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4, 20, 94

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Rev. 1
Revision Date 9/30/93

Economic Evaluation of Closure Cap Barrier Materials Study(U)

Volume II

Site Geotechnical Services Department/Environmental Restoration Department

UNCLASSIFIED

Does not contain Unclassified Controlled Nuclear Information

Joginder S. Bhutani
Stephen M. Mead, P.E.
Michael G. Serrato

September 1993

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Economic Evaluation of Closure CAP Barrier Materials Volume I and Volume II (U)

by

M. G. Serrato

Westinghouse Savannah River Company

Savannah River Site

Aiken, South Carolina 29808

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4, 20, 94

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Rev. 1
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Economic Evaluation of Closure Cap Barrier Materials (U)

Volume II

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Acknowledgments

This study was prepared, as a part of the ongoing efforts by the Site Geotechnical Services (SGS) and Environmental Restoration (ER) departments of the Westinghouse Savannah River Company (WSRC), to select the most cost-effective and reliable barrier material for a given Savannah River Site (SRS) hazardous waste site. The study involved a major effort by the Cost Estimating, Procurement, and Materials Management departments of WSRC Engineering and Projects Division in developing unit prices and preparing cost estimates. The number of personnel who cooperated in this endeavor is too large to list here, but we have identify those individuals whose contributions were of great value.

We wish to express our thanks to James W. Iwert, manager Project Control and Cost Estimating, for his timely help and cooperation throughout the project; M. Shakoor and William Kulp for developing unit prices and for their keen interest in ensuring the estimates reflect the most accurate cost of covering a site; and Pravina Ghelani for her help in preparing and typing the cost estimates.

1.0 Introduction

1.1 General

Volume II of the Economic Evaluation of the Closure Cap Barrier Materials, Revision 1 contains detailed cost estimates to support the economic evaluation of closure cap barrier materials. The cost estimates incorporate the life cycle costs for a generic hazardous waste seepage basin closure cap under the RCRA Post Closure Period of thirty years. The economic evaluation assessed six barrier material categories. Each of these categories consists of several composite cover system configurations, which were used to develop individual cost estimates. The information contained in this report is not intended to be used as a cost estimating manual. This information provides the decision makers with the ability to screen barrier materials, cover system configurations, and identify cost-effective materials for further consideration.

Outlined below are the composite cover system configurations evaluated:

Barrier Material Category	Composite Cover System
• Geosynthetic clay liners	• Claymax® and 30-mil FML • Bentomat® and 30-mil FML • Gundseal®
• Flexible membrane liner	• 120-mil high-density polyethylene (HDPE) liner
• Asphalt barriers	• 1/4-inch-thick hot sprayed or emulsified asphalt and 30-mil FML • 1/4-inch-thick reinforced sprayed asphalt with geotextile fabric and 30-mil FML
• Clays	• Kaolin clay (offsite) and 30-mil FML • Onsite clay and 30-mil FML
• Soil additives	• Soil cement and 30-mil FML • Bentonite soil and 30-mil FML
• Nonsoil materials	• 4-inch-thick asphalt concrete slab and 30-mil FML • 4-inch-thick poured-in-place concrete slab and 30-mil FML

Cost estimates were generated for each composite cover system configuration using ten different waste site areas. A total of 120 cost estimates were developed for waste site areas of 0.1 acre, 0.2 acre, 0.5 acre, 1.0 acre, 2.0 acres, 5.0 acres, 10 acres, 20 acres, 40 acres, and 80 acres.

1.2 Cost Estimates

Each cost estimate incorporates three major cost parameters:

- initial construction/installation costs
- operations and maintenance (O/M) costs for post closure monitoring period (30 years)
- total life cycle costs at present worth (1994 costs) amortized over the entire project duration to include post closure monitoring period (30 years)

The initial estimated construction costs include direct construction costs (e.g.; materials, equipment and labor) and indirect costs (e.g., design, project management, industrial/health protection, and safety). The total present worth costs were calculated by projecting the annual O&M costs over the entire postclosure monitoring period of 30 years, bringing back the projected O&M costs to present worth cost and then adding these costs to the initial construction costs. The cost estimates generated for this economic evaluation are contained in Appendices A through J.

Note: These estimates were generated based on a generic seepage basin waste site closure cover system configuration and do not incorporate any follow-on remediation measures.

Appendix A

Cost Estimates for 0.1 Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/KULP

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,660
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	950	238	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,498	2,690	448	14.20	4,830
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(A) PAGE 1 TOTAL						1,014	20,288	4,728	5,861		33,290

A-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE26M12

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/KULP

PHONE: 7-5766

DATE: 09/08/93

LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.80	20,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	807	CY	-	0.175	141	2,823	0	847	4.50	3,970
12	Placement of Claymax Geotextile Mat	6160	SF	0.50	0.01	62	1,232	3,080	-	0.70	4,310
13	Placement of 30 Mil Flexible Membrane Liner	6160	SF	0.19	0.009	55	1,109	1,170	-	0.40	2,280
14	Placement of 1'-0" Coarse Sand Drainage Layer	212	CY	10.50	0.035	7	148	2,228	45	11.40	2,420
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	701	SY	0.20	0.007	5	98	140	-	0.30	240
16	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	908	102	8.00	1,350
17	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	863	49	11.90	1,060
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	107	SY	1.50	0.24	26	514	181	154	7.80	830
19	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	176	0	53	5.20	230
(A) PAGE 2 TOTAL						350	7,008	28,649	1,370		37,030

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/KULP

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	1000	SY	0.25	0.017	17	340	250	102	0.70	690
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" -- Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	-	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1920	2580	10,320
(A) PAGES 1,2,3 TOTAL						1,898	37,722	45,445	10,168		96,010
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							717	1,138			1,853
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,800
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							15,380				15,380
(A) TOTAL DIRECT COST						1,890	53,820	46,580	10,170		118,040

A-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/KULP

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,540
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,900
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,000
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,000
5	Engineering & Services @ 20% of Total Direct Cost										23,610
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					393	7,469				7,470
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						25,026	12,344			37,370
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					476					20,800
9	Project Management @ 8% of Total Direct + Indirects										19,230
	(A) TOTAL INDIRECT COST										141,520

A-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/KULP

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										118,040
	TOTAL INDIRECT COST										141,520
	TOTAL INITIAL CONSTRUCTION COST										260,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.1	AC								300
•	Cover Repair Due To Subsidence	1	LS								300
•	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(A) TOTAL O & M COST										9,550

A-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/KULP
PHONE: 7-5266
DATE: 09/08/93
LOC: MDC-106

SUMMARY	
<u>ONE TENTH (.1) ACRE SITE - CLAYMAX</u>	
C TOTAL COST (Total Present Worth)	
(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	147,000
(II) Total Initial Construction Cost	260,000
(A) TOTAL PROJECT COST (Rounded to the nearest Thousand)	407,000

A-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

FILE: L_1TENTH

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/MLK

PHONE: 7-5288

DATE: 09/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,680
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	960	238	-	2.50	1,180
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,690	449	14.20	4,630
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(L) PAGE 1 TOTAL						1,014	20,288	4,728	5,861		33,290

A-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5286

DATE: 09/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.00	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	807	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Placement of Bentonite Geotextile Mat	6,160	SF	0.50	0.01	62	1,232	3,060	-	0.70	4,310
13	Placement of 30 Mil Flexible Membrane Liner	6,160	SF	0.19	0.009	55	1,109	1,170	-	0.40	2,200
14	Placement of 1'-0" Coarse Sand Drainage Layer	212	CY	10.50	0.035	7	148	2,228	45	11.40	2,420
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	701	SY	0.20	0.007	5	98	140	-	0.30	240
16	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	906	102	5.00	1,350
17	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	665	49	11.90	1,060
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	107	SY	1.50	0.24	26	514	181	154	7.80	830
19	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	178	0	53	5.20	230
(L) PAGE 2 TOTAL						350	7,006	28,649	1,370		37,030

A-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MLK

PHONE: 7-5288

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1990	1,990
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2590	10,320
(L) PAGES 1,2,3 TOTAL						1,886	37,722	45,445	10,168		96,010
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							717	1,136			1,850
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,800
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							15,376				15,380
(L) TOTAL DIRECT COST						1,890	53,810	46,580	10,170		118,040

A-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5288

DATE: 09/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,540
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,800
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,600
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,600
5	Engineering & Services @ 20% of Total Direct Cost										23,610
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					393	7,469				7,470
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						25,022	12,344			37,370
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					476					20,800
9	Project Management @ 8% of Total Direct + Indirects										19,230
	(L) TOTAL INDIRECT COST										141,520

A-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MLK

PHONE: 7-5266

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										118,040
	TOTAL INDIRECT COST										141,520
	TOTAL INITIAL CONSTRUCTION COST										260,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.1	AC								300
•	Cover Repair Due to Subsidence										300
•	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(L) TOTAL O & M COST										9,550

A-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5208
DATE: 09/07/93
LOC: MDC-108

SUMMARY	
<u>ONE TENTH (.1) ACRE SITE - BENTOMAT (GBM)</u>	
C TOTAL COST (Total Present Worth)	
(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	147,000
(ii) Total Initial Construction Cost	260,000
(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	407,000

A-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

FILE: LITENTH

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. HEAD

ESTD BY: FOWHLK

PHONE: 7-5266

DATE: 08/02/88

LOG: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - GUNDSEAL</u>											
A	<u>1 DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,260	0	364	-	1,000
2	Precontouring Site	1.5	AC	-	32	48	960	0	268	-	1,250
3	Silt Fence (Includes Maintenance)	478	LF	0.50	0.1	48	950	238	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8' Deep	340	LF	0.50	0.22	75	1,496	2,690	449	14.20	4,530
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,200	768	364	38.00	2,430
7	35'x 35'x 4' Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(I) PAGE 1 TOTAL						1,014	20,268	4,728	5,861		33,290

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.60	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD Proctor	807	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Placement of Gundseal Geomembrane/ Bentonite Mat	6,160	SF	0.50	0.01	62	1,232	3,080	-	0.70	4,310
13	Placement of 1'-0" Coarse Sand Drainage Layer	212	CY	10.50	0.035	7	148	2,228	45	11.40	2,420
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	701	SY	0.20	0.007	5	95	140	-	0.30	240
15	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	908	102	5.00	1,350
16	Placement of 6" Topsoil	91	CY	9.50	0.06	6	164	885	48	11.90	1,080
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	107	SY	1.50	0.24	26	514	181	154	7.00	830
18	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	176	0	53	5.20	230
(I) PAGE 2 TOTAL						295	5,897	27,479	1,370		34,750

A-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWLK

PHONE: 7-5296

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
20	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						1,831	36,613	44,274	10,168		93,730
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							696	1,107			1,800
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,090
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							14,924				14,920
(I) TOTAL DIRECT COST						1,830	52,230	45,380	10,170		115,140

A-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

CHKD BY: S. MEAD

ESTD BY: PGM/LK

PHONE: 7-5266

DATE 08/20/80

LOC 207
MDC-108

A-17

94X00975

D E T A I L E S T I M A T E

LOG # - 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL.

CHKD BY: S. MEAD

ESTD BY: PGAWLK

PHONE 7-6286

DATE 08/02/93

LOC MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MATL	UNIT MH	TOTAL MH	LABOR MHx\$20	MATL \$	BEMCAP \$/UMH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										116,140
	TOTAL INDIRECT COST										197,670
	TOTAL INITIAL CONSTRUCTION COST										253,000
B	O & M COSTS										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								9,000
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	0.1	AC								300
•	Cover Repair Due to Subsidence										250
•	Annual Fence Maintenance	1									100
•	Annual Sign Maintenance	4									160
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(U) TOTAL O & M COST										9,900

A-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG # : 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-8288

DATE: 09/02/93

LOC: MDC-108

SUMMARY

ONE TENTH (.1) ACRE SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	146,000
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(ii) Total Initial Construction Cost	253,000
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(i) TOTAL PROJECT COST (Rounded to the nearest Thousand)	399,000
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FILE: F_1TENTH

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGWLK

PHONE: 7-5298

DATE: 09/02/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,660
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	960	238	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	76	1,496	2,890	449	14.20	4,830
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(F) PAGE TOTAL						1,014	20,288	4,728	5,661		33,280

A-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWLK

PHONE: 7-5206

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.00	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	807	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Placement of 120 Mil Flexible Membrane Liner	6,160	SF	0.50	0.01	62	1,232	3,080	-	0.70	4,310
13	Placement of 1'-0" Coarse Sand Drainage Layer	212	CY	10.50	0.035	7	146	2,226	45	11.40	2,420
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	701	SY	0.20	0.007	5	98	140	-	0.30	240
15	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	906	102	5.60	1,350
16	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	865	49	11.90	1,080
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	107	SY	1.50	0.24	26	514	161	154	7.60	630
18	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	176	0	53	5.20	230
(F) PAGE TOTAL						295	5,697	27,479	1,370		34,750

A-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/02/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	\$40	250	102	0.70	690
20	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						1,831	36,813	44,274	10,168		83,730
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							696	1,107			1,800
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,080
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							14,924				14,920
(F) TOTAL DIRECT COST						1,830	52,230	45,380	10,170		115,140

A-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWLK

PHONE: 7-5200

DATE: 08/02/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,450
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,757
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,510
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,510
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								23,030
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					361	7,232				7,230
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						24,267	12,026			36,310
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					461					20,140
9	Project Management @ 8% of Total Direct + Indirects										16,730
(F) TOTAL INDIRECT COST											137,670

A-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											115,140
TOTAL INDIRECT COST											137,870
TOTAL INITIAL CONSTRUCTION COST											253,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,000
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.1	AC								300
	• Cover Repair Due to Subsidence										250
	• Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(F) TOTAL O & M COST											9,500

A-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-8266

DATE: 09/02/93

LOC: MDC-106

SUMMARY

ONE TENTH (.1) ACRE SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

146,000

(ii) Total Initial Construction Cost

253,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

399,000

A-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: EKE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-3266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,060
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	950	238	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,890	449	14.20	4,630
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	36.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(C) PAGE 1 TOTAL						1,014	20,286	4,728	5,661		33,290

A-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: EXE26M12

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.00	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	807	CY	-	0.175	141	2,826	0	847	4.50	3,670
12	Placement of 30 Mil Flexible Membrane Liner	6,160	SF	0.19	0.009	55	1,109	1,170	-	0.40	2,260
13	Applied Hot Asphalt using 3 passes at a rate of 0.6 gal / SY	542	SY	2	0.15	81	1,626	1,084	480	5.90	3,200
14	Placement of 1'-0" Coarse Sand Drainage Layer	181	CY	10.50	0.035	6	127	1,901	36	11.40	2,070
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	542	SY	0.20	0.007	4	78	108	-	0.30	180
16	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	908	102	8.60	1,350
17	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	885	49	11.90	1,050
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Crushed Stone	107	SY	1.50	0.24	26	514	161	154	7.80	830
19	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	178	0	53	5.20	230
(C) PAGE 2 TOTAL											35,510

A-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: EXE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24 - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2500	10,320
(C) PAGES 1,2,3 TOTAL						1,904	38,072	43,091	10,849		94,490
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							723	1,077			1,800
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,720
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							15,516				15,520
(C) TOTAL DIRECT COST						1,900	54,310	44,170	10,850		118,530

A-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: EXE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,500
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,830
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,050
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,050
5	Engineering & Services @ 20% of Total Direct Cost										23,310
6	Craft Support @ 20.8 % of Total MNHRS (\$18/HR)					395	7,509				7,510
7	Field Indirects on Total Direct Labor @ 48.5%, Bulk Material @ 28.5%						25,254	11,705			36,900
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					479					20,910
9	Project Management @ 8% on Total Direct + Indirects										19,030
(C) TOTAL INDIRECT COST											140,350

A-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: EXE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										118,530
	TOTAL INDIRECT COST										140,350
	TOTAL INITIAL CONSTRUCTION COST										258,880
B	O & M COSTS										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	0.1	AC								300
*	Cover Repair Due to Subsidence										300
*	Annual Fence Maintenance	1									100
*	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
*	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
	(C) TOTAL O & M COST										9,550

A-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: EXE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

SUMMARY

ONE TENTH (.1) ACRE SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

**(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)**

147,000

(II) Total Capital Cost

256,880

(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)

404,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5268

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,660
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	950	238	-	2.50	1,180
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,890	449	14.20	4,830
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	16,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(D) PAGE 1 TOTAL						1,014	20,286	4,726	5,861		33,290

A-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.60	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	807	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Placement of Geotextile Reinforcement on Foundation Layer	542	SY	0.30	0.01	5	106	163	-	0.50	270
13	Placement of 30 Mil Flexible Membrane Liner	6,160	SF	0.19	0.009	55	1,109	1,170	-	0.40	2,280
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5g/Sy	542 813	SY GAL	2	0.15	81	1,626	1,084	488	5.90	3,200
15	Placement of 1'-0" Coarse Sand Drainage Layer	181	CY	10.50	0.04	7	145	1,901	43	11.50	2,090
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	542	SY	0.20	0.007	4	76	106	-	0.30	160
17	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	906	102	5.60	1,350
18	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	865	49	11.90	1,060
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	107	SY	1.50	0.24	26	514	161	154	7.00	830
20	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	176	0	53	5.20	230
(D) PAGE TOTAL						374	7,483	26,458	1,857		35,800

A-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWLK

PHONE: 7-5288

DATE: 10/06/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
22	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1,980	1,980
24	Warning Signs 4-18"x24" - Install	4	EA	250	2	8	160	1,000	-	290	1,160
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2,580	10,320
(D) PAGES 1,2,3 TOTAL						1,910	38,199	43,254	10,655		94,780
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							726	1,081			1,810
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,740
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							15,570				15,570
(D) TOTAL DIRECT COST						1,910	54,490	44,340	10,650		116,900

A-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 10/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,510
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,050
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,090
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,090
5	Engineering & Services @ 20% of Total Direct Cost										23,380
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					397	7,548				7,550
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						25,336	11,750			37,080
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					481					21,020
9	Project Management @ 8% of Total Direct + Indirects										19,090
(D) TOTAL INDIRECT COST											140,570

A-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 10/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										118,900
	TOTAL INDIRECT COST										140,870
	TOTAL INITIAL CONSTRUCTION COST										258,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	0.1	AC								300
*	Cover Repair Due to Subsidence										300
*	Annual Fence Maintenance	1									100
*	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
*	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
	(D) TOTAL O & M COST										9,550

A-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5200

DATE: 10/08/93

LOC: MDC-106

SUMMARY

ONE TENTH (.1) ACRE SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

147,000

(ii) Total Initial Construction Cost

258,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand)

405,000

A-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,000
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	950	236	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,890	449	14.20	4,830
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6' x 35' x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(K) PAGE 1 TOTAL						1,014	20,286	4,726	5,861		33,290

A-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWMLK
PHONE: 7-5286
DATE: 09/07/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.00	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	807	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	339	CY	13.00	0.165	56	1,119	4,407	336	17.30	5,860
13	Placement of 30 Mil Flexible Membrane Liner	5,220	SF	0.19	0.009	47	940	992	-	0.40	1,830
14	Placement of 1'-0" Coarse Sand Drainage Layer	181	CY	10.50	0.035	6	127	1,901	38	11.40	2,070
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	557	SY	0.20	0.007	4	78	111	-	0.30	180
16	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	906	102	5.60	1,350
17	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	885	49	11.90	1,080
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	107	SY	1.50	0.24	26	514	161	154	7.80	830
19	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	178	0	53	5.20	230
(K) PAGE 2 TOTAL						334	6,662	29,443	1,699		37,630

A-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(K) PAGES 1,2,3 TOTAL						1,870	37,396	48,239	10,497		96,810
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							711	1,156			1,870
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,840
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							15,243				15,240
(K) TOTAL DIRECT COST						1,870	53,350	47,390	10,500		116,760

A-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,560
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,940
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,660
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,660
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								23,750
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					369	7,390				7,390
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						24,608	12,558			37,370
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					471					20,560
9	Project Management @ 8% of Total Direct + Indirects										19,290
(K) TOTAL INDIRECT COST											141,840

A-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5286

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											116,700
TOTAL INDIRECT COST											141,640
TOTAL INITIAL CONSTRUCTION COST											260,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
*	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.1	AC								300
*	Cover Repair Due to Subsidence										650
*	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
(K) TOTAL O & M COST											9,900

A-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5286

DATE: 09/07/93

LOC: MDC-106

S U M M A R Y

ONE TENTH (.1) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	152,000
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(II) Total Initial Construction Cost	260,000
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(K) TOTAL PROJECT COST (Rounded to the nearest Thousand)	412,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,660
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	950	236	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,690	449	14.20	4,630
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(J) PAGE 1 TOTAL						1,014	20,286	4,726	5,661		33,290

A-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.60	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	807	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Compact 2'-0" Thick Clay Layer in 8" Lifts	339	CY	-	0.165	56	1,119	0	336	4.30	1,450
13	Placement of 30 Mil Flexible Membrane Liner	5,220	SF	0.19	0.009	47	940	992	-	0.40	1,930
14	Placement of 1'-0 Coarse Sand Drainage Layer	181	CY	10.50	0.035	6	127	1,901	38	11.40	2,070
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	557	SY	0.20	0.007	4	78	111	-	0.30	190
16	Placement of 1'-8" Common Fill	242	CY	3.75	0.07	17	339	906	102	5.60	1,350
17	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	885	49	11.90	1,060
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	107	SY	1.50	0.24	26	514	161	154	7.80	830
19	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	176	0	53	5.20	230
(J) PAGE 2 TOTAL						334	6,662	25,036	1,699		33,420

A-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(J) PAGES 1,2,3 TOTAL						1,870	37,398	41,832	10,497		92,400
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							711	1,046			1,760
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,620
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							15,243				15,240
(J) TOTAL DIRECT COST						1,870	53,350	42,880	10,500		114,020

A-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,420
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,700
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,400
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,400
5	Engineering & Services @ 20% of Total Direct Cost										22,800
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					389	7,390				7,390
7	Field Indirects of Total Direct Labor @ 48.5%, Bulk Material @ 26.5%						24,808	11,363			36,170
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					471					20,580
9	Project Management @ 8% of Total Direct + Indirects										18,630
(J) TOTAL INDIRECT COST											137,490

A-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MLK

PHONE: 7-5288

DATE: 09/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										114,020
	TOTAL INDIRECT COST										137,490
	TOTAL INITIAL CONSTRUCTION COST										252,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
*	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.1	AC								300
*	Cover Repair Due to Subsidence										600
*	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
	(J) TOTAL O & M COST										9,850

A-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5286

DATE: 09/07/93

LOC: MDC-106

SUMMARY

ONE TENTH (.1) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	151,000
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(ii) Total Initial Construction Cost	252,000
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(J) TOTAL PROJECT COST (Rounded to the nearest Thousand)	403,000
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A-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 10/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - SOIL CEMENT COVER</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.8	AC	-	40	64	1,280	0	384	-	1,660
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.1	48	950	238	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,690	449	14.20	4,630
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(G) PAGE 1 TOTAL						1,014	20,288	4,728	5,861		33,290

A-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 10/06/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.60	20,820
11	Place and Compact Foundation Soil In 8" Lifts to 95% STD. Proctor	607	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed In 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil- cement uniformly to 98% max. density.	514	CY	18	0.165	85	1,696	9,252	509	22	11,400
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	549	SY	0.33	0.05	27	549	181	-	1.30	730
		549	SY	0.17	0.03	16	329	93	-	0.80	420
14	Placement of 30 Mil Flexible Membrane Liner	5,220	SF	0.19	0.009	47	940	892	-	0.40	1,830
15	Placement of 1'-0 Coarse Sand Drainage Layer	181	CY	10.50	0.035	6	127	1,901	36	11.40	2,070
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	701	SY	0.2	0.007	5	100	140	-	0.30	240
17	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	906	102	5.00	1,350
18	Placement of 6" Topsoil	91	CY	9.5	0.09	8	164	865	49	11.90	1,080
(G) PAGE 2 TOTAL						373	7,470	34,431	1,066		43,570

A-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MLK

PHONE: 7-5288

DATE: 10/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	107	SY	1.5	0.24	26	514	161	154	7.80	630
20	Excavation of Trapezoidal Drainage Ditch	44	CY	-	0.20	9	176	0	53	5.20	230
21	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
22	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1900	1,900
24	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,100
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						1,944	38,675	51,387	10,670		103,610
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							739	1,285			2,020
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											5,180
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							15,848				15,850
(G) TOTAL DIRECT COST						1,940	55,400	52,670	10,670		128,600

A-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5288

DATE: 10/06/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,800
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								6,330
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								12,670
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								12,670
5	Engineering & Services @ 20% of Total Direct Cost										25,330
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					404	7,667				7,670
7	Field Indirects of Total Direct Labor @ 46.5, Bulk Material @ 26.5%						25,789	13,958			39,750
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					489					21,350
9	Project Management @ 8% of Total Direct + Ind	8.0%									20,500
(G) TOTAL INDIRECT COST											150,070

A-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										126,680
	TOTAL INDIRECT COST										150,070
	TOTAL INITIAL CONSTRUCTION COST										277,000
B	O & M COSTS										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	1	AC								300
	• Cover Repair Due to Subsidence										650
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(G) TOTAL O & M COST										8,900

A-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 10/08/93

LOC: MDC-108

SUMMARY

ONE TENTH (.1) ACRE SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

152,000

(II Total Initial Construction Cost

277,000

(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)

429,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/02/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	364	-	1,000
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (includes Maintenance)	475	LF	0.50	0.1	48	950	236	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	6.50	0.22	75	1,496	2,890	449	14.20	4,830
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,580
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(H) PAGE 1 TOTAL						1,014	20,266	4,726	5,861		33,290

A-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.00	20,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	807	CY	-	0.175	141	2,825	0	847	4.50	3,670
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	5	TN	148.50	3.5	18	350	733	-	216	1,080
		178	CY	15.00	0.165	29	587	2,670	178	19.30	3,430
13	Placement of 30 Mil Flexible Membrane Liner	5,220	SF	0.19	0.009	47	940	992	-	0.40	1,930
14	Placement of 1'-0 Coarse Sand Drainage Layer	181	CY	10.50	0.035	6	127	1,901	38	11.40	2,070
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	557	SY	0.20	0.007	4	78	111	-	0.30	180
16	Placement of 1'-6" Common Fill	242	CY	3.75	0.07	17	339	908	102	5.00	1,350
17	Placement of 6" Topsoil	91	CY	9.50	0.09	8	164	865	49	11.90	1,080
(H) PAGE 2 TOTAL						285	5,308	26,508	1,182		35,420

A-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/02/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	107	SY	1.50	0.24	26	514	181	154	7.00	830
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	44	CY	-	0.20	9	176	0	53	5.20	230
20	Seeding, Fertilizing & Mulching	1,000	SY	0.25	0.017	17	340	250	102	0.70	690
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2500	10,320
PAGES 1,2,3 TOTAL						1,836	36,714	43,482	10,187		95,400
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							698	1,087			1,780
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,770
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							14,985				14,980
(H) TOTAL DIRECT COST						1,840	52,380	44,550	10,180		116,970

A-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5286

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,510
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								5,850
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								11,700
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								11,700
5	Engineering & Services @ 20% of Total Direct Cost										23,390
6	Craft Support @ 20.6% of Total MNHRS (\$19/HR)					363	7,272				7,270
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 28.5%						24,357	11,808			36,160
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					494					20,250
9	Project Management @ 8% of Total Direct + Indirects										18,940
(H) TOTAL INDIRECT COST											136,770

A-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										116,970
	TOTAL INDIRECT COST										136,770
	TOTAL INITIAL CONSTRUCTION COST										256,000
B	O & M COSTS										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.1	AC								300
	• Cover Repair Due to Subsidence										400
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(H) TOTAL O & M COST										9,650

A-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5286

DATE: 09/02/93

LOC: MDC-106

SUMMARY

ONE TENTH (.1) ACRE SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	148,000
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(ii) Total Initial Construction Cost	256,000
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	404,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,660
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Slit Fence (Includes Maintenance)	475	LF	0.50	0.10	48	950	236	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,890	449	14.20	4,830
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(B) PAGE 1 TOTAL						1,014	20,266	4,726	5,861		33,290

A-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGM/LK

PHONE: 7-5288

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.80	20,620
11	Place and Compact Foundation Soil In 8" Lifts to 95% STD. Proctor	639	CY	-	0.175	112	2,237	0	671	4.80	2,910
12	Placement of 30 Mil Flexible Membrane Liner	5,220	SF	0.19	0.009	47	940	992	-	0.40	1,930
13	Placement of 1'-0 Coarse Sand Drainage Layer	169	CY	10.50	0.035	6	118	1,775	35	11.40	1,930
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	450	LF	1.0	0.24	108	2,160	450	-	5.80	2,610
15	2 1/2" Binder Course	530	SY	4.20	0.08	32	636	2,226	191	5.80	3,050
16	4" Hydraulic Asphalt Conc.	530	SY	6.75	0.03	16	316	3,578	95	7.50	3,990
17	Asphalt Mastic Seal	530	SY	0.50	0.015	8	159	265	-	0.80	420
18	Sprayed Asphaltic Concrete Sealant	530	SY	0.75	0.02	11	212	399	64	1.30	670
19	Excavation of Traingular Drainage Ditch	22	CY	-	0.36	8	159	0	43	9.50	210
20	4" Thick Asphalt Perimeter Drainage Ditch	67	SY	7.85	0.15	10	201	526	80	11.80	790
(B) PAGE 2 TOTAL											39,150

A-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/02/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	412	SY	0.25	0.017	7	140	103	42	0.70	290
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,180
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,520
(B) PAGES 1,2,3 TOTAL						1,903	38,057	48,957	10,022		87,716
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							723	1,174			1,900
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											4,890
• LOCATION FACTOR @ 40% of TOTAL LABOR COST (Total Labor Cost + Escalation)							15,512				15,510
(B) TOTAL DIRECT COST						1,900	54,290	48,130	10,020		120,010

A-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 08/02/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$8/HR	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,600
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								6,000
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								12,000
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								12,000
5	Engineering & Services @ 20% of Total Direct Cost										24,000
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					395	7,509				7,510
7	Field Indirects of Total Direct Labor @ 46.5, Bulk Material @ 26.5%						25,245	12,754			38,000
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					479					20,910
9	Project Management @ 8% of Total Direct + Indirects										19,520
	(B) TOTAL INDIRECT COST										143,540

A-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG # 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MLK

PHONE: 7-5206

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										120,010
	TOTAL INDIRECT COST										143,540
	TOTAL INITIAL CONSTRUCTION COST										264,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	0.1	AC								600
•	Cover Repair Due to Subsidence										400
•	Annual Fence Maintenance	1									100
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(B) TOTAL O & M COST										9,950

A-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5288

DATE: 09/02/93

LOC: MDC-108

SUMMARY

ONE TENTH (.1) ACRE SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

153,000

(ii) Total Initial Construction Cost

284,000

(B) TOTAL PROJECT COST (Rounded to the nearest Thousand)

417,000

A-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE280412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE TENTH (.1) ACRE SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	1.6	AC	-	40	64	1,280	0	384	-	1,660
2	Precontouring Site	1.5	AC	-	32	48	960	0	288	-	1,250
3	Silt Fence (Includes Maintenance)	475	LF	0.50	0.10	48	950	238	-	2.50	1,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	340	LF	8.50	0.22	75	1,496	2,890	449	14.20	4,830
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	8Y	3.00	0.10	16	320	480	96	5.80	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(E) PAGE 1 TOTAL						1,014	20,266	4,728	5,861		33,290

A-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/02/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>H COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	201	TN	100	0.1	20	402	20,100	121	102.00	20,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	639	CY	-	0.175	112	2,237	0	671	4.00	2,910
12	Placement of 30 Mil Flexible Membrane Liner	5,220	SF	0.19	0.009	47	940	992	-	0.40	1,930
13	Placement of 1'-0 Coarse Sand Drainage Layer	169	CY	10.50	0.035	6	118	1,770	36	11.40	1,820
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	450	LF	1.00	0.24	108	2,160	450	-	5.60	2,610
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X6-W 2.9xW 2.9(wid.wire fab)Broom Finish.	530	SY	7.50	0.5	265	5,300	3,975	(0.80/hr) 212 (comp.rate)	17.90	9,490
16	Sprayed on Curing Compound	530	SY	0.25	0.015	8	159	133	48	0.60	340
17	Joint Sealant 6" PVC Water Stops	340	LF	3.00	0.14	48	962	1,020	-	5.80	1,970
18	Excavation of Traingular Drainage Ditch	22	CY	-	0.36	8	160	0	48	9.50	210
19	4" Thick Concrete Perimeter Drainage Ditch	67	SY	7.50	0.4	27	536	503	161	17.90	1,200
(E) PAGE 2 TOTAL						648	12,963	28,942	1,295		43,200

A-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK
PHONE: 7-5256
DATE: 09/02/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	412	SY	0.25	0.017	7	140	103	42	0.70	290
21	Install 8' High Chain Link Perimeter Fence	610	LF	12	0.25	153	3,050	7,320	915	18.50	11,290
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,180
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	250	250
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(E) PAGES 1,2,3 TOTAL						2,174	43,479	45,591	10,033		101,780
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material								628	1,140		1,970
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											5,000
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)								17,722			17,720
(E) TOTAL DIRECT COST						2,170	62,030	48,730	10,030		126,580

A-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								3,800
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								6,330
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								12,000
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								12,000
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								25,310
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					451	8,578				8,580
7	Field Indirects of Total Direct Labor @ 48.5%, Bulk Material @ 28.5%						26,844	12,383			41,230
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					547					23,690
9	Project Management @ 8% of Total Direct + Indirects										20,860
(E) TOTAL INDIRECT COST											155,340

A-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/02/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										128,500
	TOTAL INDIRECT COST										155,340
	TOTAL INITIAL CONSTRUCTION COST										282,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Concrete Slab	0.1	AC								400
	• Cover Repair Due to Subsidence										750
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(E) TOTAL O & M COST										10,100

A-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L B S T I M A T E

LOG #: 7-03
 ACTIVITY CODE: ESE20412
 PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
 EST'D BY: PG/MLK
 PHONE: 7-8208
 DATE: 08/02/93
 LOG: MDC-108

SUMMARY	
ONE TENTH (.1) ACRE SITE - CONCRETE SLAB	
C TOTAL COST (Total Present Worth)	
(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	155,000
(II) Total Initial Construction Cost	282,000
(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)	437,000

A-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

Appendix B
Cost Estimates for 0.2 Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/MLK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	8" DP x 20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(A) PAGE 1 TOTAL						1,059	21,178	5,191	6,080		34,880

B-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK
PHONE: 7-5266
DATE: 09/08/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
H COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.60	41,040
11	Place and Compact Foundation Soil In 8" Lifts to 95% Std. Proctor	1,614	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Placement of Claymax Geotextile Mat	12,320	SF	0.50	0.01	123	2,464	6,160	-	0.70	8,620
13	Placement of 30 Mil Flexible Membrane Liner	12,320	SF	0.19	0.009	111	2,218	2,341	-	0.40	4,560
14	Placement of 1'-0" Coarse Sand Drainage Layer	425	CY	10.50	0.035	15	298	4,463	69	11.40	4,550
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,402	SY	0.20	0.007	10	196	280	-	0.30	480
16	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,619	204	5.60	2,700
17	Placement of 6" Topsoil	182	CY	9.50	0.09	16	328	1,729	96	11.60	2,150
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	143	SY	1.50	0.24	34	696	215	206	7.80	1,110
19	Excavation of Trapezoidal Drainage Ditch	88	CY	-	0.2	18	352	0	106	5.20	480
(A) PAGE 2 TOTAL						683	13,669	57,006	2,637		73,310

B-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 03/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,380
21	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(A) PAGES 1,2,3 TOTAL						2,308	46,162	75,824	11,920		137,530
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							877	1,896			2,770
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,860
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							18,816				18,820
(A) TOTAL DIRECT COST						2,310	65,860	77,720	11,920		166,000

B-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5288

DATE: 09/08/93

LOG: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,980
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								6,300
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,600
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,600
5	Engineering & Services @ 20% of Total Direct Cost										33,200
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					480	9,120				9,130
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						30,625	20,596			51,220
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					582					25,430
9	Project Management @ 8% of Total Direct + Indirects										26,520
(A) TOTAL INDIRECT COST											191,960

B-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										166,000
	TOTAL INDIRECT COST										191,900
	TOTAL INITIAL CONSTRUCTION COST										358,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.2	AC								400
•	Cover Repair Due to Subsidence										350
•	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(A) TOTAL O & M COST										9,700

B-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L B S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5286

DATE: 09/08/93

LOC: MDC-106

SUMMARY

ONE FIFTH (.2) ACRE SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	149,000
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(ii) Total Initial Construction Cost	358,000
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(A) TOTAL PROJECT COST (Rounded to the nearest Thousand)	507,000
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DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/08/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
	<u>I SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	8,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(L) PAGE 1 TOTAL						1,059	21,178	5,191	6,060		34,000

B-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/06/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.60	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,614	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Placement of Bentonite Geotextile Mat	12,320	SF	0.50	0.01	123	2,464	6,160	-	0.70	8,620
13	Placement of 30 Mil Flexible Membrane Liner	12,320	SF	0.19	0.009	111	2,218	2,341	-	0.40	4,560
14	Placement of 1'-0" Coarse Sand Drainage Layer	425	CY	10.5	0.035	15	296	4,463	89	11.40	4,850
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,402	SY	0.20	0.007	10	196	280	-	0.30	480
16	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,819	204	5.60	2,700
17	Placement of 6" Topsoil	182	CY	9.50	0.09	16	326	1,729	96	11.60	2,150
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	143	SY	1.50	0.24	34	636	215	206	7.60	1,110
19	Excavation of Trapezoidal Drainage Ditch	68	CY	-	0.20	16	352	0	106	5.20	400
(L) PAGE 2 TOTAL						683	13,669	57,006	2,637		73,310

B-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE26012

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,380
21	Install 8" High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,828	1,079	18.50	13,300
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	60.00	320	6,400	2,000	2,000	2600	10,400
(L) PAGES 1,2,3 TOTAL						2,308	46,162	75,824	12,000		137,610
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							877	1,896			2,770
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											8,880
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							18,616				18,620
(L) TOTAL DIRECT COST						2,310	65,660	77,720	12,000		166,080

B-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,960
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								8,300
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,610
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,610
5	Engineering & Services @ 20% of Total Direct Cost										33,220
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					480	9,120				9,130
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						30,625	20,596			51,220
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					582					25,430
9	Project Management @ 8% of Total Direct + Indirects										26,530
(L) TOTAL INDIRECT COST											182,030

B-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										106,080
	TOTAL INDIRECT COST										182,030
	TOTAL INITIAL CONSTRUCTION COST										358,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
*	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.2	AC								400
*	Cover Repair Due to Subsidence										350
*	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
	(L) TOTAL O & M COST										9,700

B-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L B S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 08/08/93

LOC: MDC-108

S U M M A R Y

ONE FIFTH (.2) ACRE SITE - BENTOMAT (GBM)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

149,000

(H) Total Initial Construction Cost

358,000

(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)

507,000

B-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5208

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - GUNDSEAL</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	180	SY	3.00	0.10	18	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(I) PAGE 1 TOTAL						1,059	21,178	5,191	6,000		34,800

B-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.60	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD Proctor	1,614	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Placement of Gundseal Geomembrane/ Bentonite Mat	12,320	SF	0.50	0.01	123	2,464	6,160	-	0.70	8,620
13	Placement of 1'-0" Coarse Sand Drainage Layer	425	CY	10.50	0.035	15	296	4,463	89	11.40	4,850
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,402	SY	0.20	0.007	10	196	280	-	0.30	480
15	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,619	204	5.80	2,700
16	Placement of 6" Topsoil	182	CY	9.50	0.09	16	326	1,729	96	11.80	2,150
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	143	SY	1.50	0.24	34	686	215	206	7.80	1,110
18	Excavation of Trapezoidal Drainage Ditch	88	CY	-	0.20	18	352	0	106	5.20	460
(I) PAGE 2 TOTAL						573	11,432	54,665	2,637		66,780

B-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,380
20	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						2,197	43,945	73,484	11,920		132,970
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							835	1,637			2,670
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,650
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							17,912				17,910
(I) TOTAL DIRECT COST						2,200	62,690	75,320	11,920		160,200

B-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGAWLK

PHONE: 7-5266

DATE: 09/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,810
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								8,010
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,020
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,020
5	Engineering & Services @ 20% of Total Direct Cost										32,040
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					458	8,694				8,690
7	Field Indirects Labor @ 46.5%, Bulk Material @ 26.5%						29,151	19,960			49,110
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					554					24,220
9	Project Management @ 8% of Total Direct + Indirects										25,530
	(I) TOTAL INDIRECT COST										184,450

B-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MLK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										160,200
	TOTAL INDIRECT COST										184,450
	TOTAL INITIAL CONSTRUCTION COST										345,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	0.2	AC								400
•	Cover Repair Due to Subsidence										300
•	Annual Fence Maintenance	1									100
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(I) TOTAL O & M COST										9,650

B-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 09/08/93

LOC: MDC-108

SUMMARY

ONE FIFTH (.2) ACRE SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	148,000
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(II) Total Initial Construction Cost	345,000
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(I) TOTAL PROJECT COST (Rounded to the nearest Thousand)	493,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5296

DATE: 08/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
	<u>I SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	346	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.10	56	1,110	276	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	180	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(F) PAGE TOTAL						1,059	21,178	5,191	6,060		34,880

B-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.00	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,614	CY	-	0.175	282	5,649	0	1,605	4.50	7,340
12	Placement of 120 Mil Flexible Membrane Liner	12,320	SF	0.50	0.01	123	2,464	6,160	-	0.70	8,620
13	Placement of 1'-0" Coarse Sand Drainage Layer	425	CY	10.50	0.035	15	296	4,463	89	11.40	4,850
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,402	SY	0.20	0.007	10	196	280	-	0.30	480
15	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,819	204	5.60	2,700
16	Placement of 6" Topsoil	182	CY	9.50	0.09	16	326	1,729	96	11.00	2,150
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	143	^{SY} CY	1.50	0.24	34	686	215	206	7.80	1,110
18	Excavation of Trapezoidal Drainage Ditch	88	CY	-	0.2	16	352	0	106	5.50	460
(F) PAGE TOTAL						573	11,452	54,605	2,637		66,750

B-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWLK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,360
20	Install 6' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						2,187	43,945	73,484	11,920		132,970
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Materials							835	1,837			2,670
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,650
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							17,912				17,910
(F) TOTAL DIRECT COST						2,200	62,690	75,320	11,920		160,200

B-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 09/06/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,810
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								8,010
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,020
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,020
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								32,040
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					458	8,694				8,690
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						29,151	19,980			49,110
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					554					24,220
9	Project Management @ 8% of Total Direct + Indirects										25,530
(F) TOTAL INDIRECT COST											154,450

B-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										180,200
	TOTAL INDIRECT COST										184,450
	TOTAL INITIAL CONSTRUCTION COST										345,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.2	AC								400
	• Cover Repair Due to Subsidence										300
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(F) TOTAL O & M COST										9,650

