

Company Name Thompson Bros (Caustic)
 Project ABS DISCHARGES (Caustic)
 Site Name Alder Run #1 (37/36 combined C)



AMD TREAT

Costs

AMD TREAT MAIN COST FORM

AMDTREAT

<u>Passive Treatment</u>	<u>A</u>	<u>S</u>	
Vertical Flow Pond			\$0
Anoxic Limestone Drain			\$0
Anaerobic Wetlands			\$0
Aerobic Wetlands			\$0
Manganese Removal Bed			\$0
Oxic Limestone Channel			\$0
Limestone Bed			\$0
BIO Reactor			\$0
Passive Subtotal:			\$0
<u>Active Treatment</u>			
Caustic Soda	1	0	\$7,812
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash			\$0
Active Subtotal:			\$0
<u>Ancillary Cost</u>			
Ponds	2	0	\$19,744
Roads			\$0
Land Access			\$0
Ditching			\$0
Engineering Cost	1	0	\$2,756
Ancillary Subtotal:			\$22,500
Other Cost (Capital Cost)			\$0
Total Capital Cost:			\$30,312
<u>Annual Costs</u>			
Sampling	1	0	\$2,356
Labor	1	0	\$7,280
Maintenance	1	0	\$964
Pumping			\$0
Chemical Cost			\$0
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$1,589
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
Total Annual Cost:			\$12,189
Other Cost			

Water Quality

Calculated Acidity mg/L
 Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity) mg/L

Design Flow gpm
 Typical Flow gpm
 Total Iron mg/L
 Aluminum mg/L
 Manganese mg/L
 pH su
 Ferric Iron mg/L
 Ferrous Iron mg/L
 Sulfate mg/L
 Filtered Fe mg/L
 Filtered Al mg/L
 Filtered Mn mg/L
 Specific Conductivity uS/cm
 Total Dissolved Solids mg/L
 Dissolved Oxygen mg/L
 Typical Acid Loading tons/yr

**Total Annual Cost: per
 1000 Gal of H2O Treated \$0.279**

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COMMENTS:

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AMDTREAT

AMD TREAT CAUSTIC SODA

Opening Screen Water Parameters

Caustic Soda Name

Influent Water Parameters that Affect Caustic Soda

Calculated Acidity mg/L
 Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually
 Net Acidity (Hot Acidity) mg/L

Design Flow gpm

Typical Flow gpm

Total Iron mg/L

Aluminum mg/L

Manganese mg/L

- 1. Gallons of Caustic per Year gal/yr
- 2. Gallons of Caustic per Month gal/mo
- 3. Gallons of Caustic per Day gal/day
- 4. Titration?
- 5. Caustic Titration Volume gal caustic/gal water treated
- 6. Purity of Caustic Solution purity of 20% caustic solution %
- 7. Mixing Efficiency of Caustic Solution %
- 8. Tank Cost \$
- 9. Tank Volume gal
- 10. Delivery Frequency times/yr
- 11. Valve Unit Cost \$
- 12. Number of Valves nbr
- 13. Feeder Line Length ft
- 14. Feeder Line Unit Cost \$/ft
- 15. Installation of System Unit Cost \$/hr
- 16. Installation Hours hours

17. Automatic System?

- 18. PID pH Proportional Control \$
- 19. pH Probe \$
- 20. Chemical Metering Pump \$
- 21. Water Wheel Dispenser
- 22. Dispenser Cost \$

Caustic Sub-Totals

- 23. Number of Tanks Required nbr
- 24. Tank Cost \$
- 25. Automatic System or Wheel Dispenser Cost \$
- 26. Cost of Valves \$
- 27. Feeder Line Cost \$
- 28. Labor Cost \$

29. Total Capital Cost \$

Record Number 1 of 1

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AMD TREAT PONDS

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Pond Name

Pond Design Based On:

Retention Time

1. Desired Retention Time hours

3. Sludge Removal Frequency times/year

4. Titration?

5. Sludge Rate gal sludge/
gal H2O

6. Percent Solids %

7. Sludge Density lbs./gal

Pond Size

8. Pond Length at Top of Freeboard ft

9. Pond Width at Top of Freeboard ft

	Run	Rise
10. Slope Ratio of Pond Sides	<input type="text" value="2.0"/>	<input type="text" value="1"/>
11. Freeboard Depth	<input type="text" value="2.0"/> ft	
12. Water Depth	<input type="text" value="4.0"/> ft	
13. Excavation Unit Cost	<input type="text" value="5.50"/> \$/yd3	
14. Total Length of Effluent / Inlet Pipe	<input type="text" value="0.00"/> ft	
15. Unit Cost of Pipe	<input type="text" value="10.00"/> \$/ft	

