

Company Name Delta

Project MD2

Site Name Hay #2



AMDTREAT

AMD TREAT

AMD TREAT MAIN COST FORM

Costs

<u>Passive Treatment</u>	<u>A</u>	<u>S</u>	
Vertical Flow Pond			\$0
Anoxic Limestone Drain			\$0
Anaerobic Wetlands			\$0
Aerobic Wetlands	1	0	\$16,761
Manganese Removal Bed			\$0
Oxic Limestone Channel			\$0
Limestone Bed			\$0
BIO Reactor			\$0
Passive Subtotal:			\$16,761
<u>Active Treatment</u>			
Caustic Soda			\$0
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash			\$0
Active Subtotal:			\$0
<u>Ancillary Cost</u>			
Ponds			\$0
Roads			\$0
Land Access			\$0
Ditching			\$0
Engineering Cost	1	0	\$3,352
Ancillary Subtotal:			\$3,352
Other Cost (Capital Cost)			\$0
Total Capital Cost:			\$20,113
<u>Annual Costs</u>			
Sampling	1	0	\$674
Labor	1	0	\$837
Maintenance	1	0	\$168
Pumping			\$0
Chemical Cost			\$0
Oxidant Chem Cost			\$0
Sludge Removal			\$0
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
Total Annual Cost:			\$1,679
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

**Total Annual Cost: per
1000 Gal of H2O Treated \$1.596**

Company Name

Project

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Printed on 03/20/2008



AMDTREAT

AMD TREAT AEROBIC WETLANDS

Aerobic Wetlands Name

**Opening Screen
Water Parameters**

SIZING METHODS Select One

- Aerobic Wetland Based on Metal Removal Rates 1. Iron Removal Rate g/m2/day 2. Mn Removal Rate g/m2/day
- Aerobic Wetland Based on Dimensions 3. Top Length at Freeboard ft 4. Top Width at Freeboard ft
- Aerobic Wetland Based on Iron Oxidation Kinetics 5. Rate Constant moles/sec 6. Effluent Fe Concentration mg/l
- 7. Dissolved Oxygen mg/l 8. H2O Temperature °C

**Influent Water
Parameters
that Affect
Aerobic Wetlands**

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

- 9. Length to Width Ratio Length : Width
- 10. Slope of Wetland Sides Run of Slope : Rise of Slope
- 11. Freeboard Depth ft
- 12. Free Standing Water Depth ft
- 13. Organic Matter Depth ft
- 14. Organic Matter Unit Cost \$/yd3
- 15. Organic Matter Spreading Unit Cost \$/yd3
- 16. Excavation Unit Cost \$/yd3
- 17. Wetland Planting Unit Cost \$/acre

Liner Cost

- No Liner
- Clay Liner
 - 18. Clay Liner Unit Cost \$/yd3
 - 19. Thickness of Clay Liner ft
- Synthetic Liner
 - 20. Synthetic Liner Unit Cost \$/yd2

- 21. Clearing and Grubbing?
- 22. Land Multiplier ratio
- 23. Clear/Grub Acres acres
- 24. Clear and Grub Unit Cost \$/acre

Aerobic Wetland Sizing Summaries

25. Length at Top of Freeboard	<input type="text" value="250.00"/>	ft
26. Width at Top of Freeboard	<input type="text" value="75.00"/>	ft
27. Freeboard Volume	<input type="text" value="988"/>	yd3
28. Water Surface Area	<input type="text" value="16,836"/>	ft2
29. Water Volume	<input type="text" value="306"/>	yd3
30. Organic Matter Volume	<input type="text" value="577"/>	yd3
31. Excavation Volume	<input type="text" value="883"/>	yd3
32. Clear and Grub Area	<input type="text" value="0.0"/>	acres
33. Liner Area	<input type="text" value="0"/>	ft2
34. Retention Time	<input type="text" value="206"/>	hrs

Aerobic Cost Summaries

35. Organic Matter Cost	<input type="text" value="13,001"/>	\$
36. Excavation Cost	<input type="text" value="2,210"/>	\$
37. Liner Cost	<input type="text" value="0"/>	\$
38. Clear and Grub Cost	<input type="text" value="0"/>	\$
39. Wetland Planting Cost	<input type="text" value="1,550"/>	\$

40. Total Cost \$

Record Number 1 of 1

Company Name Delta

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**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**

Company Name Delta

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Project MD2

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AMDTREAT

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 \$

Record Number 1 of 1

Company Name Delta

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Project MD2

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AMDTREAT

AMD TREAT

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

Company Name Delta
Project MD2
Site Name Hay #2



AMDTREAT

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 \$
- 10. Total Maintenance Cost \$

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

Company Name Delta

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AMD TREAT RECAPITIALIZATION COST

AMDTREAT

Calculation Period yrs Inflation Rate % Net Return Rate %

Recapitalization Name

A. Description of Item	B. Unit Cost Per Item	C. Quantity	D. Total Item Cost	E. Life Cycle	F. Number of Periods	G. Total PV
1. replace aerobic wetlands	16,761	1	16,761	10	7	44,908
2.	0	0	0	0	0	0
3.	0	0	0	0	0	0
4.	0	0	0	0	0	0
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 \$