B-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 08/08/93

LOC: MDC-106

S U M M A R Y

ONE FIFTH (.2) ACRE SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.9725)

148,000

(II) Total Initial Construction Cost

345,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

493,000

B-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/KULP

PHONE: 7-5206

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	38.00	2,430
7	35'x 35'x4" Gravel Decon. Area	180	SY	3.00	0.10	18	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(C) PAGE 1 TOTAL						1,059	21,178	5,191	6,060		34,880

B-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGKULP

PHONE: 7-5288

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	<u>H COVER CONSTRUCTION</u>										
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.80	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1614	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Placement of 30 Mil Flexible Membrane Liner	12320	SF	0.19	0.009	111	2,218	2,341	665	0.40	5,220
13	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	1084 1627	SY GAL	2	0.15	163	3,252	2,168	978	5.90	6,400
14	Placement of 1'-0" Coarse Sand Drainage Layer	360	CY	10.5	0.035	13	252	3,780	78	11.40	4,110
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1084	SY	0.20	0.007	8	152	217	-	0.30	370
16	Placement of 1'-8" Common Fill	485	CY	3.75	0.07	34	679	1,618	204	5.80	2,700
17	Placement of 6" Topsoil	182	CY	9.50	0.09	16	328	1,729	98	11.80	2,150
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Crushed Stone	143	SY	1.50	0.24	34	688	215	208	7.80	1,110
19	Excavation of Trapezoidal Drainage Ditch	88	CY	-	0.2	18	352	0	108	5.20	480
	(C) PAGE 2 TOTAL					718	14,367	52,268	4,265		70,900

B-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/KULP

PHONE: 7-5286

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,300
21	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,585	8,628	1,079	18.50	13,300
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x24 - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(C) PAGES 1,2,3 TOTAL						2,343	46,860	71,088	13,548		135,120
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							690	1,777			2,670
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,760
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							19,100				19,100
(C) TOTAL DIRECT COST						2,340	66,850	72,860	13,550		163,650

B-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L B S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/KULP

PHONE: 7-5288

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,910
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								8,180
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,370
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,370
5	Engineering & Services @ 20% of Total Direct Cost										32,730
6	Craft Support @ 20.8 % of Total MNHRS (\$19/HR)					487	9,248				9,250
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						31,085	19,308			50,390
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					590					25,760
9	Project Management @ 8% on Total Direct + Indirects										26,210
	(C) TOTAL INDIRECT COST										190,170

B-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/KULP

PHONE: 7-5268

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										163,650
	TOTAL INDIRECT COST										180,170
	TOTAL INITIAL CONSTRUCTION COST										354,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	0.2	AC								400
•	Cover Repair Due to Subsidence										350
•	Annual Fence Maintenance	1									100
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
•	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
	(C) TOTAL O & M COST										9,700

B-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/KULP
PHONE: 7-3266
DATE: 09/08/93
LOC: MDC-106

SUMMARY

ONE FIFTH (.2) ACRE SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost **149,000**
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(II) Total Initial Construction Cost **354,000**

(C) TOTAL PROJECT COST (Rounded to the nearest Thousand) **503,000**

B-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE280412

PROJ.NAME: ECON. OF EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/MKL

PHONE: 7-5288

DATE: 08/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Slit Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	88	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(D) PAGE 1 TOTAL						1,059	21,178	5,181	6,060		34,000

B-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. OF EVALUATION CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MKL

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.60	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,614	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Placement of Geotextile Reinforcement on Foundation Layer	1,084	SY	0.30	0.01	11	217	325	-	0.50	540
13	Placement of 30 Mil Flexible Membrane Liner	12,320	SF	0.19	0.009	111	2,218	2,341	-	0.40	4,560
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5gal/Sy	1,084 1,627	SY GAL	2.00	0.15	163	3,252	2,168	976	5.90	9,400
15	Placement of 1'-0" Coarse Sand Drainage Layer	361	CY	10.50	0.035	13	253	3,791	76	11.40	4,120
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,084	SY	0.20	0.007	8	152	217	-	0.30	370
17	Placement of 1'-8" Common Fill	485	CY	3.75	0.07	34	679	1,619	204	5.60	2,700
18	Placement of 6" Topsoil	182	CY	9.50	0.09	16	326	1,729	69	11.60	2,160
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	143	SY	1.50	0.24	34	686	215	206	7.60	1,110
20	Excavation of Trapezoidal Drainage Ditch	66	CY	-	0.20	18	362	0	106	5.20	460
(D) PAGE TOTAL						729	14,565	52,604	3,600		70,790

B-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. OF EVALUATION CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WKL
PHONE: 7-5266
DATE: 09/08/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,300
22	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1,980	1,980
24	Warning Signs 4-18"x24" - Install	4	EA	250	2	8	160	1,000	-	290	1,160
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1,200	1,200
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2,560	10,320
(D) PAGES 1,2,3 TOTAL						2,354	47,078	71,422	12,883		135,010
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							894	1,766			2,660
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,750
• LOCATION FACTOR @ 40% of (Total Labor Cost + Clean up & Demobilize)							19,189				19,180
(D) TOTAL DIRECT COST						2,350	67,160	73,210	12,880		183,630

B-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. OF EVALUATION CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WKL

PHONE: 7-5286

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,910
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								6,180
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,360
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,360
5	Engineering & Services @ 20% of Total Direct Cost										32,730
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					489	9,287				9,290
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						31,229	19,401			50,630
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					592					25,870
9	Project Management @ 8% of Total Direct + Indirects										25,240
(D) TOTAL INDIRECT COST											180,570

B-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. OF EVALUATION CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WKL

PHONE: 7-5208

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										163,630
	TOTAL INDIRECT COST										190,570
	TOTAL INITIAL CONSTRUCTION COST										354,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	0.2	AC								400
*	Cover Repair Due to Subsidence										400
*	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
*	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
	(D) TOTAL O & M COST										9,750

B-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. OF EVALUATION CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MKL
PHONE: 7-5266
DATE: 09/08/93
LOC: MDC-106

SUMMARY

ONE FIFTH (.2) ACRE SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	150,000
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(II) Total Initial Construction Cost	354,000
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(D) TOTAL PROJECT COST (Rounded to the nearest Thousand)	504,000
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B-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 08/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$0/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(K) PAGE 1 TOTAL						1,059	21,178	5,191	6,060		34,660

B-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/03/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.00	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,614	CY	-	0.175	282	5,649	0	1,665	4.50	7,340
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	678	CY	13.00	0.165	112	2,237	8,814	671	17.30	11,720
13	Placement of 30 Mil Flexible Membrane Liner	10,440	SF	0.19	0.009	94	1,879	1,804	-	0.40	3,800
14	Placement of 1'-0" Coarse Sand Drainage Layer	361	CY	10.50	0.035	13	253	3,791	76	10.00	4,120
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,114	SY	0.20	0.007	8	156	223	-	0.30	360
16	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,819	204	5.00	2,700
17	Placement of 6" Topsoil	182	CY	9.50	0.09	16	328	1,729	96	11.80	2,150
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	143	SY	1.50	0.24	34	686	215	206	7.80	1,110
19	Excavation of Trapezoidal Drainage Ditch	68	CY	-	0.2	18	352	0	106	5.20	480
(K) PAGE 2 TOTAL						651	13,019	58,573	3,295		74,860

B-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY:

PG/WLK

PHONE:

7-5266

DATE:

09/09/93

LOC:

MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,380
21	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(K) PAGES 1,2,3 TOTAL						2,276	45,512	77,392	12,578		139,100
• Escalation for 1994 on Direct Labor is 1.8% and 2.5% on Direct Material							865	1,935			2,800
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,900
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							18,551				18,550
(K) TOTAL DIRECT COST						2,280	64,930	79,330	12,580		167,410

B-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESR260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTD BY: PGW/LK
PHONE: 7-5266
DATE: 08/09/93
LOC: MDC-108

LINE #	ACTIVITY	EST	UM UNIT	MAT'L UNIT	TOTAL LABOR	\$	BEMCAP \$/MH	UNIT COST	TOTAL COST
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS						8,020
2	Health & Safety Assume 5% of Total Direct Cost	1	LS						8,370
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS						16,740
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS						16,740
5	Engineering & Services @ 20% of Total Direct Cost	1	LS						33,480
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)	474		9,011					9,010
7	Field Indirects of Total Direct Labor @ 48.5%, Bulk Material @ 26.5%	30,192		21,022					51,210
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68	575							25,100
9	Project Management @ 8% of Total Direct + Indirects								26,650
(K) TOTAL INDIRECT COST									182,320

B-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										167,410
	TOTAL INDIRECT COST										182,320
	TOTAL INITIAL CONSTRUCTION COST										300,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	18	EA								3,600
*	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
*	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.2	AC								400
*	Cover Repair Due to Subsidence										800
*	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
	(K) TOTAL O & M COST										10,150

B-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 08/09/93

LOC: MDC-106

S U M M A R Y

ONE FIFTH (.2) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 156,000

(II) Total Initial Construction Cost 360,000

(K) TOTAL PROJECT COST (Rounded to the nearest Thousand) 516,000

B-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

EST'D BY: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5206

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	346	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	-	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	180	8Y	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(J) PAGE 1 TOTAL						1,059	21,178	5,191	6,080		34,860

B-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/08/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.60	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,614	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	678	CY	-	0.165	112	2,237	0	671	4.30	2,910
13	Placement of 30 Mil Flexible Membrane Liner	10,440	SF	0.19	0.009	94	1,879	1,984	-	0.40	3,880
14	Placement of 1'-0 Coarse Sand Drainage Layer	361	CY	10.50	0.035	13	253	3,791	76	11.40	4,120
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,114	SY	0.20	0.007	8	156	223	-	0.30	360
16	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,819	204	5.80	2,700
17	Placement of 6" Topsoil	182	CY	9.50	0.09	16	328	1,729	96	11.80	2,150
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	143	SY	1.50	0.24	34	686	215	206	7.80	1,110
19	Excavation of Trapezoidal Drainage Ditch	88	CY	-	0.2	18	352	0	106	5.20	460
(J) PAGE 2 TOTAL						651	13,019	49,759	3,295		66,070

B-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 09/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,360
21	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1960	1,960
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(J) PAGES 1,2,3 TOTAL						2,276	45,512	66,578	12,578		130,290
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							865	1,714			2,580
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,510
* LOCATION FACTOR @ 40% of (Total Labor Cost + Clean up & Escalation)							16,551				16,550
(J) TOTAL DIRECT COST						2,280	64,930	70,290	12,580		187,930

B-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5208

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,740
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								7,900
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								15,790
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								15,790
5	Engineering & Services @ 20% of Total Direct Cost										31,580
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					474	9,011				9,010
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						30,182	16,627			46,820
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					575					25,100
9	Project Management @ 6% of Total Direct + Indirects										25,339
(J) TOTAL INDIRECT COST											184,070

B-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										157,930
	TOTAL INDIRECT COST										184,070
	TOTAL INITIAL CONSTRUCTION COST										342,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.2	AC								400
•	Cover Repair Due to Subsidence										750
•	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(J) TOTAL O & M COST										10,100

B-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE26M12

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5206

DATE: 09/08/93

LOC: MDC-106

SUMMARY

ONE FIFTH (1/5) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

155,000

(II) Total Initial Construction Cost

342,000

(J) TOTAL PROJECT COST (Rounded to the nearest Thousand)

497,000

B-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260M12

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGWMLK

PHONE: 7-5288

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - SOIL CEMENT COVER</u>											
A	DIRECT COSTS										
I	SITE PREPARATION										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,450
7	35'x 35'x 4" Gravel Decon. Area	180	SY	3.00	0.10	16	320	480	96	5.80	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(G) PAGE 1 TOTAL											
						1,059	21,178	5,191	8,080		\$4,860

B-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWMLK

PHONE: 7-5200

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.00	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,814	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	1,029	CY	18	0.165	170	3,396	18,522	1,019	22.30	22,940
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	1,098	SY	0.33	0.05	55	1,098	362	-	1.30	1,460
		1,098	SY	0.17	0.03	33	659	187	-	0.80	850
14	Placement of 30 Mil Flexible Membrane Liner	10,440	SF	0.19	0.009	94	1,879	1,964	-	0.40	3,000
15	Placement of 1'-0" Coarse Sand Drainage Layer	381	CY	10.50	0.035	13	253	3,791	78	11.40	4,120
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,114	SY	0.20	0.007	8	156	223	-	0.30	360
17	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,819	204	5.00	2,700
18	Placement of 6" Topsoil	182	CY	9.50	0.09	16	328	1,729	98	11.00	2,150
(G) PAGE 2 TOTAL						694	13,869	65,068	3,029		68,040

B-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/MLK

PHONE: 7-5286

DATE: 09/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	143	SY	1.50	0.24	34	686	215	206	7.80	1,110
20	Excavation of Trapezoidal Drainage Ditch	88	CY	-	0.2	16	353	0	106	5.20	460
21	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,380
22	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1900	1,900
24	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,820	2580	10,320
PAGES 1,2,3 TOTAL						2,371	47,422	84,101	12,624		152,630
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							901	2,103			3,000
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											7,630
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							19,329				19,330
(G) TOTAL DIRECT COST						2,370	67,650	86,200	12,620		182,590

B-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								5,480
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								9,130
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								18,260
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								18,260
5	Engineering & Services @ 20% of Total Direct Cost										36,520
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					493	9,368				9,370
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						31,457	22,843			54,300
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					597					26,090
9	Project Management @ 8% of Total Direct + Ind		8.0%								28,800
(G) TOTAL INDIRECT COST											208,210

B-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5286

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										162,590
	TOTAL INDIRECT COST										206,210
	TOTAL INITIAL CONSTRUCTION COST										368,800
B	O & M COSTS										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.2	AC								400
	• Cover Repair Due to Subsidence										800
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									160
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(G) TOTAL O & M COST										10,160

B-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 08/08/93

LOC: MDC-106

SUMMARY

ONE FIFTH (.2) ACRE SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	156,000
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(II Total Initial Construction Cost	389,000
-------------------------------------	---------

(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)	545,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	0.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(H) PAGE 1 TOTAL						1,059	21,178	5,191	6,080		34,800

B-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.60	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,614	CY	-	0.175	282	5,649	0	1,695	4.50	7,340
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	10	TN	148.50	3.5	35	700	1,465	-	217	2,170
		355	CY	15.00	0.165	59	1,172	5,325	351	19.30	6,850
13	Placement of 30 Mil Flexible Membrane Liner	10,440	SF	0.19	0.009	94	1,879	1,984	-	0.40	3,860
14	Placement of 1'-0 Coarse Sand Drainage Layer	361	CY	10.50	0.035	13	253	3,791	76	11.40	4,120
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	1,114	SY	0.20	0.007	8	156	223	-	0.30	360
16	Placement of 1'-6" Common Fill	485	CY	3.75	0.07	34	679	1,819	204	5.60	2,700
17	Placement of 6" Topsoil	182	CY	9.50	0.09	16	328	1,729	96	11.60	2,150
(H) PAGE 2 TOTAL						530	10,606	52,787	2,362		70,610

B-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	143	SY	1.5	0.24	34	686	215	206	7.60	1,110
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	88	CY	-	0.2	18	352	0	106	5.20	460
20	Seeding, Fertilizing & Mulching	2,000	SY	0.25	0.017	34	680	500	204	0.70	1,380
21	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	6,628	1,079	18.50	13,300
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						2,207	44,140	71,820	11,956		136,400
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							839	1,795			2,630
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											6,620
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							17,991				17,990
(H) TOTAL DIRECT COST						2,210	62,970	73,620	11,960		163,840

B-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 10/06/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								4,920
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								8,190
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,380
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,380
5	Engineering & Services @ 20% of Total Direct Cost										32,770
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					460	8,734				8,730
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						29,281	19,509			48,790
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					557					24,330
9	Project Management @ 8% of Total Direct + Indirects										25,950
(H) TOTAL INDIRECT COST											166,440

B-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5286
DATE: 10/08/93
LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST									163,040
	TOTAL INDIRECT COST									186,440
	TOTAL INITIAL CONSTRUCTION COST									350,000
B	<u>O & M COSTS</u>									
	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	1	EA	16						3,000
	Inspection Activities of Closed Facility Monthly	48	HR		75.00	3,600				3,600
	Subsidence Monitoring Annual Survey	16	HR		75.00	1,200				1,200
	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.2	AC							400
	Cover Repair Due to Subsidence									
	Annual Fence Maintenance	1								500
	Annual Sign Maintenance	4								100
	Annual Monitoring Well Maintenance	4			75.00	300				150
	(H) TOTAL O & M COST									300
										9,850

B-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 10/06/93
LOC: MDC-106

S U M M A R Y

ONE FIFTH (.2) ACRE SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	151,000
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(II Total Initial Construction Cost	350,000
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	501,000
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B-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/MLK

PHONE: 7-5208

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	553	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	39.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(B) PAGE 1 TOTAL						1,059	21,178	5,191	6,080		34,860

B-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	240	102.60	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	1,278	CY	-	0.175	224	4,473	0	1,342	4.50	5,810
12	Placement of 30 Mil Flexible Membrane Lner	10,440	SF	0.19	0.009	94	1,879	1,984	-	0.40	3,660
13	Placement of 1'-0 Coarse Sand Drainage Layer	337	CY	10.50	0.035	12	236	3,541	71	11.40	3,650
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	635	LF	1.0	0.24	152	3,048	635	-	5.60	3,660
15	2 1/2" Binder Course	1,060	SY	4.20	0.06	64	1,272	4,452	362	5.80	6,110
16	4" Hydraulic Asphalt Conc.	1,060	SY	6.75	0.03	32	636	7,155	181	7.50	7,960
17	Asphalt Mastic Seal	1,060	SY	0.50	0.015	16	316	530	-	0.60	650
18	Sprayed Asphaltic Concrete Sealant	1,060	SY	0.75	0.02	21	424	795	127	1.30	1,350
19	Excavation of Traingular Drainage Ditch	44	CY	-	0.35	16	320	0	66	8.50	420
20	4" Thick Asphalt Perimeter Drainage Ditch	134	SY	7.85	0.15	20	402	1,052	121	11.70	1,570
(B) PAGE 2 TOTAL						690	13,808	60,143	2,569		76,520

B-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGWLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$&MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	824	SY	0.25	0.017	14	280	206	64	0.70	570
21	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	19,900
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,180
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(B) PAGES 1,2,3 TOTAL						2,295	45,901	78,668	11,732		139,930
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							872	1,967			2,840
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											7,000
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							18,709				18,710
(B) TOTAL DIRECT COST						2,300	65,480	80,630	11,730		168,480

B-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHX\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								8,060
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								8,420
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								16,850
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								16,850
5	Engineering & Services @ 20% of Total Direct Cost										33,700
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					478	9,090				9,090
7	Field Indirects of Total Direct Labor @ 46.5, Bulk Material @ 26.5%						30,448	21,367			51,820
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					580					25,320
9	Project Management @ 8% of Total Direct + Indirects										26,850
	(B) TOTAL INDIRECT COST										183,850

B-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										168,480
	TOTAL INDIRECT COST										193,950
	TOTAL INITIAL CONSTRUCTION COST										362,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	0.2	AC								800
	• Cover Repair Due to Subsidence										500
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(B) TOTAL O & M COST										10,250

B-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: B5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-3266

DATE: 09/08/93

LOC: MDC-106

SUMMARY

ONE FIFTH (.2) ACRE SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	158,000
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(II) Total Initial Construction Cost	362,000
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(B) TOTAL PROJECT COST (Rounded to the nearest Thousand)	520,000
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B-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE280412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5206

DATE: 08/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE FIFTH (.2) ACRE SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.0	AC	-	40	80	1,600	0	480	-	2,080
2	Precontouring Site	1.8	AC	-	32	58	1,152	0	348	-	1,500
3	Silt Fence (Includes Maintenance)	555	LF	0.50	0.1	56	1,110	278	-	2.50	1,390
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	390	LF	8.50	0.22	86	1,716	3,315	515	14.20	5,550
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	8Y	3.00	0.10	16	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	3	MO	-	-	0	0	0	-	720	2,160
(E) PAGE 1 TOTAL						1,059	21,178	5,181	6,080		34,000

B-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJNAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5396

DATE: 09/09/93

LOG: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
I. COVER CONSTRUCTION										
10	Waste Stabilization (Crushed Limestone)	400	TN	100	0.1	40	800	40,000	102.80	41,040
11	Place and Compact Foundation Soil in 8" Lifts to 85% STD. Proctor	1,278	CY	-	0.175	224	4,473	0	4.50	5,810
12	Placement of 30 Mil Flexible Membrane Liner	10,440	SF	0.19	0.009	94	1,879	1,984	0.40	3,680
13	Placement of 1'-0" Coarse Sand Drainage Layer	337	CY	10.50	0.035	12	238	3,541	11.40	3,860
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	635	LF	1.00	0.24	152	3,048	635	5.80	3,680
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X8-W 2.9xW 2.8(wid.wire fab)Broom Finish.	1,060	SY	7.50	0.5	530	10,800	7,960	17.90	18,970
16	Sprayed on Curing Compound	1,060	SY	0.25	0.015	16	318	265	0.80	880
17	Joint Sealant 6" PVC Water Stops	680	LF	3.00	0.14	95	1,904	2,040	5.80	3,940
18	Excavation of Traingular Drainage Ditch	44	CY	-	0.38	16	320	0	9.50	450
19	4" Thick Concrete Perimeter Drainage Ditch	134	SY	7.50	0.4	54	1,072	1,005	17.90	2,400
(E) PAGE 2 TOTAL					1,232	24,650	57,419	2,530		84,850

B-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 09/08/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area Inside the Security Fence	824	SY	0.25	0.017	14	280	208	84	0.70	570
21	Install 8' High Chain Link Perimeter Fence	719	LF	12	0.25	180	3,595	8,628	1,079	18.50	13,300
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,180
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(E) PAGES 1,2,3 TOTAL						2,837	58,743	75,944	11,753		148,080
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,078	1,899			2,980
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											7,400
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							23,129				23,130
(E) TOTAL DIRECT COST						2,840	60,850	77,840	11,750		181,870

B-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								6,450
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								9,000
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								18,100
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								18,100
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								36,310
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					591	11,224				11,220
7	Field Indirects of Total Direct Labor @ 48.5%, Bulk Material @ 28.5%						37,642	20,628			58,270
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					716					31,200
9	Project Management @ 8% of Total Direct + Indirects										29,580
(E) TOTAL INDIRECT COST											217,470

B-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										181,570
	TOTAL INDIRECT COST										217,470
	TOTAL INITIAL CONSTRUCTION COST										399,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Concrete Slab	0.2	AC								600
	• Cover Repair Due to Subsidence										900
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(E) TOTAL O & M COST										10,450

B-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE26042

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5296

DATE: 09/08/93

LOC: MDC-106

SUMMARY

ONE FIFTH (.2) ACRE SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	161,000
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(II) Total Initial Construction Cost	399,000
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(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)	560,000
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Appendix C
Cost Estimates for 0.5 Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGWLK

PHONE: 7-5298

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(A) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.80	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.165	666	13,316	0	3,995	4.30	17,310
12	Placement of Claymax Geotextile Mat	30,800	SF	0.50	0.01	308	6,160	15,400	-	0.70	21,560
13	Placement of 30 Mil Flexible Membrane Liner	30,800	SF	0.18	0.006	246	4,928	5,544	-	0.30	10,470
14	Placement of 1'-0" Coarse Sand Drainage Layer	1,062	CY	10.50	0.035	37	743	11,151	223	11.40	12,120
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	3,506	SY	0.18	0.006	21	421	631	-	0.30	1,050
16	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	65	1,697	4,545	509	5.80	6,750
17	Placement of 6" Topsoil	455	CY	9.50	0.06	36	727	4,318	218	11.60	5,290
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	216	SY	1.50	0.22	48	950	324	265	7.20	1,580
19	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.185	41	816	0	245	4.80	1,080
(A) PAGE 2 TOTAL						1,589	31,772	142,613	6,079		180,460

C-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5286

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,480
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(A) PAGES 1,2,3 TOTAL						3,407	68,144	165,803	18,427		256,150
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,295	4,145			5,440
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											12,810
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							27,775				27,780
(A) TOTAL DIRECT COST						3,410	97,210	169,950	18,430		302,180

C-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								9,070
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								15,110
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								30,220
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								30,220
5	Engineering & Services @ 20% of Total Direct Cost										60,440
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					709	13,476				13,480
7	Field Indirects on Total Direct Labor @ 46.5, Bulk Material @ 26.5%						45,203	45,037			90,240
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					859					37,540
9	Project Management @ 8% of Total Direct + Indirects										47,060
(A) TOTAL INDIRECT COST											333,400

C-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										302,180
	TOTAL INDIRECT COST										333,400
	TOTAL INITIAL CONSTRUCTION COST										636,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.5	AC								800
•	Cover Repair Due to Subsidence										500
•	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(A) TOTAL O & M COST										10,050

C-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5288
DATE: 09/09/93
LOC: MDC-108

S U M M A R Y

ONE HALF (.5) ACRE SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	154,000
(II) Total Initial Construction Cost	636,000

(A) TOTAL PROJECT COST (Rounded to the nearest Thousand)	790,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5268

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - BENTOMAT (GBM)</u>											
A	<u>1 DIRECT COSTS</u>										
I	<u>1 SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	600	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(L) PAGE 1 TOTAL						1,148	22,932	6,206	6,514		46,250

C-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	804	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.185	666	13,316	0	3,995	4.30	17,310
12	Placement of Bentonite Geotextile Mat	30,800	SF	0.50	0.01	308	6,160	15,400	-	0.70	21,560
13	Placement of 30 Mil Flexible Membrane Liner	30,800	SF	0.18	0.008	246	4,928	5,544	-	0.30	10,470
14	Placement of 1'-0" Coarse Sand Drainage Layer	1,082	CY	10.50	0.035	37	743	11,151	223	11.40	12,120
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	3,506	SY	0.18	0.008	21	421	631	-	0.30	1,050
16	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,543	509	5.80	6,750
17	Placement of 6" Topsoil	455	CY	9.50	0.08	36	727	4,318	218	11.60	5,290
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	216	SY	1.50	0.22	48	950	324	285	7.20	1,560
19	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.185	41	816	0	245	4.80	1,060
(L) PAGE 2 TOTAL						1,589	31,772	142,513	8,079		180,460

C-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PGW/LK
PHONE: 7-5206
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,460
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(L) PAGES 1,2,3 TOTAL						3,407	68,144	165,803	16,427		256,150
• Escalation for 1994 on Direct Labor is 1.8% and 2.5% on Direct Material							1,295	4,145			5,440
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											12,810
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							27,775				27,780
(L) TOTAL DIRECT COST						3,410	97,210	169,950	16,430		302,160

C-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

CHKD BY: 8. MEAD

ACTIVITY CODE: BSEZ60412

PROJ.NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

C-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											302,180
TOTAL INDIRECT COST											333,400
TOTAL INITIAL CONSTRUCTION COST											636,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.5	AC								600
•	Cover Repair Due to Subsidence										500
•	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
(L) TOTAL O & M COST											10,050

C-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5286
DATE: 09/09/93
LOC: MDC-106

SUMMARY	
<u>ONE HALF (.5) ACRE SITE - BENTOMAT (GBM)</u>	
C TOTAL COST (Total Present Worth)	
(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	154,000
(II) Total Initial Construction Cost	636,000
(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	790,000

C-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/MLK

PHONE: 7-5288

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - GUNDSEAL</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	86	5.60	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(I) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGWLK

PHONE: 7-5286

DATE: 09/09/93

LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH-\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
I COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil In 8" Lifts to 85% STD Proctor	4,035	CY	-	0.165	666	13,318	0	3,986	4.30	17,310
12	Placement of Gundseal Geomembrane/ Bentonite Mat	30,600	SF	0.50	0.01	306	6,100	15,400	-	0.70	21,560
13	Placement of 1'-0 Coarse Sand Drainage Layer	1,062	CY	10.50	0.035	37	743	11,151	223	11.40	12,120
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	3,506	SY	0.18	0.008	21	421	631	-	0.30	1,060
15	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	85	1,897	4,545	509	5.90	6,750
16	Placement of 6" Topsoil	455	CY	9.50	0.06	38	727	4,318	216	11.90	5,290
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	216	SY	1.50	0.22	48	960	324	285	7.20	1,560
18	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.185	41	816	0	245	4.80	1,060
(I) PAGE 2 TOTAL						1,342	28,944	157,006	6,079		169,960

C-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

CHKD BY: 8. MEAD

ESTD BY: PGM/LK

PHONE 7-5268

DATE 08/30/60

C-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/03/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								8,670
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								14,450
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								28,890
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								28,890
5	Engineering & Services @ 20% of Total Direct Cost										57,780
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					657	12,486				12,490
7	Field Indirects Labor @ 46.5%, Bulk Material @ 26.5%						41,934	43,532			85,470
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					796					34,780
9	Project Management @ 8% of Total Direct + Indirects										44,830
(I) TOTAL INDIRECT COST											316,290

C-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5286

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										288,940
	TOTAL INDIRECT COST										316,200
	TOTAL INITIAL CONSTRUCTION COST										605,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	0.5	AC								600
•	Cover Repair Due to Subsidence										450
•	Annual Fence Maintenance	1									100
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(I) TOTAL O & M COST										10,000

C-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5206
DATE: 09/09/93
LOC: MDC-106

SUMMARY

ONE HALF (.5) ACRE SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) **154,000**

(II) Total Initial Construction Cost **605,000**

(I) TOTAL PROJECT COST (Rounded to the nearest Thousand) **759,000**

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGAWLK

PHONE: 7-5266

DATE: 08/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	600	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,650
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(F) PAGE TOTAL						1,148	22,952	6,208	6,514		40,250

C-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE26012

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5208

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.185	666	13,318	0	3,995	4.30	17,310
12	Placement of 120 Mil Flexible Membrane Liner	30,600	SF	0.50	0.01	306	6,160	15,400	-	0.70	21,560
13	Placement of 1'-0" Coarse Sand Drainage Layer	1,062	CY	10.50	0.035	37	743	11,151	223	11.40	12,120
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	3,506	SY	0.18	0.006	21	421	631	-	0.30	1,050
15	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,545	509	5.80	6,750
16	Placement of 6" Topsoil	455	CY	9.50	0.06	36	727	4,318	218	11.80	5,260
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	216	CY	1.50	0.22	48	950	324	285	7.20	1,550
18	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.185	41	816	0	245	4.80	1,060
(F) PAGE TOTAL						1,342	26,844	137,068	6,079		189,980

C-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,400
20	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	16.50	17,320
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						3,161	63,216	160,259	16,427		245,680
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,201	4,006			5,210
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											12,280
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							25,767				25,770
(F) TOTAL DIRECT COST						3,160	90,180	164,270	16,430		266,940

C-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								8,670
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								14,450
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								28,600
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								28,600
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								57,700
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					657	12,486				12,490
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						41,834	43,532			85,470
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					796					34,780
9	Project Management @ 8% of Total Direct + Indirects										44,830
	(F) TOTAL INDIRECT COST										\$18,200

C-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PGWLK
PHONE: 7-5266
DATE: 08/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											288,940
TOTAL INDIRECT COST											316,260
TOTAL INITIAL CONSTRUCTION COST											605,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.5	AC								600
•	Cover Repair Due to Subsidence										450
•	Annual Fence Maintenance	1									100
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
(F) TOTAL O & M COST											10,000

C-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5286

DATE: 09/08/93

LOC: MDC-106

SUMMARY

ONE HALF (.5) ACRE SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

154,000

(II) Total Initial Construction Cost

605,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

759,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGAWLK

PHONE: 7-5206

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.6	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" DP	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	39.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(C) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

EST'D BY: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5268

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil In 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.165	666	13,316	0	3,995	4.00	17,310
12	Placement of 30 Mil Flexible Membrane Liner	30,800	SF	0.18	0.006	246	4,926	5,544	-	0.30	10,470
13	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	2,711 4,067	SY GAL	2	0.15	407	8,133	5,422	2,440	5.90	15,990
14	Placement of 1'-0" Coarse Sand Drainage Layer	904	CY	10.50	0.035	32	633	9,492	190	11.40	10,310
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	2,711	SY	0.18	0.006	16	325	468	-	0.30	810
16	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,545	509	5.60	6,750
17	Placement of 6" Topsoil	455	CY	9.50	0.06	36	726	4,323	216	11.60	5,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Crushed Stone	216	SY	1.50	0.22	48	950	324	285	7.20	1,560
19	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.165	41	816	0	245	4.80	1,060
(C) PAGE 2 TOTAL						1,677	33,540	130,637	8,486		172,650

C-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,460
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24 - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(C) PAGES 1,2,3 TOTAL						3,496	69,912	154,027	18,634		248,540
• Escalation for 1994 on Direct Labor is 1.5% and 2.5% on Direct Material							1,328	3,651			5,180
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											12,430
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							28,496				28,500
(C) TOTAL DIRECT COST						3,500	99,740	157,680	18,630		294,050

C-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5268

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								8,840
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								14,730
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								29,470
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								29,470
5	Engineering & Services @ 20% of Total Direct Cost										58,930
6	Craft Support @ 20.8 % of Total MNHRS (\$19/HR)					728	13,832				13,830
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						46,379	41,838			88,220
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					682					36,530
9	Project Management @ 8% on Total Direct + Indirects										48,130
	(C) TOTAL INDIRECT COST										328,150

C-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										294,650
	TOTAL INDIRECT COST										328,150
	TOTAL INITIAL CONSTRUCTION COST										623,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	0.5	AC								600
•	Cover Repair Due to Subsidence										500
•	Annual Fence Maintenance	1									100
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
•	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
	(C) TOTAL O & M COST										10,050

C-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

S U M M A R Y

ONE HALF (.5) ACRE SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	154,000
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(ii) Total Initial Construction Cost	623,000
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(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)	777,000
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C-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	300	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(D) PAGE 1 TOTAL						1,148	22,962	6,208	6,514		40,250

C-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE280412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK
PHONE: 7-5288
DATE: 09/09/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
H COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	804	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.185	668	13,318	0	3,995	4.30	17,310
12	Placement of Geotextile Reinforcement on Foundation Layer	2,711	SY	0.30	0.01	27	542	813	-	0.50	1,360
13	Placement of 30 Mil Flexible Membrane Liner	30,800	SF	0.18	0.006	248	4,928	5,544	-	0.30	10,470
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5gal/Sy	2,711 4,067	SY GAL	2.00	0.15	407	8,133	5,422	2,440	5.90	15,990
15	Placement of 1'-0" Coarse Sand Drainage Layer	904	CY	10.50	0.035	32	633	9,492	190	11.40	10,310
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	2,711	SY	0.18	0.006	18	325	488	-	0.30	810
17	Placement of 1'-8" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,545	509	5.60	6,750
18	Placement of 6" Topsoil	455	CY	9.50	0.08	36	728	4,323	218	11.60	5,270
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	216	SY	1.50	0.22	48	950	324	285	7.20	1,560
20	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.185	41	818	0	245	4.80	1,080
(D) PAGE TOTAL						1,704	34,062	131,851	8,486		174,210

C-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 08/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,400
22	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1,980	1,980
24	Warning Signs 4-18"x24" - Install	4	EA	250	2	8	160	1,000	-	290	1,180
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1,200	1,200
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2,560	10,320
(D) PAGES 1,2,3 TOTAL						3,523	70,454	154,841	18,834		248,900
							1,339	3,871			5,210
• Escalation for 1994 on Direct Labor is 1.8% and 2.5% on Direct Material											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											12,500
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							28,717				28,720
(D) TOTAL DIRECT COST						3,520	100,510	158,710	18,830		296,330

C-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5288
DATE: 09/09/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								8,630
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								14,820
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								29,630
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								29,630
5	Engineering & Services @ 20% of Total Direct Cost										59,270
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					732	13,911				13,910
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						46,737	42,058			88,800
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					667					29,760
9	Project Management @ 8% of Total Direct + Indirects										46,400
(D) TOTAL INDIRECT COST											330,100

C-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											296,330
TOTAL INDIRECT COST											330,100
TOTAL INITIAL CONSTRUCTION COST											626,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	0.5	AC								600
*	Cover Repair Due to Subsidence										550
*	Annual Fence Maintenance	1									100
*	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
*	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
(D) TOTAL O & M COST											10,100

C-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE280412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5288
DATE: 09/09/93
LOC: MDC-108

SUMMARY

ONE HALF (.5) ACRE SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 155,000

(ii) Total Initial Construction Cost 626,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand) 781,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	6.00	900
8	6' x 35' x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(K) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.185	666	13,316	0	3,995	4.30	17,310
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	1,695	CY	13.00	0.185	260	5,594	22,035	1,678	17.30	29,310
13	Placement of 30 Mil Flexible Membrane Liner	26,100	SF	0.18	0.006	209	4,176	4,698	-	0.30	8,870
14	Placement of 1'-0" Coarse Sand Drainage Layer	904	CY	10.50	0.035	32	632	9,487	190	11.40	10,310
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	2,785	SY	0.18	0.006	17	334	501	-	0.30	840
16	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,545	509	5.60	6,750
17	Placement of 6" Topsoil	455	CY	9.50	0.06	36	726	4,323	218	11.00	8,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	216	SY	1.50	0.22	48	950	324	265	7.20	1,560
19	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.185	41	816	0	245	4.60	1,060
(K) PAGE 2 TOTAL						1,513	30,257	146,612	7,724		164,600

C-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/MLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	810	0.70	3,480
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1960	1,960
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(K) PAGES 1,2,3 TOTAL						3,331	66,629	169,802	18,072		200,290
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,266	4,245			5,510
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											13,010
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							27,158				27,180
(K) TOTAL DIRECT COST						3,330	95,050	174,050	18,070		305,970

C-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								9,180
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								15,300
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								30,800
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								30,800
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								61,180
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					893	13,100				13,100
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						44,188	46,123			90,320
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					839					36,650
9	Project Management @ 8% of Total Direct + Indirects										47,440
	(K) TOTAL INDIRECT COST										334,440

C-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5268
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST										305,970
TOTAL INDIRECT COST										334,440
TOTAL INITIAL CONSTRUCTION COST										640,000
B	<u>O & M COSTS</u>									
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA							3,000
•	Inspection Activities of Facility - Monthly	48	HR		75.00	3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00	1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.5	AC							600
•	Cover Repair Due to Subsidence									1,200
•	Annual Fence Maintenance	1								100
	Annual Sign Maintenance	4								150
•	Annual Monitoring Well Maintenance	4			75.00	300				300
(K) TOTAL O & M COST										10,750

C-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5288
DATE: 08/09/93
LOC: MDC-108

SUMMARY	
<u>ONE HALF (.5) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>	
C TOTAL COST (Total Present Worth)	
(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	165,000
(ii) Total Initial Construction Cost	640,000
(K) TOTAL PROJECT COST (Rounded to the nearest Thousand)	805,000

C-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5288

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>I SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.10	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(J) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.165	666	13,316	0	3,995	4.30	17,310
12	Compact 2'-0" Thick Clay Layer in 8" Lifts	1,695	CY	-	0.165	280	5,594	0	1,678	4.30	7,270
13	Placement of 30 Mil Flexible Membrane Liner	26,100	SF	0.18	0.008	209	4,176	4,696	-	0.30	8,870
14	Placement of 1'-0" Coarse Sand Drainage Layer	904	CY	10.50	0.035	32	632	9,487	190	11.40	10,310
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	2,785	SY	0.18	0.008	17	334	501	-	0.30	840
16	Placement of 1'-8" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,545	509	5.00	6,750
17	Placement of 6" Topsoil	455	CY	9.50	0.08	36	726	4,323	216	11.00	5,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	216	SY	1.50	0.22	48	950	324	265	7.20	1,560
19	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.165	41	816	0	245	4.00	1,000
(J) PAGE 2 TOTAL						1,513	30,257	124,577	7,724		162,500

C-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 08/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,480
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(J) PAGES 1,2,3 TOTAL						3,331	66,629	147,767	18,072		238,250
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,266	3,694			4,960
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											11,910
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							27,158				27,160
(J) TOTAL DIRECT COST						3,330	66,060	151,460	18,070		282,280

C-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK
PHONE: 7-6266

DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								8,470
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								14,110
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								28,230
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								28,230
5	Engineering & Services @ 20% of Total Direct Cost										56,460
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					693	13,160				13,160
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						44,196	40,137			84,340
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					839					36,530
9	Project Management @ 8% of Total Direct + Indirects										44,160
	(J) TOTAL INDIRECT COST										\$13,800

C-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5268

DATE: 09/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										252,200
	TOTAL INDIRECT COST										\$13,800
	TOTAL INITIAL CONSTRUCTION COST										598,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
*	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	0.5	AC								600
*	Cover Repair Due to Subsidence										1,100
*	Annual Fence Maintenance	1									100
*	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
	(J) TOTAL O & M COST										10,950

C-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PGWLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

S U M M A R Y

ONE HALF (.5) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	164,000
(II) Total Initial Construction Cost	596,000

(J) TOTAL PROJECT COST (Rounded to the nearest Thousand)	760,000
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C-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 10/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - SOIL CEMENT COVER</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(G) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 10/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.00	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.165	666	13,318	0	3,995	4.30	17,310
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	2,572	CY	18	0.165	424	8,488	48,296	2,546	22.30	57,330
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	2,746	SY	0.33	0.05	137	2,746	906	-	1.30	3,650
		2,746	SY	0.17	0.03	82	1,647	487	-	0.80	2,110
14	Placement of 30 Mil Flexible Membrane Liner	26,100	SF	0.16	0.008	209	4,176	4,696	-	0.30	8,870
15	Placement of 1'-0" Coarse Sand Drainage Layer	904	CY	10.50	0.035	32	632	9,487	190	11.40	10,310
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	2,785	SY	0.18	0.008	17	334	501	-	0.50	640
17	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,545	509	5.00	6,750
18	Placement of 6" Topsoil	455	CY	9.50	0.08	36	727	4,318	218	11.00	5,200
(G) PAGE 2 TOTAL						1,789	35,777	171,918	8,062		215,750

C-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/MLK

PHONE: 7-5266

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	216	SY	1.50	0.22	48	950	324	285	7.20	1,500
20	Excavation of Trapezoidal Drainage Ditch	221	CY	-	0.185	41	816	0	245	4.80	1,080
21	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,400
22	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
24	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,180
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						3,696	73,915	185,432	18,940		294,060
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,404	4,886			6,290
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											14,700
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							30,128				30,130
(G) TOTAL DIRECT COST						3,700	105,450	200,320	18,940		345,180

C-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								10,360
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								17,260
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								34,520
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								34,520
5	Engineering & Services @ 20% of Total Direct Cost										69,040
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					770	14,622				14,620
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						49,034	53,065			102,120
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					932					40,750
9	Project Management @ 8% of Total Direct + Ind		8.0%								53,470
	(G) TOTAL INDIRECT COST										378,640

C-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

EST'D BY: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5288

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											345,180
TOTAL INDIRECT COST											376,640
TOTAL INITIAL CONSTRUCTION COST											722,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.5	AC								600
	• Cover Repair Due to Subsidence										1,150
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(G) TOTAL O & M COST											10,700