Liner Cost

No Liner

Clay Liner

16. Clay Liner Unit Cost \$/yd3

17. Thickness of Clay Liner ft

Synthetic Liner

18. Synthetic Liner Unit Cost \$/yd2

19. Clearing and Grubbing?

20. Land Multiplier ratio

21. Clear/Grub Acres acres

22. Clear and Grub Unit Cost \$/acre

23. Revegetation Cost \$/acre

24. Cost of Baffles \$

Calculated Pond Dimensions per Pond

25. Length at Top of Freeboard ft

26. Width at Top of Freeboard ft

27. Freeboard Volume yd3

28. Water Volume yd3

29. Estimated Annual Sludge yd3/yr

30. Volume of Sludge per Removal yd3/removal

31. Excavation Volume acre ft

32. Excavation Volume yd3

33. Clear and Grub Area acres

34. Liner Area yd2

35. Calculated Retention Time hours

Ponds Sub-Totals per Pond

36. Excavation Cost \$

37. Pipe Cost \$

38. Liner Cost \$

39. Clearing and Grubbing Cost \$

40. Revegetation Cost \$

41. Baffle Cost \$

42. Estimated Cost \$

Opening Screen Water Parameters

Influent Water Parameters that Affect Ponds

Calculated Acidity mg/L

Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity) mg/L

Design Flow gpm

Typical Flow gpm

Total Iron mg/L

Aluminum mg/L

Manganese mg/L

Record Number
1 of 2

Company Name Thompson Bros (Caustic)
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AMD TREAT PONDS

AMDTREAT

Pond Name Sludge

Pond Design Based On:

Retention Time

1. Desired Retention Time 24.0 hours

3. Sludge Removal Frequency times/year

4. Titration?

5. Sludge Rate gal sludge/
gal H2O

6. Percent Solids %

7. Sludge Density lbs./gal

Pond Size

8. Pond Length at Top of Freeboard ft

9. Pond Width at Top of Freeboard ft

	Run	Rise	
10. Slope Ratio of Pond Sides	2.0	:	1
11. Freeboard Depth			2.0 ft
12. Water Depth			4.0 ft
13. Excavation Unit Cost			5.50 \$/yd3
14. Total Length of Effluent / Inlet Pipe			0.00 ft
15. Unit Cost of Pipe			10.00 \$/ft

Liner Cost

No Liner

Clay Liner

16. Clay Liner Unit Cost \$/yd3

17. Thickness of Clay Liner ft

Synthetic Liner

18. Synthetic Liner Unit Cost \$/yd2

19. Clearing and Grubbing?

20. Land Multiplier 1.50 ratio

21. Clear/Grub Acres acres

22. Clear and Grub Unit Cost 1300.00 \$/acre

23. Revegetation Cost 1500.00 \$/acre

24. Cost of Baffles 0 \$

Calculated Pond Dimensions per Pond

25. Length at Top of Freeboard 158 ft

26. Width at Top of Freeboard 83 ft

27. Freeboard Volume 2,335 yd3

28. Water Volume 1,425 yd3

29. Estimated Annual Sludge 0 yd3/yr

30. Volume of Sludge per Removal 0 yd3/removal

31. Excavation Volume 0.88 acre ft

32. Excavation Volume 1,425 yd3

33. Clear and Grub Area 0.45 acres

34. Liner Area 0 yd2

35. Calculated Retention Time 24 hours

Ponds Sub-Totals per Pond

36. Excavation Cost 7,842 \$

37. Pipe Cost 0 \$

38. Liner Cost 0 \$

39. Clearing and Grubbing Cost 591 \$

40. Revegetation Cost 227 \$

41. Baffle Cost 0 \$

42. Estimated Cost 8,662 \$

Opening Screen Water Parameters

Influent Water Parameters that Affect Ponds

Calculated Acidity 0.00 mg/L

Alkalinity 0.00 mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity) 79.40 mg/L

