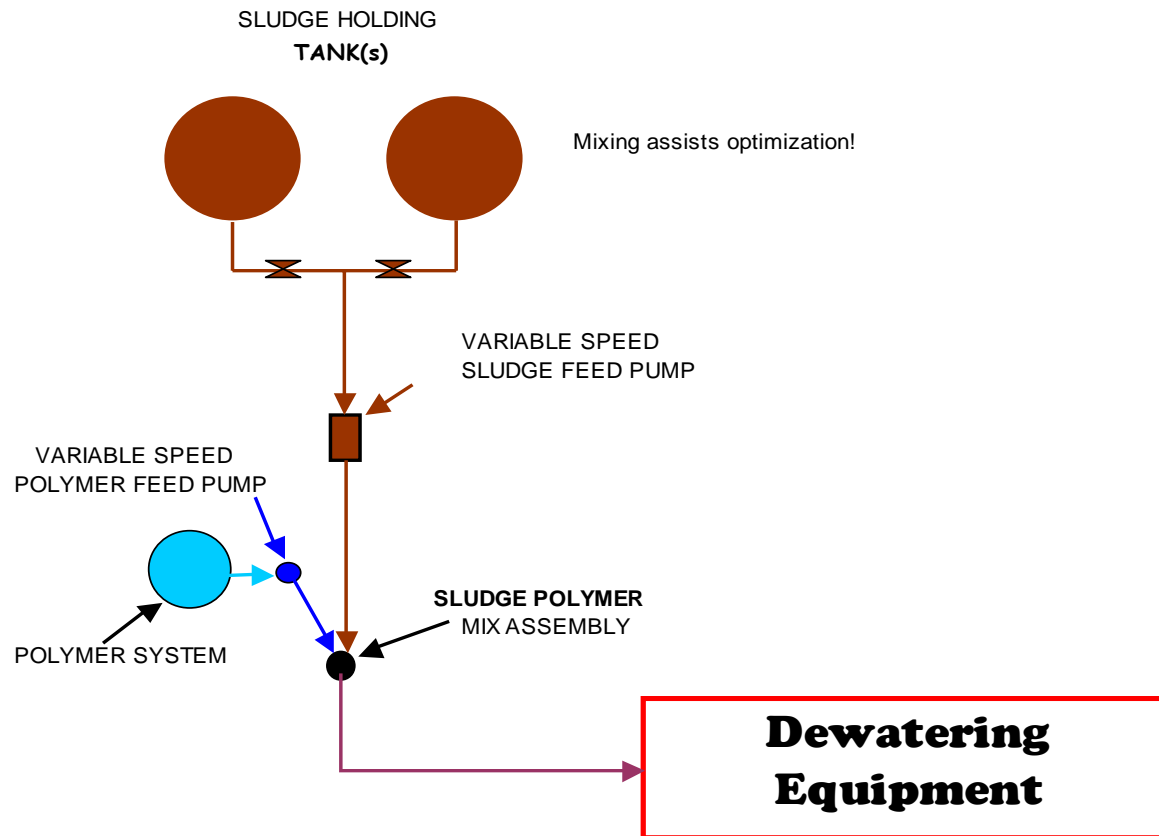
- *Financing*
- *Labor*
- *Electric*
- *Polymer /Chemical*
- *Maintenance*
- *Properties of Dewatered Solids*
- *Solids Disposal Costs*
- *Other*