C-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PQW/LK

PHONE: 7-5266

DATE: 10/07/93

LOC: MDC-108

SUMMARY

ONE HALF (.5) ACRE SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

164,000

(II) Total Initial Construction Cost

722,000

(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)

886,000

C-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5288

DATE: 10/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST. QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$5/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	680	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(H) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	4,035	CY	-	0.165	666	13,318	0	3,995	4.30	17,310
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	25	TN	146.50	3.0	75	1,500	3,663	-	206	6,160
		887	CY	15.00	0.165	146	2,927	13,305	678	19.30	17,110
13	Placement of 30 Mil Flexible Membrane Liner	26,100	SF	0.16	0.006	209	4,176	4,696	-	0.30	6,670
14	Placement of 1'-0 Coarse Sand Drainage Layer	904	CY	10.50	0.035	32	632	9,467	190	11.40	10,310
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	2,785	SY	0.16	0.006	17	334	501	-	0.30	640
16	Placement of 1'-6" Common Fill	1,212	CY	3.75	0.07	85	1,697	4,545	509	5.60	6,750
17	Placement of 6" Topsoil	455	CY	9.50	0.06	36	727	4,318	216	11.60	5,260
(H) PAGE 2 TOTAL						1,366	27,323	141,216	6,394		174,930

C-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	216	SY	1.50	0.22	48	950	324	285	7.20	1,560
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	221	CY	-	0.185	41	816	0	245	4.80	1,000
20	Seeding, Fertilizing & Mulching	5,000	SY	0.25	0.017	85	1,700	1,250	510	0.70	3,480
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	16.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1960	1,960
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	60.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						3,273	65,482	164,730	17,271		253,240
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Materials							1,244	4,116			5,360
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											12,680
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							26,682				26,680
(H) TOTAL DIRECT COST						3,270	93,390	168,850	17,270		297,940

C-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

EST'D BY: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5266

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								8,940
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								14,900
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								29,790
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								29,790
5	Engineering & Services @ 20% of Total Direct Cost										59,590
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					680	12,923				12,920
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						43,426	44,745			88,170
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					824					35,990
9	Project Management @ 8% of Total Direct + Indirects										46,240
	(H) TOTAL INDIRECT COST										328,530

C-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

EST'D BY: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5298

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 10/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										297,940
	TOTAL INDIRECT COST										328,330
	TOTAL INITIAL CONSTRUCTION COST										624,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	0.5	AC								600
	• Cover Repair Due to Subsidence										750
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(H) TOTAL O & M COST										10,300

C-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

D B T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5286
DATE: 10/07/93
LOC: MDC-106

SUMMARY

ONE HALF (.5) ACRE SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	158,000
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(II Total Initial Construction Cost	624,000
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	782,000
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C-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5208

DATE: 08/09/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	672	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(B) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PGW/LK

PHONE: 7-5266

DATE: 09/09/93

LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	3195	CY	-	0.165	527	10,544	0	3,163	4.30	13,710
12	Placement of 30 Mil Flexible Membrane Liner	26,100	SF	0.18	0.008	209	4,178	4,898	-	0.30	8,870
13	Placement of 1'-0 Coarse Sand Drainage Layer	843	CY	10.50	0.035	30	590	8,852	177	11.40	9,620
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	980	LF	1.0	0.24	235	4,704	980	-	5.80	5,680
15	2 1/2" Binder Course	2650	SY	4.20	0.06	159	3,180	11,130	954	5.80	15,280
16	4" Hydraulic Asphalt Conc.	2650	SY	6.75	0.03	80	1,590	17,888	477	7.50	19,950
17	Asphalt Mastic Seal	2650	SY	0.50	0.015	40	795	1,325	-	0.60	2,120
18	Sprayed Asphaltic Concrete Sealant	2650	SY	0.75	0.02	53	1,060	1,968	318	1.30	3,570
19	Excavation of Traingular Drainage Ditch	111	CY	-	0.3	33	666	0	200	7.60	870
20	4" Thick Asphalt Perimeter Drainage Ditch	335	SY	7.85	0.15	50	1,005	2,630	302	11.00	3,940
(B) PAGE 2 TOTAL						1,518	30,324	150,189	6,195		186,710

C-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR \$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	2061	SY	0.25	0.017	35	701	515	210	0.70	1,430
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(B) PAGES 1,2,3 TOTAL						621	12,421	14,247	3534		33,410
						3,265	65,696	172,645	18,242		260,370
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,248	4,318			5,560
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											13,020
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							26,776				26,780
(B) TOTAL DIRECT COST						3,260	83,720	176,960	18,240		305,730

C-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

EST'D BY: PG/WLK

ACTIVITY CODE: E3E260412

PHONE: 7-5266

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								9,170
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								15,290
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								30,570
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								30,570
5	Engineering & Services @ 20% of Total Direct Cost										61,150
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					662	12,963				12,960
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						43,580	46,894			90,470
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					827					36,100 216,250
9	Project Management @ 8% of Total Direct + Indirects										47,360
	(B) TOTAL INDIRECT COST										333,840

C-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5286

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR \$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											305,730
TOTAL INDIRECT COST											333,640
TOTAL INITIAL CONSTRUCTION COST											639,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	0.5	AC								1,500
	• Cover Repair Due to Subsidence										700
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(B) TOTAL O & M COST											11,150

C-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L B S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PGW/LK
PHONE: 7-3206
DATE: 09/03/93
LOC: MDC-108

SUMMARY	
<u>ONE HALF (.5) ACRE SITE - ASPHALTIC CONCRETE</u>	
C TOTAL COST (Total Present Worth)	
(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	171,000
(II) Total Initial Construction Cost	639,000
(B) TOTAL PROJECT COST (Rounded to the nearest Thousand)	810,000

C-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>ONE HALF (.5) ACRE SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	2.8	AC	-	40	112	2,240	0	872	-	2,910
2	Precontouring Site	2.3	AC	-	32	74	1,472	0	442	-	1,910
3	Silt Fence (Includes Maintenance)	720	LF	0.50	0.1	72	1,440	360	-	2.50	1,800
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	320
5	20' Wide Gravel Haul Road x 8" Deep	500	LF	8.50	0.22	110	2,200	4,250	660	14.20	7,110
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(E) PAGE 1 TOTAL						1,148	22,952	6,208	6,514		40,250

C-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: E3E260412
PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	1,007	TN	100	0.1	101	2,014	100,700	604	102.60	103,320
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	3,195	CY	-	0.165	527	10,544	0	3,163	4.30	13,710
12	Placement of 30 Mil Flexible Membrane Liner	26,100	SF	0.18	0.008	209	4,176	4,696	-	0.30	8,870
13	Placement of 1'-0 Coarse Sand Drainage Layer	843	CY	10.50	0.035	30	590	8,852	177	11.40	9,620
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	980	LF	1.00	0.24	235	4,704	980	-	5.60	5,680
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X6-W 2.9xW 2.9(wid.wire fab)Broom Finish.	2,650	SY	7.50	0.50	1325	26,500	19,875	(0.80/hr) 1,000 (comp rate)	17.90	47,440
16	Sprayed on Curing Compound	2,650	SY	0.25	0.015	40	795	863	239	0.60	1,700
17	Joint Sealant 6" PVC Water Stops	1,700	LF	3.00	0.14	238	4,760	5,100	-	5.60	9,660
18	Excavation of Traingular Drainage Ditch	111	CY	-	0.3	33	666	0	200	7.80	870
19	4" Thick Concrete Perimeter Drainage Ditch	335	SY	7.40	0.36	127	2,548	2,479	764	17.30	5,790
(E) PAGE 2 TOTAL						2,665	57,295	143,348	6,206		206,600

C-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
EST'D BY: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	2,061	SY	0.25	0.017	35	701	515	210	0.70	1,430
21	Install 8' High Chain Link Perimeter Fence	936	LF	12	0.25	234	4,680	11,232	1,404	18.50	17,320
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2.00	8	160	1,000	-	290	1,180
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(E) PAGES 1,2,3 TOTAL						4,633	92,667	165,801	16,254		280,520
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							1,781	4,145			5,910
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											14,030
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							37,771				37,770
(E) TOTAL DIRECT COST						4,630	132,200	169,950	16,250		336,230

C-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

EST'D BY: PG/WLK

PHONE: 7-5206

DATE: 09/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								10,150
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								18,910
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								33,820
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								33,820
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								67,650
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					963	18,296				18,300
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 28.5%						61,473	45,037			106,510
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,167					80,960
9	Project Management @ 8% of Total Direct + Indirects										54,110
(E) TOTAL INDIRECT COST											392,230

C-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											336,230
TOTAL INDIRECT COST											392,230
TOTAL INITIAL CONSTRUCTION COST											730,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Concrete Slab	0.5	AC								1,000
	• Cover Repair Due to Subsidence										1,300
	• Annual Fence Maintenance	1									100
	• Annual Sign Maintenance	4									160
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(E) TOTAL O & M COST											11,250

C-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

EST'D BY: PG/WLK

PHONE: 7-5200

DATE: 09/09/93

LOC: MDC-100

S U M M A R Y

ONE HALF (.5) ACRE SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

173,000

(II Total Initial Construction Cost

730,000

(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)

903,000

C-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

Appendix D
Cost Estimates for 1-Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGAWLK

PHONE: 7-5206

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	812	-	3,850
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	480
5	8"DP x 20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	8,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	800
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(A) PAGE 1 TOTAL						1,236	24,712	7,318	6,834		43,880

D-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5268

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$5/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1208	102.80	208,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	8,070	CY	-	0.185	1332	28,631	0	7989	4.30	34,820
12	Placement of Claymax Geotextile Mat	61,600	SF	0.45	0.01	616	12,320	27,720	-	0.70	40,040
13	Placement of 30 Mil Flexible Membrane Liner	61,600	SF	0.18	0.008	493	9,856	11,088	-	0.30	20,940
14	Placement of 1'-0" Coarse Sand Drainage Layer	2,124	CY	10.50	0.03	64	1,274	22,302	382	11.30	23,660
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	7,011	SY	0.18	0.008	42	841	1,262	-	0.30	2,100
16	Placement of 1'-6" Common Fill	2,424	CY	3.75	0.06	145	2,909	9,090	873	5.30	12,870
17	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,636	382	11.30	10,290
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	297	SY	1.50	0.22	65	1,307	448	382	7.20	2,140
19	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.185	82	1,632	0	490	4.80	2,120
(A) PAGE 2 TOTAL						3,104	62,071	281,943	11,716		355,720

D-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	980	0.70	8,660
21	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1770	18.50	21,630
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1920	2580	10,320
(A) PAGES 1,2,3 TOTAL						5,146	102,923	310,421	23,300		442,550
• Escalation for 1994 on Direct Labor is 1.9% & on Direct material is 2.5%							1,956	7,761			9,720
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											22,610
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							41,850				41,850
(A) TOTAL DIRECT COST						5,150	148,830	318,180	23,300		516,830

D-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								15,500
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								25,840
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								51,680
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								51,680
5	Engineering & Services @ 20% of Total Direct Cost										103,370
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					1,071					20,350
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						66,276	84,318			152,590
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					1,296					56,690
9	Project Management @ 8% of Total Direct + Indirects										79,580
(A) TOTAL INDIRECT COST											557,200

D-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5200

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH:\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											616,630
TOTAL INDIRECT COST											557,200
TOTAL INITIAL CONSTRUCTION COST											1,074,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	1	AC								1,000
	• Cover Repair Due To Subsidence										800
	• Annual Fence Maintenance	1									150
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(A) TOTAL O & M COST											10,800

D-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5208
DATE: 09/10/93
LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) **166,000**

(ii) Total Initial Construction Cost **1,074,000**

(A) TOTAL PROJECT COST (Rounded to the nearest Thousand) **1,240,000**

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
1	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	812	-	3,850
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	538	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	460
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(L) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,860

D-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PQW/LK
PHONE: 7-8286
DATE: 09/10/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH-\$20	MAT'L \$	BEACAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1208	102.80	208,640
11	Place and Compact Foundation Soil In 8" Lifts to 95% Standard Proctor	8,070	CY	-	0.185	1332	26,631	0	7869	4.30	34,620
12	Placement of Bentomat Geotextile Mat	61,800	SF	0.45	0.01	618	12,320	27,720	-	0.70	40,040
13	Placement of 30 Mil Flexible Membrane Liner	61,800	SF	0.16	0.008	493	9,856	11,008	-	0.30	20,940
14	Placement of 1'-0" Coarse Sand Drainage Layer	2,124	CY	10.50	0.03	64	1,274	22,302	382	11.30	23,900
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	7,011	SY	0.18	0.008	42	841	1,262	-	0.30	2,100
16	Placement of 1'-8" Common Fill	2,424	CY	3.75	0.06	145	2,909	9,050	873	5.30	12,870
17	Placement of 6" Topsoil	809	CY	8.50	0.07	66	1,327	8,638	388	11.40	10,360
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	237	SY	1.50	0.22	65	1,307	446	382	7.20	2,140
19	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.185	82	1,632	0	490	4.80	2,120
(L) PAGE 2 TOTAL						3,106	62,125	281,843	11,732		355,790

D-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5286

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$2/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	960	0.70	6,660
21	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1,770	18.50	21,830
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1960	1,960
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2560	10,320
(L) PAGES 1,2,3 TOTAL						5,149	102,977	310,421	23,316		442,620
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							1,957	7,761			9,720
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											22,620
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							41,970				41,970
(L) TOTAL DIRECT COST						5,150	146,900	318,180	23,320		516,930

D-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5286

DATE: 09/10/93

LOC: MDC-106

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

LINE #	ACTIVITY	EST	UM	UNIT	MAT'L	UNIT	MH	TOTAL	LABOR	MH	\$64.20	MAT'L	\$	BEMCAP	\$64/MH	UNIT	COST	TOTAL	COST
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS															18,510	
2	Health & Safety Assume 5% of Total Direct Cost	1	LS															25,850	
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS															51,680	
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS															51,680	
5	Engineering & Services @ 20% of Total Direct Cost																	103,360	
6	Craft Support @ 20.8% of Total MHR(\$19/hr)																	20,330	
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%																	152,630	
8	Construction Normal @ 25.2% of Total Direct MH @ Rate Of \$43.68																	56,080	
9	Project Management @ 8% of Total Direct + Indirects																	79,560	
(L) TOTAL INDIRECT COST																		557,360	

D-2. Cost Estimate for a Cover System Utilizing Bentonmat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											\$16,830
TOTAL INDIRECT COST											\$57,300
TOTAL INITIAL CONSTRUCTION COST											1,074,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	1	AC								1,000
•	Cover Repair Due To Subsidence										800
•	Annual Fence Maintenance	1									150
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
(L) TOTAL O & M COST											10,800

D-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5206
DATE: 08/10/93
LOC: MDC-106

S U M M A R Y

ONE(1) ACRE SITE - BENTOMAT (GBM)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	166,000
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(II) Total Initial Construction Cost	1,074,000
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(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	1,240,000
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D-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5208

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - GUNDSEAL</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	812	-	3,850
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	400
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	800
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(I) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,680

D-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	DEM CAP \$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1206	102.00	206,640
11	Place and Compact Foundation Soil In 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.165	1332	26,631	0	7969	4.30	34,620
12	Placement of Gundseal Geomembrane/ Bentonite Mat	61,600	SF	0.50	0.01	616	12,320	50,600	-	0.70	43,120
13	Placement of 1'-0" Coarse Sand Drainage Layer	2,124	CY	10.50	0.03	64	1,274	22,302	362	11.30	23,960
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	7,011	SY	0.16	0.006	42	841	1,262	-	0.30	2,100
15	Placement of 1'-8" Common Fill	2,424	CY	3.75	0.06	145	2,909	9,090	873	5.30	12,870
16	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,636	362	11.30	10,290
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	297	SY	1.50	0.22	65	1,307	446	392	7.20	2,140
18	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.165	62	1,632	0	490	4.60	2,120
(I) PAGE 2 TOTAL						2,611	52,215	273,935	11,718		337,800

D-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5268
DATE: 09/10/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	960	0.70	6,000
20	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1770	18.50	21,830
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
22	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	60	320	6,400	2,000	1920	2500	10,320
PAGES 1,2,3 TOTAL						4,653	93,067	302,413	23,300		424,690
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							1,768	7,560			9,330
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											21,700
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							37,930				37,930
(I) TOTAL DIRECT COST						4,650	132,760	309,970	23,300		493,650

D-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								14,810
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								24,660
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								49,370
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								49,370
5	Engineering & Services @ 20% of Total Direct Cost										98,730
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					970					18,430
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						61,733	62,142			143,860
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					1,172					51,180
9	Project Management @ 8% of Total Direct + Indirects										75,530
	(I) TOTAL INDIRECT COST										525,960

D-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5206

DATE: 08/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											493,050
TOTAL INDIRECT COST											525,900
TOTAL INITIAL CONSTRUCTION COST											1,020,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	1	AC								1,000
	• Cover Repair Due To Subsidence										750
	• Annual Fence Maintenance	1									150
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(I) TOTAL O & M COST											10,750

D-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

SUMMARY

ONE(1) ACRE SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

165,000

(ii) Total Initial Construction Cost

1,020,000

(i) TOTAL PROJECT COST (Rounded to the nearest Thousand)

1,185,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	912	-	3,950
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	460
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(F) PAGE TOTAL						1,236	24,712	7,318	6,934		43,680

D-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	SEMCAP \$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1,208	102.80	206,840
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.185	1332	26,631	0	7,989	4.30	34,620
12	Placement of 120 Mil Flexible Membrane Liner	61,600	SF	0.50	0.01	616	12,320	50,600	-	0.70	43,120
13	Placement of 1'-0" Coarse Sand Drainage Layer	2,124	CY	10.50	0.03	64	1,274	22,302	382	11.30	23,960
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	7,011	SY	0.18	0.008	42	841	1,262	-	0.30	2,100
15	Placement of 1'-6" Common Fill	2,424	CY	3.75	0.06	145	2,909	9,080	873	5.30	12,870
16	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,636	382	11.30	10,290
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	297	SY	1.50	0.22	65	1,307	448	382	7.20	2,140
18	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.185	82	1,632	0	490	4.00	2,120
(F) PAGE TOTAL						2,611	52,215	273,935	11,718		337,880

D-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5288
DATE: 09/10/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mutching	10,000	SY	0.25	0.016	160	3,200	2,500	980	0.70	6,680
20	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1,770	18.50	21,830
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						4,653	93,087	302,413	23,300		424,690
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Materials 2.5%							1,768	7,560			9,330
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											21,700
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							37,930				37,930
(F) TOTAL DIRECT COST						4,650	132,780	309,970	23,300		483,650

D-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK
PHONE: 7-5206

DATE: 08/10/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								14,810
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								24,880
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								49,370
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								49,370
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								98,730
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					970					18,430
7	Field Indirects of Total Direct Labor @ 46.5, Material @ 28.5%						61,733	82,142			143,880
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,172					51,160
9	Project Management @ 8% of Total Direct + Indirects										75,530
(F) TOTAL INDIRECT COST											525,960

D-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: BSE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 09/10/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										493,650
	TOTAL INDIRECT COST										525,900
	TOTAL INITIAL CONSTRUCTION COST										1,020,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility-Monthly	48	HR		75.00		3,600				3,600
•	Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	1	AC								1,000
•	Cover Repair Due To Subsidence										750
•	Annual Fence Maintenance	1									150
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(F) TOTAL O & M COST										10,750

D-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGAWLK

PHONE: 7-5206

DATE: 09/10/93

LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

165,000

(II) Total Initial Construction Cost

1,020,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

1,185,000

D-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.6	AC	-	40	152	3,040	0	912	-	3,950
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	460
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-18" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	36.00	2,430
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6' x 35' x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(C) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,660

D-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$5/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1,208	102.00	206,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.165	1332	26,631	0	7,980	4.30	34,620
12	Placement of 30 Mil Flexible Membrane Liner	61,600	SF	0.18	0.006	493	9,858	11,000	-	0.30	20,940
13	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	5,422 8,133	SY GAL	2	0.15	813	16,266	10,644	4,000	5.90	31,990
14	Placement of 1'-0" Coarse Sand Drainage Layer	1,807	CY	10.50	0.03	54	1,084	18,974	325	11.30	20,360
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	5,422	SY	0.18	0.006	33	651	976	-	0.30	1,630
16	Placement of 1'-6" Common Fill	2,424	CY	3.75	0.06	145	2,909	9,090	873	5.30	12,870
17	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,636	362	11.30	10,290
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	297	SY	1.50	0.22	65	1,307	448	392	7.20	2,140
19	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.165	62	1,632	0	490	4.60	2,120
(C) PAGE 2 TOTAL						3,262	65,638	261,452	16,539		343,620

D-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

CHKD BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5266

DATE: 08/10/93

LOC: MDC-106

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ACTIVITY CODE: ESE26M12

LOG #: 7-03

LINE #	ACTIVITY	EST	UM UNIT	MATL UNIT	TOTAL	LABOR MH	MH	MH	MH	\$	BEMCAP	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500			960	0.70	6,000
21	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160			1,770	18.50	21,830
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500			-	1980	1,980
23	Warning Signs 4'-18"x24" - Installed	4	EA	250	2	8	160	1,000			-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0			-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000			1,920	2580	10,320
(C) PAGES 1,2,3 TOTAL													
		5,324		106,468		269,830		28,122					430,450
	Escalation for 1994 on Direct Labor is 1.8% & on Direct Material is 2.5%					2,023		7,246					9,270
	Clean up & Demobilize												21,990
	LOCATION FACTOR @ 40% on												43,400
	(Total Labor Cost + Escalation)												
	(C) TOTAL DIRECT COST					5,320		151,910		297,160		28,120	806,110

D-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5206

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$2/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								15,150
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								25,200
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								50,510
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								50,510
5	Engineering & Services @ 20% of Total Direct Cost										101,020
6	Craft Support @ 20.8 % of Total Direct MHRS(\$19/hr)					1,110					21,090
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						70,836	78,753			149,589
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,342					58,610
9	Project Management @ 8% on Total Direct + Indirects										78,130
(C) TOTAL INDIRECT COST											549,670

D-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/10/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										505,110
	TOTAL INDIRECT COST										549,870
	TOTAL INITIAL CONSTRUCTION COST										1,055,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	1	AC								1,000
•	Cover Repair Due To Subsidence										800
•	Annual Fence Maintenance	1									150
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
•	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
	(C) TOTAL O & M COST										10,800

D-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 09/10/93
LOC: MDC-106

S U M M A R Y

ONE(1) ACRE SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	163,000
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(ii) Total Initial Construction Cost	1,055,000
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(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)	1,221,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	912	-	3,950
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	480
5	20' Wide Gravel Haul Road x 8" Deep	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	8Y	3.00	0.1	16	320	480	96	5.00	800
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	8	MO	-	-	0	0	0	-	720	4,320
(D) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,660

D-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5208
DATE: 09/10/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1,208	102.80	208,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.185	1332	26,631	0	7,989	4.30	34,820
12	Placement of 30 Mil Flexible Membrane Liner	61,600	SF	0.18	0.008	493	9,856	11,088	-	0.30	20,940
13	Placement of Geotextile Reinforcement on Foundation Layer	5422	SY	0.30	0.01	54	1,084	1,627	-	0.50	2,710
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5g/Sy	5,422 8,133	SY GAL	2	0.15	813	16,266	10,844	4,880	5.90	51,880
15	Placement of 1'-0" Coarse Sand Drainage Layer	1,807	CY	10.50	0.03	54	1,084	18,974	325	11.30	20,380
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	5,422	SY	0.18	0.008	33	651	976	-	0.30	1,630
17	Placement of 1'-6" Common Fill	2,424	CY	3.75	0.08	145	2,909	9,090	873	5.30	12,870
18	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,636	382	11.30	10,250
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	297	SY	1.50	0.22	65	1,307	448	392	7.20	2,140
20	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.185	82	1,632	0	490	4.80	2,120
(D) PAGE TOTAL						3,336	66,720	263,078	16,539		346,330

D-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	980	0.70	6,660
22	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,180	1,770	18.50	21,830
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
24	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(D) PAGES 1,2,3 TOTAL						5,379	107,572	291,557	28,122		433,160
* Escalation for 1994 on Direct Labor is 1.8% & on Direct Material is 2.5%							2,044	7,289			9,333
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											22,120
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							43,850				43,850
(D) TOTAL DIRECT COST						5,380	153,470	298,850	28,120		506,460

D-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: BSE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGW/LK
PHONE: 7-5268
DATE: 09/10/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								15,250
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								25,420
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								50,850
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								50,850
5	Engineering & Services @ 20% of Total Direct Cost										101,690
6	Craft Support @ 20.8% of Total Direct MHRS(\$19/hr)					1120					21,280
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						71,364	79,195			150,559
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,358					59,220
9	Project Management @ 8% of Total Direct + Indirects										78,090
(D) TOTAL INDIRECT COST											553,810

D-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										508,400
	TOTAL INDIRECT COST										653,810
	TOTAL INITIAL CONSTRUCTION COST										1,062,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Closed Facility Monthly	48	HR	0	75.00		3,600				3,600
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	1	AC								1,000
*	Cover Repair Due To Subsidence										650
*	Annual Fence Maintenance	1									150
	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
*	Subsidence Monitoring (Annual Survey)	16	HR		75.00		1,200				1,200
	(D) TOTAL O & M COST										10,850

D-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5206
DATE: 09/10/93
LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 167,000

(II) Total Initial Construction Cost 1,062,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand) 1,229,000

D-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	912	-	3,950
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	480
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(K) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,600

D-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-8266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,026	201,400	1,206	102.60	206,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.165	1332	26,631	0	7,989	4.30	34,620
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	3,390	CY	13.00	0.165	559	11,167	44,070	3,356	17.30	58,610
13	Placement of 30 Mil Flexible Membrane Liner	52,200	SF	0.18	0.006	418	8,352	9,398	-	0.30	17,750
14	Placement of 1'-0" Coarse Sand Drainage Layer	1,807	CY	10.50	0.03	54	1,084	18,974	325	11.30	20,560
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	5,569	SY	0.18	0.006	33	668	1,002	-	0.30	1,670
16	Placement of 1'-8" Common Fill	2,424	CY	3.75	0.06	145	2,909	9,090	873	5.30	12,670
17	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,636	362	11.30	10,290
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	297	SY	1.50	0.22	65	1,307	446	392	7.20	2,140
19	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.165	82	1,632	0	490	4.60	2,120
(K) PAGE 2 TOTAL						2,954	59,070	293,013	15,015		367,080

D-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 09/10/93
LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	960	0.70	6,060
21	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1,770	18.50	21,830
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,820	2560	10,320
(K) PAGES 1,2,3 TOTAL						4,996	99,922	321,491	26,599		453,920
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							1,899	8,037			9,940
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											22,700
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							40,730				40,730
(K) TOTAL DIRECT COST						5,000	142,550	329,530	28,600		527,280

D-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-6288

DATE: 08/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								15,820
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								28,360
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								52,730
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								52,730
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								105,460
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					1,040					19,760
7	Field Indirects of Total Direct Labor @ 48.5%, Material @ 26.5%						66,266	87,325			153,610
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					1,260					55,040
9	Project Management @ 8% of Total Direct + Indirects										80,700
(K) TOTAL INDIRECT COST											562,210

D-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 09/10/93
LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										527,290
	TOTAL INDIRECT COST										562,210
	TOTAL INITIAL CONSTRUCTION COST										1,090,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,900
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,900
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	1	AC								1,000
	• Cover Repair Due To Subsidence										1,900
	• Annual Fence Maintenance	1									150
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(K) TOTAL O & M COST										11,800

D-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG # : 7-03

ACTIVITY CODE: ESIE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWHLK

PHONE: 7-5286

DATE: 08/10/93

LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

181,000

(ii) Total Initial Construction Cost

1,080,000

(K) TOTAL PROJECT COST (Rounded to the nearest Thousand)

1,271,000

D-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGAWLK

PHONE: 7-6266

DATE: 08/10/93

LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH\$20	MAT'L \$	BEMCAP \$/SMH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>1 SITE PREPARATION</u>										
1	Clearing & Grubbing	3.6	AC	-	40	162	3,040	0	912	-	3,950
2	Precontouring Site	2.6	AC	-	32	90	1,782	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	460	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	460
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,400	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,260	786	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
<u>(J) PAGE 1 TOTAL</u>						1,236	24,712	7,318	6,934		43,660

D-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSR260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	DEM CAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1,208	102.60	208,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.105	1332	26,631	0	7,989	4.30	34,620
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	3,390	CY	-	0.105	559	11,187	0	3,358	4.30	14,540
13	Placement of 30 Mil Flexible Membrane Liner	52,200	SF	0.18	0.008	418	8,352	9,398	-	0.30	17,750
14	Placement of 1'-0 Coarse Sand Drainage Layer	1,607	CY	10.50	0.03	54	1,084	18,974	325	11.30	20,300
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	5,569	SY	0.18	0.008	33	668	1,002	-	0.30	1,670
16	Placement of 1'-6" Common Fill	2,424	CY	3.75	0.08	145	2,909	9,090	873	5.30	12,870
17	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,538	362	11.30	10,290
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	297	SY	1.50	0.22	65	1,307	448	392	7.20	2,140
19	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.185	82	1,632	0	490	4.80	2,120
(J) PAGE 2 TOTAL						2,954	59,070	249,943	15,015		323,020

D-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK
PHONE: 7-5296
DATE: 09/10/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	960	0.70	6,660
21	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1,770	19	21,830
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2560	10,320
(J) PAGES 1,2,3 TOTAL						4,996	99,922	277,421	26,599		409,650
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							1,899	6,936			8,830
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											20,830
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							40,730				40,730
(J) TOTAL DIRECT COST						5,000	142,550	284,360	26,600		460,340

D-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 09/10/93

LOC: MOC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								14,410
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								24,020
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								48,030
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								48,030
5	Engineering & Services @ 20% of Total Direct Cost										96,070
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					1,040					19,760
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						66,286	75,355			141,640
8	Construction Normmanual @ 25.2% of Total MH @ Rate of \$43.68					1,200					52,416
9	Project Management @ 8% of Total Direct + Indirects										80,840
	(J) TOTAL INDIRECT COST										527,640

D-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5206

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										480,340
	TOTAL INDIRECT COST										527,640
	TOTAL INITIAL CONSTRUCTION COST										1,008,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	1	AC								1,000
	• Cover Repair Due To Subsidence										1,750
	• Annual Fence Maintenance	1									150
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(J) TOTAL O & M COST										11,750

D-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGAWLK
PHONE: 7-5298
DATE: 08/10/93
LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 161,000

(II) Total Initial Construction Cost 1,008,000

(J) TOTAL PROJECT COST (Rounded to the nearest Thousand) 1,169,000

D-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - SOIL CEMENT COVER</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	912	-	3,950
2	Precontouring Site	2.8	AC	-	32	90	1,782	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	480
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	6,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	16,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(G) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,660

D-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5208

DATE: 10/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1,208	102.80	208,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.165	1332	26,631	0	7,989	4.30	34,620
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	5,143	CY	18	0.165	849	16,972	92,574	5,092	22.30	114,640
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	5,491	SY	0.33	0.05	275	5,491	1,812	-	1.30	7,300
		5,491	SY	0.17	0.03	165	3,295	933	-	0.80	4,230
14	Placement of 30 Mil Flexible Membrane Liner	52,200	SF	0.18	0.008	418	8,352	9,396	-	0.30	17,750
15	Placement of 1'-0" Coarse Sand Drainage Layer	1,807	CY	10.50	0.03	54	1,084	18,974	325	11.30	20,300
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	5,569	SY	0.18	0.008	33	668	1,002	-	0.50	1,670
17	Placement of 1'-8" Common Fill	2,424	CY	3.75	0.08	145	2,909	9,090	873	5.30	12,870
18	Placement of 6" Topsoil	909	CY	9.50	0.07	64	1,273	8,636	382	11.30	10,290
(G) PAGE 2 TOTAL						3,535	70,702	343,617	15,869		430,390

D-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PGW/LK

PHONE: 7-5208

DATE: 10/07/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	297	SY	1.50	0.22	65	1,307	448	392	7.20	2,140
20	Excavation of Trapezoidal Drainage Ditch	441	CY	-	0.185	82	1,632	0	490	4.80	2,120
21	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	960	0.70	6,060
22	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1,770	18.50	21,830
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
24	Warning Signs 4'-18"x24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						5,725	114,493	372,740	28,334		621,480
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							2,175	9,319			11,490
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											26,050
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							46,670				46,670
(G) TOTAL DIRECT COST						5,725	163,340	382,060	28,330		606,290

D-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ESTIMATOR: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5266

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								18,180
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								30,310
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								60,630
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								60,630
5	Engineering & Services @ 20% of Total Direct Cost										121,260
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					1,191					22,630
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						75,953	101,246			177,200
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,443					63,020
9	Project Management @ 8% of Total Direct + Indirects										92,810
(G) TOTAL INDIRECT COST											648,680

D-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGAWLK

PHONE: 7-5266

DATE: 10/07/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										606,290
	TOTAL INDIRECT COST										646,680
	TOTAL INITIAL CONSTRUCTION COST										1,253,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	1	AC								1,000
	• Cover Repair Due To Subsidence										1,600
	• Annual Fence Maintenance	1									150
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(G) TOTAL O & M COST										11,800

D-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: BSE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5206
DATE: 10/07/93
LOC: MDC-106

SUMMARY

ONE(1) ACRE SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	181,000
--	---------

(II Total Initial Construction Cost	1,253,000
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(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)	1,434,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MR	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	912	-	3,950
2	Precontouring Site	2.8	AC	-	32	90	1,792	0	536	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	480
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(H) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,080

D-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5288
DATE: 10/06/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MR	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1208	102.60	208,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	8,070	CY	-	0.165	1332	26,631	0	7989	4.30	34,820
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	49	TN	148.50	3.0	147	2,940	7,179	-	208.50	10,120
		1,774	CY	15.00	0.165	293	5,864	26,610	1,756	18.30	34,220
13	Placement of 30 Mil Flexible Membrane Liner	52,200	SF	0.18	0.008	418	8,352	9,398	-	0.30	17,750
14	Placement of 1'-0 Coarse Sand Drainage Layer	1,807	CY	10.50	0.03	54	1,064	18,974	325	11.30	20,360
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	5,569	SY	0.18	0.008	33	668	1,002	-	0.30	1,670
16	Placement of 1'-8" Common Fill	2,424	CY	3.75	0.08	145	2,909	9,090	673	5.30	12,670
17	Placement of 6" Topsoil	809	CY	9.50	0.07	64	1,273	8,636	382	11.30	10,290
(H) PAGE 2 TOTAL						2,687	53,739	282,286	12,534		348,560

D-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 10/06/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	297	SY	1.50	0.22	65	1,307	448	392	7.20	2,140
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	441	CY	-	0.185	82	1,632	0	490	4.80	2,120
20	Seeding, Fertilizing & Mulching	10,000	SY	0.25	0.016	160	3,200	2,500	860	0.70	6,060
21	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,180	1,770	18.50	21,830
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24"	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						4,876	97,530	311,209	24,999		439,650
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							1,853	7,780			9,630
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											21,980
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							39,750				39,750
(H) TOTAL DIRECT COST						4,880	139,130	318,990	25,000		511,010

D-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ESTIMATOR: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5266

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 10/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MR	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								15,330
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								25,550
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								51,100
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								51,100
5	Engineering & Services @ 20% of Total Direct Cost										102,200
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					1,015					19,290
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						64,695	64,532			149,230
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					1,230					53,720
9	Project Management @ 8% of Total Direct + Indirects										78,280
(H) TOTAL INDIRECT COST											545,000

D-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHKD BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: E3E26M12
PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL
ESTIMATOR: PGM/LK
PHONE: 7-5266
DATE: 10/06/93
LOC: MDC-108

LINE	ACTIVITY	EST	UM	UNIT	MATL	UNIT	MH	TOTAL	LABOR	MH	\$20	MATL	\$	BEMCAP	UNIT	COST	TOTAL
	TOTAL DIRECT COST																
	TOTAL INDIRECT COST																
	TOTAL INITIAL CONSTRUCTION COST																
B	O & M COSTS																
*	Groundwater Monitoring Laboratory	16	EA														3,600
	Analysis of Samples & Report																
	Writing (Quarterly)																
*	Inspection Activities of Closed Facility	48	HR														3,600
	Assume Monthly																
*	Subsidence Monitoring Annual Survey	16	HR														1,200
	Maintenance of Vegetative Cover	1	AC														1,000
	- 2 Mowings / year																
	- Fertilizing once / year																
	- Rodent Control																
	- Erosion Cont. & Drainage Maintenance																
*	Cover Repair Due To Subsidence																1,200
*	Annual Fence Maintenance	1															150
	Annual Sign Maintenance	4															150
*	Annual Monitoring Well Maintenance	4															300
	(H) TOTAL O & M COST																11,200

D-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 10/06/93
LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	172,000
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(II Total Initial Construction Cost	1,057,000
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	1,229,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5268

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
	<u>I SITE PREPARATION</u>										
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	812	-	3,950
2	Precontouring Site	2.8	AC	-	32	80	1,782	0	838	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	60	-	480
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,480
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'-0 x 35'-0 x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(B) PAGE 1 TOTAL						1,236	24,712	7,318	6,834		43,680

D-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5206

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1,206	102.60	206,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	6,390	CY	-	0.185	1054	21,067	0	6,326	4.30	27,410
12	Placement of 30 Mil Flexible Membrane Liner	52,200	SF	0.18	0.008	418	8,352	9,396	-	0.30	17,750
13	Placement of 1'-0 Coarse Sand Drainage Layer	1,686	CY	10.50	0.03	51	1,012	17,703	303	11.30	19,020
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	1,380	LF	1.0	0.22	304	6,072	1,380	-	5.40	7,450
15	2 1/2" Binder Course	5,300	SY	4.20	0.06	318	6,300	22,260	1,906	5.80	30,530
16	4" Hydraulic Asphalt Conc.	5,300	SY	6.70	0.03	159	3,180	35,510	954	7.50	39,640
17	Asphalt Mastic Seal	5,300	SY	0.50	0.015	80	1,590	2,650	-	0.80	4,240
18	Sprayed Asphaltic Concrete Sealant	5,300	SY	0.75	0.02	106	2,120	3,975	636	1.50	6,730
19	Excavation of Triangular Drainage Ditch	222	CY	-	0.3	67	1,332	0	400	7.80	1,730
20	4" Thick Asphalt Perimeter Drainage Ditch	670	SY	7.85	0.15	101	2,010	5,280	603	11.70	7,870
(B) PAGE 2 TOTAL						2,857	57,143	299,534	12,336		308,010

D-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGW/LK
PHONE: 7-5306
DATE: 09/10/93
LOC: MDC-108

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEACAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	4,122	SY	0.25	0.016	66	1,319	1,031	\$96	0.70	2,750
21	Install 6' High Chain Link Perimeter Fence	1,160	LF	12	0.25	295	5,900	14,160	1,770	18.50	21,830
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(B) PAGES 1,2,3 TOTAL											451,830
<ul style="list-style-type: none"> Escalation for 1994 on Direct Labor is 1.8% & on Direct Material is 2.5% Clean up & Demobilize (Assume 5% of Total Direct Cost) LOCATION FACTOR @ 40% on (Total Labor Cost+Escalation) 											9,990 23,100 96,840
(B) TOTAL DIRECT COST											581,860

D-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH:\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								17,480
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								29,090
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								58,180
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								58,180
5	Engineering & Services @ 20% of Total Direct Cost										116,370
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					1000					19,010
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						90,573	66,696			179,270
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1212					52,950
9	Project Management @ 8% of Total Direct + Indirects										66,990
(B) TOTAL INDIRECT COST											619,520

D-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5206

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											561,800
TOTAL INDIRECT COST											619,520
TOTAL INITIAL CONSTRUCTION COST											1,201,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	1	AC								2,400
	• Cover Repair Due To Subsidence										1150
	• Annual Fence Maintenance	1									150
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(B) TOTAL O & M COST											12,550

D-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5206
DATE: 09/10/93
LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) **193,000**

(ii) Total Initial Construction Cost **1,201,000**

(B) TOTAL PROJECT COST (Rounded to the nearest Thousand) 1,394,000

D-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@420	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>ONE(1) ACRE SITE - CONCRETE SLAB</u>											
A DIRECT COSTS											
I SITE PREPARATION											
1	Clearing & Grubbing	3.8	AC	-	40	152	3,040	0	812	-	3,850
2	Precontouring Site	2.8	AC	-	32	80	1,792	0	636	-	2,330
3	Silt Fence (Includes Maintenance)	900	LF	0.50	0.1	90	1,800	450	-	2.50	2,250
4	Temporary Sediment Control	1	LS	-	-	0	0	0	80	-	480
5	20' Wide Gravel Haul Road	620	LF	8.50	0.2	124	2,480	5,270	744	13.70	8,490
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	800
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	6	MO	-	-	0	0	0	-	720	4,320
(E) PAGE 1 TOTAL						1,236	24,712	7,318	6,934		43,880

D-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: E3E260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5200
DATE: 09/10/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	2,014	TN	100	0.1	201	4,028	201,400	1,206	102.60	206,640
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	6,390	CY	-	0.165	1054	21,067	0	6,326	4.30	27,410
12	Placement of 30 Mil Flexible Membrane Liner	52,200	SF	0.16	0.006	416	8,352	9,396	-	0.30	17,760
13	Placement of 1'-0 Coarse Sand Drainage Layer	1,686	CY	10.50	0.03	51	1,012	17,703	303	11.30	19,020
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	1,380	LF	1.00	0.22	304	8,072	1,380	-	5.40	7,450
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X6-W 2.9xW 2.9(wld.wire fab)Broom Finish.	5,300	SY	7.50	0.45	2365	47,700	39,750	(0.60/hr) 1,910 (comp rate)	16.90	89,360
16	Sprayed on Curing Compound	5,300	SY	0.20	0.015	80	1,590	1,000	477	0.60	3,130
17	Joint Sealant 6" PVC Water Stops	3,400	LF	2.50	0.1	340	8,800	8,500	-	4.50	15,300
18	Excavation of Traingular Drainage Ditch	222	CY	-	0.30	67	1,332	0	400	7.60	1,730
19	4" Thick Concrete Perimeter Drainage Ditch	670	SY	7.40	0.36	255	5,092	4,958	1,528	17.30	11,500
(E) PAGE 2 TOTAL						5,153	103,005	264,147	12,152		389,370

D-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PGW/LK

PHONE: 7-5286

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	4,122	SY	0.25	0.016	66	1,319	1,031	396	0.70	2,750
21	Install 8' High Chain Link Perimeter Fence	1,180	LF	12	0.25	295	5,900	14,160	1,770	18.50	21,630
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1960	1,960
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	1200	1,200
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(E) PAGES 1,2,3 TOTAL						7,102	142,036	311,156	23,171		482,290
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							2699	7779			10480
* Clean up & Demobilize. (Assume 5% of Total Direct Cost)											24,640
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							57,890				57,890
(E) TOTAL DIRECT COST						7,100	202,620	318,930	23,170		575,300