Company Name Delta Mining

Project MD3

Site Name Hay #2



AMD TREAT

AMD TREAT MAIN COST FORM

AMDTREAT

Costs

<u>Passive Treatment</u>	<u>A</u>	<u>S</u>	
Vertical Flow Pond			\$0
Anoxic Limestone Drain			\$0
Anaerobic Wetlands			\$0
Aerobic Wetlands	1	0	\$2,440
Manganese Removal Bed			\$0
Oxic Limestone Channel			\$0
Limestone Bed			\$0
BIO Reactor			\$0
Passive Subtotal:			\$2,440
<u>Active Treatment</u>			
Caustic Soda			\$0
Hydrated Lime			\$0
Pebble Quick Lime			\$0
Ammonia			\$0
Oxidants			\$0
Soda Ash			\$0
Active Subtotal:			\$0
<u>Ancillary Cost</u>			
Ponds	1	0	\$5,000
Roads			\$0
Land Access			\$0
Ditching			\$0
Engineering Cost	1	0	\$1,488
Ancillary Subtotal:			\$6,488
Other Cost (Capital Cost)			\$0
Total Capital Cost:			\$8,928
<u>Annual Costs</u>			
Sampling	1	0	\$674
Labor	1	0	\$837
Maintenance	1	0	\$25
Pumping			\$0
Chemical Cost			\$0
Oxidant Chem Cost			\$0
Sludge Removal	1	0	\$16
Other Cost (Annual Cost)			\$0
Land Access (Annual Cost)			\$0
Total Annual Cost:			\$1,552
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

**Total Annual Cost: per
1000 Gal of H2O Treated \$1.475**

Company Name

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AMD TREAT

AEROBIC WETLANDS

AMDTREAT

Aerobic Wetlands Name

Opening Screen Water Parameters

SIZING METHODS Select One

- Aerobic Wetland Based on Metal Removal Rates 1. Iron Removal Rate g/m2/day 2. Mn Removal Rate g/m2/day
- Aerobic Wetland Based on Dimensions 3. Top Length at Freeboard ft 4. Top Width at Freeboard ft
- Aerobic Wetland Based on Iron Oxidation Kinetics 5. Rate Constant moles/sec 6. Effluent Fe Concentration mg/l
- 7. Dissolved Oxygen mg/l 8. H2O Temperature °C

Influent Water Parameters that Affect Aerobic Wetlands

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

- 9. Length to Width Ratio : Width
- 10. Slope of Wetland Sides Run of Slope : Rise of Slope
- 11. Freeboard Depth ft
- 12. Free Standing Water Depth ft
- 13. Organic Matter Depth ft
- 14. Organic Matter Unit Cost \$/yd3
- 15. Organic Matter Spreading Unit Cost \$/yd3
- 16. Excavation Unit Cost \$/yd3
- 17. Wetland Planting Unit Cost \$/acre

Liner Cost

- No Liner
- Clay Liner
 - 18. Clay Liner Unit Cost \$/yd3
 - 19. Thickness of Clay Liner ft
- Synthetic Liner
 - 20. Synthetic Liner Unit Cost \$/yd2

- 21. Clearing and Grubbing?
- 22. Land Multiplier ratio
- 23. Clear/Grub Acres acres
- 24. Clear and Grub Unit Cost \$/acre

Aerobic Wetland Sizing Summaries

25. Length at Top of Freeboard	78.54	ft
26. Width at Top of Freeboard	42.27	ft
27. Freeboard Volume	164	yd3
28. Water Surface Area	2,631	ft2
29. Water Volume	46	yd3
30. Organic Matter Volume	81	yd3
31. Excavation Volume	128	yd3
32. Clear and Grub Area	0.0	acres
33. Liner Area	0	ft2
34. Retention Time	31	hrs

Aerobic Cost Summaries

35. Organic Matter Cost	1,844	\$
36. Excavation Cost	322	\$
37. Liner Cost	0	\$
38. Clear and Grub Cost	0	\$
39. Wetland Planting Cost	274	\$

40. Total Cost \$

Record Number 1 of 1

Company Name
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AMD TREAT PONDS

AMDTREAT

Pond Name

Pond Design Based On:

Retention Time

1. Desired Retention Time hours

2. Include Sludge Removal?

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 :

11. Freeboard Depth ft

12. Water Depth ft

13. Excavation Unit Cost \$/yd3

14. Total Length of Effluent / Inlet Pipe ft

15. Unit Cost of Pipe \$/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. Number of Ponds for this Design number

25. Cost of Baffles \$

Calculated Pond Dimensions per Pond

26. Length at Top of Freeboard ft

27. Width at Top of Freeboard ft

28. Freeboard Volume yd3

29. Water Volume yd3

30. Estimated Annual Sludge yd3/yr

31. Volume of Sludge per Removal yd3/removal

32. Excavation Volume acre ft

33. Excavation Volume yd3

34. Clear and Grub Area acres

35. Liner Area yd2

36. Calculated Retention Time hours

Ponds Sub-Totals per Pond

37. Excavation Cost \$

38. Pipe Cost \$

39. Liner Cost \$

40. Clearing and Grubbing Cost \$

41. Revegetation Cost \$

42. Baffle Cost \$

43. Estimated Cost \$

44. Accept Minimum Pond Cost?

The Recommended Minimum Construction Cost of Building a Pond is \$ 5,000

45. Recommended Minimum Cost \$

46. Total 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

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AMDTREAT

**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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AMDTREAT

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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AMD TREAT

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

Company Name Delta Mining

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AMDTREAT

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 \$

10. Total Maintenance Cost \$

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

Company Name Delta Mining

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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

1. Select One Selection for Method of Removing Sludge

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 \$

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

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 \$

Record Number 1 of 1

Company Name Delta Mining

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AMD TREAT RECAPITIALIZATION COST

AMDTREAT

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. replace aerobic wetland	2,440	1	2,440	10	7	6,538
2. replace pond	5,000	1	5,000	20	3	5,466
3.	0	0	0	0	0	0
4.	0	0	0	0	0	0
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 \$