Design Flow 200.00 gpm

Typical Flow 83.00 gpm

Total Iron 6.67 mg/L

Aluminum 5.98 mg/L

Manganese 17.29 mg/L

Record Number
2 of 2

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AMD TREAT

AMD TREAT ENGINEERING COST

1. Capital Cost * \$

2. Per Cent of Capital Cost %

3. Actual Engineering Cost \$

4. Total Engineering Cost \$

*** Total Capital Cost minus Engineering and
Land Access Capital Cost**

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AMD TREAT SAMPLING

Sampling Name

☒ Estimate Sampling Cost

1. Unit Labor Cost \$/hr

2. Collection Time per Sample hours/sample

3. Travel Time hr

4. Sample Frequency samples/mo

5. Lab Cost Per Sample \$/sample

6. Number of Sample Points points

☒ Enter Established Annual Sampling Cost

7. Actual Annual Sampling Cost \$

Sampling Sub-Totals

8. Yearly Sample Analysis Cost \$

9. Yearly Travel Cost \$

10. Yearly Collection Cost \$

11. Sampling Cost \$

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LABOR

Labor Name

Estimate Labor Cost

1. Site Visits per Week

2. Site Labor Time per Visit hours

3. Travel Time per Visit hours

4. Unit Labor Cost \$/hour

Enter Established Annual Labor Cost

5. Actual Annual Labor Cost \$

6. Total Cost \$

Record Number 1 of 1

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AMD TREAT

MAINTANENCE

Estimate Maintenance Cost

- 1. Percent of Active Cost %
- 2. Percent of Passive Cost %
- 3. Percent of Ancillary Cost * %
- 4. Percent of Other Capital Cost %

Enter Established Annual Maintenance Cost

5. Annual Maintenance Cost \$

Maintenance Sub-Totals

- 6 Total Maintenance Active Cost \$
- 7. Total Maintenance Passive Cost \$
- 8. Total Maintenance Ancillary Cost \$
- 9. Total Maintenance Other Capital Cost \$

\$

* Ancillary Cost does int include Cost for
 Land Access and Engineering Cost

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AMDTREAT

AMD TREAT SLUDGE REMOVAL

Opening Screen Water Parameters

Sludge Removal Name

Influent Water Parameters that Affect Sludge Removal

Calculated Acidity mg/L

Alkalinity mg/L

Calculate Net Acidity (Acid-Alkalinity)

Enter Net Acidity manually

Net Acidity (Hot Acidity) mg/L

Design Flow gpm

Typical Flow gpm

Total Iron mg/L

Aluminum mg/L

Manganese mg/L

Selection for Method of Removing Sludge

1. Select One

Sludge Removal by \$ per Gallon

2. Sludge Removal Unit Cost \$/gal

Sludge Removal by Vacuum Truck

3. Vacuum Truck Unit Cost \$/hr

4. Mobilization Cost \$

5. Hours to be Used hr

Sludge Removal by Mechanical Excavation

6. Mechanical Excavation Unit Rate \$/hr

7. Mobilization Cost \$

8. Hours to be Used hr

Sludge Removal by Lagoon Cleaner

9. Lagoon Cleaning Unit Rate \$/hr

10. Mobilization Cost \$

11. Hours to be Used hr

Actual Sludge Removal Cost

12. Actual Sludge Removal Cost \$

13. Off Site Disposal Cost \$

Concentrations from Main Water Quality Screen

14. Iron Concentration mg/L

15. Manganese Concentration mg/L

16. Aluminum Concentration mg/L

17. Total Miscellaneous Concentration mg/L

18. Percent Solids %

19. Sludge Density lbs/gal

20. Titration?

21. Gal. of Sludge per Gal of Water Treated gal

22. Estimated Sludge Volume yd³/yr

Cost for Sludge Removal Types

23. Removal by \$ per Gallon \$

24. Removal by Vacuum Truck \$

25. Removal by Mechanical Excavation \$

26. Removal by Lagoon Cleaner \$

27. Actual Sludge Removal Cost \$

Sludge Removal Sub-Totals

28. Currently Selected Removal Cost \$

Plus Off Site Disposal Cost

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AMD TREAT RECAPITIALIZATION COST

Calculation Period yrs Inflation Rate % Net Return Rate %

Recapitalization Name

A	B	C	D	E	F	G
Description of Item	Unit Cost Per Item	Quantity	Total Item Cost	Life Cycle	Number of Periods	Total PV
1. Caustic Tank	2,000	1	2,000	15	5	3,392
2. Auto dispenser Sys	5,425	1	5,425	15	5	9,200
3. Valves	100	1	100	15	5	170
4. Fedder Line	7	1	7	15	5	12
5.	0	0	0	0	0	0
6.	0	0	0	0	0	0
7.	0	0	0	0	0	0
8.	0	0	0	0	0	0
9.	0	0	0	0	0	0
10.	0	0	0	0	0	0
11.	0	0	0	0	0	0
12.	0	0	0	0	0	0
13.	0	0	0	0	0	0
14.	0	0	0	0	0	0
15.	0	0	0	0	0	0
16.	0	0	0	0	0	0
17.	0	0	0	0	0	0
18.	0	0	0	0	0	0
19.	0	0	0	0	0	0
20.	0	0	0	0	0	0

Total Capital Cost \$ PV Grand Total \$

RECEIVED TIME JUN. 5. 11:52AM

PRINT TIME JUN. 5. 12:01PM