D-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ESTIMATOR: PGWLK

ACTIVITY CODE: ESE260412

PHONE: 7-5200

PROJ. NAME: BCOR. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 08/10/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								17,200
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								28,770
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								57,530
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								57,530
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								115,060
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					1,480					28,120
7	Field Indirects of Total Direct Labor @ 48.5%, Material @ 28.5%						84,218	84,518			178,730
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,789					63,520
9	Project Management @ 8% of Total Direct + Indirects										81,350
(E) TOTAL INDIRECT COST											657,870

D-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/10/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										575,300
	TOTAL INDIRECT COST										657,870
	TOTAL INITIAL CONSTRUCTION COST										1,233,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility-Monthly	48	HR		75.00		3,600				3,600
	• Subsidence Monitoring Annual Survey	16	HR		75.00		1,200				1,200
	• Maintenance of Concrete Slab	1	AC								1,500
	• Cover Repair Due To Subsidence										2,050
	• Annual Fence Maintenance	1									150
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(E) TOTAL O & M COST										12,550

D-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/10/93
LOC: MDC-108

SUMMARY

ONE(1) ACRE SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

193,000

(II Total Initial Construction Cost

1,233,000

(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)

1,426,000

D-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

Appendix E

Cost Estimates for 2-Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E5B260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TWO(2) ACRES SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,400	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	580	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,688	6,715	606	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(A) PAGE 1 TOTAL						1,370	27,390	8,093	7,641		53,270

E-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,800	2,417	102.00	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	18,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Placement of Claymax Geotextile Mat	123,200	SF	0.45	0.01	1232	24,640	55,440	-	0.70	60,000
13	Placement of 30 Mil Flexible Membrane Liner	123,200	SF	0.17	0.0075	924	18,480	20,944	-	0.30	39,420
14	Placement of 1'-0" Coarse Sand Drainage Layer	4,248	CY	10.50	0.03	127	2,549	44,604	765	11.30	47,920
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	14,022	SY	0.17	0.005	70	1,402	2,364	-	0.30	3,790
16	Placement of 1'-6" Common Fill	4,848	CY	3.75	0.06	291	5,818	18,180	1,745	5.30	25,740
17	Placement of 6" Topsoil	1,820	CY	9.50	0.06	109	2,184	17,290	655	11.10	20,150
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	412	SY	1.50	0.2	82	1,648	618	494	6.70	2,760
19	Excavation of Trapezoidal Drainage Ditch	682	CY	-	0.175	154	3,087	0	828	4.50	4,010
(A) PAGE 2 TOTAL						5,895	117,898	562,260	22,013		702,160

E-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
21	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	382	7,630	18,312	2,289	18.50	28,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2500	10,320
(A) PAGES 1,2,3 TOTAL						1084	21,070	27,812	6129		57,410
						8,318	166,358	598,965	35,783		812,640
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							3,161	14,974			18,130
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											40,640
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							67,810				67,810
(A) TOTAL DIRECT COST						8,320	237,330	613,840	35,780		939,420

E-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/MLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								28,180
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								46,970
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								93,940
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								93,940
5	Engineering & Services @ 20% of Total Direct Cost										187,880
6	Craft Support @ 20.8% of Total MHRS(\$19/HR)					1,730					32,870
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 28.5%						110,358	162,694			273,050
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					2,097					91,520 845,410
9	Project Management @ 8% of Total Direct + Indirects										143,030
(A) TOTAL INDIRECT COST											991,440

E-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											939,420
TOTAL INDIRECT COST											991,440
TOTAL INITIAL CONSTRUCTION COST											1,931,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA		225.00		3,600				3,600
•	Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
•	Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	2	AC								1,200
•	Cover Repair Due To Subsidence										1,400
•	Annual Fence Maintenance	1									200
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
(A) TOTAL O & M COST											12,050

E-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5286
DATE: 09/11/93
LOC: MDC-108

SUMMARY

TWO(2) ACRES SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 198,000

(ii) Total Initial Construction Cost 1,931,000

(A) TOTAL PROJECT COST (Rounded to the nearest Thousand) 2,129,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGAWLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>TWO (2) ACRE SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
1	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	590	-	3	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,688	6,715	606	13	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	36	2,430
7	35'x 35'x 4" Gravel Decon. Area	180	8Y	3.00	0.1	18	320	480	96	6	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,840
(L) PAGE 1 TOTAL						1,370	27,380	8,693	7,841		83,270

E-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/MLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
I COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,900	2,417	103	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% Standard Proctor	16,140	CY	-	0.155	2,502	50,034	0	15,010	4	65,040
12	Placement of Bentonite Geotextile Mat	123,200	SF	0.45	0.01	1,232	24,640	55,440	-	1	50,080
13	Placement of 30 Mil Flexible Membrane Liner	123,200	SF	0.17	0.0075	924	18,480	20,944	-	0	39,420
14	Placement of 1'-0" Coarse Sand Drainage Layer	4,246	CY	10.50	0.03	127	2,548	44,004	765	11	47,920
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	14,022	SY	0.17	0.005	70	1,402	2,384	-	0	3,790
16	Placement of 1'-6" Common Fill	4,848	CY	3.75	0.06	291	5,818	16,160	1,745	5	25,740
17	Placement of 6" Topsoil	1,820	CY	9.50	0.06	109	2,184	17,290	855	11	20,190
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	412	SY	1.50	0.2	82	1,648	618	494	7	2,780
19	Excavation of Trapezoidal Drainage Ditch	882	CY	-	0.175	154	3,087	0	926	5	4,010
(L) PAGE 2 TOTAL						5,995	117,898	562,260	22,015		702,160

E-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5298
DATE: 09/11/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	1	13,320
21	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	382	7,630	16,312	2,289	19	26,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1,900	1,900
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2,400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2,580	10,320
(L) PAGES 1,2,3 TOTAL						6,316	166,356	596,963	35,783		812,640
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							3,161	14,974			18,130
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											40,640
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							67,807				67,810
(L) TOTAL DIRECT COST						6,320	237,530	613,940	35,780		839,420

E-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PGW/LK

PHONE: 7-5268

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								28,180
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								48,970
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								93,940
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								93,940
5	Engineering & Services @ 20% of Total Direct Cost										187,880
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					1,731	32,891				32,890
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						110,358	182,694			273,050
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					2,097					91,580
9	Project Management @ 8% of Total Direct + Indirects										143,030
(L) TOTAL INDIRECT COST											691,460

E-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/MLK

PHONE 7-5288

DATE 09/11/93

LOC MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										939,420
	TOTAL INDIRECT COST										991,450
	TOTAL INITIAL CONSTRUCTION COST										1,931,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,800
	• Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
	• Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	2	AC								1,200
	• Cover Repair Due to Subsidence										1,400
	• Annual Fence Maintenance	1									200
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(L) TOTAL O & M COST										12,850

E-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-8268

DATE: 09/11/93

LOC: MDC-108

SUMMARY

TWO (2) ACRE SITE - BENTOMAT (GBM)

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	129,000
--	---------

(II Total Initial Construction Cost	1,931,000
-------------------------------------	-----------

(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	2,129,000
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E-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PGW/LK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TWO (2) ACRE SITE - GUNDSEAL</u>											
A	<u>DIRECT COSTS</u>										
	<u>I SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	590	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,688	6,715	808	12.90	10,210
6	2-18" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	800
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(I) PAGE 1 TOTAL						1,370	27,300	8,893	7,641		53,270

E-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: B5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,800	2,417	102.00	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Placement of Gundseal Geomembrane/ Bentonite Mat	123,200	SF	0.50	0.01	1232	24,640	61,600	-	0.70	66,240
13	Placement of 1'-0" Coarse Sand Drainage Layer	4,248	CY	10.50	0.03	127	2,549	44,604	785	11.30	47,820
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	14,022	SY	0.17	0.005	70	1,402	2,364	-	0.30	3,790
15	Placement of 1'-6" Common Fill	4,848	CY	3.75	0.06	291	5,818	18,180	1,745	5.30	25,740
16	Placement of 6" Topsoil	1,820	CY	6.50	0.06	108	2,184	17,290	653	11.10	20,130
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	412	SY	1.50	0.2	82	1,648	618	494	6.70	2,780
18	Excavation of Trapezoidal Drainage Ditch	882	CY	-	0.175	154	3,087	0	928	4.50	4,010
(I) PAGE 2 TOTAL						4,971	89,418	547,476	22,013		668,900

E-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PGM/LK
PHONE: 7-5286
DATE: 09/11/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
20	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	382	7,630	18,312	2,269	18.50	28,230
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						7,394	147,878	584,161	35,763		57,410 779,580
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							2,810	14,805			17,410
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											36,960
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							60,275				60,270
(I) TOTAL DIRECT COST						7,390	210,960	596,790	35,760		696,240

E-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								28,890
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								44,810
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								89,620
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								89,620
5	Engineering & Services @ 20% of Total Direct Cost										179,250
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					1,537	29,205				29,210
7	Field Indirects Labor @ 46.5%, Bulk Materials @ 26.5%						98,098	158,679			256,780
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					1,862					81,340
9	Project Management @ 8% of Total Direct + Indirects										747,520 135,500
(I) TOTAL INDIRECT COST											833,020

E-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR

PGWLK

PHONE:

7-5286

DATE:

09/11/93

LOC:

MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											696,240
TOTAL INDIRECT COST											833,020
TOTAL INITIAL CONSTRUCTION COST											1,529,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
	• Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	2	AC								1,200
	• Cover Repair Due To Subsidence										1,300
	• Annual Fence Maintenance	1									200
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(I) TOTAL O & M COST											12,750

E-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE20412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR PGAWLK
PHONE: 7-5206
DATE: 08/11/93
LOC: MDC-108

SUMMARY	
<u>TWO (2) ACRE SITE - GUNDSEAL</u>	
C TOTAL COST (Total Present Worth)	
(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	198,000
(ii) Total Initial Construction Cost	1,829,000
(i) TOTAL PROJECT COST (Rounded to the nearest Thousand)	2,028,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TWO ACRES (2) ACRE SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	580	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,686	6,715	806	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,580
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,840
(F) PAGE TOTAL						1,370	27,390	8,693	7,641		83,270

E-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PGW/LK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,600	2,417	102.60	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Placement of 120 Mil Flexible Membrane Liner	123,200	SF	0.50	0.01	1232	24,640	61,600	-	0.70	66,240
13	Placement of 1'-0" Coarse Sand Drainage Layer	4,248	CY	10.50	0.03	127	2,549	44,604	765	11.30	47,920
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	14,022	SY	0.17	0.005	70	1,402	2,364	-	0.30	3,790
15	Placement of 1'-8" Common Fill	4,848	CY	3.75	0.06	291	5,818	16,180	1,745	5.30	25,740
16	Placement of 6" Topsoil	1,820	CY	9.50	0.06	109	2,184	17,290	653	11.10	20,130
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	412	CY	1.50	0.2	62	1,648	618	494	6.70	2,760
18	Excavation of Trapezoidal Drainage Ditch	882	CY	-	0.175	154	3,067	0	926	4.50	4,010
(F) PAGE TOTAL						4,971	99,418	547,478	22,013		668,900

E-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
20	Install 8' High Chain Link Perimeter Fence	1,528	LF	12	0.25	382	7,630	18,312	2,289	18.50	28,230
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						7,394	147,878	584,181	35,783		779,580
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							2,810	14,605			17,410
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											36,900
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							60,270				60,270
(F) TOTAL DIRECT COST						7,390	210,900	598,780	35,780		885,240

E-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								28,890
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								44,810
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								88,620
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								88,620
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								177,250
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					1,537	29,205				29,205
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						96,096	158,679			256,780
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,862					81,340
9	Project Management @ 8% of Total Direct + Indirects										135,500
(F) TOTAL INDIRECT COST											833,020

E-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR PG/WLK
PHONE: 7-5268
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											895,240
TOTAL INDIRECT COST											933,020
TOTAL INITIAL CONSTRUCTION COST											1,829,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
•	Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	2	AC								1,200
•	Cover Repair Due To Subsidence										1,300
•	Annual Fence Maintenance	1									200
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
(F) TOTAL O & M COST											12,750

E-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5286

DATE: 08/11/93

LOC: MDC-100

SUMMARY

TWO ACRES (2) ACRE SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

198,000

(ii) Total Initial Construction Cost

1,829,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

2,026,000

E-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$8/MH	UNIT COST	TOTAL COST
<u>TWO (2) ACRES SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	116	2,304	0	681	-	3,000
3	Silt Fence (Includes Maintenance)	1160	LF	0.50	0.1	116	2,320	580	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	820
5	20' Wide Gravel Haul Road x 6" Deep	790	LF	8.60	0.17	134	2,668	8,718	806	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	38.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(C) PAGE 1 TOTAL						1,370	27,390	8,893	7,641		53,270

E-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD
ESTIMATOR: PGAWLK
PHONE: 7-5268
DATE: 09/11/93
LOC: MDC-106

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$\$/MH	UNIT COST	TOTAL COST
1 COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,800	2,417	102.60	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Placement of 30 mil Flexible Membrane Liner	123,200	SF	0.17	0.0075	924	18,480	20,944	-	0.30	39,420
13	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	10,844 16,268	SY GAL	2	0.15	1627	32,532	21,688	9,760	5.90	63,960
14	Placement of 1'-0" Coarse Sand Drainage Layer	3,614	CY	10.50	0.03	108	2,168	37,947	651	11.30	40,770
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	10,844	SY	0.17	0.005	54	1,084	1,843	-	0.30	2,930
16	Placement of 1'-6" Common Fill	4,848	CY	3.75	0.06	291	5,818	18,180	1,745	5.30	25,740
17	Placement of 6" Topsoil	1,820	CY	9.50	0.06	109	2,184	17,290	655	11.10	20,130
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Crushed Stone	412	SY	1.50	0.2	82	1,648	618	494	6.70	2,760
19	Excavation of Trapezoidal Drainage Ditch	882	CY	-	0.175	154	3,067	0	828	4.50	4,010
(C) PAGE 2 TOTAL						6,255	125,091	521,310	31,658		678,050

E-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESR260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
21	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	382	7,630	18,312	2,269	18.50	26,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24 - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(C) PAGES 1,2,3 TOTAL						1,051	21,070	27,812	4,129		57,410
						8,678	173,551	658,015	45,428		788,730
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Materials							3,297	13,950			17,250
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											39,440
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							70,740				70,740
(C) TOTAL DIRECT COST						8,680	247,590	671,970	45,430		918,180

E-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$6/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								27,480
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								46,810
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								91,620
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								91,620
5	Engineering & Services @ 20% of Total Direct Cost										183,230
6	Craft Support @ 20.8 % of Total MHRS (\$19/HR)					1,805	34,303				34,300
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						115,129	151,572			266,700
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					2,187	95,544				95,540
9	Project Management @ 8% on Total Direct + Indirects						140,200				140,200
	(C) TOTAL INDIRECT COST										976,500

E-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										\$16,100
	TOTAL INDIRECT COST										\$76,500
	TOTAL INITIAL CONSTRUCTION COST										1,693,000
B	O & M COSTS										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Closed Facility Monthly	60	HR		75.00		4,500				4,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	2	AC								1,200
•	Cover Repair Due To Subsidence										1,400
•	Annual Fence Maintenance	1									200
•	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
•	Subsidence Monitoring (Annual Survey)	20	HR		75.00		1,500				1,500
	(C) TOTAL O & M COST										12,650

E-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-108

S U M M A R Y

TWO (2) ACRES SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	198,000
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(II) Total Initial Construction Cost	1,893,000
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(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)	2,091,000
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E-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TWO (2) ACRES SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	500	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,688	6,715	808	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(D) PAGE 1 TOTAL						1,370	27,300	8,893	7,641		83,270

E-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5206
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,800	2,417	102.60	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Placement of Geotextile Reinforcement on Foundation Layer	10,844	SY	0.30	0.01	108	2,169	3,253	-	0.50	5,420
13	Placement of 30 mil Flexible Membrane Liner	123,200	SF	0.17	0.0075	924	18,480	20,944	-	0.30	39,420
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5g/Sy	10,844 16,266	SY GAL	2	0.15	1627	32,532	21,688	9,760	5.00	63,960
15	Placement of 1'-0" Coarse Sand Drainage Layer	3,814	CY	10.50	0.03	108	2,168	37,947	651	11.30	40,770
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	10,844	SY	0.17	0.005	54	1,084	1,843	-	0.30	2,930
17	Placement of 1'-8" Common Fill	4,848	CY	3.75	0.08	291	5,818	16,180	1,745	5.30	25,740
18	Placement of 6" Topsoil	1,820	CY	9.50	0.08	109	2,184	17,290	655	11.10	20,130
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	412	SY	1.50	0.2	82	1,648	616	494	6.70	2,760
20	Excavation of Trapezoidal Drainage Ditch	882	CY	-	0.175	154	3,087	0	926	4.50	4,010
(D) PAGE TOTAL						6,363	127,260	524,564	31,658		663,470

E-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5206

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
22	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	362	7,630	18,312	2,269	18.50	26,230
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1,900	1,900
24	Warning Signs 4-18"x24" - Install	4	EA	250	2	8	160	1,000	-	290	1,160
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2,400	2,400
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2,560	10,320
(D) PAGES 1,2,3 TOTAL						8,766	175,720	561,269	45,428		794,150
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							3,339	14,032			17,370
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											39,710
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							71,824				71,820
(D) TOTAL DIRECT COST						8,790	250,880	575,300	45,430		\$22,850

E-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								27,000
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								40,140
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								92,290
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								92,290
5	Engineering & Services @ 20% of Total Direct Cost										184,570
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					1,828	34,738				34,740
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						116,568	175,467			292,030
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$41.11					2,215					91,080
9	Project Management @ 8% of Total Direct + Indirects										142,000
(D) TOTAL INDIRECT COST											1,003,600

E-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WJK
PHONE: 7-5206
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										922,850
	TOTAL INDIRECT COST										1,003,500
	TOTAL INITIAL CONSTRUCTION COST										1,926,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA							225	3,600
•	Inspection Activities of Closed Facility Monthly	60	HR		75.00		4,500				4,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	2	AC								1,200
•	Cover Repair Due to Subsidence										1,500
•	Annual Fence Maintenance	1									200
	Annual Sign Maintenance	4									150
•	Annual Monitoring Well Maintenance	4			75.00		300				300
•	Subsidence Monitoring (Annual Survey)	20	HR		75.00		1,500				1,500
	(D) TOTAL O & M COST										12,950

E-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE200412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/MLK
PHONE: 7-5286
DATE: 09/11/93
LOC: MDC-108

SUMMARY

TWO (2) ACRES SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost 199,000
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(II) Total Initial Construction Cost 1,928,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand) 2,125,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TWO (2) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	116	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	580	-	2.90	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	620
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,688	6,715	806	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(K) PAGE 1 TOTAL						1,370	27,300	8,693	7,841		53,270

E-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: E3E260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5206
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,600	2,417	102.60	413,270
11	Place and Compact Foundation Soil In 8" Lifts to 95% Std. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Compact 2'-0" Thick Clay Layer In 6" Lifts	6,780	CY	13.00	0.165	1119	22,374	68,140	6,712	17.30	117,230
13	Placement of 30 Mil Flexible Membrane Liner	104,400	SF	0.17	0.0075	783	15,660	17,748	-	0.30	33,410
14	Placement of 1'-0 Coarse Sand Drainage Layer	3,614	CY	10.50	0.03	106	2,168	37,947	651	11.30	40,770
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	11,138	SY	0.17	0.005	56	1,114	1,693	-	0.30	3,010
16	Placement of 1'-6" Common Fill	4,648	CY	3.75	0.06	291	5,816	16,160	1,745	5.30	25,740
17	Placement of 6" Topsoil	1,620	CY	9.50	0.06	109	2,184	17,290	655	11.10	20,120
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	412	SY	1.50	0.2	82	1,648	618	494	6.70	2,760
19	Excavation of Trapezoidal Drainage Ditch	682	CY	-	0.175	154	3,087	0	926	4.50	4,010
(K) PAGE 2 TOTAL						5,607	112,143	584,616	28,611		725,370

E-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PGWLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
21	Install 8' High Chain Link Perimeter Fence	1,528	LF	12	0.25	382	7,630	18,312	2,289	18.50	28,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(K) PAGES 1,2,3 TOTAL						8,030	180,803	621,321	42,361		636,050
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							3,051	15,533			18,580
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											41,803
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							65,462				65,460
(K) TOTAL DIRECT COST						8,030	228,120	636,850	42,360		961,890

E-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5206

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								28,857
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								48,085
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								96,169
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								96,169
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								192,378
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					1,670	31,735				31,730
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						106,541	166,765			275,310
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					2,024					88,390
9	Project Management @ 8% of Total Direct + Indirects										148,280
(K) TOTAL INDIRECT COST											1,005,400

E-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PGM/MLK

PHONE: 7-5288

DATE: 09/11/93

LOG: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										\$61,800
	TOTAL INDIRECT COST										1,008,400
	TOTAL INITIAL CONSTRUCTION COST										1,070,200
B	O & M COSTS										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
•	Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	2	AC								1,200
•	Cover Repair Due to Subsidence										
•	Annual Fence Maintenance	1									3,300
	Annual Sign Maintenance	4									200
•	Annual Monitoring Well Maintenance	4			75.00		300				150
	TOTAL O & M COST										300
											14,780

E-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5208
DATE: 09/11/93
LOC: MDC-100

SUMMARY

TWO (2) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 227,000

(II Total Initial Construction Cost 1,967,290

(K) TOTAL PROJECT COST (Rounded to the nearest Thousand) 2,194,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>TWO (2) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.10	116	2,320	500	-	3	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	620
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,686	6,715	606	13	10,210
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	766	364	36	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	6	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(J) PAGE 1 TOTAL						1,370	27,390	8,693	7,641		53,270

E-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PGWLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
I COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,800	2,417	103	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4	65,040
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	6,790	CY	-	0.165	1119	22,374	0	6,712	4	29,090
13	Placement of 30 Mil Flexible Membrane Liner	104,400	SF	0.17	0.0075	783	15,660	17,748	-	0	33,410
14	Placement of 1'-0 Coarse Sand Drainage Layer	3,614	CY	10.50	0.03	109	2,166	37,947	651	11	40,770
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	11,138	SY	0.17	0.005	56	1,114	1,083	-	0	3,010
16	Placement of 1'-6" Common Fill	4,848	CY	3.75	0.06	291	5,818	18,180	1,745	5	25,740
17	Placement of 6" Topsoil	1,620	CY	9.50	0.06	109	2,184	17,290	653	11	20,130
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	412	SY	1.50	0.2	82	1,648	618	494	7	2,760
19	Excavation of Trapezoidal Drainage Ditch	882	CY	-	0.175	154	3,087	0	926	5	4,010
(J) PAGE 2 TOTAL						5,807	112,143	496,476	28,611		637,230

E-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	1	13,320
21	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	382	7,630	16,312	2,269	16	26,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1,980	1,980
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2,400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2,580	10,320
(J) PAGES 1,2,3 TOTAL						6,030	21,070	27,812	6,129		57,419
						8,030	160,803	533,181	42,381		747,910
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							3,051	13,330			16,380
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											37,400
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							65,462				65,460
(J) TOTAL DIRECT COST						8,030	229,120	548,510	42,380		667,150

E-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5200

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								26,010
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								43,360
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								66,720
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								66,720
5	Engineering & Services @ 20% of Total Direct Cost										173,430
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					1,670	31,735				31,730
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						106,541	144,625			251,370
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					2,024					66,360
9	Project Management @ 8% of Total Direct + Indirects										132,300
(J) TOTAL INDIRECT COST											620,120

E-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											667,150
TOTAL INDIRECT COST											920,120
TOTAL INITIAL CONSTRUCTION COST											1,787,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
	• Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	2	AC								1,200
	• Cover Repair Due to Subsidence										3,150
	• Annual Fence Maintenance	1									200
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(J) TOTAL O & M COST											14,600

E-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: E3E260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 09/11/93
LOC: MDC-106

SUMMARY

TWO (2) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	224,000
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(II Total Initial Construction Cost	1,787,000
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(J) TOTAL PROJECT COST (Rounded to the nearest Thousand)	2,011,000
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E-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$6/MH	UNIT COST	TOTAL COST
<u>TWO (2) ACRE SITE - SOIL CEMENT COVER</u>											
<u>A DIRECT COSTS</u>											
<u>I SITE PREPARATION</u>											
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	580	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,688	6,715	806	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	584	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	86	5.00	800
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	16,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	6,840
(G) PAGE 1 TOTAL						1,370	27,390	8,893	7,641		63,270

E-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,600	2,417	102.60	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	10,286	CY	18	0.165	1697	33,944	185,148	10,183	22.30	229,270
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	10,982	SY	0.33	0.05	549	10,982	3,624	-	1.30	14,610
		10,982	SY	0.17	0.03	329	6,589	1,867		0.80	8,460
14	Placement of 30 Mil Flexible Membrane Liner	104,400	SF	0.17	0.0075	783	15,660	17,748	-	0.30	33,410
15	Placement of 1'-0 Coarse Sand Drainage Layer	3,614	CY	10.50	0.03	108	2,168	37,947	651	11.30	40,770
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	11,138	SY	0.17	0.005	56	1,114	1,893	-	0.30	3,010
17	Placement of 1'-8" Common Fill	4,848	CY	3.75	0.06	291	5,818	18,180	1,745	5.30	25,740
18	Placement of 6" Topsoil	1,820	CY	9.5	0.06	109	2,184	17,290	655	11.10	20,130
(G) PAGE 2 TOTAL						6,827	136,549	666,497	30,661		663,710

E-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 10/06/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	412	SY	1.50	0.2	82	1,648	618	494	6.70	2,760
20	Excavation of Trapezoidal Drainage Ditch	882	CY	-	0.175	154	3,087	0	926	4.50	4,010
21	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
22	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	382	7,630	16,312	2,269	16.50	26,230
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
24	Warning Signs 4-18"x24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,180
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						9,487	189,744	723,820	45,852		871,100
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							3,605	18,096			21,700
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											48,580
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							77,340				77,340
(G) TOTAL DIRECT COST						9,490	270,690	741,920	45,850		1,118,760

E-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5208

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								33,580
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								55,940
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								111,880
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								111,880
5	Engineering & Services @ 20% of Total Direct Cost										223,760
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					1,974					37,504
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						125,871	196,609			322,480
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					2,391					104,480
9	Project Management @ 8% of Total Direct + Ind	8.0%									169,620
(G) TOTAL INDIRECT COST											1,171,070

E-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5268
DATE: 10/06/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$/MH	UNIT COST	TOTAL COST
TOTAL DIRECT COST											1,116,780
TOTAL INDIRECT COST											1,171,070
TOTAL INITIAL CONSTRUCTION COST											2,280,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	60	HR		75.00		4,500				4,500
	• Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	2	AC								1,200
	• Cover Repair Due To Subsidence										3250
	• Annual Fence Maintenance	1									200
	Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(G) TOTAL O & M COST											14,700

E-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 10/08/93

LOC: MDC-108

SUMMARY

TWO (2) ACRE SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	228,000
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(II) Total Initial Construction Cost	2,290,000
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(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)	2,518,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$6/HR	UNIT COST	TOTAL COST
	<u>TWO (2) ACRE SITE - BENTONITE SOIL ADDITIVE</u>										
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	116	2,304	0	691	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	580	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	-	-	-	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,686	6,715	806	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
	(H) PAGE 1 TOTAL					1,370	27,390	8,833	7,641		53,270

E-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$8/HR	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,800	2,417	102.60	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	16,140	CY	-	0.155	2502	50,034	0	15,010	4.00	65,040
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	58	TN	148.50	2.5	145	2,900	8,497	-	196.60	11,400
		3,436	CY	15.00	0.165	567	11,339	51,540	3,402	19.30	66,280
13	Placement of 30 Mil Flexible Membrane Liner	104,400	SF	0.17	0.0075	783	15,660	17,748	-	0.30	33,410
14	Placement of 1'-0 Coarse Sand Drainage Layer	3,614	CY	16.50	0.03	108	2,168	37,947	651	11.30	40,770
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	11,138	SY	0.17	0.005	58	1,114	1,693	-	0.30	3,010
16	Placement of 1'-6" Common Fill	4,848	CY	3.75	0.06	291	5,818	18,180	1,745	5.30	25,740
17	Placement of 6" Topsoil	1,820	CY	9.50	0.06	109	2,184	17,290	655	11.10	20,130
(H) PAGE 2 TOTAL						4,964	99,273	555,695	23,860		679,050

E-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGW/LK
PHONE: 7-5266
DATE: 10/06/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$6/HR	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	412	SY	1.5	0.2	82	1,648	618	494	6.70	2,760
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	882	CY	-	0.175	154	3,087	0	926	4.50	4,010
20	Seeding, Fertilizing & Mulching	20,000	SY	0.25	0.016	320	6,400	5,000	1,920	0.70	13,320
21	Install 8' High Chain Link Perimeter Fence	1,526	LF	12	0.25	382	7,630	16,312	2,269	18.50	26,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24"	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						7,623	152,468	593,218	39,070		796,500
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Materials							2,897	14,830			17,730
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											38,825
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							62,148				62,150
(H) TOTAL DIRECT COST						7,620	217,510	608,050	39,070		916,210

E-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$8/HR	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								27,486
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								45,811
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								91,621
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								91,621
5	Engineering & Services @ 20% of Total Direct Cost										183,242
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					1,585					30,114
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						101,142	161,133			262,275
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					1,920					83,680
9	Project Management @ 8% of Total Direct + Indirects										138,580
	(H) TOTAL INDIRECT COST										954,630

E-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$/HR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										916,210
	TOTAL INDIRECT COST										954,630
	TOTAL INITIAL CONSTRUCTION COST										1,870,840
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Closed Facility Assume 2/Year	60	HR		75.00		4,500				4,500
*	Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	2	AC								1,200
*	Cover Repair Due To Subsidence										2,100
*	Annual Fence Maintenance	1									200
	Annual Sign Maintenance	4									150
*	Annual Monitoring Well Maintenance	4			75.00		300				300
	(H) TOTAL O & M COST										13,550

E-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

D E T A I L B S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5268
DATE: 10/06/93
LOC: MDC-106

SUMMARY

TWO (2) ACRE SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	208,000
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(II Total Initial Construction Cost	1,870,840
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	2,079,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5206

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>TWO(2) ACRES SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6	AC	-	40	224	4,480	0	1,344	-	5,820
2	Precontouring Site	3.6	AC	-	32	115	2,304	0	801	-	3,000
3	Silt Fence (Includes Maintenance)	1,160	LF	0.50	0.1	116	2,320	580	-	2.50	2,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	120	-	820
5	20' Wide Gravel Haul Road x 8" Deep	790	LF	8.50	0.17	134	2,688	6,715	806	12.90	10,210
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	36.00	2,430
7	35'-0 x 35'-0 x 4" Gravel Decon. Area	180	SY	3.00	0.1	18	320	480	86	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(B) PAGE 1 TOTAL						1,370	27,390	8,893	7,641		53,270

E-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: B3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5206

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,056	402,800	2,417	102.60	415,270
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	12,780	CY	-	0.153	1961	39,618	0	11,885	4.00	51,500
12	Placement of 30 Mil Flexible Membrane Liner	104,400	SF	0.17	0.0075	783	15,660	17,748	-	0.30	33,410
13	Placement of 1'-0 Coarse Sand Drainage Layer	3,372	CY	10.50	0.03	101	2,023	35,406	607	11.30	36,040
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	1,990	LF	1.0	0.22	431	8,624	1,990	-	5.40	10,580
15	2 1/2" Binder Course	10,600	SY	4.2	0.06	636	12,720	44,520	3,016	5.80	61,000
16	4" Hydraulic Asphalt Conc.	10,600	SY	6.70	0.03	318	6,360	71,020	1,906	7.50	78,290
17	Asphalt Mastic Seal	10,600	SY	0.50	0.015	159	3,180	5,300	-	0.80	8,480
18	Sprayed Asphaltic Concrete Sealant	10,600	SY	0.75	0.02	212	4,240	7,550	1,272	1.30	13,460
19	Excavation of Traingular Drainage Ditch	444	CY	-	0.2	89	1,776	0	533	5.20	2,310
20	4" Thick Asphalt Perimeter Drainage Ditch	1,340	SY	7.85	0.15	201	4,020	10,519	1,208	11.80	15,750
(B) PAGE 2 TOTAL						5,314	106,277	597,223	23,644		727,150

E-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$0/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	8,244	SY	0.25	0.016	132	2,638	2,061	791	0.70	5,490
21	Install 8' High Chain Link Perimeter Fence	1,528	LF	12	0.25	382	7,630	18,312	2,289	18.50	28,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x 24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(B) PAGES 1,2,3 TOTAL						7,549	150,975	630,969	36,285		630,000
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							2,869	15,775			18,640
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											41,500
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							61,538				61,540
(B) TOTAL DIRECT COST						7,550	215,300	648,700	36,290		951,880

E-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-6288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								28,650
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								47,580
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								95,170
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								95,170
5	Engineering & Services @ 20% of Total Direct Cost										190,340
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					1,570	29,830				29,830
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						100,162	171,391			271,540
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					1,903					83,106
9	Project Management @ 8% of Total Direct + Indirects						143,440				143,440
	(B) TOTAL INDIRECT COST										864,730

E-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL LABOR MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										951,680
	TOTAL INDIRECT COST										884,730
	TOTAL INITIAL CONSTRUCTION COST										1,836,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,000
	• Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
	• Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	2	AC								3,000
	• Cover Repair Due To Subsidence										2,000
	• Annual Fence Maintenance	1									200
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(B) TOTAL O & M COST										15,250

E-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5268
DATE: 09/11/93
LOC: MDC-108

SUMMARY

TWO(2) ACRES SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	234,000
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(II) Total Initial Construction Cost	1,936,000
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(B) TOTAL PROJECT COST (Rounded to the nearest Thousand)	2,170,000
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E-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 08/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>TWO ACRES (2) ACRE SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	5.6 AC	-		40	224	4,480	0	1344	-	5,820
2	Precontouring Site	3.6 AC	-		32	115	2,304	0	691	-	3,000
3	Silt Fence. (Includes Maintenance)	1160 LF	0.50		0.1	116	2,320	580	-	2.50	2,900
4	Temporary Sediment Control	1 LS	-		-	-	-	-	120	-	620
5	20' Wide Gravel Haul Road x 8" Deep	790 LF	8.50		0.17	134	2,686	6,715	806	12.90	10,210
6	2-15" RCP Culverts	64 LF	12.00		1	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160 SY	3.00		0.1	16	320	480	96	5.60	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35 CY	10		20	700	14,000	350	4200	630	16,550
9	Construction Trailer (Rental) (Include Power & Water)	12 MO	-		-	0	0	0	-	720	8,640
(E) PAGE 1 TOTAL						1,370	27,390	8,693	7,641		63,270

E-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PGW/LK

PHONE: 7-6266

DATE: 09/1/83

LOG: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx320	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	4,028	TN	100	0.1	403	8,058	402,800	2,417	102.80	413,270
11	Place and Compact Foundation Soil in 8" Lifts to 85% STD. Proctor	12,780	CY	-	0.153	1961	39,816	0	11,885	4.00	51,500
12	Placement of 30 Mil Flexible Membrane Liner	104,400	SF	0.17	0.0075	783	15,860	17,745	-	0.30	33,410
13	Placement of 1'-0 Coarse Sand Drainage Layer	3,372	CY	10.50	0.03	101	2,023	35,406	607	11.30	36,040
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	1,980	LF	1.00	0.22	431	8,624	1,900	-	8.40	10,560
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X8-W 2.9xW 2.9(wid.wire fab)Broom Finish.	10,800	SY	7.50	0.45	4770	55,400	79,500	(0.60/HF) 3,516 (comp rate)	16.90	178,720
16	Sprayed on Curing Compound	10,800	SY	0.20	0.015	159	3,180	2,120	864	0.80	8,250
17	Joint Sealant 6" PVC Water Stops	6,550	LF	2.50	0.1	680	13,800	17,000	-	4.50	30,800
18	Excavation of Traingular Drainage Ditch	444	CY	-	0.2	80	1,778	0	-	5.20	2,310
19	4" Thick Concrete Perimeter Drainage Ditch	1,340	SY	7.30	0.37	496	9,916	9,782	2,978	16.90	22,670
(E) PAGE 2 TOTAL											787,350

E-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: E3E260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR PG/WLK
PHONE: 7-5288
DATE: 09/11/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	8,244	SY	0.25	0.016	132	2,638	2,061	791	0.70	5,490
21	Install 8' High Chain Link Perimeter Fence	1,528	LF	12	0.25	382	7,630	18,312	2,289	18.50	28,230
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x24" - Installed	4	EA	250	2	8	160	1,000	-	290	1,160
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	2400	2,400
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(E) PAGES 1,2,3 TOTAL						12,128	242,551	600,082	35,828		890,200
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							4,608	15,002			19,610
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											44,510
* LOCATION FACTOR @ .40% of (Total Labor Cost + Escalation)							98,664				98,660
(E) TOTAL DIRECT COST						12,130	348,020	615,080	35,830		1,053,180

E-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGAWLK
PHONE: 7-5288
DATE: 09/11/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								31,800
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								52,800
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								105,320
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								105,320
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								210,640
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					2,520	47,880				47,880
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						160,880	162,996			323,876
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					3,057					133,520
9	Project Management @ 8% of Total Direct + Indirects										165,120
(E) TOTAL INDIRECT COST											1,175,900

E-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										1,053,180
	TOTAL INDIRECT COST										1,175,900
	TOTAL INITIAL CONSTRUCTION COST										2,229,080
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,800
	• Inspection Activities of Facility - Monthly	60	HR		75.00		4,500				4,500
	• Subsidence Monitoring Annual Survey	20	HR		75.00		1,500				1,500
	• Maintenance of Concrete Slab	2	AC								2,000
	• Cover Repair Due To Subsidence										3,700
	• Annual Fence Maintenance	1									200
	• Annual Sign Maintenance	4									150
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(E) TOTAL O & M COST										15,850

E-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 09/11/93
LOC: MDC-106

S U M M A R Y

TWO ACRES (2) ACRE SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 245,000

(II Total Initial Construction Cost 2,229,000

(E) TOTAL PROJECT COST (Rounded to the nearest Thousand) 2,474,000

Appendix F
Cost Estimates for 5-Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJNAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
<u>FIVE (5) ACRES SITE - CLAYMAX</u>											
A	DIRECT COSTS										
1	SITE PREPARATION										
1	Clearing & Grubbing	10.2	AC	-	40	408	6,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	168	3,328	0	998	-	4,330
3	Silt Fence (Includes Maintenance)	1,675	LF	0.50	0.1	168	3,350	838	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,876	9,880	1,163	12.00	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,200	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(A) PAGE 1 TOTAL						1,716	34,314	12,128	9,589		60,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/HR	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1,007	20,140	1,007,000	6,042	102.60	1,033,180
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	40,350	CY	-	0.155	6,254	125,085	0	37,526	4.00	162,610
12	Placement of Claymax Geotextile Mat	308,000	SF	0.45	0.01	3,080	61,600	138,000	-	0.70	200,200
13	Placement of 30 Mil Flexible Membrane Liner	308,000	SF	0.17	0.0075	2,310	46,200	52,300	-	0.30	96,500
14	Placement of 1'-0" Coarse Sand Drainage Layer	10,620	CY	10.50	0.03	319	6,372	111,510	1,912	11.30	119,790
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	35,055	SY	0.17	0.005	175	3,500	5,959	-	0.30	9,480
16	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,360
17	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	50,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	641	SY	1.50	0.2	128	2,564	962	769	6.70	4,250
19	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,718	0	2,315	4.50	10,030
(A) PAGE 2 TOTAL						14,059	293,162	1,405,018	54,563		1,752,760

F-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/11/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,000	0.70	33,300
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,318	18.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(A) PAGES 1,2,3 TOTAL						16,088	361,756	1,461,688	74,190		1,911,870
* Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							6,673	36,542			43,420
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											95,590
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							147,452				147,450
(A) TOTAL DIRECT COST						16,090	516,080	1,498,230	74,190		2,196,330

F-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								65,950
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								109,920
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								219,830
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								219,830
5	Engineering & Services @ 20% of Total Direct Cost										439,670
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					3,763	71,492				71,490
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						239,977	397,031			637,010
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					4,559					199,120
9	Project Management @ 8% of Total Direct + Indirects										332,690
(A) TOTAL INDIRECT COST											2,285,710

F-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,100,330
	TOTAL INDIRECT COST										2,295,710
	TOTAL INITIAL CONSTRUCTION COST										4,494,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Facility - Monthly	72	HR		75		5,400				5,400
•	Subsidence Monitoring Annual Survey	24	HR		75		1,800				1,800
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	5	AC				500				2,500
•	Cover Repair Due to Subsidence										2,900
•	Annual Fence Maintenance	1									500
	Annual Sign Maintenance	8									200
•	Annual Monitoring Well Maintenance	4			75		300				300
	(A) TOTAL O & M COST										17,200

F-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L B E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5206
DATE: 09/11/93
LOC: MDC-106

SUMMARY

FIVE (5) ACRES SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

264,000

(II Total Initial Construction Cost

4,484,000

(A) TOTAL PROJECT COST (Rounded to the nearest Thousand)

4,768,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5206

DATE: 09/13/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FIVE (5) ACRE SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	168	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1,675	LF	0.50	0.1	168	3,350	636	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	6.50	0.17	194	3,876	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(L) PAGE 1 TOTAL						1,716	34,314	12,126	9,569		66,060

F-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5288
DATE: 09/13/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.00	1,033,100
11	Place and Compact Foundation Soil in 8" Lifts to 95% Standard Proctor	40,350	CY	-	0.155	6254	125,085	0	37,526	4.00	162,610
12	Placement of Bentonite Geotextile Mat	308,000	SF	0.45	0.01	3080	61,600	136,000	-	0.70	200,200
13	Placement of 30 Mil Flexible Membrane Liner	308,000	SF	0.17	0.0075	2310	46,200	52,360	-	0.30	96,500
14	Placement of 1'-0" Coarse Sand Drainage Layer	10,620	CY	10.50	0.03	319	6,372	111,510	1,912	11.30	119,790
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	35,055	SY	0.17	0.005	175	3,506	5,959	-	0.30	9,400
16	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,360
17	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	49,178	1,636	11.10	50,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	641	SY	1.50	0.2	126	2,564	962	769	6.70	4,290
19	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,716	0	2,315	4.50	10,030
(L) PAGE 2 TOTAL						14,659	293,182	1,405,018	54,563		1,752,750

F-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5268

DATE: 09/13/93

LOC: MDC-108

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,800	0.70	33,300
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	28,544	3,318	18.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	8	EA	250	2.00	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
(L) PAGES 1,2,3 TOTAL						18,088	361,756	1,481,658	74,190		1,911,870
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							6,873	36,542			43,420
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											85,590
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							147,452				147,450
(L) TOTAL DIRECT COST						18,090	518,080	1,498,230	74,190		2,196,330

F-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ESTIMATOR: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5208