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System Layout





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Sludge Hauling vs. Dewatering Cost Analysis	
Sludge Hauling	Dewatering Cost
Date: March 31, 2005	Capital Costs:
To: WWTP Anytown, Pennsylvania	Capital for Dewatering \$ 100,000 \$ 100,000
	\$ 100,000 Total
From: Therese Wheaton Crystal Environmental 23422 State Highway 18 Springboro, PA 16435 800-328-9720 614-587-3149 FAX sludge@crystalenv.com	100% Financing:
	Interest rate \$ 1.05% per month
	10 Years \$ 14,238 per year
	Labor Cost:
	Dewatering System size in gallons
	\$ 25,000 Labor rate per hour
	\$ - Roll-off cost per hour
	62 Loads per year \$ 4,680
	3 Operator hours per load \$ 468
	1 Management hours per load \$ -
	Roll-off hours per load \$ 5,148 per year
	Electrical Cost:
	\$ 0.1000 Electricity Cost per KWH
	25.000% On / Day
	20.00 Average HP
	33,600 KWH per Year \$ 3,360 per year
	Polymer Cost:
	\$ 2.00 Cost per Pound
	10.00 Pounds per Dry Ton
	1,313 Pounds per Year \$ 2,627 per year
	Maintenance:
	\$ 400 Parts \$ 400
	0 Man Hours per De-Tainer \$ 120
	\$ 520 per year
	Other Costs:
	per day \$ -
	per week \$ -
	per month \$ -
	per year \$ -
	per year \$ -
Key to Color Coding:	
Customize Values into Yellow Cells	
Green Cells are Calculated	
Orange Cells are Totals	
Blue Cells are Summary	
White Cells are Constants/Labels	
Properties of Water:	
1.000 specific gravity	
1,690.965 pounds / cubic yard	
8.334 pounds / gallon	
202.851 gallons / cubic yard	
239.92 gallons / ton	
Gallons to Process:	
3 days / week	3 days / week
10,000 per day	10,000 per day
per week	30,000 per week
per month	130,000 per month
per year	1,560,000 per year
Properties of Liquid Septage:	
1.010 specific gravity	
1,707.874 pounds / cubic yard	
8.443 pounds / gallon	
237.55 gallons / ton	
2.007% feed solids	
30.168 pounds dry solids / gallon	
13,131,200 pounds per year	
7,690 cubic yards per year	
6,567 tons per year	
262,684 dry solids per year	
131,342 tons dry solids per year	
Properties of Dewatered Solids:	
18.000% cake solids	
0.935 pounds cake solids / gallon	
4,459,284 lbs. cake solids per year	
730 tons cake solids per year	
Solids Disposal Costs:	
\$ 2,432 per month	
\$ 40.00 per cake ton	
\$ 29,187 per year	
Clear Liquid Disposal Cost:	
\$ - per gallon	
\$ - per month	
1,400,533 gallons per year	
\$ - per year	
\$ - per ton	
Sludge Hauling Cost	Dewatering Total Costs:

*A Financial Approach to Choosing
Dewatering Equipment*





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SPREADSHEET COMPONENTS:

- Properties of Water
- Gallons to Process
- Properties of Liquid Sludge
- Potential Capital Costs
- Financing
- Labor
- Electrical
- Polymer / Chemistry
- Maintenance
- Properties of Dewatered Sludge
- Solids Disposal Costs

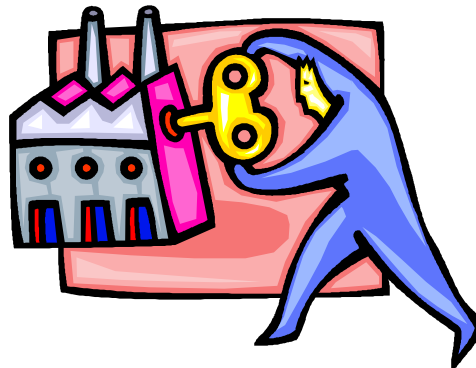




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**IS IT TIME TO UNLOCK YOUR
FUTURE?**

LET'S LOOK AT A SMALL SYSTEM





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SPREADSHEET COMPONENTS

Properties of Water:

1.000	specific gravity
1,690.965	pounds / cubic yard
8.336	pounds / gallon
202.851	gallons / cubic yard
239.92	gallons / ton





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SPREADSHEET COMPONENTS

Gallons to Process:			
5	days / week	5	days / week
5,000	per day	5,000	per day
	per week	25,000	per week
	per month	108,333	per month
	per year	1,300,000	per year





