

**ENVIRONMENTAL COST BREAKDOWN
CORPUS CHRISTI REFINERY**

1. <u>Perform Site Survey</u>	\$ 80,000
2. <u>Disposal of PCB's (Electrical Equipment)</u> (Assume same order of magnitude as Enid Refinery - \$700,000) \$700,000 x 3	2,100,000
3. <u>Asbestos Disposal</u> (Assume same order of magnitude as Enid Refinery - \$50,000) \$50,000 x 3	150,000
4. <u>Disposal of Crude and Feed Tank Bottoms</u> 200' Dia. Tank 3' deep = 95,000 cu.ft. <u>95,000</u> 27 = 3500 cu.yds. 3,500 cu.yds. x 8 tanks = 28,000 cu.yds. 28,000 x (150/yd for disposal) =	4,200,000
5. <u>Disposal of Lead Sludges from Leaded Gasoline Tanks</u> (Assume 3 times Enid 17 x 3 = 51 tanks) 51 tanks x 5 yds/tank = 255 cu.yds. 255 x 150/yd.	38,000
6. Sandblast and Test leaded gasoline Storage Tanks for Dismantling (Enid cost \$250,000 x 3 = \$750,000)	750,000
7. Clean-up Lead Contaminated Soils Enid cost \$47,000 x 3 = \$141,000	140,000
8. <u>Heavy Oil Tank Sludges (Decant oil, No. 6 Oil)</u> Heavy oil tanks will contain some tank bottoms that will be disposed of at the land farm. (Assume 2,000 bbl and 5 tanks = 10,000 bbls. Sampling and analysis \$ 5,000 Hauling to land farm - \$2/bbl 20,000 Placing on land farm 5,000 \$30,000	30,000

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9. Disposal of Coke Contaminated Soil in West Plant
 Corpus coke fines contain heavy metals particularly Vanadium which will require disposal as toxic wastes. Remove top of coke yard and sell as coke with no charge to project. Scrap top six inches of top soil and coke and dispose of at dump @ \$150/cu.yd.
 $1000' \times 500' \times .5' = 250,000 \text{ cu.ft.}$
 $\frac{250,000}{27} = 9,260 \text{ cu.yds.}$
 say 10,000 cu.yds. x \$150 = \$ 1,500,000
10. Recovery of Hydrocarbons below Grade
 Enid costs estimated to be \$4 MM
 net of credit for recovery
 \$4 MM x 3 over 5 years 12,000,000
11. Cooling Water Tower Sludges
 Assume 4" of sludge in 6 CWTs
 $75' \times 100' \times .33 \times 6 = 14,850 \text{ cu.ft.} = 550 \text{ cu.yds.}$
 $550 \times 150 = \$82,500$
 say \$83,000 83,000
12. Disposal of CWT Construction Materials
 The wood and plastic materials are contaminated, i.e., chromium, perservatives etc., and would have to be disposed of at a controlled dump.
 $75' \times 100' \times 20' \times 6 = 300,000 \text{ cu.ft.}$
 $\frac{300,000}{3} = 100,000 \text{ cu.yds.}$
 $100,000 \times 11,000 \text{ cu.yds.} \times \$150 = 1,650,000$
13. Tend Land Farm Rototill 4 times a Year for 5 Yrs.
 Cost of equipment rental and operation = \$100/Day
 5 days/quarter - $500 \times 4 \times 5 = 10,000$
14. Rototilling Spills in Place
 Assume 30 spill areas rototill 4 times a year
 in place one day/spill area - $30 \times 4 \times 100 = 12,000$
15. Consulting Services and Testing
 3 years @ \$100,000/yr = \$300,000
 2 years @ \$ 50,000/yr = $\frac{100,000}{\$400,000}$
 300,000

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16. Establish 4 "Borrow Pit" areas

This site will need "clean" dirt for closure activities and backfill for the pond areas in both East and West Plants. Site will also need areas to dispose of concrete, brick, etc.

Engineering survey	\$ 50,000
Strip and store top soil	20,000
Establish borrow pits	20,000
Operation covered in dismantlement costs	—
Fill, cover, and grade	40,000
	<u>\$130,000</u>

\$ 130,000

17. Closing of Ponds (4 ponds)

Assume pond bottoms will be non-hazardous. Lake bottoms will be removed by dredging and dewatered by aeration.

500' x 500' x 3' x 4 = 3,000,000 cu.ft.

3 MM cu.ft. = 111,000 cu.yds.

27

Dredging 111,000 @ \$10/yd	=	\$1,110,000
Dewatering (aerate) @ \$10/yd	=	1,110,000
Landfarm 111,000 @ \$12/yd	=	1,332,000

Back Fill ponds

500' x 500' x 10' 4 = 10 MM cu.ft.

10 MM = say 400,000 cu.yds.

27

400,000 @ \$5/yd	2,000,000
	<u>\$5,552,000</u>

5,552,000

18. Land Farm Closure and Post Closure

As required by RCRA, the landfarm also will be closed and a 30-year post closure monitoring instituted. The land must never be sold.

Enid estimated costs:

Survey	\$ 20,000
Closure	81,500
Post Closure (30 yrs)	120,000
	<u>\$221,500</u>

\$221,500 x 3 = \$664,500

665,000

TOTALS \$29,490,000

Say \$30,000,000

Range \$20 to \$40 MM

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Breakdown of \$27 MM S.D. Costs for East Plant

Enid S.D. started Oct. 1, 1983, and continued through October 31, 1984. The booked cost was \$9 MM.

General breakdown is as follows:

Electrical Power	\$ 1 MM
Fuel gas	2 MM
Abandonment costs	5 MM
(Tank and line cleaning, SD of Units)	
Miscellaneous	<u>1 MM</u>
	\$ 9 MM

Enid had 8 operating units with contiguous offsite tankage and pipelines.

Corpus has 17 operating units in the East Plant, has separate offsite areas, i.e., 90-91 area, Docks 1, 2, 3 and 6, PPG dock, S.W. dock, Deep Sea Terminal, and West Plant.

Due to number of units and complexity of offsites a factor of 3 times Enid costs is considered in the ball park for factoring to Corpus.

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