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 09/13/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								65,950
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								109,920
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								219,830
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								219,830
5	Engineering & Services @ 20% of Total Direct Cost										439,670
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					3,763	71,492				71,490
7	Field Indirects of Total Direct Labor @ 46.5, Bulk Material @ 26.5%						239,977	397,031			637,010
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					4,559					199,120
9	Project Management @ 6% of Total Direct + Indirects										332,890
	(L) TOTAL INDIRECT COST										2,295,710

F-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/13/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,198,330
	TOTAL INDIRECT COST										2,295,710
	TOTAL INITIAL CONSTRUCTION COST										4,494,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	72	HR		75.00		5,400				5,400
	• Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	5	AC								2,500
	• Cover Repair Due to Subsidence										2,900
	• Annual Fence Maintenance	1									500
	• Annual Sign Maintenance	8									200
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(L) TOTAL O & M COST										17,200

F-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/13/93
LOC: MDC-106

SUMMARY

FIVE (5) ACRE SITE - BENTOMAT (GBM)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	264,000
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(II) Total Initial Construction Cost	4,494,000
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(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	4,758,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PGWMLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>FIVE (5) ACRE SITE - GUNDSEAL</u>											
A	<u>1 DIRECT COSTS</u>										
I	<u>1 SITE PREPARATION</u>										
1	Clearing & Grubbing	10.20	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.20	AC	-	32	168	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1.676	LF	0.50	0.1	168	3,360	838	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,878	9,890	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	788	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	88	5.00	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(I) PAGE 1 TOTAL						1,716	34,314	12,126	9,588		68,060

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK

PHONE: 7-5806

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	<u>II COVER CONSTRUCTION</u>										
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1,007	20,140	1,007,000	6,042	102.60	1,033,180
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	40,350	CY	-	0.155	6,254	125,085	0	37,526	4.00	162,610
12	Placement of Gundseal Geomembrane/ Bentonite Mat	308,000	SF	0.50	0.01	3,080	61,600	154,000	-	0.70	215,600
13	Placement of 1'-0 Coarse Sand Drainage Layer	10,620	CY	10.50	0.03	319	6,372	111,510	1,912	11.30	119,790
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	35,055	SY	0.17	0.005	175	3,506	5,959	-	0.30	9,460
15	Placement of 1'-8" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,360
16	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	50,270
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	641	SY	1.50	0.2	128	2,564	962	769	6.70	4,290
18	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,720	0	2,316	4.60	10,040
	(I) PAGE 2 TOTAL					12,349	246,965	1,368,058	54,584		1,869,600

F-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PGWLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,800	0.70	33,300
20	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,318	18.50	40,920
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
22	Warning Signs 4-18"x 24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						15,778	315,559	1,424,728	74,191		1,828,720
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							5,996	35,618			41,610
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											91,440
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							128,622				128,620
(I) TOTAL DIRECT COST						15,780	450,180	1,460,350	74,190		2,080,380

F-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								62,710
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								104,520
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								209,040
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								209,040
5	Engineering & Services @ 20% of Total Direct Cost										418,080
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					3,282	62,363				62,360
7	Field Indirects Labor @ 46.5%, Bulk Material @ 28.5%						209,334	366,993			596,330
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					3,977					173,700
9	Project Management @ 8% of Total Direct + Indirects										314,090
	(I) TOTAL INDIRECT COST										2,149,670

F-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,090,390
	TOTAL INDIRECT COST										2,149,870
	TOTAL INITIAL CONSTRUCTION COST										4,240,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	72	HR		75.00		5,400				5,400
	• Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	5	AC								2,500
	• Cover Repair Due to Subsidence										2,650
	• Annual Fence Maintenance	1					0				500
	• Annual Sign Maintenance	4									200
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(I) TOTAL O & M COST										16,950

F-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

SUMMARY

FIVE (5) ACRE SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	281,000
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(II) Total Initial Construction Cost	4,240,000
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(I) TOTAL PROJECT COST (Rounded to the nearest Thousand)	4,501,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PGW/LK

PHONE: 7-5208

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>FIVE ACRES (5) ACRE SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	168	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1,675	LF	0.50	0.1	168	3,350	838	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,878	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	98	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(F) PAGE TOTAL						1,718	34,314	12,128	9,589		98,660

F-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR

PG/WLK

PHONE:

7-5288

DATE:

09/11/93

LOC:

MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1,007	20,140	1,007,000	6,042	102.00	1,033,180
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	40,350	CY	-	0.155	6,254	125,085	0	37,528	4.00	162,810
12	Placement of 120 Mil Flexible Membrane Liner	308,000	SF	0.50	0.01	3,080	61,000	154,000	-	0.70	215,600
13	Placement of 1'-0" Coarse Sand Drainage Layer	10,620	CY	10.50	0.03	319	6,372	111,510	1,912	11.30	119,790
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	35,055	SY	0.17	0.005	175	3,506	5,959	-	0.30	9,465
15	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,363
16	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	50,270
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	641	CY	1.50	0.2	126	2,564	962	769	6.70	4,290
18	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,718	0	2,315	4.50	10,030
(F) PAGE TOTAL						12,349	246,982	1,368,058	54,563		1,009,590

F-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PGW/LK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,800	0.70	33,300
20	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,316	18.50	40,920
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
22	Warning Signs 4-18"x24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
24	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						15,778	315,556	1,424,728	74,190		1,828,710
							5,996	35,616			41,610
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											91,440
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							128,621				128,620
(F) TOTAL DIRECT COST						15,780	450,170	1,460,350	74,190		2,080,360

F-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK
PHONE: 7-5266

DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								62,710
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								104,520
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								209,040
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								209,040
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								418,080
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					3,282	62,363				62,360
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						209,329	386,993			596,320
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					3,977					173,700
9	Project Management @ 8% of Total Direct + Indirects										314,090
(F) TOTAL INDIRECT COST											2,149,800

F-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,090,360
	TOTAL INDIRECT COST										2,149,660
	TOTAL INITIAL CONSTRUCTION COST										4,240,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
*	Inspection Activities of Facility - Monthly	72	HR		75.00		5,400				5,400
*	Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	5	AC								2,500
*	Cover Repair Due to Subsidence										2050
*	Annual Fence Maintenance	1									500
	Annual Sign Maintenance	8									200
*	Annual Monitoring Well Maintenance	4			75.00		300				300
	(F) TOTAL O & M COST										16,950

F-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5206

DATE: 03/11/93

LOG: MDC-106

S U M M A R Y

FIVE ACRES (5) ACRE SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

261,000

(II) Total Initial Construction Cost

4,240,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

4,501,000

F-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/MLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>FIVE (5) ACRES SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>1 SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	168	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1675	LF	0.50	0.1	168	3,350	838	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1140	LF	8.50	0.17	194	3,878	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	88	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(C) PAGE 1 TOTAL						1,718	34,314	12,128	9,589		68,000

F-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.60	1,033,160
11	Placement of 30 mil Flexible Membrane Liner	308,000	SF	0.17	0.0075	2310	46,200	52,360	-	0.30	96,560
12	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	40,350	CY	-	0.155	6254	125,065	0	57,526	4.00	162,610
13	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	27,110	SY	2	0.15	4067	81,330	84,220	24,309	5.90	159,950
		40,665	GAL								
14	Placement of 1'-0" Coarse Sand Drainage Layer	9,035	CY	10.50	0.03	271	5,421	94,665	1,626	11.30	101,910
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	27,110	SY	0.17	0.005	136	2,711	4,609	-	0.30	7,320
16	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,360
17	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	60,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Crushed Stone	641	SY	1.50	0.2	126	2,564	962	769	6.70	4,290
19	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,717	0	2,315	4.50	10,030
(C) PAGE 2 TOTAL						15,558	\$11,167	1,302,645	76,677		1,692,480

F-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.018	800	16,000	12,500	4,800	0.70	33,300
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,318	18.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24 - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(C) PAGES 1,2,3 TOTAL						1713	29,260	44,544	10,038		92,440
						18,967	378,741	1,359,318	98,304		1,851,800
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							7,215	33,963			41,200
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											92,580
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							154,782				154,780
(C) TOTAL DIRECT COST						18,990	541,740	1,393,300	98,300		2,140,160

F-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								64,200
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								107,010
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								214,020
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								214,020
5	Engineering & Services @ 20% of Total Direct Cost										428,030
6	Craft Support @ 20.8 % of Total MNHRS (\$19/HR)					3,949					75,037
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						251,909	369,225			621,130
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					4,785					208,000
9	Project Management @ 8% on Total Direct + Indirects										325,810
	(C) TOTAL INDIRECT COST										2,258,260

F-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,140,100
	TOTAL INDIRECT COST										2,256,200
	TOTAL INITIAL CONSTRUCTION COST										4,396,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Closed Facility Monthly	72	HR		75.00		5,400				5,400
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	5	AC								2,500
•	Cover Repair Due to Subsidence										2,900
•	Annual Fence Maintenance	1									500
	Annual Sign Maintenance	8									200
•	Annual Monitoring Well Maintenance	4			75.00		300				300
•	Subsidence Monitoring (Annual Survey)	24	HR		75.00		1,800				1,800
	(C) TOTAL O & M COST										17,200

F-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/11/93
LOC: MDC-106

SUMMARY

FIVE (5) ACRES SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost 264,000
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(II) Total Initial Construction Cost 4,398,000

(C) TOTAL PROJECT COST (Rounded to the nearest Thousand) 4,662,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5268

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FIVE (5) ACRES SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	166	3,328	0	896	-	4,330
3	Silt Fence (Includes Maintenance)	1,875	LF	0.50	0.1	168	3,350	838	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,878	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	800
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(D) PAGE 1 TOTAL						1,716	34,314	12,128	9,589		66,000

F-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

LOG #: 7-25
PROJ.NO: K 86821100
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MIN-\$20	MAT'L \$	EQUIP	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.60	1,033,160
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	40,350	CY	-	0.155	6254	125,065	0	37,526	4.00	162,610
12	Placement of Geotextile Reinforcement on Foundation Layer	27,110	SY	0.30	0.01	271	5,422	8,133	-	0.50	13,560
13	Placement of 30 mil Flexible Membrane Liner	308,000	SF	0.17	0.0075	2310	46,200	52,360	-	0.30	96,580
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5gal/Sy	27,110 40,665	SY GAL	2.00	0.15	4067	81,330	54,220	24,399	5.90	159,950
15	Placement of 1'-0" Coarse Sand Drainage Layer	9,035	CY	10.50	0.03	271	5,421	84,868	1,826	11.30	101,910
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	27,110	SY	0.17	0.005	136	2,711	4,609	-	0.30	7,320
17	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,360
18	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	50,270
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	641	SY	1.50	0.2	126	2,564	962	769	6.70	4,290
20	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,716	0	2,315	4.50	10,030
(D) PAGE TOTAL						15,829	316,589	1,310,778	78,677		1,705,040

F-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-25
PROJ.NO: K 86821100
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EQUIP	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,800	0.70	33,300
22	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,316	18.50	40,920
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1,980	1,980
24	Warning Signs 4-18"x24" - Install	8	EA	250	2	16	320	2,000	-	290	2,320
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3,600	3,600
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2,580	10,320
(D) PAGES 1,2,3 TOTAL						19,258	385,163	1,367,448	98,304		1,865,180
							7,316	34,166			41,500
• Escalation for 1994 on Direct Labor is 1.8% and 2.5% on Direct Material											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											83,280
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							156,992				156,990
(D) TOTAL DIRECT COST						19,260	549,470	1,401,630	98,300		2,158,910

F-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-25
PROJ.NO: K 86821100

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266

DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR \$	MAT'L \$	EQUIP	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								64,710
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								107,850
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								215,690
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								215,690
5	Engineering & Services @ 20% of Total Direct Cost										431,380
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					4,006	76,116				76,120
7	Field Indirects on Total Direct Labor @ 46.5%, Bulk Materials @ 26.5%						255,504	371,432			626,940
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					4,854					212,000
9	Project Management @ 8% of Total Direct + Indirects										320,500
(D) TOTAL INDIRECT COST											2,278,960

F-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-25

PROJ.NO: K 86821100

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5306

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QUNTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR \$	MAT'L \$	EQUIP	UNIT COST	TOTAL COST
TOTAL DIRECT COST											2,156,910
TOTAL INDIRECT COST											2,278,900
TOTAL INITIAL CONSTRUCTION COST											4,435,810
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Closed Facility Monthly	72	HR		75.00		5,400				5,400
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	5	AC								2,500
•	Cover Repair Due to Subsidence										
•	Annual Fence Maintenance Annual Sign Maintenance	1 8									3,100
•	Annual Monitoring Well Maintenance	4			75.00		300				300
•	Subsidence Monitoring (Annual Survey)	24	HR		75.00		1,800				1,800
(D) TOTAL O & M COST											17,400

F-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-25
PROJ.NO: K 86821100
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/11/93
LOC: MDC-108

SUMMARY

FIVE (5) ACRES SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost 267,000
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(II Total Initial Construction Cost 4,436,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand) 4,703,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FIVE (5) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	168	3,328	0	896	-	4,330
3	Silt Fence (Includes Maintenance)	1,875	LF	0.50	0.1	188	3,350	838	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	0	0	0	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,878	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(K) PAGE 1 TOTAL						1,716	34,314	12,126	9,569		66,000

F-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.60	1,033,160
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	40,350	CY	-	0.155	6254	125,065	0	37,526	4.00	162,610
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	16,950	CY	13.00	0.165	2797	55,935	220,350	16,781	17.30	293,070
13	Placement of 30 Mil Flexible Membrane Liner	261,000	SF	0.17	0.0075	1958	39,150	44,370	-	0.30	63,520
14	Placement of 1'-0 Coarse Sand Drainage Layer	9,035	CY	10.50	0.03	271	5,421	94,868	1,626	11.30	101,910
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	27,845	SY	0.17	0.005	139	2,785	4,734	-	0.30	7,520
16	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,300
17	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	60,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	641	SY	1.50	0.2	126	2,564	962	769	6.70	4,290
19	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,718	0	2,315	4.50	10,030
(K) PAGE 2 TOTAL						13,940	278,795	1,480,910	71,058		1,610,760

F-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,800	0.70	33,300
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,316	18.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(K) PAGES 1,2,3 TOTAL						17,368	347,368	1,517,580	90,685		1,969,060
							6,600	37,939			44,540
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											96,490
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							141,588				141,590
(K) TOTAL DIRECT COST						17,370	495,560	1,555,520	90,690		2,254,500

F-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								67,640
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								112,730
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								225,450
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								225,450
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								450,900
6	Craft Support @ 20.8% of Total MHRS (\$19/HR)					3,613	68,646				468,940
7	Field Indirects of Total Direct Labor @ 46.5, Bulk Material @ 26.5%						230,435	412,213			642,650
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					4,377					191,200
9	Project Management @ 8% of Total Direct + Indirects										371,160
	(K) TOTAL INDIRECT COST										2,756,120

F-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,254,500
	TOTAL INDIRECT COST										2,756,120
	TOTAL INITIAL CONSTRUCTION COST										5,010,620
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	72	HR		75.00		5,400				5,400
	• Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	5	AC								2,500
	• Cover Repair Due to Subsidence										6,050
	• Annual Fence Maintenance	1									500
	• Annual Sign Maintenance	8									200
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(K) TOTAL O & M COST										20,950

F-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5200
DATE: 09/11/83
LOC: MDC-106

SUMMARY

FIVE (5) ACRE SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) **322,000**

(ii) Total Initial Construction Cost **5,010,620**

(K) TOTAL PROJECT COST (Rounded to the nearest Thousand) 5,333,000

F-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>FIVE (5) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	168	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1,875	LF	0.50	0.1	168	3,350	838	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,878	9,890	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(J) PAGE 1 TOTAL						1,716	34,314	12,128	9,588		68,000

F-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.60	1,033,180
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	40,350	CY	-	0.155	6254	125,085	0	37,526	4.00	162,610
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	16,950	CY	-	0.165	2797	55,935	0	16,781	4.30	72,720
13	Placement of 30 Mil Flexible Membrane Liner	261,000	SF	0.17	0.0075	1958	39,150	44,370	-	0.30	83,520
14	Placement of 1'-0" Coarse Sand Drainage Layer	9,035	CY	10.50	0.03	271	5,421	94,668	1,626	11.30	101,910
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	27,845	SY	0.17	0.005	139	2,785	4,734	-	0.30	7,520
16	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,360
17	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	50,270
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	641	SY	1.50	0.2	126	2,564	962	769	6.70	4,290
19	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,716	0	2,315	4.50	10,030
(J) PAGE 2 TOTAL						13,940	278,785	1,240,560	71,058		1,590,410

F-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.018	800	16,000	12,500	4,800	0.70	33,300
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,318	18.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(J) PAGES 1,2,3 TOTAL						17,368	347,368	1,297,230	90,885		1,749,530
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							6,600	32,431			39,030
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											87,480
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							141,588				141,590
(J) TOTAL DIRECT COST						17,370	495,560	1,329,660	90,890		2,017,830

F-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								60,530
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								100,880
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								201,760
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								201,760
5	Engineering & Services @ 20% of Total Direct Cost										403,530
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					3,613	68,646				68,646
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						230,435	352,360			582,795
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					4,377					191,200
9	Project Management @ 8% of Total Direct + Indirects										306,300
	(J) TOTAL INDIRECT COST										2,117,400

F-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5206
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,017,630
	TOTAL INDIRECT COST										2,117,400
	TOTAL INITIAL CONSTRUCTION COST										4,135,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	72	HR		75.00		5,400				6,400
	• Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	5	AC								2,500
	• Cover Repair Due to Subsidence										6,400
	• Annual Fence Maintenance	1									500
	• Annual Sign Maintenance	8									200
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(J) TOTAL O & M COST										20,700

F-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWMLK

PHONE: 7-5208

DATE: 09/11/83

LOC: MDC-106

SUMMARY

FIVE (5) ACRE SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

318,000

(II) Total Initial Construction Cost

4,135,000

(J) TOTAL PROJECT COST (Rounded to the nearest Thousand)

4,453,000

F-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/MLK

PHONE: 7-5266

DATE: 10/06/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>FIVE (5) ACRE SITE - SOIL CEMENT COVER</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	166	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1675	LF	0.50	0.1	168	3,350	638	-	2.50	4,180
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1140	LF	8.50	0.17	194	3,876	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	39.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(G) PAGE 1 TOTAL						1,716	34,314	12,126	9,589		66,060

F-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 5266

DATE: 06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.60	1,033,180
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	40,350	CY	-	0.155	6254	125,085	0	37,526	4.00	162,610
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	25,715	CY	18	0.165	4243	84,860	462,870	25,458	22.30	573,190
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	27,455	SY	0.33	0.05	1373	27,455	9,060	-	1.30	36,520
		27,455	SY	0.17	0.03	824	16,473	4,667	-	0.80	21,140
14	Placement of 30 Mil Flexible Membrane Liner	261,000	SF	0.17	0.0075	1958	39,150	44,370	-	0.30	63,520
15	Placement of 1'-0 Coarse Sand Drainage Layer	9,035	CY	10.50	0.03	271	5,421	94,868	1,626	11.30	101,910
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	27,845	SY	0.17	0.005	139	2,785	4,734	-	0.30	7,520
17	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,300
18	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,178	1,636	11.10	50,270
(G) PAGE 2 TOTAL						17,068	341,366	1,718,196	76,651		2,134,220

F-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5268
DATE: 10/06/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/HR	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	641	SY	1.50	0.2	128	2,564	962	769	6.70	4,290
20	Excavation of Trapezoidal Drainage Ditch	2,205	CY	-	0.175	386	7,718	0	2,315	4.50	10,030
21	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,800	0.70	33,300
22	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0	553	11,060	26,544	3,318	18.50	40,920
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1980	1,980
24	Warning Signs 4-18"x 24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3000	3,000
26	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80.00	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						21,011	420,222	1,773,627	99,363		2,307,660
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							7,984	44,346			52,330
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											115,380
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							171,282				171,280
(G) TOTAL DIRECT COST						21,010	599,490	1,818,170	99,360		2,648,050

F-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 10/06/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								79,400
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								132,330
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								264,670
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								264,670
5	Engineering & Services @ 20% of Total Direct Cost										529,330
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					4,370	83,032				83,030
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						276,763	481,815			760,580
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					5,295					231,260
9	Project Management @ 8% of Total Direct + Ind	8.0%									399,350
(G) TOTAL INDIRECT COST											2,744,620

F-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5268

DATE: 10/08/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/HR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,646,650
	TOTAL INDIRECT COST										2,744,620
	TOTAL INITIAL CONSTRUCTION COST										5,391,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
•	Inspection Activities of Closed Facility Monthly	72	HR		75.00		5,400				5,400
•	Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	5	AC								2,500
•	Cover Repair Due to Subsidence										6,600
•	Annual Fence Maintenance	1									500
•	Annual Sign Maintenance	8									200
•	Annual Monitoring Well Maintenance	4			75.00		300				300
	(G) TOTAL O & M COST										20,900

F-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 10/08/93

LOC: MDC-108

SUMMARY

FIVE (5) ACRE SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(i Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	321,000
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(ii Total Initial Construction Cost	5,391,000
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(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)	5,712,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/MLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FIVE (5) ACRE SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	166	3,328	0	888	-	4,330
3	Silt Fence (Includes Maintenance)	1,675	LF	0.50	0.1	168	3,350	836	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,876	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(H) PAGE 1 TOTAL						1,716	34,314	12,126	9,588		66,860

F-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.60	1,033,160
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	40,350	CY	-	0.155	6254	125,065	0	37,526	4.00	162,610
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	229	TN	146.50	2.5	573	11,450	\$3,549	-	196.50	45,000
		8,346	CY	15.00	0.165	1377	27,542	125,190	8,263	19.30	160,990
		Sl.Sa									
13	Placement of 30 Mil Flexible Membrane Liner	261,000	SF	0.17	0.0075	1956	\$9,150	44,370	-	0.30	63,520
14	Placement of 1'-0 Coarse Sand Drainage Layer	9,035	CY	10.50	0.03	271	5,421	94,606	1,626	11.30	101,910
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	27,845	SY	0.17	0.005	139	2,765	4,734	-	0.30	7,520
16	Placement of 1'-6" Common Fill	12,120	CY	3.75	0.06	727	14,544	45,450	4,363	5.30	64,300
17	Placement of 6" Topsoil	4,545	CY	9.50	0.06	273	5,454	43,176	1,636	11.10	60,270
(H) PAGE 2 TOTAL						12,579	251,570	1,396,337	59,456		1,709,360

F-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	641	SY	1.50	0.2	128	2,564	962	769	6.70	4,290
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	2,205	CY	-	0.175	386	7,716	0	2,315	4.50	10,030
20	Seeding, Fertilizing & Mulching	50,000	SY	0.25	0.016	800	16,000	12,500	4,800	0.70	33,300
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,316	18.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1960	1,960
23	Warning Signs 4-18"x24"	8	EA	250	2	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
PAGES 1,2,3 TOTAL						16,521	330,426	1,455,968	13,122 82,167		106,160 1,662,600
* Escalation for 1994 on Direct labor is 1.9% and 2.5% on Direct Material							6,278	36,399			42,680
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											94,140
* LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							134,662				134,680
(H) TOTAL DIRECT COST						16,520	471,390	1,492,370	82,170		2,154,300

F-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

CHKD BY: S. MEAD

DETAILS ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL
ESTIMATOR: PGW/LK
PHONE: 7-5286
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST	UM	UNIT	MATL	LABOR	\$	BEMCAP	UNIT	TOTAL
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS							64,630
2	Health & Safety Assume 5% of Total Direct Cost	1	LS							107,720
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS							215,430
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS							215,430
5	Engineering & Services @ 20% of Total Direct Cost									430,860
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)	3,436				65,287				65,290
7	Field Indirects of Total Direct Labor @ 48.5%, Bulk Material @ 28.5%					219,196	395,478			614,670
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					4,163				181,840
9	Project Management @ 8% of Total Direct + Indirects									324,010
	(H) TOTAL INDIRECT COST									2,219,880

F-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5268
DATE: 09/11/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,154,300
	TOTAL INDIRECT COST										2,219,880
	TOTAL INITIAL CONSTRUCTION COST										4,374,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Closed Facility Monthly	72	HR		75.00		5,400				5,400
	• Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	5	AC								2,500
	• Cover Repair Due to Subsidence										4,300
	• Annual Fence Maintenance	1									500
	• Annual Sign Maintenance	8									200
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(H) TOTAL O & M COST										18,900

F-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR PG/WLK
PHONE: 7-5268
DATE: 09/11/93
LOC: MDC-106

S U M M A R Y

FIVE (5) ACRE SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	266,000
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(II Total Initial Construction Cost	4,574,000
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	4,660,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK

PHONE: 7-5286

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>FIVE (5) ACRES SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	168	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1,875	LF	0.50	0.1	188	3,350	638	-	2.50	4,190
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1,140	LF	8.50	0.17	194	3,876	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	364	38.00	2,430
7	35'-0" x 35'-0" x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(B) PAGE 1 TOTAL						1,716	34,314	12,128	9,589		66,000

F-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PGW/LK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.80	1,033,180
11	Place and Compact Foundation Soil In 8" Lifts to 95% Std. Proctor	31,950	CY	-	0.155	4952	99,045	0	29,714	4.00	128,760
12	Placement of 30 Mil Flexible Membrane Liner	281,000	SF	0.17	0.0075	1958	39,150	44,370	-	0.30	83,520
13	Placement of 1'-0 Coarse Sand Drainage Layer	8,430	CY	10.50	0.03	253	5,058	88,515	1,517	11.30	95,090
14	2" PVC Perforated Drainage Pipe placed In Drainage layer	3,090	LF	1.0	0.22	680	13,596	3,090	-	5.40	16,690
15	2 1/2" Binder Course	26,500	SY	4.2	0.06	1590	31,800	111,300	9,540	5.80	152,640
16	4" Hydraulic Asphalt Conc.	26,500	SY	6.70	0.03	795	15,900	177,550	4,770	7.50	198,220
17	Asphalt Mastic Seal	26,500	SY	0.50	0.015	398	7,950	13,250	-	0.80	21,200
18	Sprayed Asphaltic Concrete Sealant	26,500	SY	0.75	0.02	530	10,600	19,875	3,180	1.30	33,660
19	Excavation of Triangular Drainage Ditch	1,110	CY	-	0.2	222	4,440	0	1,332	5.20	5,770
20	4" Thick Asphalt Perimeter Drainage Ditch	3,350	SY	7.85	0.15	503	10,050	28,298	3,015	11.70	39,360
(B) PAGE 2 TOTAL						12,086	257,729	1,491,248	59,110		1,808,080

F-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PGWLK

PHONE 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area Inside the Security Fence	20,610	SY	0.25	0.016	330	6,595	5,153	1,979	0.70	13,730
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,316	16.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1960	1,960
23	Warning Signs 4-18"x 24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	60	320	6,400	2,000	1,920	2580	10,320
(B) PAGES 1,2,3 TOTAL						15,645	316,696	1,540,570	75,916		1,947,640
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							6,021	36,514			44,540
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											97,360
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							129,168				129,170
(B) TOTAL DIRECT COST						15,640	452,090	1,579,080	75,920		2,218,730

F-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR PG/WLK
PHONE: 7-5288

DATE: 09/11/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/HR	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								66,500
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								110,940
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								221,870
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								221,870
5	Engineering & Services @ 20% of Total Direct Cost										443,750
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					3,295	62,600				62,600
7	Field Indirects of Total Direct Labor @ 48.5%, Bulk Materials @ 28.5%						210,222	418,458			628,680
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					3992					174,360
9	Project Management @ 8% of Total Direct + Indirects										331,950
(B) TOTAL INDIRECT COST											2,262,580

F-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR PG/WLK
PHONE: 7-5266
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,218,730
	TOTAL INDIRECT COST										2,262,580
	TOTAL INITIAL CONSTRUCTION COST										4,481,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,600
	• Inspection Activities of Facility - Monthly	72	HR		75.00		5,400				5,400
	• Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	5	AC								2,500
	• Cover Repair Due to Subsidence										4,100
	• Annual Fence Maintenance	1									500
	• Annual Sign Maintenance	8									200
	• Annual Monitoring Well Maintenance	4			75.00		300				300
	(B) TOTAL O & M COST										18,400

F-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK
PHONE: 7-5208
DATE: 09/11/93
LOC: MDC-106

SUMMARY

FIVE (5) ACRES SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost 283,000
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(II) Total Initial Construction Cost 4,481,000

(B) TOTAL PROJECT COST (Rounded to the nearest Thousand) 4,764,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
<u>FIVE ACRES (5) ACRE SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	10.2	AC	-	40	408	8,160	0	2,448	-	10,610
2	Precontouring Site	5.2	AC	-	32	166	3,328	0	996	-	4,330
3	Silt Fence (Includes Maintenance)	1675	LF	0.50	0.1	168	3,350	838	-	2.50	4,180
4	Temporary Sediment Control	1	LS	-	-	-	-	-	300	-	2,300
5	20' Wide Gravel Haul Road x 8" Deep	1140	LF	8.50	0.17	194	3,878	9,690	1,163	12.90	14,730
6	2-15" RCP Culverts	64	LF	12.00	1	64	1,280	768	384	38.00	2,450
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	86	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	12	MO	-	-	0	0	0	-	720	8,640
(E) PAGE 1 TOTAL						1,716	34,314	12,126	9,560		66,690

F-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-25

PROJ.NO: K 86821100

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PGWLK

PHONE: 7-5206

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/HR	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	10,070	TN	100	0.1	1007	20,140	1,007,000	6,042	102.60	1,033,180
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	31,950	CY	-	0.155	4952	99,045	0	29,714	4.00	128,760
12	Placement of 30 Mil Flexible Membrane Liner	261,000	SF	0.17	0.0075	1958	39,150	44,370	-	0.30	83,520
13	Placement of 1'-0 Coarse Sand Drainage Layer	8,430	CY	10.50	0.03	253	5,058	88,515	1,517	11.30	95,090
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	3,090	LF	1.00	0.22	680	13,596	3,090	-	5.40	16,680
15	4" Concrete Slab with 1 Layer of (con/frm) 6X6-W 2.9xW 2.9(wid.wire fab)Broom Finish.	26,500	SY	7.50	0.45	11925	238,500	196,750	(0.80/hr) 9,540 (comp rate)	16.90	446,790
16	Sprayed on Curing Compound	26,500	SY	0.20	0.015	398	7,950	5,300	2,365	0.60	15,640
17	Joint Sealant 6" PVC Water Stops	17,000	LF	2.50	0.1	1700	34,000	42,500	-	4.50	76,500
18	Excavation of Traingular Drainage Ditch	1,110	CY	-	0.2	222	4,440	0	1,332	5.20	5,770
19	4" Thick Concrete Perimeter Drainage Ditch	3,350	SY	7.30	0.37	1240	24,790	24,455	7,437	16.90	56,660
(E) PAGE 2 TOTAL						24,333	486,669	1,413,980	57,967		1,958,620

F-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-25
PROJ.NO: K 86821100
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5288
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	20,610	SY	0.25	0.016	330	6,595	5,153	1,979	0.70	13,730
21	Install 8' High Chain Link Perimeter Fence	2,212	LF	12	0.25	553	11,060	26,544	3,318	18.50	40,920
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24	24	480	1,500	-	1900	1,900
23	Warning Signs 4-18"x24" - Installed	8	EA	250	2	16	320	2,000	-	290	2,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	3600	3,600
25	Ground Water Monitoring Wells (100' Deep)	4	EA	500	80	320	6,400	2,000	1,920	2580	10,320
(E) PAGES 1,2,3 TOTAL						27,292	545,638	1,463,302	74,773		2,098,170
• Escalation for 1994 on Direct Labor is 1.9% and 2.5% on Direct Material							10,371	36,563			46,930
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											104,910
• LOCATION FACTOR @ 40% of (Total Labor Cost + Escalation)							222,484				222,480
(E) TOTAL DIRECT COST						27,290	778,690	1,499,860	74,770		2,472,510

F-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-25

PROJ.NO: K 86821100

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5288

DATE: 09/11/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/HR	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 3% of the Total Direct Cost)	1	LS								74,180
2	Health & Safety Assume 5% of Total Direct Cost	1	LS								123,630
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								247,250
4	Administrative & Legal @ 10% of Total Direct Cost	1	LS								247,250
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								494,500
6	Craft Support @ 20.8% of Total MNHRS (\$19/HR)					5,676	107,650				107,650
7	Field Indirects of Total Direct Labor @ 46.5%, Bulk Material @ 26.5%						362,091	397,468			759,560
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					6,677					300,390
9	Project Management @ 8% of Total Direct + Indirects										396,170
(E) TOTAL INDIRECT COST											2,740,780

F-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-25
PROJ.NO: K 86821100
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5206
DATE: 09/11/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/HR	UNIT COST	TOTAL COST
TOTAL DIRECT COST											2,472,510
TOTAL INDIRECT COST											2,740,780
TOTAL INITIAL CONSTRUCTION COST											5,213,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	16	EA								3,800
	• Inspection Activities of Facility - Monthly	72	HR		75.00		5,400				5,400
	• Subsidence Monitoring Annual Survey	24	HR		75.00		1,800				1,800
	• Maintenance of Concrete Slab	5	AC								3,000
	• Cover Repair Due to Subsidence										7,550
	• Annual Fence Maintenance	1									500
	• Annual Sign Maintenance	8									200
	• Annual Monitoring Well Maintenance	4			75.00		300				300
(E) TOTAL O & M COST											22,950

F-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-25
PROJ.NO: K 86821100
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 09/11/93
LOC: MDC-108

SUMMARY

FIVE ACRES (5) ACRE SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(i Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

344,000

(ii Total Initial Construction Cost

5,213,000

(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)

5,557,000

Appendix G

Cost Estimates for 10-Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S.MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8" DP x 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(A) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,860

G-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,384	77.60	1,081,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	88,709	CY	-	0.145	12,863	257,256	0	77,177	3.80	334,430
12	Placement of Claymax Geotextile Mat	478,400	SF	0.40	0.006	2,870	57,408	191,360	-	0.52	248,770
13	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	66,560	71,314	-	0.30	137,870
14	Placement of 1'-0" Coarse Sand Drainage Layer	16,875	CY	10.50	0.025	422	8,438	177,188	2,531	11.20	188,160
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	264	5,270	7,378	-	0.20	12,850
16	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
17	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,161	2,531	10.80	91,130
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,358	SY	1.50	0.16	217	4,346	2,037	1,304	5.70	7,690
19	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
(A) PAGE 2 TOTAL						23,880	477,595	1,571,939	104,507		2,254,040

G-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,248	5,459	0.60	39,900
21	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
23	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,650
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	-	5,000
25	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2,580	20,840
(A) PAGES 1,2,3 TOTAL						28,669	573,380	1,769,393	132,775		2,500,610
							10,894	44,235			55,130
• Escalation for 1994 on Direct Labor is 1.9% & on Direct material is 2.5%											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											125,030
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							233,710				233,710
(A) TOTAL DIRECT COST						28,670	617,960	1,813,630	132,770		2,914,480

G-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								72,680
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								116,580
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								291,450
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								233,160
5	Engineering & Services @ 20% of Total Direct Cost										582,900
6	Craft Support @ 20.6% of Total MHRS (\$19/hr)					5,963					113,300
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						380,361	480,612			860,970
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					7,225					315,580
9	Project Management @ 8% of Total Direct + Indirects										440,100
(A) TOTAL INDIRECT COST											3,026,900

G-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,914,480
	TOTAL INDIRECT COST										3,028,900
	DURATION FACTOR (3% On Direct+Indirect)										178,241
	TOTAL INITIAL CONSTRUCTION COST										6,120,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Facility - Monthly	36	HR							75	2,700
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								4,500
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12									480
*	Annual Monitoring Well Maintenance	8								75	600
	(A) TOTAL O & M COST										22,430

G-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S.MEAD

ESTIMATOR: PO/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 345,000

(ii) Total Initial Construction Cost 6,120,000

(A) TOTAL PROJECT COST (Rounded to the nearest Thousand) 6,465,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8" DP X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(L) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,860

G-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	.75	0.1	1,394	27,880	1,045,500	8,364	77.60	1,081,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Standard Proctor	88,709	CY	-	0.145	12,863	257,256	0	77,177	3.80	334,430
12	Placement of Bentomat Geotextile Mat	478,400	SF	0.40	0.006	2,870	57,408	191,360	-	0.52	248,770
13	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	66,560	71,314	-	0.30	137,870
14	Placement of 1'-0 Coarse Sand Drainage Layer	16,875	CY	10.50	0.025	422	8,438	177,188	2,531	11.20	188,180
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	264	5,270	7,378	-	0.20	12,650
16	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
17	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,161	2,531	10.80	91,130
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,358	SY	1.50	0.16	217	4,346	2,037	1,304	5.70	7,690
19	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
(L) PAGE 2 TOTAL						23,880	477,595	1,671,939	104,507		2,254,040

G-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,246	5,459	0.60	39,900
21	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
23	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,880
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
25	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2,580	20,840
(L) PAGES 1,2,3 TOTAL						28,669	573,380	1,769,393	132,775		2,500,610
							10,894	44,235			55,130
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											125,030
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							233,710				233,710
(L) TOTAL DIRECT COST						28,670	617,980	1,813,630	132,770		2,914,480

G-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								72,000
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								116,580
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								291,450
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								233,160
5	Engineering & Services @ 20% of Total Direct Cost										582,900
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					5,960					113,240
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						380,361	480,612			860,970
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					7,225					315,580
9	Project Management @ 8% of Total Direct + Indirects										440,100
(L) TOTAL INDIRECT COST											3,026,840

G-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,914,480
	TOTAL INDIRECT COST										3,026,840
	DURATION FACTOR (3% On Direct+Indirect)										178,240
	TOTAL INITIAL CONSTRUCTION COST										6,120,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Facility - Monthly	36	HR							75	2,700
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								4,500
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
	(L) TOTAL O & M COST										22,430

G-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - BENTOMAT (GBM)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	345,000
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(ii) Total Initial Construction Cost	6,120,000
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(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	6,465,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - GUNDSEAL</u>											
A	DIRECT COSTS										
	SITE PREPARATION										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8" DP X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(I) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,860

G-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,364	77.60	1,061,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.145	12,863	257,258	0	77,177	3.80	334,430
12	Placement of Gundseal Geomembrane/ Bentonite Mat	478,400	SF	0.40	0.006	2,870	57,408	191,360	-	0.52	248,770
13	Placement of 1'-0" Coarse Sand Drainage Layer	16,875	CY	10.5	0.025	422	8,438	177,168	2,531	11.20	168,160
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	264	5,270	7,378	-	0.20	12,650
15	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
16	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,161	2,531	10.80	91,130
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,358	SY	1.50	0.16	217	4,346	2,037	1,304	5.70	7,690
18	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
(I) PAGE 2 TOTAL						20,552	411,035	1,600,625	104,507		2,116,170

G-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,246	5,459	0.60	39,900
20	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
22	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,680
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
24	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2,580	20,640
PAGES 1,2,3 TOTAL						25,341	506,821	1,698,079	132,775		2,362,740
							9,630	42,452			52,000
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											118,140
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							206,580				206,580
(I) TOTAL DIRECT COST						25,340	723,030	1,740,530	132,770		2,739,540

G-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								68,490
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								109,580
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								273,950
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								219,160
5	Engineering & Services @ 20% of Total Direct Cost										547,910
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					5,270					100,130
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						336,209	461,240			797,450
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					6,386					278,930
9	Project Management @ 8% of Total Direct + Indirects										410,810
(I) TOTAL INDIRECT COST											2,806,410

G-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,739,540
	TOTAL INDIRECT COST										2,806,410
	DURATION FACTOR (3% On Direct+Indirect)										166,378
	TOTAL INITIAL CONSTRUCTION COST										5,712,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Facility - Monthly	36	HR							75	2,700
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								4,100
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
	(I) TOTAL O & M COST										22,030

G-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: E3E260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

SUMMARY	
<u>TEN (10) ACRES SITE - GUNDSEAL</u>	
C TOTAL COST (Total Present Worth)	
(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	339,000
(II) Total Initial Construction Cost	5,712,000
(I) TOTAL PROJECT COST (Rounded to the nearest Thousand)	6,051,000

G-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8"DP X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(F) PAGE TOTAL						2,309	46,180	30,948	13,674		110,860

G-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,364	77.60	1,081,740
11	Place and Compact Foundation Soil In 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.145	12,863	257,258	0	77,177	3.80	334,430
12	Placement of 120 Mil Flexible Membrane Liner	478,400	SF	0.40	0.008	3,827	76,544	191,380	-	0.60	287,900
13	Placement of 1'-0" Coarse Sand Drainage Layer	16,875	CY	10.50	0.025	422	8,438	177,188	2,531	11.20	188,160
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	264	5,270	7,376	-	0.20	12,650
15	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
16	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,161	2,531	10.80	91,130
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	1,358	SY	1.50	0.16	217	4,346	2,037	1,304	5.70	7,690
18	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
(F) PAGE TOTAL						21,509	430,171	1,600,625	104,507		2,135,300

G-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,186	16,246	5,459	0.60	39,900
20	Install 8' High Chain Link Perimeter Fence	9,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
21	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
22	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,680
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
24	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
PAGES 1,2,3 TOTAL						26,298	525,957	1,698,079	132,775		2,381,870
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Materials 2.5%							9,993	42,452			52,450
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											119,090
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							214,380				214,380
(F) TOTAL DIRECT COST						26,300	750,330	1,740,530	132,770		2,767,790

G-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								69,190
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								110,710
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								276,780
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								221,420
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								553,560
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					5,470					103,930
7	Field Indirects of Total Direct Labor @ 46.5, Material @ 26.5%						348,903	481,240			810,140
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					6,628					289,490
9	Project Management @ 8% of Total Direct + Indirects										416,240
(F) TOTAL INDIRECT COST											2,851,480

G-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,767,790
	TOTAL INDIRECT COST										2,851,480
	DURATION FACTOR (3% On Direct+Indirect)										168,578
	TOTAL INITIAL CONSTRUCTION COST										5,788,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Facility-Monthly	36	HR							75	2,700
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								4,100
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
	(F) TOTAL O & M COST										22,030

G-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/24/93

LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

339,000

(II) Total Initial Construction Cost

5,768,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

6,127,000

G-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: B5E260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PO/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8"DPx20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35' x 35'x 4" Gravel Decon. Area	160	BY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,980
(C) PAGE 1 TOTAL						2,309	48,180	30,948	13,674		110,880

G-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH'	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,384	77.60	1,061,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.145	12,863	257,256	0	77,177	3.80	334,430
12	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	51,132 76,698	SY GAL	2	0.13	6,647	132,943	102,264	39,883	5.40	275,090
13	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	66,560	71,314	-	0.30	137,670
14	Placement of 1'-0" Coarse Sand Drainage Layer	16,675	CY	10.50	0.025	422	8,438	177,188	2,531	11.20	188,160
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	264	5,270	7,378	-	0.20	12,650
16	Placement of 1'-8" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
17	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,161	2,531	10.80	91,130
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	1,358	SY	1.50	0.16	217	4,346	2,037	1,304	5.70	7,690
19	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
(C) PAGE 2 TOTAL						27,656	553,130	1,582,843	144,390		2,280,360

G-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,246	5,459	0.60	39,900
21	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,680
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
25	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
(C) PAGES 1,2,3 TOTAL						32,448	648,915	1,680,297	172,658		2,526,930
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							12,329	42,007			54,340
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											126,350
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							264,500				264,500
(C) TOTAL DIRECT COST						32,450	925,740	1,722,300	172,660		2,972,120

G-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								74,300
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								118,660
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								297,210
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								237,770
5	Engineering & Services @ 20% of Total Direct Cost										594,420
6	Craft Support @ 20.8 % of Total Direct MHRS(\$19/hr)					6,750					128,250
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						430,469	458,410			888,880
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					8,178					357,140
9	Project Management @ 8% on Total Direct + Indirects										453,360
(C) TOTAL INDIRECT COST											3,148,210

G-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,972,120
	TOTAL INDIRECT COST										3,148,210
	DURATION FACTOR (3% On Direct+Indirect)										183,610
	TOTAL INITIAL CONSTRUCTION COST										6,304,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Closed Facility Monthly	36	HR							75	2,700
*	Subsidence Monitoring (Annual Survey)	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								4,500
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
	(C) TOTAL O & M COST										22,430

G-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

S U M M A R Y

TEN (10) ACRES SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	345,000
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(II) Total Initial Construction Cost	6,304,000
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(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)	6,649,000
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G-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 08/26/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	20' Wide Gravel Haul Road x 8" Deep	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	86	5.60	900
8	6'x 35'x 4" Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(D) PAGE 1 TOTAL						2,309	48,180	30,948	13,674		110,880

G-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5288
DATE: 08/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,364	77.60	1,081,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.143	12,683	257,256	0	77,177	3.80	334,430
12	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	66,560	71,314	-	0.30	137,870
13	Placement of Geotextile Reinforcement on Foundation Layer	53,200	SY	0.26	0.005	266	5,320	13,832	-	0.40	19,150
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5gal/Sy	51,132 76,698	SY GAL	2.00	0.13	6,647	132,943	102,284	39,883	5.40	275,090
15	Placement of 1'-0" Coarse Sand Drainage Layer	16,875	CY	10.50	0.025	422	8,438	177,188	2,531	11.20	188,160
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	284	5,270	7,378	-	0.20	12,650
17	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
18	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	60,161	2,531	10.80	91,130
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,358	SY	1.50	0.16	217	4,348	2,037	1,304	5.70	7,690
20	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
(D) PAGE TOTAL						27,922	558,450	1,596,875	144,390		2,299,510

G-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,248	5,459	0.60	39,900
22	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
24	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,680
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
26	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
(D) PAGES 1,2,3 TOTAL						32,712	654,235	1,694,129	172,658		2,546,080
							12,430	42,353			54,784
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											127,300
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							266,670				266,670
(D) TOTAL DIRECT COST						32,710	933,340	1,736,480	172,660		2,994,830

G-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								74,870
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								119,790
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								299,480
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								239,590
5	Engineering & Services @ 20% of Total Direct Cost										599,970
6	Craft Support @ 20.8% of Total Direct MHRS(\$19/hr)					6,800					129,200
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						434,003	460,167			894,170
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					8,243					360,050
9	Project Management @ 8% of Total Direct + Indirects										456,880
(D) TOTAL INDIRECT COST											3,173,000

G-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD.