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SPREADSHEET COMPONENTS

Properties of Liquid Sludge:	
1.010	specific gravity
1,707.874	pounds / cubic yard
8.419	pounds / gallon
237.55	gallons / ton
2.00%	feed solids
0.168	pounds dry solids / gallon
10,945,168	pounds per year
6,409	cubic yards per year
5,473	tons per year
218,903	dry solids per year
109.452	tons dry solids per year





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SPREADSHEET COMPONENTS

Capital Costs:				
1	Dewatering Process	\$ 100,000	\$ 100,000	
			\$ -	
			\$ -	
			\$ -	
			\$ -	
		\$ -	\$ -	
			\$ -	
			\$ 100,000	Total





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SPREADSHEET COMPONENTS

100% Financing:			
8%	Interest rate	\$ 1,242	per month
10	Years	\$ 14,903	per year





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SPREADSHEET COMPONENTS

Labor Cost:		
25,000	Dewatering System size in gallons per day	
\$ 15	Labor rate per hour	
\$ -	Roll-off cost per hour	
52	Loads per year	
5	Operator hours per load	\$ 3,900
1	Management hours per load	\$ 390
-	Roll-off hours per load	\$ -
		\$ 4,290 per year





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SPREADSHEET COMPONENTS

Electrical Cost:	
\$ 0.1000	Electricity Cost per KWHr
30.00%	% On / Day
20.00	Average HP
40,320	KWHr per Year
	\$ 4,032 per year





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SPREADSHEET COMPONENTS

Polymer Cost:	
\$ 2.00	Cost per Pound
10.0	Pounds per Dry Ton
1,095	Pounds per Year
	\$ 2,189 per year





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SPREADSHEET COMPONENTS

Maintenance:			
\$	400	Parts	\$ 400
	8	Man Hours	\$ 120
			\$ 520 per year





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SPREADSHEET COMPONENTS

Other Costs / (Savings):			
		per day	\$ -
\$ (300)	Fuel Savings	per week	\$ (15,600)
		per month	\$ -
		per year	\$ -
			\$ (15,600) per year





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SPREADSHEET COMPONENTS

Properties of Dewatered Solids:

20.00%	cake solids
0.842	pounds cake solids / gallon
1,094,517	lbs. cake solids per year
547	tons cake solids per year





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SPREADSHEET COMPONENTS

Solids Disposal Cost:

\$ 35.00	per cake ton	\$ 1,596	per month
		\$ 19,154	per year





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SPREADSHEET COMPONENTS

Clear Liquid Disposal Cost:			
\$ 0.0050	per gallon	\$ 492	per month
1,181,700	gallons per year	\$ 5,909	per year
		\$ 1.20	per ton





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SPREADSHEET COMPONENTS

Gallons to Process:			
5	days / week	5	days / week
5,000	per day	5,000	per day
	per week	25,000	per week
	per month	108,333	per month
	per year	1,300,000	per year





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SPREADSHEET SUMMARY

Sludge Hauling Cost			
\$	0.0500	per gallon	\$ 5,417 per month
\$	50.00	per thousand gallons	\$ 65,000 per year

Dewatering Total Costs:			
\$	0.0272	per gallon	\$ 2,950 per month
\$	27.23	per thousand gallons	\$ 35,397 per year

Total Savings of Dewatering:			
\$	2,467	per month	
\$	29,603	per year	
\$	0.0228	per gallon	
\$	22.77	per thousand	

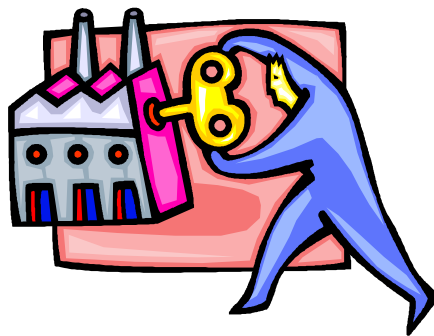




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**IS IT TIME TO UNLOCK YOUR
FUTURE?**