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG
PHONE: 7-5268
DATE: 08/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,994,830
	TOTAL INDIRECT COST										3,173,000
	DURATION FACTOR (3% On Direct+Indirect)										185,035
	TOTAL INITIAL CONSTRUCTION COST										6,353,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Closed Facility Monthly	36	HR							75	2,700
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								4,800
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
*	Subsidence Monitoring (Annual Survey)	20	HR							75	1,500
	(D) TOTAL O & M COST										22,730

G-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106.

SUMMARY

TEN (10) ACRES SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost 349,000
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(ii) Total Initial Construction Cost 6,353,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand) 6,702,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8"DP X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(K) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,860

G-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,384	77.60	1,081,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.145	12,863	257,258	0	77,177	3.80	334,430
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	32,660	CY	13.00	0.165	5,389	107,778	424,580	32,333	17.30	564,690
13	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	66,560	71,314	-	0.30	137,870
14	Placement of 1'-0 Coarse Sand Drainage Layer	16,875	CY	10.50	0.025	422	8,438	177,188	2,531	11.20	188,160
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,200	SY	0.14	0.005	281	5,220	7,308	-	0.20	12,530
16	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
17	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,181	2,531	10.80	91,130
18	Placement of Perimeter Exterior Drainage Layer 3/4"x9" DP (Crushed Stone)	1,358	SY	1.50	0.16	217	4,348	2,037	1,304	5.70	7,690
19	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,640	4.40	20,970
(K) PAGE 2 TOTAL						26,396	527,915	1,905,069	136,841		2,569,840

G-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,246	5,459	0.60	39,900
21	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
23	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,880
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
25	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2,580	20,840
(K) PAGES 1,2,3 TOTAL						31,185	623,700	2,002,543	165,108		2,816,410
							11,850	50,064			61,910
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											140,820
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							254,220				254,220
(K) TOTAL DIRECT COST						31,190	889,770	2,052,610	165,110		3,273,390

G-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								81,830
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								130,930
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								327,340
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								261,870
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								654,670
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					6,468					123,280
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						413,743	543,942			957,680
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					7,860					343,320
9	Project Management @ 8% of Total Direct + Indirects										492,340
(K) TOTAL INDIRECT COST											3,373,240

G-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										3,273,360
	TOTAL INDIRECT COST										3,373,240
	DURATION FACTOR (3% On Direct+Indirect)										199,398
	TOTAL INITIAL CONSTRUCTION COST										6,846,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Facility - Monthly	36	HR							75	2,700
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								10,300
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
	(K) TOTAL O & M COST										28,230

G-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 434,000

(II) Total Initial Construction Cost 6,848,000

(K) TOTAL PROJECT COST (Rounded to the nearest Thousand) 7,280,000

G-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8"DP X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(J) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,880

G-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PO/WLK

PHONE: 7-3266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,364	77.60	1,081,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.145	12,863	257,256	0	77,177	3.80	334,430
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	32,660	CY	-	0.165	5,389	107,778	0	32,333	4.30	140,110
13	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	66,560	71,314	-	0.30	137,670
14	Placement of 1'-0 Coarse Sand Drainage Layer	16,875	CY	10.50	0.025	422	8,438	177,168	2,531	11.20	188,160
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	264	5,270	7,378	-	0.20	12,650
16	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	87,001	7,760	5.10	130,630
17	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,161	2,531	10.80	91,130
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,358	SY	1.50	0.16	217	4,348	2,037	1,304	5.70	7,690
19	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
(J) PAGE 2 TOTAL						26,398	527,965	1,480,579	136,841		2,145,380

G-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,246	5,459	0.60	39,900
21	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	19	65,310
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
23	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,680
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
25	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
(J) PAGES 1,2,3 TOTAL						31,188	623,750	1,576,033	165,108		2,391,950
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							11,851	39,451			51,300
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											119,600
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							254,240				254,240
(J) TOTAL DIRECT COST						31,190	889,840	1,617,480	165,110		2,617,090

G-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								70,430
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								112,680
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								281,710
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								225,370
5	Engineering & Services @ 20% of Total Direct Cost										583,420
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					6,490					123,310
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						413,776	428,632			842,410
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					7,860					343,320
9	Project Management @ 8% of Total Direct + Indirects										467,800
(J) TOTAL INDIRECT COST											3,030,450

G-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										2,617,090
	TOTAL INDIRECT COST										3,030,450
	DURATION FACTOR (3% On Direct+Indirect)										175,428
	TOTAL INITIAL CONSTRUCTION COST										6,023,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
	• Inspection Activities of Facility - Monthly	36	HR							75	2,700
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	10	AC							500	5,000
	• Cover Repair Due To Subsidence	1	LS								10,000
	• Annual Fence Maintenance	1									450
	• Annual Sign Maintenance	12								40	480
	• Annual Monitoring Well Maintenance	8								75	600
	(J) TOTAL O & M COST										27,930

G-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 429,000

(ii) Total Initial Construction Cost 6,023,000

(J) TOTAL PROJECT COST (Rounded to the nearest Thousand) 6,452,000

G-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ESTIMATOR: PG/WLK

ACTIVITY CODE: ESE260412

PHONE: 7-5266

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - SOIL CEMENT COVER</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,000	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8" DP X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	18	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(G) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,660

G-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,364	77.60	1,081,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.145	12,863	257,258	0	77,177	3.80	334,430
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	49,285	CY	18	0.12	5,914	118,284	887,130	35,485	21.10	1,040,900
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	50,388	SY	0.33	0.03	1,512	30,232	16,627	-	0.90	46,660
		50,388	SY	0.17	0.02	1,008	20,154	8,568	-	0.60	28,720
14	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	68,560	71,314	-	0.30	137,670
15	Placement of 1'-0" Coarse Sand Drainage Layer	16,875	CY	10.5	0.025	422	8,438	177,188	2,531	11.20	168,160
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	62,700	SY	0.14	0.005	264	5,270	7,378	-	0.20	12,650
17	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
18	Placement of 6" Topsoil	8,438	CY	9.5	0.05	422	8,438	80,161	2,531	10.80	91,130
(G) PAGE 2 TOTAL						26,704	534,073	2,213,702	123,557		3,093,090

G-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLX

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,358	SY	1.5	0.16	217	4,348	2,037	1,304	5.70	7,690
20	Excavation of Trapezoidal Drainage Ditch	4,745	CY	-	0.17	807	16,133	0	4,640	4.40	20,970
21	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,246	5,459	0.60	39,900
22	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
24	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,680
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
26	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
PAGES 1,2,3 TOTAL						32,517	650,337	2,313,193	157,969		3,368,320
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							12,356	57,830			70,190
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											166,420
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							265,080				265,080
(G) TOTAL DIRECT COST						32,520	927,770	2,371,020	157,970		3,872,010

G-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								96,800
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								154,880
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								387,200
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								309,760
5	Engineering & Services @ 20% of Total Direct Cost										774,400
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					6,760					128,440
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						431,413	628,320			1,059,730
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					8,195					357,960
9	Project Management @ 8% of Total Direct + Indirects										571,290
	(G) TOTAL INDIRECT COST										3,840,480

G-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										3,872,010
	TOTAL INDIRECT COST										3,840,460
	DURATION FACTOR (3% On Direct+Indirect)										231,374
	TOTAL INITIAL CONSTRUCTION COST										7,944,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Closed Facility Monthly	36	HR							75	2,700
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	10	AC							500	5,000
*	Cover Repair Due To Subsidence	1	LS								10,300
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
	(G) TOTAL O & M COST										28,230

G-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(i Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	434,000
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(ii Total Initial Construction Cost	7,944,000
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(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)	8,378,000
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G-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MR	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8"DP X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(H) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,860

G-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MF	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,364	77.60	1,061,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	88,709	CY	-	0.145	12,863	257,256	0	77,177	3.80	334,430
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	442	TN	146.5	2.3	1,017	20,332	64,753	-	192.50	85,090
		15,958	CY	15.00	0.16	2,553	51,068	239,370	15,320	19.20	305,760
13	Placement of 30 Mil Flexible Membrane Liner	475,425	SF	0.15	0.007	3,328	66,560	71,314	-	0.30	137,870
14	Placement of 1'-0 Coarse Sand Drainage Layer	16,875	CY	10.50	0.025	422	8,438	177,188	2,531	11.20	188,160
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	52,700	SY	0.14	0.005	264	5,270	7,378	-	0.20	12,650
16	Placement of 1'-6" Common Fill	25,867	CY	3.75	0.05	1,293	25,867	97,001	7,760	5.10	130,630
17	Placement of 6" Topsoil	8,438	CY	9.50	0.05	422	8,438	80,181	2,531	10.80	91,130
(H) PAGE 2 TOTAL						21,840	436,801	1,605,502	103,392		2,367,480

G-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MR	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	1,358	SY	1.5	0.16	217	4,346	2,037	1,304	5.70	7,690
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	4,745	CY	-	0.17	807	16,133	0	4,840	4.40	20,970
20	Seeding, Fertilizing & Mulching	64,984	SY	0.25	0.014	910	18,196	16,246	5,459	0.60	39,900
21	Install 8' High Chain Link Perimeter Fence	3,530	LF	12	0.25	883	17,650	42,360	5,295	18.50	65,310
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1980	1,980
23	Warning Signs 4-18"x24"	12	EA	200	2.00	24	480	2,400	-	240	2,680
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
25	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
PAGES 1,2,3 TOTAL						27,653	553,065	1,704,993	137,803		2,642,690
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							10,508	42,625			53,130
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											132,130
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							225,430				225,430
(H) TOTAL DIRECT COST						27,650	789,000	1,747,620	137,800		3,053,380

G-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MR	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								76,330
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								122,140
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								305,340
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								244,270
5	Engineering & Services @ 20% of Total Direct Cost										610,680
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					5,750					109,250
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						366,885	463,119			830,000
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					6,968					304,350
9	Project Management @ 8% of Total Direct + Indirects										452,460
	(H) TOTAL INDIRECT COST										3,054,820

G-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/24/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										3,053,380
	TOTAL INDIRECT COST										3,054,820
	DURATION FACTOR (3% On Direct+Indirect)										183,248
	TOTAL INITIAL CONSTRUCTION COST										6,291,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
	• Inspection Activities of Closed Facility Assume Monthly	36	HR							75	2,700
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	10	AC							500	5,000
	• Cover Repair Due To Subsidence	1	LS								6,700
	• Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
	• Annual Monitoring Well Maintenance	8								75	600
	(H) TOTAL O & M COST										24,830

G-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE28412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/24/93
LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	379,000
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(ii) Total Initial Construction Cost	6,291,000
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	6,670,000
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G-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8" Deep X 20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35'-0 x 35'-0 x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(B) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,800

G-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1394	27,880	1,045,500	8,364	77.60	1,081,740
11	Place and Compact Foundation Soil In 8" Lifts to 95% Std. Proctor	73,907	CY	-	0.145	10,717	214,330	0	64,299	3.80	278,830
12	Placement of 30 Mil Flexible Membrane Liner	421,076	SF	0.15	0.007	2,948	58,951	63,161	-	0.30	122,110
13	Placement of 1'-0 Coarse Sand Drainage Layer	15,202	CY	10.50	0.025	380	7,601	159,621	2,280	11.10	169,500
14	2" PVC Perforated Drainage Pipe placed In Drainage layer	5,016	LF	1.0	0.2	1,003	20,064	5,016	-	5.00	25,060
15	2 1/2" Binder Course	45,640	SY	4.15	0.055	2,510	50,204	189,408	15,061	5.60	254,670
16	4" Hydraulic Asphalt Conc.	45,640	SY	6.60	0.03	1,369	27,384	301,224	8,215	7.40	336,820
17	Asphalt Mastic Seal	45,640	SY	0.50	0.015	685	13,692	22,820	-	0.80	36,510
18	Sprayed Asphaltic Concrete Sealant	45,640	SY	0.75	0.015	685	13,692	34,230	4,108	1.10	52,030
19	Excavation of Traingular Drainage Ditch	2,592	CY	-	0.17	441	8,813	0	2,644	4.40	11,460
20	4" Thick Asphalt Perimeter Drainage Ditch	5,854	SY	7.6	0.144	843	16,860	44,490	5,058	11.30	66,410
(B) PAGE 2 TOTAL						22,974	459,470	1,865,469	110,029		2,434,960

G-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PO/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching of Grassed area Inside the Security Fence	8,922	SY	0.25	0.014	125	2,498	2,231	749	0.60	5,480
22	Install 8' High Chain Link Perimeter Fence	3,400	LF	12	0.25	850	17,000	40,800	5,100	18.50	62,900
23	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
24	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,680
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
26	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
(B) PAGES 1,2,3 TOTAL						26,945	538,908	1,947,347	133,393		2,644,700
							10,239	48,684			58,920
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											132,240
• LOCATION FACTOR @ 40% On (Total Labor Cost+Escalation)							219,660				219,660
(B) TOTAL DIRECT COST						26,950	768,810	1,996,030	133,390		3,055,520

G-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								76,390
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								122,220
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								305,550
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								244,440
5	Engineering & Services @ 20% of Total Direct Cost										611,100
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					5,606					106,510
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						357,497	528,948			886,440
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					6,791					296,650
9	Project Management @ 8% of Total Direct + Indirects										456,390
(B) TOTAL INDIRECT COST											3,105,690

G-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5268
DATE: 08/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										3,055,520
	TOTAL INDIRECT COST										3,105,690
	DURATION FACTOR (3% On Direct+Indirect)										184,836
	TOTAL INITIAL CONSTRUCTION COST										6,346,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
*	Inspection Activities of Facility - Monthly	36	HR							75	2,700
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	10	AC							800	8,000
*	Cover Repair Due To Subsidence	1	LS								6,400
*	Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
*	Annual Monitoring Well Maintenance	8								75	600
	(B) TOTAL O & M COST										27,330

G-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

SUMMARY

TEN (10) ACRES SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost 420,000
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(II) Total Initial Construction Cost 6,346,000

(B) TOTAL PROJECT COST (Rounded to the nearest Thousand) 6,766,000

G-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PW/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>TEN (10) ACRES SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	17	AC	-	40	680	13,600	0	4,080	-	17,680
2	Precontouring Site	7	AC	-	32	224	4,480	0	1,344	-	5,820
3	Silt Fence (Includes Maintenance)	2,600	LF	0.50	0.05	130	2,600	1,300	-	1.50	3,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	600	-	7,700
5	8"DPX20' Wide Gravel Haul Road	3,300	LF	8.50	0.15	495	9,900	28,050	2,970	12.40	40,920
6	2-15" RCP Culverts	64	LF	12	1	64	1,280	768	384	38.00	2,430
7	35' x 35'x 4" Gravel Decon. Area	160	SY	3	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	18	MO	-	-	0	0	0	-	720	12,960
(E) PAGE 1 TOTAL						2,309	46,180	30,948	13,674		110,860

G-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: KULP

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	13,940	TN	75	0.1	1,394	27,880	1,045,500	8,384	77.60	1,061,740
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	73,907	CY	-	0.145	10,717	214,330	0	64,299	3.80	278,630
12	Placement of 30 Mil Flexible Membrane Liner	421,076	SF	0.15	0.007	2,948	58,951	63,161	-	0.30	122,110
13	Placement of 1'-0 Coarse Sand Drainage Layer	15,202	CY	10.50	0.025	380	7,601	159,621	2,280	11.10	169,500
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	5,016	LF	1.00	0.2	1,003	20,064	5,016	-	5.00	25,080
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X6-W 2.9xW 2.9(wid.wire fab)Broom Finish.	45,640	SY	7.50	0.36	16,430	328,608	342,300	(0.60/hr) 13,144 (comp rate)	15.00	684,050
16	Sprayed on Curing Compound	45,640	SY	0.16	0.01	456	9,128	7,302	2,738	0.40	19,170
17	Joint Sealant 6" PVC Water Stops	47,550	LF	2.30	0.05	2,378	47,550	109,365	-	3.30	156,920
18	Excavation of Traingular Drainage Ditch	2,592	CY	-	0.17	441	8,813	0	2,644	4.40	11,480
19	4" Thick Concrete Perimeter Drainage Ditch	5,854	SY	7.20	0.36	2,107	42,149	42,149	12,645	16.60	96,940
(E) PAGE 2 TOTAL						38,254	765,074	1,774,415	108,115		2,645,000

G-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: KULP

LOG #: 7-03

ACTIVITY CODE: ESR260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PO

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area Inside the Security Fence	8,922	SY	0.25	0.014	125	2,498	2,231	749	0.60	5,480
21	Install 8' High Chain Link Perimeter Fence	3,400	LF	12	0.25	850	17,000	40,800	5,100	18.50	62,900
22	Chain Link Security Gate 8'Hx20'W	1	EA	1500	24.00	24	480	1,500	-	1,980	1,980
23	Warning Signs 4-18"x 24" - Installed	12	EA	200	2.00	24	480	2,400	-	240	2,880
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	5,000	5,000
25	Ground Water Monitoring Wells (100' Deep)	8	EA	500	80.00	640	12,800	4,000	3,840	2580	20,640
(E) PAGES 1,2,3 TOTAL						42,228	844,512	1,858,293	129,478		2,855,340
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							16,046	48,407			62,450
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											142,770
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							344,220				344,220
(E) TOTAL DIRECT COST						42,230	1,204,780	1,902,700	129,480		3,404,780

G-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: KULP

LOG #: 7-03

ESTIMATOR: PG

ACTIVITY CODE: ESE260412

PHONE: 7-5266

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								65,120
2	Health & Safety Assume 4% of Total Direct Cost	1	LS								136,190
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								340,480
4	Administrative & Legal @ 8% of Total Direct Cost	1	LS								272,380
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								680,960
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					8,780					166,820
7	Field Indirects of Total Direct Labor @ 46.5%, Matrrial @ 26.5%						560,223	504,216			1,064,440
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					10,642					496,770
9	Project Management @ 8% of Total Direct + Indirects										531,840
(E) TOTAL INDIRECT COST											3,775,000

G-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: KULP
ESTIMATOR: PG
PHONE: 7-5266
DATE: 06/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										3,404,780
	TOTAL INDIRECT COST										3,775,000
	DURATION FACTOR (3% On Direct+Indirect)										215,393
	TOTAL INITIAL CONSTRUCTION COST										7,395,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	32	EA							225	7,200
	• Inspection Activities of Facility-Monthly	36	HR							75	2,700
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Concrete Slab	10	AC							800	8,000
	• Cover Repair Due To Subsidence	1	LS								11,700
	• Annual Fence Maintenance	1									450
	Annual Sign Maintenance	12								40	480
	• Annual Monitoring Well Maintenance	8								75	600
	(E) TOTAL O & M COST										32,830

G-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: KULP
ESTIMATOR: PG
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

S U M M A R Y

TEN (10) ACRES SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	502,000
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(ii) Total Initial Construction Cost	7,395,000
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(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)	7,897,000
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G-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

Appendix H
Cost Estimates for 20-Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8"DP x 20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	680	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) Include Power & Water	24	MO	-	-	0	0	0	-	720	17,280
(A) PAGE 1 TOTAL						3,130	62,000	40,696	18,960		151,540

H-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.00	2,160,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Placement of Claymax Geotextile Mat	947,000	SF	0.38	0.0055	5,209	104,170	359,660	-	0.49	484,030
13	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,338	126,750	136,500	-	0.30	263,250
14	Placement of 1'-0" Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,698	350,848	5,009	11.10	372,350
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
16	Placement of 1'-8" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,676	13,297	4.90	242,300
17	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,660	156,653	4,458	10.70	178,170
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,900	SY	1.50	0.18	304	6,080	2,850	1,824	5.70	10,750
19	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,480
(A) PAGE 2 TOTAL						45,871	\$17,430	3,296,923	202,743		4,419,090

H-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	8,801	0.80	68,700
21	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,060
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,900	3,900
23	Warning Signs 4-18"x 24" - Installed	18	EA	175	2.00	32	640	2,800	-	215	3,440
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	-	10,000
25	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
(A) PAGES 1,2,3 TOTAL						52,565	1,051,308	3,439,398	242,606		4,772,590
							19,975	85,985			105,960
• Escalation for 1994 on Direct Labor is 1.9% & on Direct material is 2.5%											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											238,630
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							428,510				428,510
(A) TOTAL DIRECT COST						52,570	1,499,790	3,525,380	242,610		5,545,860

H-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECRH EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								138,640
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								188,370
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								554,570
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								368,200
5	Engineering & Services @ 20% of Total Direct Cost										1,109,140
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					10,935					207,760
7	Field Indirects on Total Direct Labor @ 48.5%, Material @ 26.5%						697,402	934,226			1,631,630
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					13,248					578,080
9	Project Management @ 8% of Total Direct + Indirects										825,650
(A) TOTAL INDIRECT COST											5,600,620

H-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$&MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,545,690
	TOTAL INDIRECT COST										5,600,620
	DURATION FACTOR (3% On Direct+Indirect)										334,369
	TOTAL INITIAL CONSTRUCTION COST										11,481,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
	• Inspection Activities of Facility - Monthly	72	HR							75	5,400
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	20	AC							500	10,000
	• Cover Repair Due To Subsidence	1	LS								6,400
	• Annual Fence Maintenance	1									600
	• Annual Sign Maintenance	16								40	640
	• Annual Monitoring Well Maintenance	10								75	750
	(A) TOTAL O & M COST										34,290

H-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: E5E260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - CLAYMAX

C . TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	527,000
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(II) Total Initial Construction Cost	11,481,000
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(A) TOTAL PROJECT COST (Rounded to the nearest Thousand)	12,008,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" DP X 20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	86	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(L) PAGE 1 TOTAL						3,130	62,600	40,688	18,960		151,540

H-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.60	2,166,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Standard Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Placement of Bentomat Geotextile Mat	947,000	SF	0.38	0.0055	5,209	104,170	359,860	-	0.49	484,030
13	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,338	126,750	136,500	-	0.30	263,250
14	Placement of 1'-0" Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,698	350,648	5,008	11.10	372,350
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
16	Placement of 1'-8" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,678	13,297	4.80	242,300
17	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,860	158,855	4,458	10.70	178,170
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,900	SY	1.50	0.16	304	6,080	2,850	1,824	5.70	10,750
19	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,480
(L) PAGE 2 TOTAL						45,871	917,430	3,298,923	202,743		4,419,090

H-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	8,801	0.60	68,700
21	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,080
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
23	Warning Signs 4-18"x 24" - Installed	16	EA	175	2.00	32	640	2,800	-	215	3,440
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
25	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
(L) PAGES 1,2,3 TOTAL						52,565	1,051,308	3,439,396	242,006		4,772,590
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							19,975	85,985			105,960
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											238,630
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							428,510				428,510
(L) TOTAL DIRECT COST						52,570	1,499,790	3,525,380	242,610		8,545,090

H-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: R1/W1.K

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								136,640
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								166,370
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								554,570
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								366,200
5	Engineering & Services @ 20% of Total Direct Cost										1,109,140
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					10,930					207,670
7	Field Indirects of Total Direct Labor @ 48.5%, Material @ 26.5%						697,402	834,226			1,631,630
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					13,248					578,000
9	Project Management @ 8% of Total Direct + Indirects										625,950
(L) TOTAL INDIRECT COST											5,600,530

H-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,545,690
	TOTAL INDIRECT COST										5,600,530
	DURATION FACTOR (3% On Direct+Indirect)										334,367
	TOTAL INITIAL CONSTRUCTION COST										11,481,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
	• Inspection Activities of Facility - Monthly	72	HR							75	5,400
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	20	AC							500	10,000
	• Cover Repair Due To Subsidence	1	LS								6,400
	• Annual Fence Maintenance	1									600
	• Annual Sign Maintenance	16								40	640
	• Annual Monitoring Well Maintenance	10								75	750
	(L) TOTAL O & M COST										34,290

H-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5366

DATE: 08/26/93

LOC: MDC-106

SUMMARY	
<u>TWENTY (20) ACRES SITE - BENTOMAT (GBM)</u>	
C TOTAL COST (Total Present Worth)	
(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	527,000
(ii) Total Initial Construction Cost	11,481,000
(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	12,008,000

H-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH:\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - GUNDSEAL</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8"DP X 20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(I) PAGE 1 TOTAL						3,130	62,600	40,696	18,960		151,540

H-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
H COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.60	2,168,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Placement of Gundseal Geomembrane/ Bentonite Mat	947,000	SF	0.38	0.0055	5,209	104,170	359,880	-	0.50	484,030
13	Placement of 1'-0" Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,698	350,648	5,009	11.10	372,350
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
15	Placement of 1'-8" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,678	13,297	4.90	242,300
16	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,880	156,855	4,458	10.70	178,170
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,900	SY	1.50	0.16	304	6,080	2,850	1,824	5.70	10,750
18	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,480
(I) PAGE 2 TOTAL						39,534	790,680	3,162,423	202,743		4,155,840

H-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	DEM CAP \$/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,580	8,801	0.80	68,700
20	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,080
21	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
22	Warning Signs 4-18"x 24" - Installed	18	EA	175	2.00	32	640	2,800	-	215	3,440
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
24	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
PAGES 1,2,3 TOTAL						46,228	924,558	3,302,698	242,606		4,509,340
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							17,567	82,572			100,140
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											225,470
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							376,850				376,850
(I) TOTAL DIRECT COST						46,230	1,318,970	3,385,470	242,610		5,211,800

H-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								130,300
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								156,350
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								521,180
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								384,830
5	Engineering & Services @ 20% of Total Direct Cost										1,042,360
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					9,620					182,780
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						613,321	897,150			1,510,470
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					11,650					506,870
9	Project Management @ 8% of Total Direct + Indirects										770,320
(I) TOTAL INDIRECT COST											5,167,480

H-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR Mhr@\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,211,800
	TOTAL INDIRECT COST										5,187,480
	DURATION FACTOR (3% On Direct+Indirect)										623,958
	TOTAL INITIAL CONSTRUCTION COST										11,023,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
*	Inspection Activities of Facility - Monthly	72	HR							75	5,400
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	20	AC							500	10,000
*	Cover Repair Due To Subsidence	1	LS								5,900
*	Annual Fence Maintenance	1									600
	Annual Sign Maintenance	16								40	640
*	Annual Monitoring Well Maintenance	10								75	750
	(I) TOTAL O & M COST										33,790

H-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725) 519,000

(ii) Total Initial Construction Cost 11,023,000

(i) TOTAL PROJECT COST (Rounded to the nearest Thousand) 11,542,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGWLK

PHONE: 7-3366

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH	MAT'L \$	BEACAP \$5MM	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - (120 MIL FML)</u>											
<u>A 1 DIRECT COSTS</u>											
<u>1 SITE PREPARATION</u>											
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" DP X 20' Wide Gravel Haul Road	4,400	LF	6.50	0.15	660	13,200	37,400	3,960	12.40	84,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	39.00	2,430
7	35"x 35"x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	8.80	900
8	6"x 35"x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rent) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(F) PAGE TOTAL						3,130	62,800	40,636	16,960		151,540

H-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$3/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.00	2,106,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	206,760	CY	-	0.125	25,845	516,900	0	165,070	3.30	671,870
12	Placement of 120 Mil Flexible Membrane Liner	947,000	SF	0.39	0.007	6,629	132,580	369,330	-	0.50	501,910
13	Placement of 1'-0" Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,698	350,648	5,000	11.10	372,350
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
15	Placement of 1'-6" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	164,676	13,297	4.90	242,300
16	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,860	156,855	4,458	10.70	176,170
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	1,900	SY	1.50	0.18	304	6,060	2,850	1,624	5.70	10,750
18	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.50	27,480
(F) PAGE TOTAL						40,954	819,090	3,171,893	202,743		4,193,720

H-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,336	30,560	8,801	0.60	68,700
20	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,060
21	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
22	Warning Signs 4-18"x 24" - Installed	16	EA	175	2.00	32	640	2,600	-	215	3,440
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
24	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
PAGES 1,2,3 TOTAL						47,648	952,968	3,312,368	242,606		4,547,220
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Materials 2.5%							18,106	62,609			100,920
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											227,360
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							388,430				388,430
(F) TOTAL DIRECT COST						47,650	1,359,500	3,395,180	242,610		5,263,930

H-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								131,000
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								157,920
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								526,390
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								368,480
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								1,052,790
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					9,910					186,290
7	Field Indirects of Total Direct Labor @ 46.5, Material @ 26.5%						632,168	899,723			1,531,890
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					12,006					524,500
9	Project Management @ 8% of Total Direct + Indirects										779,660
(F) TOTAL INDIRECT COST											5,261,520

H-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,263,930
	TOTAL INDIRECT COST										5,261,520
	DURATION FACTOR (3% On Direct+Indirect)										315,764
	TOTAL INITIAL CONSTRUCTION COST										10,841,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
*	Inspection Activities of Facility-Monthly	72	HR							75	5,400
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	20	AC							500	10,000
*	Cover Repair Due To Subsidence	1	LS								5,900
*	Annual Fence Maintenance	1									600
	Annual Sign Maintenance	16								40	640
*	Annual Monitoring Well Maintenance	10								75	750
	(F) TOTAL O & M COST										33,790

H-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

S U M M A R Y

TWENTY (20) ACRES SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

518,000

(ii) Total Initial Construction Cost

10,841,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

11,360,000

H-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Slit Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" DPx20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6' x 35' x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(C) PAGE 1 TOTAL						3,130	62,600	40,696	18,960		151,540

H-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.60	2,166,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	105,222 157,833	SY GAL	2	0.13	13,679	273,577	210,444	82,073	5.40	586,080
13	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,336	126,750	136,500	-	0.30	263,250
14	Placement of 1'-0" Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	635	16,696	350,646	5,009	11.10	372,350
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
16	Placement of 1'-6" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,676	13,297	4.90	242,300
17	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,860	156,855	4,456	10.70	176,170
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	1,900	SY	1.50	0.16	304	6,060	2,950	1,824	5.70	10,750
19	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,480
(C) PAGE 2 TOTAL						54,342	1,066,837	3,149,507	284,816		4,521,150

H-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	8,801	0.60	68,700
21	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,060
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
23	Warning Signs 4-18"x 24" - Installed	16	EA	175	2.00	32	640	2,800	-	215	3,440
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
25	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	8,000	4,800	2,580	25,800
(C) PAGES 1,2,3 TOTAL						61,036	1,220,715	3,289,962	324,679		4,874,650
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							23,194	82,250			105,440
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											243,730
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							497,560				497,560
(C) TOTAL DIRECT COST						61,040	1,741,470	3,372,230	324,680		5,721,380

H-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								143,030
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								171,640
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								572,140
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								400,500
5	Engineering & Services @ 20% of Total Direct Cost										1,144,280
6	Craft Support @ 20.8 % of Total Direct MHRS(\$19/hr)					12,700					241,300
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 28.5%						609,784	693,641			1,703,420
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					15,381					671,640
9	Project Management @ 8% on Total Direct + Indirects										661,580
(C) TOTAL INDIRECT COST											5,909,710

H-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,721,360
	TOTAL INDIRECT COST										5,909,710
	DURATION FACTOR (3% On Direct+Indirect)										348,833
	TOTAL INITIAL CONSTRUCTION COST										11,980,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
•	Inspection Activities of Closed Facility Monthly	72	HR							75	5,400
•	Subsidence Monitoring (Annual Survey)	20	HR							75	1,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	20	AC							500	10,000
•	Cover Repair Due To Subsidence	1	LS								6,400
•	Annual Fence Maintenance	1									600
	Annual Sign Maintenance	16								40	640
•	Annual Monitoring Well Maintenance	10								75	750
	(C) TOTAL O & M COST										34,290

H-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/25/93
LOC: MDC-106

S U M M A R Y

TWENTY (20) ACRES SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	527,000
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(ii) Total Initial Construction Cost	11,960,000
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(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)	12,507,000
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H-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - REINFORCED SPRAYED ASPHALT</u>											
A <u>DIRECT COSTS</u>											
 <u>SITE PREPARATION</u>											
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	20' Wide Gravel Haul Road x 8" Deep	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	64,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,200	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(D) PAGE 1 TOTAL						3,130	62,600	40,696	18,960		151,540

H-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR:

PG/WLK

PHONE:

7-5266

DATE:

08/26/93

LOC:

MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.60	2,168,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	871,970
12	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,338	126,750	136,500	-	0.30	283,250
13	Placement of Geotextile Reinforcement on Foundation Layer	105,222	SY	0.26	0.005	526	10,522	27,358	-	0.40	37,680
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5gal/Sy	105,222 157,833	SY GAL	2.00	0.13	13,679	273,577	210,444	82,073	5.40	686,090
15	Placement of 1'-0" Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,698	350,648	5,009	11.10	372,350
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
17	Placement of 1'-8" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,676	13,297	4.90	242,300
18	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,860	156,855	4,458	10.70	176,170
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,900	SY	1.50	0.16	304	6,060	2,850	1,824	5.70	10,750
20	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,460
(D) PAGE TOTAL						54,868	1,097,359	3,176,865	264,816		4,559,030

H-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5286
DATE: 08/28/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx320	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	8,801	0.80	68,700
22	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,060
23	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,960	3,960
24	Warning Signs 4-18"x 24" - Installed	16	EA	175	2.00	32	640	2,800	-	215	3,440
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
26	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
(D) PAGES 1,2,3 TOTAL						61,562	1,231,237	3,317,339	324,679		4,912,530
							23,394	82,933			106,327
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											245,630
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							501,850				501,850
(D) TOTAL DIRECT COST						61,560	1,756,480	3,400,270	324,680		5,786,340

H-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/28/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR M-Hr:\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								144,160
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								172,990
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								576,630
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								403,640
5	Engineering & Services @ 20% of Total Direct Cost										1,153,270
6	Craft Support @ 20.8% of Total Direct MHRS(\$19/hr)					12,600					243,200
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						516,763	901,072			1,717,830
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					15,513					677,910
9	Project Management @ 8% of Total Direct + Indirects										668,450
	(D) TOTAL INDIRECT COST										5,957,780

H-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,766,340
	TOTAL INDIRECT COST										5,957,780
	DURATION FACTOR (3% On Direct+Indirect)										351,724
	TOTAL INITIAL CONSTRUCTION COST										12,075,800
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
•	Inspection Activities of Closed Facility Monthly	72	HR							75	5,400
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	20	AC							500	10,000
•	Cover Repair Due To Subsidence	1	LS								6,800
•	Annual Fence Maintenance	1									800
	Annual Sign Maintenance	16								40	640
•	Annual Monitoring Well Maintenance	10								75	750
•	Subsidence Monitoring (Annual Survey)	20	HR							75	1,500
	(D) TOTAL O & M COST										34,600

H-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

533,000

(II) Total Initial Construction Cost

12,076,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand)

12,609,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" DP X 20' Wide Gravel Haul Road	4,400	LF	6.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(K) PAGE 1 TOTAL						3,130	62,600	40,698	18,960		151,540

H-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3B260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
H COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.00	2,166,200
11	Place and Compact Foundation Soil In 8" Lifts to 95% Std. Proctor	206,780	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Compact 2'-0" Thick Clay Layer In 6" Lifts	65,174	CY	13.00	0.165	10,754	215,074	847,262	64,522	17.30	1,126,860
13	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,338	126,750	136,500	-	0.30	263,250
14	Placement of 1'-0 Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,696	350,648	5,009	11.10	372,350
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
16	Placement of 1'-8" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,676	13,297	4.90	242,300
17	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,660	156,655	4,458	10.70	176,170
18	Placement of Perimeter Exterior Drainage Layer 3/4"x9" DP (Crushed Stone)	1,900	SY	1.50	0.16	304	6,080	2,850	1,824	5.70	10,750
19	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,460
(K) PAGE 2 TOTAL						51,417	1,026,334	3,786,325	267,265		5,061,920

H-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	8,801	0.60	68,700
21	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,080
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,980
23	Warning Signs 4-18"x 24" - Installed	18	EA	175	2.00	32	640	2,800	-	215	3,440
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
25	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
(K) PAGES 1,2,3 TOTAL						58,111	1,162,212	3,928,800	307,129		5,435,420
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							22,082	98,170			120,250
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											271,770
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							473,720				473,720
(K) TOTAL DIRECT COST						58,110	1,658,010	4,024,970	307,130		6,301,180

H-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH:\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	<u>INDIRECT COSTS</u>										
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								157,530
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								189,030
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								630,120
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								441,060
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								1,260,230
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					12,087					229,650
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						770,975	1,066,617			1,837,590
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					14,644					639,640
9	Project Management @ 8% of Total Direct + Indirects										834,000
	(K) TOTAL INDIRECT COST										6,319,750

H-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5264

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										8,301,160
	TOTAL INDIRECT COST										8,319,750
	DURATION FACTOR (3% On Direct+Indirect)										863,484
	TOTAL INITIAL CONSTRUCTION COST										13,504,000
B	<u>Q & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
*	Inspection Activities of Facility - Monthly	72	HR							75	5,400
*	Subsidence Monitoring Annual Survey	20	HR							75	1,500
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	20	AC							500	10,000
*	Cover Repair Due To Subsidence	1	LS								14,700
*	Annual Fence Maintenance	1									600
	Annual Sign Maintenance	16								40	640
*	Annual Monitoring Well Maintenance	10								75	750
	(K) TOTAL Q & M COST										42,590

H-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	655,000
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(II) Total Initial Construction Cost	13,504,000
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(K) TOTAL PROJECT COST (Rounded to the nearest Thousand)	14,159,000
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H-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S.MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>I SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" DP X 20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	36.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(J) PAGE 1 TOTAL						3,130	62,600	40,696	18,960		151,540

H-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>II. COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.80	2,166,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	65,174	CY	-	0.165	10,754	215,074	0	64,522	4.30	279,600
13	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,338	126,760	136,500	-	0.30	263,250
14	Placement of 1'-0 Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,696	350,646	5,009	11.10	372,350
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
16	Placement of 1'-6" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,676	13,297	4.90	242,300
17	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,860	156,655	4,458	10.70	176,170
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,900	SY	1.50	0.16	304	6,080	2,850	1,824	5.70	10,750
19	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,460
(J) PAGE 2 TOTAL						51,417	1,026,334	2,939,063	267,265		4,234,000

H-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	8,801	0.60	68,700
21	Install 8' High Chain Link Perimeter Fence	4,668	LF	12	0.25	1,217	24,340	58,416	7,302	19	90,060
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,980
23	Warning Signs 4-18"x 24" - Installed	16	EA	175	2.00	32	640	2,800	-	215	3,440
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
25	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
(J) PAGES 1,2,3 TOTAL						58,111	1,162,212	3,079,536	307,129		4,566,160
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							22,082	76,968			99,070
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											229,410
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							473,720				473,720
(J) TOTAL DIRECT COST						58,110	1,658,010	3,156,530	307,130		5,390,360

H-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								134,760
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								161,710
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								539,040
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								377,330
5	Engineering & Services @ 20% of Total Direct Cost										1,078,070
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					12,090					229,710
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						770,975	836,480			1,607,460
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					14,644					639,640
9	Project Management @ 8% of Total Direct + Indirects										663,350
(J) TOTAL INDIRECT COST											5,651,070

H-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S.MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,390,380
	TOTAL INDIRECT COST										5,651,070
	DURATION FACTOR (3% On Direct+Indirect)										772,900
	TOTAL INITIAL CONSTRUCTION COST										11,814,000
B	<u>O & M COSTS</u>										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
•	Inspection Activities of Facility - Monthly	72	HR							75	5,400
•	Subsidence Monitoring Annual Survey	20	HR							75	1,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	20	AC							500	10,000
•	Cover Repair Due To Subsidence	1	LS								14,000
•	Annual Fence Maintenance	1									600
	Annual Sign Maintenance	16								40	640
•	Annual Monitoring Well Maintenance	10								75	750
	(J) TOTAL O & M COST										42,190

H-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S.MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5264
DATE: 08/26/93
LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost 649,000
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

(II) Total Initial Construction Cost 11,814,000

(J) TOTAL PROJECT COST (Rounded to the nearest Thousand) 12,463,000

H-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/26/93

LOC: MDC-106

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@420	MAT'L \$	BEACAP \$@4MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - SOIL CEMENT COVER</u>											
<u>A DIRECT COSTS</u>											
<u>1 SITE PREPARATION</u>											
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,820	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" DP X 20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15' RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'x 35'x 4' Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
<u>(G) PAGE 1 TOTAL</u>						3,130	62,600	40,658	18,960		151,540

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.00	2,106,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	98,179	CY	18	0.12	11,781	235,630	1,767,222	70,689	21.10	2,073,540
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	99,725	SY	0.33	0.03	2,992	59,835	32,909	-	0.90	92,740
		99,725	SY	0.17	0.02	1,995	39,890	16,853	-	0.60	56,840
14	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,338	126,750	136,500	-	0.30	263,250
15	Placement of 1'-0 Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,696	350,648	5,009	11.10	372,350
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
17	Placement of 1'-6" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,676	13,297	4.90	242,300
18	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,860	156,855	4,458	10.70	176,170
(G) PAGE 2 TOTAL						53,112	1,062,232	4,411,767	247,517		6,139,970

H-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	1,900	SY	1.50	0.16	304	6,080	2,850	1,624	5.70	10,750
20	Excavation of Trapezoidal Drainage Ditch	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.30	27,480
21	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	8,801	0.80	68,700
22	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,080
23	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
24	Warning Signs 4-18"x 24" - Installed	16	EA	175	2.00	32	640	2,800	-	215	3,440
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
26	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
PAGES 1,2,3 TOTAL						61,165	1,223,310	4,555,091	295,540		6,531,680
Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							23,243	113,877			137,120
Clean up & Demobilize (Assume 5% of Total Direct Cost)											326,580
LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							498,620				498,620
(G) TOTAL DIRECT COST						61,170	1,745,170	4,668,970	295,540		7,494,000

H-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: **S. MEAD**

LOG #: 7-03

ACTIVITY CODE: ESB260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: **PG/WLK**

PHONE: **7-5266**

DATE: **08/26/93**

LOC: **MDC-106**

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								187,350
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								224,820
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								749,400
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								524,580
5	Engineering & Services @ 20% of Total Direct Cost										1,498,000
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					12,720					241,080
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						811,504	1,237,277			2,048,780
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					15,415					673,320
9	Project Management @ 8% of Total Direct + Indirects										1,091,420
	(G) TOTAL INDIRECT COST										7,240,150

H-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: BCN. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										7,494,000
	TOTAL INDIRECT COST										7,240,150
	DURATION FACTOR (3% On Direct+Indirect)										1,178,732
	TOTAL INITIAL CONSTRUCTION COST										15,913,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
	• Inspection Activities of Closed Facility Monthly	72	HR							75	5,400
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	20	AC							500	10,000
	• Cover Repair Due To Subsidence	1	LS								14,700
	• Annual Fence Maintenance	1									800
	Annual Sign Maintenance	16								40	640
	• Annual Monitoring Well Maintenance	10								75	750
	(G) TOTAL O & M COST										42,590

H-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/26/93
LOC: MDC-106

S U M M A R Y

TWENTY (20) ACRES SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

655,000

(I Total Initial Construction Cost

15,913,000

(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)

16,568,000

H-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$/MR	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" DP X 20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	38.00	2,430
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(H) PAGE 1 TOTAL						3,130	62,600	40,696	18,960		151,540

H-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR M/hr@20	MAT'L \$	BEMCAP \$\$/MR	UNIT COST	TOTAL COST
<u>H COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	18,749	77.00	2,166,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	206,760	CY	-	0.125	25,845	516,900	0	155,070	3.30	671,970
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	880	TN	148.50	2.15	1,892	37,840	128,920	-	189.50	166,760
		31,907	CY	15.00	0.155	4,946	98,912	476,805	29,674	19.00	607,190
13	Placement of 30 Mil Flexible Membrane Liner	975,000	SF	0.14	0.0065	6,338	126,750	136,500	-	0.30	263,250
14	Placement of 1'-0" Coarse Sand Drainage Layer	33,395	CY	10.50	0.025	835	16,698	350,648	5,009	11.10	372,350
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	107,000	SY	0.13	0.005	535	10,700	13,910	-	0.20	24,610
16	Placement of 1'-8" Common Fill	49,247	CY	3.75	0.045	2,216	44,322	184,676	13,297	4.90	242,300
17	Placement of 6" Topsoil	16,511	CY	9.50	0.045	743	14,800	156,855	4,458	10.70	176,170
(H) PAGE 2 TOTAL						43,181	863,629	3,202,206	208,502		4,690,800

H-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	1,900	SY	1.50	0.16	304	6,080	2,850	1,824	5.70	10,750
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	6,400	CY	-	0.165	1,056	21,120	0	6,336	4.90	27,460
20	Seeding, Fertilizing & Mulching	122,241	SY	0.25	0.012	1,467	29,338	30,560	6,801	0.60	68,700
21	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,060
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,960	3,960
23	Warning Signs 4-18"x24"	16	EA	175	2.00	32	640	2,800	-	215	3,440
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
25	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2,580	25,800
PAGES 1,2,3 TOTAL						51,235	1,024,707	3,345,532	254,525		5,062,510
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							19,469	63,638			103,110
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											254,130
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							417,670				417,670
(H) TOTAL DIRECT COST						51,240	1,481,850	3,429,170	254,530		5,857,420

H-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								146,440
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								175,720
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								585,740
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								410,020
5	Engineering & Services @ 20% of Total Direct Cost										1,171,480
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					10,660					202,540
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						679,760	906,730			1,586,490
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					12,912					564,020
9	Project Management @ 8% of Total Direct + Indirects										856,150
(H) TOTAL INDIRECT COST											5,700,800

H-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH:\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										5,857,420
	TOTAL INDIRECT COST										5,700,000
	DURATION FACTOR (3% On Direct+Indirect)										348,741
	TOTAL INITIAL CONSTRUCTION COST										11,905,000
B	O & M COSTS										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
	• Inspection Activities of Closed Facility Assume Monthly	72	HR							75	5,400
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	20	AC							500	10,000
	• Cover Repair Due To Subsidence	1	LS								9,500
	• Annual Fence Maintenance	1									600
	Annual Sign Maintenance	16								40	640
	• Annual Monitoring Well Maintenance	10								75	750
	(H) TOTAL O & M COST										37,390

H-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/27/93
LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

575,000

(II Total Initial Construction Cost

11,905,000

(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)

12,480,000

H-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/28/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8" Deep X 20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	384	38.00	2,430
7	35'-0 x 35'-0 x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(B) PAGE 1 TOTAL						3,130	62,600	40,608	18,960		151,540

H-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.60	2,168,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	168,245	CY	-	0.125	21,031	420,613	0	126,184	3.30	546,800
12	Placement of 30 Mil Flexible Membrane Liner	900,582	SF	0.14	0.0065	5,854	117,076	126,061	-	0.30	243,180
13	Placement of 1'-0 Coarse Sand Drainage Layer	33,076	CY	10.50	0.025	827	16,538	347,296	4,961	11.20	368,600
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	7,916	LF	1.00	0.16	1,267	25,331	7,916	-	4.20	33,250
15	2 1/2" Binder Course	98,441	SY	4.15	0.055	5,414	108,285	408,530	32,486	5.60	549,300
16	4" Hydraulic Asphalt Conc.	98,441	SY	6.60	0.03	2,953	59,065	649,711	17,719	7.40	726,490
17	Asphalt Mastic Seal	98,441	SY	0.50	0.015	1,477	29,532	49,221	-	0.80	78,750
18	Sprayed Asphaltic Concrete Sealant	98,441	SY	0.75	0.015	1,477	29,532	73,831	8,660	1.10	112,220
19	Excavation of Traingular Drainage Ditch	3,676	CY	-	0.165	607	12,137	0	3,641	4.30	15,780
20	4" Thick Asphalt Perimeter Drainage Ditch	8,268	SY	7.60	0.144	1,191	23,812	62,637	7,144	11.30	83,790
(B) PAGE 2 TOTAL						44,888	897,751	3,819,049	217,744		4,934,540

H-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: B5B260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5256

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	11,822	SY	0.25	0.012	142	2,837	2,956	851	0.80	6,640
22	Install 8' High Chain Link Perimeter Fence	4,888	LF	12	0.25	1,217	24,340	58,416	7,302	18.50	90,000
23	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1900	3,960
24	Warning Signs 4-18"x 24" - Installed	18	EA	175	2.00	32	640	2,600	-	215	3,440
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
26	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2580	25,800
(B) PAGES 1,2,3 TOTAL						50,256	1,005,128	3,931,919	249,657		5,225,960
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							19,097	96,298			117,400
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											261,300
• LOCATION FACTOR @ 40% On (Total Labor Cost+Escalation)							409,690				409,690
(B) TOTAL DIRECT COST						50,260	1,433,920	4,030,220	249,660		6,014,370

H-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5266

DATE: 08/26/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								150,360
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								180,430
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								601,440
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								421,010
5	Engineering & Services @ 20% of Total Direct Cost										1,202,870
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					10,454					198,630
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						668,773	1,068,008			1,734,780
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					12,668					553,230
9	Project Management @ 8% of Total Direct + Indirects										884,570
(B) TOTAL INDIRECT COST											5,927,320

H-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PGAWLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										6,014,370
	TOTAL INDIRECT COST										5,927,320
	DURATION FACTOR (3% On Direct+Indirect)										356,251
	TOTAL INITIAL CONSTRUCTION COST										12,300,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
	• Inspection Activities of Facility - Monthly	72	HR							75	5,400
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	20	AC							800	16,000
	• Cover Repair Due To Subsidence	1	LS								9,100
	• Annual Fence Maintenance	1									600
	• Annual Sign Maintenance	16								40	640
	• Annual Monitoring Well Maintenance	10								75	750
	(B) TOTAL O & M COST										42,990

H-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLJ

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

661,000

(II) Total Initial Construction Cost

12,300,000

(B) TOTAL PROJECT COST (Rounded to the nearest Thousand)

12,961,000

H-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE200412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>TWENTY (20) ACRES SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	30	AC	-	40	1,200	24,000	0	7,200	-	31,200
2	Precontouring Site	10	AC	-	32	320	6,400	0	1,920	-	8,320
3	Silt Fence (Includes Maintenance)	3,400	LF	0.50	0.05	170	3,400	1,700	-	1.50	5,100
4	Temporary Sediment Control	1	LS	-	-	0	0	0	1,200	-	13,200
5	8"DPX20' Wide Gravel Haul Road	4,400	LF	8.50	0.15	660	13,200	37,400	3,960	12.40	54,560
6	2-15" RCP Culverts	64	LF	12.00	1.00	64	1,280	768	364	38.00	2,430
7	35' x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	24	MO	-	-	0	0	0	-	720	17,280
(E) PAGE 1 TOTAL						3,130	62,600	40,666	18,960		151,540

H-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	27,915	TN	75	0.1	2,792	55,830	2,093,625	16,749	77.50	2,166,200
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	168,245	CY	-	0.125	21,031	420,613	0	126,184	3.30	545,800
12	Placement of 30 Mil Flexible Membrane Liner	900,582	SF	0.14	0.0065	5,854	117,076	126,061	-	0.30	243,160
13	Placement of 1'-0 Coarse Sand Drainage Layer	33,076	CY	10.50	0.025	827	16,538	347,296	4,961	11.20	368,800
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	7,916	LF	1.00	0.16	1,267	25,331	7,816	-	4.20	33,250
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X8-W 2.9xW 2.9(wld.wire fab)Broom Finish.	98,441	SY	7.50	0.36	35,439	708,775	738,306	(0.80/hr) 28,351 (comp rate)	15.00	1,475,430
16	Sprayed on Curing Compound	98,441	SY	0.16	0.010	964	19,688	15,751	5,906	0.40	41,350
17	Joint Sealant 6" PVC Water Stops	88,730	LF	2.30	0.05	4,437	88,730	204,079	-	3.30	292,810
18	Excavation of Traingular Drainage Ditch	3,678	CY	-	0.165	607	12,137	0	3,641	4.30	15,760
19	4" Thick Concrete Perimeter Drainage Ditch	8,268	SY	7.20	0.36	2,976	59,530	59,530	17,659	16.60	136,920
(E) PAGE 2 TOTAL						76,212	1,524,248	3,592,587	203,652		5,320,500

H-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	11,822	SY	0.25	0.012	142	2,837	2,936	851	0.60	6,640
21	Install 8' High Chain Link Perimeter Fence	4,868	LF	12	0.25	1,217	24,340	58,416	7,302	16.50	90,000
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1900	3,960
23	Warning Signs 4-18"x 24" - Installed	16	EA	175	2.00	32	640	2,800	-	215	3,440
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	10,000	10,000
25	Ground Water Monitoring Wells (100' Deep)	10	EA	500	80.00	800	16,000	5,000	4,800	2500	25,600
(E) PAGES 1,2,3 TOTAL						81,581	1,631,625	3,705,457	235,565		5,611,940
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							31,001	92,636			123,640
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											280,600
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							665,050				665,050
(E) TOTAL DIRECT COST						81,580	2,327,680	3,798,090	235,560		6,661,230

H-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2.5% of the Total Direct Cost)	1	LS								167,030
2	Health & Safety Assume 3% of Total Direct Cost	1	LS								200,440
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								668,120
4	Administrative & Legal @ 7% of Total Direct Cost	1	LS								487,690
5	Engineering & Services @ 20% of Total Direct Cost	1	LS								1,336,250
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					16,970					322,430
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						1,082,371	1,008,494			2,088,870
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					20,558					959,650
9	Project Management @ 8% of Total Direct + Indirects										1,031,340
(E) TOTAL INDIRECT COST											7,241,820

H-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										6,081,230
	TOTAL INDIRECT COST										7,241,820
	DURATION FACTOR (3% On Direct+Indirect)										417,892
	TOTAL INITIAL CONSTRUCTION COST										14,341,000
B	O & M COSTS										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	40	EA							225	9,000
	• Inspection Activities of Facility-Monthly	72	HR							75	5,400
	• Subsidence Monitoring Annual Survey	20	HR							75	1,500
	• Maintenance of Concrete Slab	20	AC							800	16,000
	• Cover Repair Due To Subsidence	1	LS								16,800
	• Annual Fence Maintenance	1									600
	• Annual Sign Maintenance	16								40	640
	• Annual Monitoring Well Maintenance	10								75	750
	(E) TOTAL O & M COST										50,690

H-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5264
DATE: 08/25/93
LOC: MDC-106

SUMMARY

TWENTY (20) ACRES SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	779,000
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(II) Total Initial Construction Cost	14,341,000
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(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)	15,120,000
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H-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

Appendix I
Cost Estimates for 40-Acre Site

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@820	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - CLAYMAX</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8"DP x 20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	51.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) Include Power & Water	30	MO	-	-	0	0	0	-	720	21,600
(A) PAGE 1 TOTAL						4,397	87,930	61,611	26,904		223,530

I-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@420	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,650	33,454	52.80	2,932,020
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,060,690
12	Placement of Claymax Geotextile Mat	1,874,665	SF	0.36	0.005	9,373	187,467	712,573	-	0.48	899,840
13	Placement of 30 Mil Flexible Membrane Liner	1,952,341	SF	0.14	0.008	11,714	234,281	273,328	-	0.30	507,610
14	Placement of 1'-0" Coarse Sand Drainage Layer	68,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	48,730
16	Placement of 1'-6" Common Fill	98,081	CY	3.75	0.04	3,923	78,455	367,004	23,539	4.80	409,810
17	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	2,650	SY	1.50	0.16	424	8,480	3,975	2,544	5.70	15,000
19	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,942	3.90	155,310
(A) PAGE 2 TOTAL						82,584	1,651,686	5,178,643	362,608		7,182,930

I-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR Mhd\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,130
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,000	10,350	18.50	127,050
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,980
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	-	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
(A) PAGES 1,2,3 TOTAL						92,968	1,859,353	5,396,401	424,890		7,749,440
* Escalation for 1994 on Direct Labor is 1.9% & on Direct material is 2.5%							35,328	134,960			170,290
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											367,470
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							757,870				757,870
(A) TOTAL DIRECT COST						92,970	2,052,550	5,533,360	424,890		9,005,070

I-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								181,300
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								226,630
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								906,510
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								543,900
5	Engineering & Services @ 15% of Total Direct Cost										1,359,760
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					19,338					367,420
7	Field Indirects on Total Direct Labor @ 48.5%, Material @ 26.5%						1,233,436	1,486,340			2,699,780
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$43.68					23,426					1,023,350
9	Project Management @ 8% of Total Direct + Indirects										1,309,900
(A) TOTAL INDIRECT COST											8,618,550

I-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										9,065,070
	TOTAL INDIRECT COST										8,618,550
	DURATION FACTOR (3.2% On Direct+Indirect)										505,878
	TOTAL INITIAL CONSTRUCTION COST										18,249,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,000
	• Inspection Activities of Facility - Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	40	AC							500	20,000
	• Cover Repair Due To Subsidence	1	LS								8,500
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(A) TOTAL O & M COST										67,370

I-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,036,000
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(II Total Initial Construction Cost	18,249,000
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(A) TOTAL PROJECT COST (Rounded to the nearest Thousand)	19,285,000
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I-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55 AC	-	40	2,200	44,000	0	13,200	-	57,200	
2	Precontouring Site	15 AC	-	32	480	9,600	0	2,880	-	12,480	
3	Silt Fence (Includes Maintenance)	4,650 LF	0.50	0.05	233	4,650	2,325	-	1.50	6,900	
4	Temporary Sediment Control	1 LS	-	-	0	0	0	2,000	-	27,200	
5	8"DP X 20' Wide Gravel Haul Road	6,720 LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590	
6	2-15" RCP Culverts	128 LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030	
7	35'x 35'x 4" Gravel Decon. Area	180 SY	3.00	0.10	18	320	480	96	5.00	900	
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35 CY	10	20	700	14,000	350	4,200	530	18,550	
9	Construction Trailer (Rental) (Include Power & Water)	30 MO	-	-	0	0	0	-	720	21,600	
(L) PAGE 1 TOTAL						4,397	87,930	61,811	28,964		223,530

I-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,850	33,454	52.60	2,832,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Standard Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,301	2.70	1,080,690
12	Placement of Bentomat Geotextile Mat	1,874,665	8F	0.38	0.005	9,373	187,467	712,373	-	0.48	898,840
13	Placement of 30 Mil Flexible Membrane Liner	1,952,341	8F	0.14	0.008	11,714	234,281	273,328	-	0.30	507,610
14	Placement of 1'-0" Coarse Sand Drainage Layer	66,126	CY	10.5	0.025	1,653	33,063	694,323	9,919	11.10	737,300
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	48,730
16	Placement of 1'-6" Common Fill	98,081	CY	3.75	0.04	3,923	78,465	367,804	23,539	4.80	489,610
17	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	2,650	SY	1.50	0.18	424	8,460	3,975	2,544	5.70	15,000
19	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	155,310
(L) PAGE 2 TOTAL						82,584	1,651,686	5,178,643	362,808		7,192,930

I-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,190
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,800	10,350	16.50	127,650
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,960	3,960
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
(L) PAGES 1,2,3 TOTAL						92,968	1,859,353	5,398,401	424,890		7,749,440
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							35,328	134,960			170,290
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											387,470
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							757,870				757,870
(L) TOTAL DIRECT COST						92,970	2,052,550	5,533,360	424,890		9,065,070

I-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								181,300
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								228,630
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								908,510
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								543,900
5	Engineering & Services @ 15% of Total Direct Cost										1,359,700
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					19,340					367,460
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 28.5%						1,233,436	1,486,340			2,669,700
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					23,428					1,023,550
9	Project Management @ 8% of Total Direct + Indirects										1,308,900
(L) TOTAL INDIRECT COST											8,618,590

I-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										9,065,070
	TOTAL INDIRECT COST										8,618,590
	DURATION FACTOR (3.2% On Direct+Indirect)										585,877
	TOTAL INITIAL CONSTRUCTION COST										18,250,000
B	<u>Q & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
	• Inspection Activities of Facility - Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	40	AC							500	20,000
	• Cover Repair Due To Subsidence	1	LS								8,500
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(L) TOTAL O & M COST										67,370

1-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - BENTOMAT (GBM)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,036,000
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(ii) Total Initial Construction Cost	18,250,000
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(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	19,286,000
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I-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - GUNDSEAL</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,980
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8"DP X 20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	180	SY	3.00	0.10	18	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,600
(I) PAGE 1 TOTAL						4,397	87,930	61,811	26,984		223,530

I-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,767,650	33,454	52.60	2,932,620
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,080,690
12	Placement of Gundseal Geomembrane/ Bentonite Mat	1,674,665	SF	0.38	0.005	9,373	187,467	712,373	-	0.48	699,840
13	Placement of 1'-0" Coarse Sand Drainage Layer	66,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
15	Placement of 1'-6" Common Fill	98,081	CY	3.75	0.04	3,923	78,463	367,604	23,539	4.80	469,810
16	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	2,650	SY	1.50	0.16	424	8,480	3,975	2,544	5.70	15,000
18	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	155,310
(I) PAGE 2 TOTAL						70,870	1,417,405	4,905,316	362,609		6,685,320

I-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PO/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,130
20	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	62,800	10,350	18.50	127,650
21	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,900	3,960
22	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
24	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
PAGES 1,2,3 TOTAL						81,254	1,625,072	5,125,074	424,890		7,241,830
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							30,876	128,127			159,000
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											362,090
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							662,380				662,380
(I) TOTAL DIRECT COST						81,250	2,318,330	5,253,200	424,890		8,425,300

I-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								168,510
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								210,630
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								842,530
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								505,520
5	Engineering & Services @ 15% of Total Direct Cost										1,263,800
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					16,900					321,100
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 28.5%						1,078,023	1,392,096			2,470,120
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					20,475					894,350
9	Project Management @ 8% of Total Direct + Indirects										1,206,150
(1) TOTAL INDIRECT COST											7,884,710

I-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/27/93
LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MATL	UNIT MH	TOTAL MH	LABOR MH/\$20	MATL \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										8,425,300
	TOTAL INDIRECT COST										7,884,710
	DURATION FACTOR (3.2% On Direct+Indirect)										521,920
	TOTAL INITIAL CONSTRUCTION COST										16,832,000
B	O & M COSTS										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
*	Inspection Activities of Facility - Monthly	140	HR							75	10,500
*	Subsidence Monitoring Annual Survey	40	HR							75	3,000
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	40	AC							500	20,000
*	Cover Repair Due To Subsidence	1	LS								7,600
*	Annual Fence Maintenance	1									650
	Annual Sign Maintenance	28								40	1,120
*	Annual Monitoring Well Maintenance	24								75	1,800
	(I) TOTAL O & M COST										68,670

I-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/27/93
LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,025,000
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(II) Total Initial Construction Cost	16,832,000
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(I) TOTAL PROJECT COST (Rounded to the nearest Thousand)	17,857,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH/\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Slit Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,980
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8" DP X 20' Wide Gravel Haul Road	6,720	LF	8.50	0.10	672	13,440	57,120	4,032	11.10	74,590
6	2-16" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	180	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,530
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,800
(F) PAGE TOTAL						4,397	87,930	61,811	26,984		223,530

I-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,767,650	33,454	52.60	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,060,690
12	Placement of 120 Mil Flexible Membrane Liner	1,874,665	SF	0.38	0.006	11,248	224,960	712,373	-	0.50	937,330
13	Placement of 1'-0" Coarse Sand Drainage Layer	68,128	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,428	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
15	Placement of 1'-8" Common Fill	98,081	CY	3.75	0.04	3,923	78,465	367,604	23,539	4.80	489,810
16	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	2,650	SY	1.50	0.18	424	8,480	3,975	2,544	5.70	15,000
18	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	155,310
(F) PAGE TOTAL						72,745	1,454,896	4,905,316	362,009		6,722,610

I-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5264

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@820	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.010	2,238	44,758	55,947	13,427	0.50	114,130
20	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,800	10,350	18.50	127,650
21	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
22	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
24	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
PAGES 1,2,3 TOTAL						83,128	1,662,568	5,125,074	424,890		7,279,320
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Materials 2.5%							31,589	128,127			159,726
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											363,970
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							677,660				677,660
(F) TOTAL DIRECT COST						83,130	2,371,810	5,253,200	424,890		8,480,670

I-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR Mlb/\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								169,810
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								212,020
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								848,070
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								506,840
5	Engineering & Services @ 15% of Total Direct Cost	1	LS								1,272,100
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					17,290					328,510
7	Field Indirects of Total Direct Labor @ 46.5, Material @ 26.5%						1,102,892	1,392,096			2,494,990
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					20,949					915,040
9	Project Management @ 8% of Total Direct + Indirects										1,218,380
(F) TOTAL INDIRECT COST											7,967,570

I-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: B5B260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										8,480,670
	TOTAL INDIRECT COST										7,967,570
	DURATION FACTOR (3.2% On Direct+Indirect)										526,344
	TOTAL INITIAL CONSTRUCTION COST										16,975,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,000
*	Inspection Activities of Facility-Monthly	140	HR							75	10,500
*	Subsidence Monitoring Annual Survey	40	HR							75	3,000
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	40	AC							500	20,000
*	Cover Repair Due To Subsidence	1	LS								7,800
*	Annual Fence Maintenance	1									850
	Annual Sign Maintenance	28								40	1,120
*	Annual Monitoring Well Maintenance	24								75	1,800
	(F) TOTAL O & M COST										68,670

I-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: **S. MEAD**

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: **PG/WLK**

PHONE: **7-5266**

DATE: **08/27/93**

LOC: **MDC-106**

S U M M A R Y

FORTY (40) ACRES SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(i Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,025,000

(ii Total Initial Construction Cost

16,975,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

18,000,000

I-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Slit Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,980
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8'DPx20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,000
(C) PAGE 1 TOTAL						4,397	87,930	61,811	26,984		223,530

I-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$@/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,850	33,454	52.00	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,080,690
12	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	198,377 297,568	SY GAL	2	0.13	25,769	515,780	398,754	154,734	5.40	1,087,270
13	Placement of 30 Mil Flexible Membrane Liner	1,952,341	SF	0.14	0.006	11,714	234,281	273,328	-	0.30	507,610
14	Placement of 1'-0" Coarse Sand Drainage Layer	66,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
16	Placement of 1'-6" Common Fill	98,061	CY	3.75	0.04	3,923	78,465	367,804	23,539	4.80	489,810
17	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	2,650	SY	1.50	0.16	424	8,480	3,975	2,544	6.70	15,000
19	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	155,310
(C) PAGE 2 TOTAL						99,000	1,979,999	4,863,025	517,343		7,360,360

I-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,756	55,947	13,427	0.50	114,130
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,600	10,350	18.50	127,650
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1980	3,960
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,560	61,920
(C) PAGES 1,2,3 TOTAL						109,383	2,187,667	5,082,783	579,624		7,916,870
							41,566	127,070			168,640
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											395,640
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							891,690				891,690
(C) TOTAL DIRECT COST						109,380	3,120,920	5,209,850	579,620		9,373,040

I-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L B S T I M A T E

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

LINE	ACTIVITY	EST	UM	UNIT	MATL	UNIT	TOTAL	LABOR	MATL	BEACAP	UNIT	TOTAL
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS									187,480
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS									234,530
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS									937,300
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS									562,380
5	Engineering & Services @ 15% of Total Direct Cost											1,405,980
6	Craft Support @ 20.8 % of Total Direct MHR(\$19/hr)						22,750					432,250
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 28.5%						1,451,228	1,380,610				2,831,840
8	Construction Nonannual @ 25.2% of Total Direct MH @ Rate of \$43.68								27,565			1,204,020
9	Project Management @ 8% on Total Direct + Indirects											1,573,480
	(C) TOTAL INDIRECT COST											8,169,030

I-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 06/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	SEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										9,373,040
	TOTAL INDIRECT COST										9,169,030
	DURATION FACTOR (3.2% On Direct+Indirect)										593,348
	TOTAL INITIAL CONSTRUCTION COST										19,135,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
	• Inspection Activities of Closed Facility Monthly	140	HR							75	10,500
	• Subsidence Monitoring (Annual Survey)	40	HR							75	3,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	40	AC							500	20,000
	• Cover Repair Due To Subsidence	1	LS								8,500
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(C) TOTAL O & M COST										67,370

I-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,036,000

(II Total Initial Construction Cost

19,135,000

(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)

20,171,000

I-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - REINFORCED SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	20' Wide Gravel Haul Road x 8" Deep	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,600
(D) PAGE 1 TOTAL						4,397	87,930	61,811	26,984		223,530

I-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,850	33,454	52.60	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,060,830
12	Placement of 30 Mil Flexible Membrane Liner	1,952,341	SF	0.14	0.006	11,714	234,281	273,328	-	0.30	507,610
13	Placement of Geotextile Reinforcement on Foundation Layer	198,377	SY	0.26	0.005	992	19,836	51,578	-	0.40	71,420
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5g/Sy	198,377 297,568	SY GAL	2.00	0.13	25,789	515,780	398,754	154,734	5.40	1,067,270
15	Placement of 1'-0" Coarse Sand Drainage Layer	66,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
17	Placement of 1'-6" Common Fill	98,081	CY	3.75	0.04	3,923	78,465	367,804	23,539	4.80	489,810
18	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	2,650	SY	1.50	0.16	424	8,480	3,975	2,544	5.70	15,000
20	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	155,310
(D) PAGE TOTAL						99,992	1,999,837	4,914,003	517,343		7,431,780

I-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/27/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,130
22	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,800	10,350	18.50	127,650
23	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,980
24	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
26	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
(D) PAGES 1,2,3 TOTAL						110,375	2,207,505	5,134,361	579,624		7,988,290
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							41,943	128,359			170,302
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											399,410
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							899,780				899,780
(D) TOTAL DIRECT COST						110,380	3,149,230	5,262,720	579,620		9,457,780

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/MLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								189,160
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								236,440
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								945,760
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								567,470
5	Engineering & Services @ 15% of Total Direct Cost										1,418,670
6	Craft Support @ 20.8% of Total Direct MHRS(\$19/hr)					22,960					436,240
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						1,464,392	1,394,621			2,859,010
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					27,616					1,214,990
9	Project Management @ 8% of Total Direct + Indirects										1,366,040
(D) TOTAL INDIRECT COST											9,253,000

I-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE280412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/27/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$&MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										9,457,780
	TOTAL INDIRECT COST										9,253,800
	DURATION FACTOR (3.2% On Direct+Indirect)										598,771
	TOTAL INITIAL CONSTRUCTION COST										19,310,000
B	O & M COSTS										
•	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
•	Inspection Activities of Closed Facility Monthly	140	HR							75	10,500
•	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	40	AC							500	20,000
•	Cover Repair Due To Subsidence	1	LS								9,000
•	Annual Fence Maintenance	1									850
	Annual Sign Maintenance	28								40	1,120
•	Annual Monitoring Well Maintenance	24								75	1,800
•	Subsidence Monitoring (Annual Survey)	40	HR							75	3,000
	(D) TOTAL O & M COST										67,870

I-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5266
DATE: 08/27/93
LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,043,000

(II Total Initial Construction Cost

19,310,000

(D) TOTAL PROJECT COST (Rounded to the nearest Thousand)

20,353,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH:\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,980
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8" DP X 20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	100	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Traller (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,600
(K) PAGE 1 TOTAL						4,397	87,930	61,811	26,984		223,530

I-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,850	33,454	52.00	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,080,690
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	132,251	CY	13.00	0.165	21,821	436,428	1,719,263	130,928	17.30	2,288,620
13	Placement of 30 Mil Flexible Membrane Liner	1,952,341	SF	0.14	0.006	11,714	234,281	273,328	-	0.30	507,610
14	Placement of 1'-0 Coarse Sand Drainage Layer	66,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
16	Placement of 1'-6" Common Fill	96,081	CY	3.75	0.04	3,923	78,465	367,804	23,539	4.80	469,810
17	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
18	Placement of Perimeter Exterior Drainage Layer 3/4"x9" DP (Crushed Stone)	2,650	SY	1.50	0.16	424	8,480	3,975	2,544	5.70	15,000
19	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.80	155,310
(K) PAGE 2 TOTAL						95,032	1,900,647	6,185,534	493,537		8,579,710

I-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	SEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,130
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,800	10,350	18.50	127,650
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,980
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
(K) PAGES 1,2,3 TOTAL						105,416	2,108,315	6,405,292	555,818		9,136,220
• Escalation for 1994 on Direct Labor is 1.8% & on Direct Material is 2.5%							40,058	180,132			200,190
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											456,810
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							859,350				859,350
(K) TOTAL DIRECT COST						105,420	3,007,720	6,565,420	555,820		10,652,570

I-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								213,060
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								206,310
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,065,200
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								639,150
5	Engineering & Services @ 15% of Total Direct Cost	1	LS								1,597,890
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					21,927					416,620
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						1,398,590	1,739,836			3,138,430
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.88					23,563					1,160,400
9	Project Management @ 8% of Total Direct + Indirects										1,531,970
(K) TOTAL INDIRECT COST											10,029,060

I-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$0/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										10,652,570
	TOTAL INDIRECT COST										10,029,080
	DURATION FACTOR (3.2% On Direct+Indirect)										661,813
	TOTAL INITIAL CONSTRUCTION COST										21,343,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
	• Inspection Activities of Facility - Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	40	AC							500	20,000
	• Cover Repair Due To Subsidence	1	LS								19,500
	• Annual Fence Maintenance	1									650
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(K) TOTAL O & M COST										78,370

I-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,205,000
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(ii) Total Initial Construction Cost	21,343,000
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(K) TOTAL PROJECT COST (Rounded to the nearest Thousand)	22,548,000
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I-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,960
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8" DP X 20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,600
(J) PAGE 1 TOTAL						4,397	87,930	61,811	26,964		223,530

I-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAMB: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-104

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,767,650	33,454	52.00	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,080,690
12	Compact 2'-0" Thick Clay Layer in 8" Lifts	132,251	CY	-	0.165	21,821	436,428	0	130,928	4.30	567,360
13	Placement of 30 Mil Flexible Membrane Liner	1,952,341	SF	0.14	0.006	11,714	234,281	273,328	-	0.30	507,610
14	Placement of 1'-0 Coarse Sand Drainage Layer	68,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
16	Placement of 1'-6" Common Fill	98,061	CY	3.75	0.04	3,923	78,465	367,604	23,539	4.80	469,810
17	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	2,650	SY	1.50	0.16	424	8,480	3,975	2,544	5.70	15,000
19	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	153,310
(J) PAGE 2 TOTAL						95,032	1,900,647	4,466,271	493,537		6,000,450

I-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$5/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	223,788	8Y	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,130
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,800	10,350	19	127,650
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
(J) PAGES 1,2,3 TOTAL						105,416	2,108,315	4,686,029	555,818		7,416,980
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							40,058	117,151			157,210
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											370,850
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							859,350				859,350
(J) TOTAL DIRECT COST						105,420	3,007,720	4,803,180	555,820		8,804,370

I-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								176,090
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								220,110
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								860,440
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								528,200
5	Engineering & Services @ 15% of Total Direct Cost										1,320,660
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					21,930					416,670
7	Field Indirects of Total Direct Labor @ 48.5%, Material @ 26.5%						1,398,590	1,272,843			2,671,430
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					26,566					1,160,400
9	Project Management @ 8% of Total Direct + Indirects										1,408,910
	(J) TOTAL INDIRECT COST										8,780,970

I-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	EMCA \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										8,804,370
	TOTAL INDIRECT COST										8,780,970
	DURATION FACTOR (3.2% On Direct+Indirect)										562,731
	TOTAL INITIAL CONSTRUCTION COST										18,148,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
	• Inspection Activities of Facility - Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	40	AC							500	20,000
	• Cover Repair Due To Subsidence	1	LS								18,900
	• Annual Fence Maintenance	1									650
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(J) TOTAL O & M COST										77,770

I-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE26042
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5766
DATE: 08/27/93
LOC: MDC-106

SUMMARY	
<u>FORTY (40) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>	
C TOTAL COST (Total Present Worth)	
(I) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,196,000
(II) Total Initial Construction Cost	18,148,000
(J) TOTAL PROJECT COST (Rounded to the nearest Thousand)	19,344,000

I-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - SOIL CEMENT COVER</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,980
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8"DP X 20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	8Y	3.00	0.10	16	320	480	96	6.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,600
(G) PAGE 1 TOTAL						4,387	87,930	61,811	28,964		223,530

I-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: B3B260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@820	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,850	33,454	52.00	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,060,690
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	195,714	CY	18	0.12	23,486	469,714	3,522,852	140,914	21.10	4,133,490
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	198,362	SY	0.33	0.03	5,951	119,017	65,459	-	0.90	184,400
		198,362	SY	0.17	0.02	3,967	79,345	33,722	-	0.90	113,070
14	Placement of 30 Mil Flexible Membrane Liner	1,785,254	SF	0.14	0.008	10,712	214,230	249,936	-	0.30	464,170
15	Placement of 1'-0 Coarse Sand Drainage Layer	66,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
17	Placement of 1'-6" Common Fill	98,061	CY	3.75	0.04	3,923	78,465	367,804	23,539	4.80	489,810
18	Placement of 6" Topsoil	33,000	CY	8.5	0.04	1,320	26,400	313,500	7,920	10.50	347,820
(G) PAGE 2 TOTAL						93,971	1,879,427	7,379,633	433,678		10,510,370

I-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	2,650	SY	1.5	0.16	424	8,480	3,975	2,544	5.70	15,000
20	Excavation of Trapezoidal Drainage Ditch	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	155,310
21	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,130
22	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,800	10,350	16.50	127,650
23	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
24	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	180	5,320
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
26	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,820
PAGES 1,2,3 TOTAL						110,752	2,215,047	7,803,368	534,345		11,237,190
◆ Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							42,066	190,064			232,170
◆ Clean up & Demobilize (Assume 5% of Total Direct Cost)											561,800
◆ LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							902,850				902,850
(G) TOTAL DIRECT COST						110,750	3,159,980	7,793,450	534,340		12,834,070

I-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								258,680
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								323,350
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,293,410
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								776,040
5	Engineering & Services @ 15% of Total Direct Cost										1,940,110
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					23,040					437,760
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						1,469,391	2,065,264			3,534,655
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					27,909					1,219,070
9	Project Management @ 8% of Total Direct + Indirects										1,817,370
(G) TOTAL INDIRECT COST											11,600,440

I-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										12,934,070
	TOTAL INDIRECT COST										11,000,440
	DURATION FACTOR (3.2% On Direct+Indirect)										1,717,418
	TOTAL INITIAL CONSTRUCTION COST										26,252,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,000
	• Inspection Activities of Closed Facility Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	40	AC							500	20,000
	• Cover Repair Due To Subsidence	1	LS								19,500
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(G) TOTAL O & M COST										78,370

I-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG # : 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5256

DATE: 09/09/93

LOC: MDC-106

S U M M A R Y

FORTY (40) ACRES SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,205,000

(II Total Initial Construction Cost

26,252,000

(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)

27,457,000

DETAIL ESTIMATE

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK

PHONE: 7-5266
DATE: 08/27/93

LOC: MDC-106

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

LINE #	ACTIVITY	EST	UM	UNIT	MAT'L	UNIT	TOTAL	LABOR	MAT'L	\$/HR	BEACAP	UNIT	TOTAL
FORTY (40) ACRES SITE - BENTONITE SOIL ADDITIVE													
DIRECT COSTS													
SITE PREPARATION													
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200				57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880				12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-			1.50	6,900
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000			-	27,200
5	8" DP X 20' Wide Gravel Haul Road	6,720	LF	0.50	0.1	672	13,440	57,120	4,032			11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576			31.50	4,030
7	35' x 35' x 4' Gravel Decon. Area	160	SY	3.00	0.10	16	320	460	96			5.00	900
8	6' x 35' x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200			530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-			720	21,600
(H) PAGE 1 TOTAL													
		4,397				67,830	61,811	28,964					223,530

I-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH @ \$20	MAT'L \$	BEMCAP \$/MR	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,860	33,454	62.00	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	395,858	CY	-	0.105	41,565	831,302	0	249,391	2.70	1,060,690
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	1,756	TN	148.50	2.0	3,512	70,240	257,254	-	106.50	327,490
	Sodium Bentonite	63,957	CY	15.00	0.15	9,594	191,871	959,355	57,561	18.90	1,208,790
	Silty Sand Soil										
13	Placement of 30 Mil Flexible Membrane Liner	1,756,102	SF	0.14	0.006	10,537	210,732	245,854	-	0.30	456,590
14	Placement of 1'-0" Coarse Sand Drainage Layer	68,126	CY	10.50	0.025	1,653	33,063	694,323	9,919	11.10	737,300
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	212,426	SY	0.12	0.005	1,062	21,243	25,491	-	0.20	46,730
16	Placement of 1'-8" Common Fill	98,081	CY	3.75	0.04	3,923	78,465	367,604	23,539	4.00	459,610
17	Placement of 6" Topsoil	33,000	CY	9.50	0.04	1,320	26,400	313,500	7,920	10.50	347,820
(H) PAGE 2 TOTAL						73,498	1,469,965	4,970,127	350,325		7,606,040

I-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	2,650	SY	1.5	0.16	424	8,480	3,975	2,544	5.70	15,000
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	39,824	CY	-	0.15	5,974	119,472	0	35,842	3.90	155,310
20	Seeding, Fertilizing & Mulching	223,788	SY	0.25	0.01	2,238	44,758	55,947	13,427	0.50	114,130
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,000	10,350	10.50	127,050
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,960
23	Warning Signs 4-18"x24"	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,820
PAGES 1,2,3 TOTAL						90,279	1,805,584	5,193,960	450,992		8,334,860
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							34,306	129,847			184,150
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											416,740
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							735,980				735,980
(H) TOTAL DIRECT COST						90,280	2,575,850	5,323,710	450,990		9,051,710

I-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MR	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								193,030
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								241,290
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								965,170
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								579,100
5	Engineering & Services @ 15% of Total Direct Cost										1,447,760
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					18,760					356,620
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						1,197,770	1,410,763			2,608,530
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					22,761					993,740
9	Project Management @ 8% of Total Direct + Indirects										1,362,970
(H) TOTAL INDIRECT COST											8,748,430

I-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$@MR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										9,851,710
	TOTAL INDIRECT COST										8,748,430
	DURATION FACTOR (3.2% On Direct+Indirect)										588,804
	TOTAL INITIAL CONSTRUCTION COST										18,989,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
	• Inspection Activities of Closed Facility Assume Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	40	AC							500	20,000
	• Cover Repair Due To Subsidence	1	LS								12,600
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(H) TOTAL O & M COST										71,470

I-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/27/93
LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,099,000

(II Total Initial Construction Cost

18,969,000

(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)

20,068,000

I-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - ASPHALTIC CONCRETE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Silt Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,980
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8" Deep X 20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'-0 x 35'-0 x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20.00	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,000
(B) PAGE 1 TOTAL						4,387	87,930	61,811	26,964		223,530