LET'S LOOK AT A LARGE SYSTEM





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SPREADSHEET COMPONENTS

Properties of Water:

1.000	specific gravity
1,690.965	pounds / cubic yard
8.336	pounds / gallon
202.851	gallons / cubic yard
239.92	gallons / ton





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SPREADSHEET COMPONENTS

Gallons to Process:			
5	days / week	5	days / week
50,000	per day	50,000	per day
	per week	250,000	per week
	per month	1,083,333	per month
	per year	13,000,000	per year





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SPREADSHEET COMPONENTS

Properties of Liquid Sludge:

1.010	specific gravity
1,707.874	pounds / cubic yard
8.419	pounds / gallon
237.55	gallons / ton
2.00%	feed solids
0.168	pounds dry solids / gallon
109,451,680	pounds per year
64,086	cubic yards per year
54,726	tons per year
2,189,034	dry solids per year
1,094.517	tons dry solids per year





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SPREADSHEET COMPONENTS

Capital Costs:				
1	Dewatering Process	\$ 500,000	\$ 500,000	
			\$ -	
			\$ -	
			\$ -	
			\$ -	
		\$ -	\$ -	
			\$ -	
			\$ 500,000	





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SPREADSHEET COMPONENTS

100% Financing:			
8%	Interest rate	\$ 6,210	per month
10	Years	\$ 74,515	per year





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SPREADSHEET COMPONENTS

Labor Cost:		
50,000	Dewatering System size in gallons per day	
\$ 15	Labor rate per hour	
\$ -	Roll-off cost per hour	
260	Loads per year	
5	Operator hours per load	\$ 19,500
1	Management hours per load	\$ 1,950
-	Roll-off hours per load	\$ -
		\$ 21,450 per year





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SPREADSHEET COMPONENTS

Electrical Cost:		
\$ 0.1000	Electricity Cost per KWHr	
30.00%	% On / Day	
20.00	Average HP	
40,320	KWHr per Year	\$ 4,032 per year





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SPREADSHEET COMPONENTS

Polymer Cost:	
\$ 2.00	Cost per Pound
10.0	Pounds per Dry Ton
10,945	Pounds per Year
	\$ 21,890 per year





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SPREADSHEET COMPONENTS

Maintenance:			
\$	400	Parts	\$ 400
	8	Man Hours	\$ 120
			\$ 520 per year





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SPREADSHEET COMPONENTS

Other Costs / (Savings)::			
		per day	\$ -
\$ (3,000)	Fuel Savings	per week	\$ (156,000)
		per month	\$ -
		per year	\$ -
			\$ (156,000) per year





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SPREADSHEET COMPONENTS

Properties of Dewatered Solids:

20.00%	cake solids
0.842	pounds cake solids / gallon
10,945,168	lbs. cake solids per year
5,473	tons cake solids per year





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SPREADSHEET COMPONENTS

Solids Disposal Cost:		
\$ 35.00	per cake ton	\$ 15,962 per month
		\$ 191,540 per year





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SPREADSHEET COMPONENTS

Clear Liquid Disposal Cost:			
\$	0.0050	per gallon	\$ 4,924 per month
	11,817,000	gallons per year	\$ 59,085 per year
			\$ 1.20 per ton





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SPREADSHEET COMPONENTS LARGE SYSTEM

Gallons to Process:			
5	days / week	5	days / week
50,000	per day	50,000	per day
	per week	250,000	per week
	per month	1,083,333	per month
	per year	13,000,000	per year





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SPREADSHEET SUMMARY

Sludge Hauling Cost

\$ 0.0500	per gallon	\$ 54,167	per month
\$ 50.00	per thousand gallons	\$ 650,000	per year

Dewatering Total Costs:

\$ 0.0167	per gallon	\$ 18,086	per month
\$ 16.69	per thousand gallons	\$ 217,033	per year

Total Savings of Dewatering:

\$ 36,081	per month
\$ 432,967	per year
\$ 0.0333	per gallon
\$ 33.31	per thousand





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