I-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: BCON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$68/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,850	33,454	52.60	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	333,850	CY	-	0.105	35,054	701,085	0	210,326	2.70	911,410
12	Placement of 30 Mil Flexible Membrane Liner	1,810,827	SF	0.14	0.006	10,865	217,299	253,516	-	0.30	470,820
13	Placement of 1'-0 Coarse Sand Drainage Layer	68,675	CY	10.50	0.025	1,667	33,338	700,088	10,001	11.20	743,430
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	14,600	LF	1.0	0.12	1,752	35,040	14,600	-	3.40	49,640
15	2 1/2" Binder Course	195,954	SY	4.15	0.055	10,777	215,549	813,209	64,665	5.60	1,093,420
16	4" Hydraulic Asphalt Conc.	195,954	SY	6.60	0.03	5,879	117,572	1,293,296	35,272	7.40	1,448,140
17	Asphalt Mastic Seal	195,954	SY	0.50	0.015	2,939	58,786	97,977	-	0.60	158,760
18	Sprayed Asphaltic Concrete Sealant	195,954	SY	0.75	0.015	2,939	58,786	146,968	17,636	1.10	223,390
19	Excavation of Triangular Drainage Ditch	22,148	CY	-	0.15	3,322	66,444	0	19,933	3.90	66,360
20	4" Thick Asphalt Perimeter Drainage Ditch	18,670	SY	7.6	0.144	2,717	54,348	143,412	16,304	11.30	214,060
(B) PAGE 2 TOTAL						83,488	1,669,780	6,250,913	407,590		8,328,270

I-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: FOWIX

PHONE: 7-5266

DATE: 06/25/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	DEM CAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area Inside the Security Fence	10,960	SY	0.25	0.01	110	2,192	2,740	658	0.50	5,590
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,800	10,350	18.50	127,650
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1980	3,960
23	Warning Signs 4-18" x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	60.00	1,920	38,400	12,000	11,520	2580	61,920
(B) PAGES 1,2,3 TOTAL											
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%											
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											
• LOCATION FACTOR @ 40% on (Total Labor Cost+Escalation)											
(B) TOTAL DIRECT COST											
91,740 2,617,610 6,577,900 457,100 10,168,240											

I-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/26/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								203,160
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								253,960
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,015,820
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								609,490
5	Engineering & Services @ 15% of Total Direct Cost										1,523,740
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					19,082					362,560
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						1,217,169	1,743,144			2,960,330
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					23,118					1,009,820
9	Project Management @ 8% of Total Direct + Indirects										1,447,770
(B) TOTAL INDIRECT COST											9,366,650

I-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: BSE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PGW/LK

PHONE: 7-5268

DATE: 09/28/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	DEM CAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										10,158,240
	TOTAL INDIRECT COST										9,388,650
	DURATION FACTOR (3.2% On Direct+Indirect)										625,436
	TOTAL INITIAL CONSTRUCTION COST										20,170,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
	• Inspection Activities of Facility - Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	40	AC							800	32,000
	• Cover Repair Due To Subsidence	1	LS								12,100
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(B) TOTAL O & M COST										82,970

I-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L B S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGW/LK
PHONE: 7-5264
DATE: 08/25/93
LOC: MDC-106

SUMMARY	
<u>FORTY (40) ACRES SITE - ASPHALTIC CONCRETE</u>	
C TOTAL COST (Total Present Worth)	
(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,275,000
(ii) Total Initial Construction Cost	20,170,000
(B) TOTAL PROJECT COST (Rounded to the nearest Thousand)	21,445,000

I-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$5/MH	UNIT COST	TOTAL COST
<u>FORTY (40) ACRES SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	55	AC	-	40	2,200	44,000	0	13,200	-	57,200
2	Precontouring Site	15	AC	-	32	480	9,600	0	2,880	-	12,480
3	Slit Fence (Includes Maintenance)	4,650	LF	0.50	0.05	233	4,650	2,325	-	1.50	6,960
4	Temporary Sediment Control	1	LS	-	-	0	0	0	2,000	-	27,200
5	8"DPX20' Wide Gravel Haul Road	6,720	LF	8.50	0.1	672	13,440	57,120	4,032	11.10	74,590
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35' x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.10	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	30	MO	-	-	0	0	0	-	720	21,600
(E) PAGE 1 TOTAL						4,397	57,830	61,511	26,964		223,530

I-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	55,757	TN	50	0.1	5,576	111,514	2,787,850	33,454	52.60	2,932,820
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	333,850	CY	-	0.105	35,054	701,085	0	210,326	2.70	911,410
12	Placement of 30 Mil Flexible Membrane Liner	1,810,827	SF	0.14	0.006	10,865	217,299	253,516	-	0.30	470,820
13	Placement of 1'-0 Coarse Sand Drainage Layer	66,675	CY	10.50	0.025	1,667	33,338	700,088	10,001	11.20	743,430
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	14,600	LF	1.00	0.12	1,752	35,040	14,600	-	3.40	49,640
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X8-W 2.9xW 2.9(wid.wire fab)Broom Finish.	195,954	SY	7.50	0.36	70,543	1,410,869	1,469,655	(0.80/hr) 55,435 (comp rate)	15.00	2,938,900
16	Sprayed on Curing Compound	195,954	SY	0.16	0.01	1,960	39,191	31,353	11,757	0.40	82,300
17	Joint Sealant 6" PVC Water Stops	190,500	LF	2.30	0.05	9,525	190,500	433,150	-	3.50	628,650
18	Excavation of Triangular Drainage Ditch	22,148	CY	-	0.15	3,322	66,444	0	19,933	3.90	88,360
19	4" Thick Concrete Perimeter Drainage Ditch	18,870	SY	7.20	0.36	6,793	135,864	135,864	40,759	16.00	312,490
(E) PAGE 2 TOTAL						147,057	2,941,143	5,831,075	382,665		9,154,900

I-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR Mlb:\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	10,960	SY	0.25	0.01	110	2,192	2,740	658	0.50	5,590
21	Install 8' High Chain Link Perimeter Fence	6,900	LF	12	0.25	1,725	34,500	82,600	10,350	18.50	127,650
22	Chain Link Security Gate 8'Hx20'W	2	EA	1500	24.00	48	960	3,000	-	1,980	3,980
23	Warning Signs 4-16"x 24" - Installed	26	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	20,000	20,000
25	Ground Water Monitoring Wells (100' Deep)	24	EA	500	80.00	1,920	38,400	12,000	11,520	2,580	61,920
(E) PAGES 1,2,3 TOTAL						155,312	3,106,245	5,997,628	432,177		9,602,870
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							59,019	149,941			208,960
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											480,140
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,266,110				1,266,110
(E) TOTAL DIRECT COST						155,310	4,431,370	6,147,570	432,180		11,858,080

I-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 2% of the Total Direct Cost)	1	LS								231,160
2	Health & Safety Assume 2.5% of Total Direct Cost	1	LS								288,950
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,155,810
4	Administrative & Legal @ 6% of Total Direct Cost	1	LS								693,480
5	Engineering & Services @ 15% of Total Direct Cost	1	LS								1,733,710
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					32,300					613,700
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						2,060,587	1,629,106			3,689,693
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					39,136					1,826,970
9	Project Management @ 8% of Total Direct + Indirects										1,743,320
(E) TOTAL INDIRECT COST											11,976,700

I-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5264

DATE: 08/27/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										11,558,080
	TOTAL INDIRECT COST										11,978,790
	DURATION FACTOR (3.2% On Direct+Indirect)										753,118
	TOTAL INITIAL CONSTRUCTION COST										24,289,988
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	96	EA							225	21,600
	• Inspection Activities of Facility-Monthly	140	HR							75	10,500
	• Subsidence Monitoring Annual Survey	40	HR							75	3,000
	• Maintenance of Concrete Slab	40	AC							800	32,000
	• Cover Repair Due To Subsidence	1	LS								22,200
	• Annual Fence Maintenance	1									650
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	24								75	1,800
	(E) TOTAL O & M COST										83,070

I-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 08/27/93

LOC: MDC-106

SUMMARY

FORTY (40) ACRES SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(i) Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 16.3725)	1,431,000
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(ii) Total Initial Construction Cost	24,288,000
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(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)	25,719,000
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Appendix J
Cost Estimates for 80-Acre Site

11

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - CLAYMAX</u>											
<u>A DIRECT COSTS</u>											
<u>I SITE PREPARATION</u>											
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8" DP x 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	76,890	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	8Y	3.00	0.1	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	16,550
9	Construction Trailer (Rental) Include Power & Water	36	MO	-	-	0	0	0	-	720	25,920
(A) PAGE 1 TOTAL						6,680	133,200	84,048	41,280		334,850

J-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,682	TN	50	0.1	11,168	223,324	5,583,100	66,997	52.00	5,673,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% STD. Proctor	974,173	CY	-	0.005	82,605	1,656,094	0	496,828	2.20	2,152,920
12	Placement of Claymax Geotextile Mat	3,722,973	SF	0.38	0.0045	16,753	335,068	1,414,730	-	0.47	1,749,800
13	Placement of 30 Mil Flexible Membrane Liner	3,832,417	SF	0.14	0.0055	21,078	421,568	536,538	-	0.20	958,100
14	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,378,881	19,898	11.10	1,464,240
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,988	46,184	-	0.20	88,170
16	Placement of 1'-6" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,185	41,058	4.70	911,100
17	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,810	10.40	684,590
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	4,010	SY	1.50	0.16	642	12,832	6,015	3,850	5.70	22,700
19	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,898	2.60	151,220
(A) PAGE 2 TOTAL						152,787	3,055,746	10,323,382	677,136		14,056,200

J-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	469,981	SY	0.25	0.01	4700	93,996	117,495	28,199	0.50	239,690
21	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2380	47,600	114,240	14,280	18.50	176,120
22	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,980	7,920
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	-	28,000
25	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2400	48,000	15,000	14,400	2,580	77,400
(A) PAGES 1,2,3 TOTAL						4632	192,036	256,435	50,879		534,450
						169,079	3,381,582	10,664,363	775,297		14,925,560
Escalation for 1994 on Direct Labor is 1.9% & on Direct material is 2.5%							64,250	268,609			330,860
Clean up & Demobilize (Assume 5% of Total Direct Cost)											748,280
LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,378,330				1,378,330
(A) TOTAL DIRECT COST						169,080	4,824,160	10,930,970	775,300		17,361,030

J-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								260,720
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								347,620
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,736,100
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								669,050
5	Engineering & Services @ 15% of Total Direct Cost										2,607,150
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					35,169					668,200
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						2,243,234	2,896,707			5,139,940
8	Construction Nonmanual 25.2% of Total Direct MH @ Rate of \$45.58					42,608					1,661,120
9	Project Management @ 8% of Total Direct + Indirects										2,469,830
	(A) TOTAL INDIRECT COST										15,961,730

J-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										17,361,030
	TOTAL INDIRECT COST										15,961,730
	DURATION FACTOR (3.2% On Direct+Indirect)										1,066,968
	TOTAL INITIAL CONSTRUCTION COST										34,410,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Facility - Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	80	HR							75	6,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								10,000
	• Annual Fence Maintenance	1									850
	Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(A) TOTAL O & M COST										105,220

J-1. Cost Estimate for a Cover System Utilizing Claymax® and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/30/93
LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - CLAYMAX

C TOTAL COST (Total Present Worth)

(Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,617,000

(I Total Initial Construction Cost

34,410,000

(A) TOTAL PROJECT COST (Rounded to the nearest Thousand)

36,027,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PO/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - BENTOMAT (GBM)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8"DP X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(L) PAGE 1 TOTAL						6,600	133,200	84,048	41,280		334,850

J-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,563,100	66,997	52.00	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Standard Proctor	974,173	CY	-	0.065	62,805	1,656,094	0	496,828	2.20	2,152,920
12	Placement of Bentomat Geotextile Mat	3,722,973	SF	0.38	0.0045	16,753	335,068	1,414,730	-	0.50	1,749,800
13	Placement of 30 Mil Flexible Membrane Liner	3,632,419	SF	0.14	0.0053	21,078	421,566	536,539	-	0.20	858,100
14	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,378,861	19,896	11.10	1,484,240
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,966	46,184	-	0.20	66,170
16	Placement of 1'-6" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,165	41,056	4.70	911,100
17	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,610	10.40	684,590
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	4,010	SY	1.50	0.16	642	12,632	6,015	3,650	5.70	22,700
19	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,696	2.60	151,220
(L) PAGE 2 TOTAL						152,787	3,055,746	10,323,362	877,136		14,056,260

J-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	469,981	SY	0.25	0.01	4,700	83,998	117,485	28,199	0.50	239,690
21	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	178,120
22	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,980	7,920
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
25	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,580	77,400
(L) PAGES 1,2,3 TOTAL						169,079	3,381,582	10,684,364	775,297		14,925,560
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							64,250	286,809			330,860
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											746,280
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,378,330				1,378,330
(L) TOTAL DIRECT COST						169,080	4,824,160	10,930,970	775,300		17,381,030

J-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								260,720
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								347,620
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,738,100
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								869,050
5	Engineering & Services @ 15% of Total Direct Cost										2,607,150
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					35,170					668,230
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						2,243,234	2,896,707			5,139,940
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					42,608					1,851,120
9	Project Management @ 8% of Total Direct + Indirects										2,468,840
(L) TOTAL INDIRECT COST											15,961,770

J-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										17,381,030
	TOTAL INDIRECT COST										15,961,770
	DURATION FACTOR (3.2% On Direct+Indirect)										1,066,970
	TOTAL INITIAL CONSTRUCTION COST										34,410,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Facility - Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	60	HR							75	6,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								10,000
	• Annual Fence Maintenance	1									650
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(L) TOTAL O & M COST										105,220

J-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - BENTOMAT (GBM)

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,617,000
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(II Total Initial Construction Cost	34,410,000
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(L) TOTAL PROJECT COST (Rounded to the nearest Thousand)	36,027,000
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J-2. Cost Estimate for a Cover System Utilizing Bentomat® and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - GUNDSEAL</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,640	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8"DP X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(I) PAGE 1 TOTAL						6,680	133,200	84,048	41,280		334,850

J-3. Cost Estimate for a Cover System Utilizing Gundseal®

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE26012

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/M#1	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,583,100	66,997	52.60	5,673,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	974,173	CY	-	0.085	82,805	1,656,094	0	496,626	2.20	2,152,920
12	Placement of Gundseal Geomembrane/ Bentonite Mat	3,722,973	SF	0.38	0.0045	16,763	335,066	1,414,730	-	0.47	1,749,600
13	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,376,661	19,696	11.10	1,464,240
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,986	46,164	-	0.20	66,170
15	Placement of 1'-6" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,165	41,058	4.70	911,100
16	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,810	10.40	684,590
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	4,010	SY	1.50	0.16	642	12,832	6,015	3,850	5.70	22,700
18	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,896	2.60	151,220
(I) PAGE 2 TOTAL						131,709	2,634,180	9,766,844	677,136		13,096,160

J-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mulching	469,981	SY	0.25	0.01	4,700	93,996	117,495	28,199	0.50	239,690
20	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	16.50	176,120
21	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,960	7,920
22	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
24	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,560	77,400
PAGES 1,2,3 TOTAL						148,001	2,960,016	10,127,825	775,297		13,967,460
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							56,240	253,196			309,440
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											696,370
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,206,500				1,206,500
(I) TOTAL DIRECT COST						148,000	4,222,760	10,381,020	775,300		16,161,770

J-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	INDIRECT COSTS										
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								242,730
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								323,640
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,618,180
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								809,090
5	Engineering & Services @ 15% of Total Direct Cost										2,427,270
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					30,780					584,820
7	Field Indirects on Total Direct Labor @ 48.5%, Material @ 26.5%						1,963,583	2,750,970			4,714,553
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					37,298					1,629,090
9	Project Management @ 8% of Total Direct + Indirects										2,282,490
	(I) TOTAL INDIRECT COST										14,531,860

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										16,181,770
	TOTAL INDIRECT COST										14,631,860
	DURATION FACTOR (3.2% On Direct+Indirect)										988,036
	TOTAL INITIAL CONSTRUCTION COST										31,800,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
*	Inspection Activities of Facility - Monthly	240	HR							75	18,000
*	Subsidence Monitoring Annual Survey	80	HR							75	6,000
*	Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & - Drainage Maintenance	80	AC							500	40,000
*	Cover Repair Due To Subsidence	1	LS								9,200
*	Annual Fence Maintenance	1									850
	Annual Sign Maintenance	28								40	1,120
*	Annual Monitoring Well Maintenance	30								75	2,250
	(I) TOTAL O & M COST										104,420

J-3. Cost Estimate for a Cover System Utilizing Gundseal® (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - GUNDSEAL

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,605,000

(II Total Initial Construction Cost

31,600,000

(I) TOTAL PROJECT COST (Rounded to the nearest Thousand)

33,405,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@1MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - (120 MIL FML)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8" DP X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	76,800	6,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	578	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	800
8	6'x 35'x 4' Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	360	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	26,920
(F) PAGE TOTAL						6,660	133,200	84,048	41,280		334,860

J-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>H: COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,583,100	66,997	52.00	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	974,173	CY	-	0.085	82,805	1,656,094	0	496,626	2.20	2,152,820
12	Placement of 120 Mil Flexible Membrane Liner	3,722,973	SF	0.37	0.005	18,615	372,297	1,377,500	-	0.50	1,749,800
13	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,376,661	19,696	11.10	1,464,240
14	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,986	46,164	-	0.20	66,170
15	Placement of 1'-6" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,185	41,058	4.70	911,100
16	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,810	10.40	664,590
17	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	4,010	SY	1.50	0.16	642	12,632	6,015	3,650	5.70	22,700
18	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,896	2.00	161,220
(F) PAGE TOTAL						133,570	2,671,410	9,749,614	677,136		13,096,160

J-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
19	Seeding, Fertilizing & Mutching	469,961	SY	0.25	0.01	4,700	93,996	117,495	26,199	0.50	239,690
20	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	176,120
21	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,960	7,920
22	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
23	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
24	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,590	77,400
PAGES 1,2,3 TOTAL						149,662	2,997,246	10,090,595	775,297		13,967,480
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Materials 2.5%							56,948	262,266			309,210
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											696,370
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,221,680				1,221,680
(F) TOTAL DIRECT COST						149,660	4,275,870	10,342,660	775,300		16,196,720

J-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: B3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								242,950
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								323,930
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,619,870
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								809,840
5	Engineering & Services @ 15% of Total Direct Cost	1	LS								2,429,510
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					31,170					592,230
7	Field Indirects of Total Direct Labor @ 46.5, Material @ 26.5%						1,968,280	2,740,858			4,729,140
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					37,765					1,649,560
9	Project Management @ 8% of Total Direct + Indirects										2,287,480
(F) TOTAL INDIRECT COST											14,684,310

J-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										16,196,720
	TOTAL INDIRECT COST										14,684,310
	DURATION FACTOR (3.2% On Direct+Indirect)										968,193
	TOTAL INITIAL CONSTRUCTION COST										31,869,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Facility-Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	80	HR							75	6,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								9,200
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(F) TOTAL O & M COST										104,420

J-4. Cost Estimate for a Cover System Utilizing 120-mil High Density Polyethylene (HDPE) Liner (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - (120 MIL FML)

C TOTAL COST (Total Present Worth)

(i Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,005,000

(ii Total Initial Construction Cost

31,869,000

(F) TOTAL PROJECT COST (Rounded to the nearest Thousand)

33,474,000

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - HOT SPRAYED ASPHALT</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8"DPx20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	876	31.50	4,030
7	35' x 35' x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(C) PAGE 1 TOTAL						6,680	133,200	84,048	41,280		334,850

J-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,583,100	66,997	52.60	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	974,173	CY	-	0.065	62,805	1,656,094	0	496,626	2.20	2,152,920
12	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY	413,664 620,496	SY GAL	2	0.13	53,776	1,075,526	827,328	322,658	5.40	2,225,510
13	Placement of 30 Mil Flexible Membrane Liner	3,832,419	SF	0.14	0.0055	21,078	421,566	536,539	-	0.20	958,100
14	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,263	65,661	1,378,661	19,666	11.10	1,464,240
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,986	46,184	-	0.20	88,170
16	Placement of 1'-6" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,165	41,058	4.70	911,100
17	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,610	10.40	684,590
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	4,010	SY	1.50	0.16	642	12,832	6,015	3,650	5.70	22,700
19	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,896	2.60	151,220
(C) PAGE 2 TOTAL						189,810	3,796,205	9,735,961	999,796		14,531,970

J-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	469,981	SY	0.25	0.01	4,700	93,996	117,495	28,199	0.50	239,690
21	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	176,120
22	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1980	7,920
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
25	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,580	77,400
(C) PAGES 1,2,3 TOTAL						206,102	4,122,041	10,076,962	1,097,955		15,401,270
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							78,319	251,924			330,240
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											770,000
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,680,140				1,680,140
(C) TOTAL DIRECT COST						206,100	5,880,500	10,328,890	1,097,950		18,181,710

J-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
<u>INDIRECT COSTS</u>											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								272,730
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								363,630
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,818,170
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								909,090
5	Engineering & Services @ 15% of Total Direct Cost										2,727,260
6	Craft Support @ 20.8 % of Total Direct MHRS(\$19/hr)					42,870					814,530
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						2,734,433	2,737,156			5,471,590
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					51,938					2,268,640
9	Project Management @ 8% on Total Direct + Indirects										2,626,190
(C) TOTAL INDIRECT COST											17,271,530

J-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										18,181,710
	TOTAL INDIRECT COST										17,271,830
	DURATION FACTOR (3.2% On Direct+Indirect)										1,134,513
	TOTAL INITIAL CONSTRUCTION COST										36,588,000
B	<u>O & M COSTS</u>										
*	Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
*	Inspection Activities of Closed Facility Monthly	240	HR							75	18,000
*	Subsidence Monitoring (Annual Survey)	80	HR							75	6,000
*	Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Yr - Pest Control - Erosion Control & Drain. Maint.	80	AC							500	40,000
*	Cover Repair Due To Subsidence	1	LS								10,000
*	Annual Fence Maintenance	1									850
*	Annual Sign Maintenance	28								40	1,120
*	Annual Monitoring Well Maintenance	30								75	2,250
	(C) TOTAL O & M COST										105,220

J-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/30/93
LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - HOT SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,617,000

(II Total Initial Construction Cost

36,588,000

(C) TOTAL PROJECT COST (Rounded to the nearest Thousand)

36,205,000

J-5. Cost Estimate for a Cover System Utilizing 1/4-inch Thick Hot Sprayed or Emulsified Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PGWLK
PHONE: 7-5268
DATE: 08/30/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - REINFORCED SPRAYED ASPHALT</u>											
A DIRECT COSTS											
I SITE PREPARATION											
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	20' Wide Gravel Haul Road x 8" Deep	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x35'x4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	900
8	6'x35'x4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(D) PAGE 1 TOTAL						6,680	133,200	84,048	41,280		334,850

J-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,682	TN	50	0.1	11,168	223,324	5,583,100	68,997	52.60	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	974,173	CY	-	0.065	62,805	1,656,094	0	496,828	2.20	2,152,920
12	Placement of 30 Mil Flexible Membrane Liner	3,832,419	SF	0.14	0.0055	21,078	421,568	536,539	-	0.20	958,100
13	Placement of Geotextile Reinforcement on Foundation Layer	413,633	SY	0.26	0.005	2,068	41,363	107,543	-	0.40	148,910
14	Applied Hot Asphalt using 3 passes at a rate of 0.5 gal / SY for a total of 1.5gal/Sy	413,664	SY	2.00	0.13	53,776	1,075,528	827,328	322,658	5.40	2,225,510
		620,496	GAL								
15	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,378,661	19,696	11.10	1,464,240
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,986	48,184	-	0.20	85,170
17	Placement of 1'-6" Common Fill	195,518	CY	3.75	0.035	6,843	136,861	733,185	41,058	4.70	911,103
18	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,810	10.40	684,590
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	4,010	SY	1.50	0.16	642	12,832	6,015	3,850	5.70	22,700
20	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,896	2.60	151,220
(D) PAGE TOTAL						191,878	3,837,568	9,843,525	999,796		14,680,680

J-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5268
DATE: 08/30/93
LOC: MDC-108

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching	469,981	SY	0.25	0.01	4,700	93,996	117,495	28,189	0.50	239,690
22	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	176,120
23	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,900	7,920
24	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
26	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,580	77,400
(D) PAGES 1,2,3 TOTAL						208,170	4,163,404	10,184,506	1,097,955		15,550,180
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							79,105	254,613			333,717
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											777,510
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,697,000				1,697,000
(D) TOTAL DIRECT COST						208,170	5,939,510	10,439,120	1,097,950		18,358,410

J-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5268

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								275,380
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								367,170
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,835,840
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								917,920
5	Engineering & Services @ 15% of Total Direct Cost										2,753,760
6	Craft Support @ 20.8% of Total Direct MHRS(\$19/hr)					43,300					822,700
7	Field Indirects on Total Direct Labor @ 46.5%, Material @ 26.5%						2,761,872	2,768,367			5,528,240
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					52,459					2,291,400
9	Project Management @ 8% of Total Direct + Indirects										2,652,070
(D) TOTAL INDIRECT COST											17,444,480

J-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK
PHONE: 7-5268
DATE: 08/30/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										16,358,410
	TOTAL INDIRECT COST										17,444,480
	DURATION FACTOR (3.2% On Direct+Indirect)										1,145,692
	TOTAL INITIAL CONSTRUCTION COST										36,949,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Closed Facility Monthly	240	HR							75	18,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing Once/Year - Pest Control - Erosion Control & Drain. Maint.	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								10,700
	• Annual Fence Maintenance	1									850
	Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	• Subsidence Monitoring (Annual Survey)	80	HR							75	6,000
	(D) TOTAL O & M COST										105,920

J-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE280412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/30/93
LOC: MDC-108

SUMMARY

EIGHTY (80) ACRES SITE - REINFORCED SPRAYED ASPHALT

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,628,000
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(II Total Initial Construction Cost	36,949,000
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(D) TOTAL PROJECT COST (Rounded to the nearest Thousand)	38,577,000
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J-6. Cost Estimate for a Cover System Utilizing Reinforced Sprayed Asphalt (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)</u>											
A DIRECT COSTS											
I SITE PREPARATION											
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8"DP X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(K) PAGE 1 TOTAL						6,000	133,200	84,048	41,280		334,850

J-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,583,100	66,997	52.00	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	974,173	CY	-	0.065	63,321	1,266,420	0	496,828	2.20	2,152,920
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	259,653	CY	13.00	0.165	42,843	856,855	3,375,489	257,056	17.30	4,488,400
13	Placement of 30 Mil Flexible Membrane Liner	3,632,419	SF	0.14	0.0055	21,078	421,568	536,539	-	0.20	956,100
14	Placement of 1'-0 Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,378,661	19,696	11.10	1,464,240
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,986	48,184	-	0.20	66,170
16	Placement of 1'-6" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,185	41,056	4.70	911,100
17	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,610	10.40	684,590
18	Placement of Perimeter Exterior Drainage Layer 3/4"x8" DP (Crushed Stone)	4,010	SY	1.50	0.16	642	12,832	6,015	3,850	5.70	22,700
19	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,696	2.60	151,220
(K) PAGE 2 TOTAL						176,877	3,577,533	12,294,142	934,184		16,795,600

J-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	469,981	SY	0.25	0.01	4,700	93,996	117,495	28,199	0.50	239,690
21	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	176,120
22	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,980	7,920
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
25	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,580	77,400
(K) PAGES 1,2,3 TOTAL						195,168	3,903,369	12,625,123	1,032,353		17,065,160
Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							74,164	315,628			389,790
Clean up & Demobilize (Assume 5% of Total Direct Cost)											863,200
LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,591,010				1,591,010
(K) TOTAL DIRECT COST						195,170	5,568,540	12,940,750	1,032,350		20,529,220

J-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								307,940
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								410,580
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								2,052,920
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								1,026,460
5	Engineering & Services @ 15% of Total Direct Cost	1	LS								3,079,380
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					40,595					771,310
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						2,589,371	3,429,299			6,018,670
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate Of \$43.68					49,183					2,148,310
9	Project Management @ 8% of Total Direct + Indirects										2,907,580
(K) TOTAL INDIRECT COST											18,723,150

J-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										20,529,220
	TOTAL INDIRECT COST										18,723,150
	DURATION FACTOR (3.2% On Direct+Indirect)										1,258,078
	TOTAL INITIAL CONSTRUCTION COST										40,508,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Facility - Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	80	HR							75	6,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								23,000
	• Annual Fence Maintenance	1									850
	Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(K) TOTAL O & M COST										118,220

J-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: E5E260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/30/93
LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - 2'-0" COMPACTED CLAY (OFF SITE)

C TOTAL COST (Total Present Worth)

(Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,817,000
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(I Total Initial Construction Cost	40,508,000
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(K) TOTAL PROJECT COST (Rounded to the nearest Thousand)	42,325,000
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J-7. Cost Estimate for a Cover System Utilizing Compacted Kaolin (Offsite) Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8" DP X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.00	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(J) PAGE 1 TOTAL						6,680	133,200	84,048	41,280		334,850

J-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR Mhd\$20	MAT'L \$	BEMCAP \$/MMH	UNIT COST	TOTAL COST
<u>II COVER CONSTRUCTION</u>											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,583,100	66,997	52.60	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	974,173	CY	-	0.085	82,805	1,656,094	0	496,828	2.20	2,152,920
12	Compact 2'-0" Thick Clay Layer in 6" Lifts	259,653	CY	-	0.185	42,843	856,855	0	257,056	4.30	1,113,910
13	Placement of 30 Mil Flexible Membrane Liner	3,832,419	SF	0.14	0.0055	21,078	421,568	536,539	-	0.20	958,100
14	Placement of 1'-0 Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,376,861	19,696	11.10	1,464,240
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,966	46,184	-	0.20	88,170
16	Placement of 1'-8" Common Fill	185,516	CY	3.75	0.035	6,843	136,861	733,185	41,058	4.70	911,100
17	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,610	10.40	684,590
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	4,010	SY	1.50	0.16	642	12,832	6,015	3,650	5.70	22,700
19	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,696	2.60	151,220
(J) PAGE 2 TOTAL						178,877	3,577,533	8,908,653	834,194		13,420,370

J-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching	469,981	SY	0.25	0.01	4,700	93,996	117,495	28,199	0.50	239,690
21	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	19	176,120
22	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,960	7,920
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
25	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,580	77,400
(J) PAGES 1,2,3 TOTAL						195,168	3,903,369	9,249,634	1,032,353		14,269,670
* Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							74,164	231,241			305,400
* Clean up & Demobilize (Assume 5% of Total Direct Cost)											714,480
* LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,591,010				1,591,010
(J) TOTAL DIRECT COST						195,170	5,568,540	9,480,870	1,032,350		16,900,500

J-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								253,510
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								338,010
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,690,000
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								845,030
5	Engineering & Services @ 15% of Total Direct Cost										2,535,000
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					40,600					771,400
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						2,589,371	2,512,431			5,101,800
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68					49,183					2,148,310
9	Project Management @ 8% of Total Direct + Indirects										2,059,400
(J) TOTAL INDIRECT COST											16,342,000

J-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										16,900,560
	TOTAL INDIRECT COST										16,342,660
	DURATION FACTOR (3.2% On Direct+Indirect)										1,063,783
	TOTAL INITIAL CONSTRUCTION COST										34,307,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Facility - Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	80	HR							75	6,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Pest Control - Erosion Control & Drainage Maintenance	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								22,300
	• Annual Fence Maintenance	1									850
	Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(J) TOTAL O & M COST										117,520

J-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - 2'-0" COMPACTED CLAY (ON SITE)

C TOTAL COST (Total Present Worth)

(I) Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

1,807,000

(II) Total Initial Construction Cost

34,307,000

(J) TOTAL PROJECT COST (Rounded to the nearest Thousand)

36,114,000

J-8. Cost Estimate a for Cover System Utilizing Compacted Onsite Sandy Clay and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOG: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - SOIL CEMENT COVER</u>											
<u>A DIRECT COSTS</u>											
<u>1 SITE PREPARATION</u>											
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8" DP X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	180	SY	3.00	0.1	18	320	480	96	5.80	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(G) PAGE 1 TOTAL						6,660	133,200	84,048	41,280		334,850

J-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$8/MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,682	TN	50	0.1	11,168	223,324	5,583,100	66,997	52.60	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	974,173	CY	-	0.085	82,805	1,656,094	0	496,828	2.20	2,152,920
12	Soil-Cement mixture transported from central mixing plant by end-dump trucks and placed in 6-8" lifts by spreaders. Assume Fine Sand Soil with 321# of cement/CY. Compact the soil-cement uniformly to 98% max. density.	390,365	CY	18	0.12	46,844	936,876	7,026,570	261,063	21.10	8,244,510
13	Curing soil-cement. Assume liquid Asphalt applied 0.4gal/sy for 1st coat & 0.2 for 2nd.	393,642	SY	0.33	0.03	11,809	236,185	129,902	-	0.90	366,090
		393,642	SY	0.17	0.02	7,873	157,457	66,919	-	0.60	224,380
14	Placement of 30 Mil Flexible Membrane Liner	3,832,419	8F	0.14	0.0055	21,078	421,568	536,539	-	0.20	856,100
15	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,378,881	19,696	11.10	1,484,240
16	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,859	SY	0.11	0.005	2,099	41,906	46,184	-	0.20	66,170
17	Placement of 1'-6" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,185	41,058	4.70	911,100
18	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,749	13,810	10.40	684,590
(G) PAGE 2 TOTAL						186,957	3,739,149	14,768,095	864,587		20,967,520

J-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
19	Placement of Perimeter Exterior Drainage Layer 3/4"x3" DP (Crushed Stone)	4,010	SY	1.5	0.16	642	12,632	6,015	3,850	5.70	22,700
20	Excavation of Trapezoidal Drainage Ditch	58,160	CY	-	0.1	5,816	116,320	0	34,896	2.60	151,220
21	Seeding, Fertilizing & Mulching	469,961	SY	0.25	0.01	4,700	93,996	117,495	28,199	0.50	239,690
22	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	176,120
23	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,960	7,920
24	Warning Signs 4-18"x24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
26	Ground Water Monitoring Wells (100' Deep)	30	EA	500	60.00	2,400	48,000	15,000	14,400	2,580	77,400
PAGES 1,2,3 TOTAL						209,707	4,194,137	15,115,091	1,001,491		22,010,740
Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							79,689	377,877			457,570
Clean up & Demobilize (Assume 5% of Total Direct Cost)											1,100,540
LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,709,530				1,709,530
(G) TOTAL DIRECT COST						209,710	5,963,366	15,492,970	1,001,490		25,278,360

J-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: BSE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH:\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								379,180
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								505,570
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								2,527,840
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								1,263,920
5	Engineering & Services @ 15% of Total Direct Cost										3,791,760
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					43,620					828,780
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						2,782,262	4,105,637			6,887,900
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					52,847					2,308,350
9	Project Management @ 8% of Total Direct + Indirects										3,501,730
(G) TOTAL INDIRECT COST											21,995,030

J-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 08/30/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MHx\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										25,278,300
	TOTAL INDIRECT COST										21,995,030
	DURATION FACTOR (3.2% On Direct+Indirect)										1,512,749
	TOTAL INITIAL CONSTRUCTION COST										48,786,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Closed Facility Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	80	HR							75	6,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								22,900
	• Annual Fence Maintenance	1									650
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(G) TOTAL O & M COST										118,120

J-9. Cost Estimate for a Cover System Utilizing Soil Cement and 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03
ACTIVITY CODE: E3E260412
PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 08/30/93
LOC: MDC-106

S U M M A R Y

EIGHTY (80) ACRES SITE - SOIL CEMENT COVER

C TOTAL COST (Total Present Worth)

(Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,816,000
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(I Total Initial Construction Cost	48,786,000
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(G) TOTAL PROJECT COST (Rounded to the nearest Thousand)	50,602,000
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DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MR	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - BENTONITE SOIL ADDITIVE</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8"DP X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(H) PAGE 1 TOTAL						6,600	133,200	84,046	41,280		334,850

J-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E5E260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$@MFL	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,583,100	66,997	52.80	5,873,420
11	Place and Compact Foundation Soil in 6" Lifts to 95% Std. Proctor	974,173	CY	-	0.065	62,005	1,056,094	0	496,626	2.20	2,162,920
12	Bentonite Soil Admix Sodium Bentonite will be added to a Silty Sand at an application rate of 2 PSF per 6 inch lift. Two lifts required for a total barrier thickness of 12" compact, each lift to 95% std. Proctor & Scarify between lifts.	3,489	TN	148.5	1.85	6,455	129,093	511,150	-	163.50	640,230
		127,223	CY	15.00	0.145	18,447	368,947	1,906,345	110,684	18.80	2,387,960
13	Placement of 30 Mil Flexible Membrane Liner	3,832,419	SF	0.14	0.0055	21,078	421,568	536,539	-	0.20	958,100
14	Placement of 1'-0" Coarse Sand Drainage Layer	131,322	CY	10.50	0.025	3,283	65,661	1,378,661	18,696	11.10	1,464,240
15	Placement of Geotextile (TYPAR) Filter on 1'-0" Coarse Sand Drainage Layer	419,659	SY	0.11	0.005	2,099	41,966	48,164	-	0.20	66,170
16	Placement of 1'-8" Common Fill	195,516	CY	3.75	0.035	6,843	136,861	733,185	41,058	4.70	911,100
17	Placement of 6" Topsoil	65,763	CY	9.50	0.035	2,302	46,034	624,748	13,610	10.40	684,590
(H) PAGE 2 TOTAL						145,334	2,908,671	9,964,163	694,206		15,160,750

J-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
18	Placement of Perimeter Exterior Drainage Layer 3/4"x3" Stone	4,010	SY	1.5	0.16	642	12,832	6,015	3,850	5.70	22,700
19	Excavation of Trapezoidal Drainage Ditch around Cap Perimeter	58,160	CY	-	0.1	5,816	116,320	0	34,896	2.80	161,220
20	Seeding, Fertilizing & Mulching	469,961	SY	0.25	0.01	4,700	93,998	117,495	28,199	0.50	239,690
21	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	176,120
22	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,980	7,920
23	Warning Signs 4-18"x24"	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
25	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,580	77,400
PAGES 1,2,3 TOTAL						168,063	3,361,659	10,311,184	831,112		16,203,970
• Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							63,872	257,780			321,650
• Clean up & Demobilize (Assume 5% of Total Direct Cost)											810,200
• LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							1,370,210				1,370,210
(H) TOTAL DIRECT COST						168,060	4,795,740	10,568,980	831,110		16,708,030

J-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PJ/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT	TOTAL MH	LABOR MH	MAT'L	BEMCAP \$/MR	UNIT COST	TOTAL COST
	INDIRECT COSTS									
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS							280,580
2	Health & Safety Assume 2% of Total Direct Cost	1	LS							374,120
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS							1,870,920
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS							935,300
5	Engineering & Services @ 15% of Total Direct Cost									2,805,900
6	Craft Support @ 20.8% of Total MHR(\$19/hr)				34,960					664,240
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%					2,230,018	2,800,774			5,030,790
8	Construction Nonmanual @ 25.2% of Total MH @ Rate of \$43.68				42,356					1,850,120
9	Project Management @ 8% of Total Direct + Indirects									2,001,420
	(H) TOTAL INDIRECT COST									16,413,060

J-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MR	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										18,706,030
	TOTAL INDIRECT COST										18,413,080
	DURATION FACTOR (3.2% On Direct+Indirect)										1,123,812
	TOTAL INITIAL CONSTRUCTION COST										36,243,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Closed Facility Assume Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	80	HR							75	6,000
	• Maintenance of Vegetative Cover - 2 Mowings / year - Fertilizing once/ year - Rodent Control - Erosion Cont. & Drainage Maintenance	80	AC							500	40,000
	• Cover Repair Due To Subsidence	1	LS								14,900
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(H) TOTAL O & M COST										110,120

J-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

SUMMARY

EIGHTY (80) ACRES SITE - BENTONITE SOIL ADDITIVE

C TOTAL COST (Total Present Worth)

(I Present Worth of O & M Cost (5% discount Rate for 30 Years) (Total O & M x 15.3725)	1,693,000
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(II Total Initial Construction Cost	36,243,000
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(H) TOTAL PROJECT COST (Rounded to the nearest Thousand)	37,936,000
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J-10. Cost Estimate for a Cover System Utilizing Bentonite Soil Additive and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - ASPHALTIC CONCRETE</u>											
A DIRECT COSTS											
I SITE PREPARATION											
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,840	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8" Deep X 20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35'-0 x 35'-0 x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	530	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(B) PAGE 1 TOTAL						6,680	133,200	84,048	41,280		334,850

J-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@20	MAT'L \$	BEMCAP \$@MH	UNIT COST	TOTAL COST
II COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,583,100	66,997	52.00	5,873,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	667,000	CY	-	0.065	56,695	1,133,900	0	340,170	2.20	1,474,070
12	Placement of 30 Mil Flexible Membrane Liner	3,619,800	SF	0.14	0.0055	19,909	398,178	506,772	-	0.30	904,950
13	Placement of 1'-0 Coarse Sand Drainage Layer	133,350	CY	10.50	0.025	3,334	66,675	1,400,175	20,003	11.10	1,486,650
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	29,200	LF	1.0	0.06	2,336	46,720	29,200	-	2.60	75,920
15	2 1/2" Binder Course	391,908	SY	4.15	0.055	21,555	431,099	1,626,418	129,330	5.00	2,186,650
16	4" Hydraulic Asphalt Conc.	391,908	SY	6.00	0.03	11,757	235,145	2,586,593	70,843	7.40	2,692,260
17	Asphalt Mastic Seal	391,908	SY	0.50	0.015	5,879	117,572	185,954	-	0.60	313,530
18	Sprayed Asphaltic Concrete Sealant	391,908	SY	0.75	0.015	5,879	117,572	283,931	35,272	1.10	446,780
19	Excavation of Triangular Drainage Ditch	44,296	CY	-	0.1	4,430	88,592	0	26,576	2.60	115,170
20	4" Thick Asphalt Perimeter Drainage Ditch	37,740	SY	7.00	0.144	5,435	108,691	266,824	32,007	11.30	428,120
(B) PAGE 2 TOTAL						146,573	2,967,469	12,506,967	721,499		16,197,940

J-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	DEM CAP \$@MH	UNIT COST	TOTAL COST
21	Seeding, Fertilizing & Mulching of Grassed area inside the Security Fence	21,920	SY	0.25	0.01	219	4,384	5,480	1,315	0.50	11,180
22	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	178,120
23	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,980	7,920
24	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	190	5,320
25	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
26	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2580	77,400
(B) PAGES 1,2,3 TOTAL						180,185	3,203,693	12,737,933	792,775		16,836,730
Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							80,870	318,448			379,320
Clean up & Demobilize (Assume 5% of Total Direct Cost)											841,840
LOCATION FACTOR @ 40% On (Total Labor Cost+Escalation)							1,305,830				1,305,830
(B) TOTAL DIRECT COST						180,185	4,570,390	13,056,360	792,770		19,365,820

J-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR Mlb@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								290,490
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								367,320
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								1,836,580
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								968,290
5	Engineering & Services @ 15% of Total Direct Cost										2,904,670
6	Craft Support @ 20.8% of Total MHRS (\$19/hr)					33,517					633,030
7	Field Indirects of Total Direct Labor @ 46.5%, Material @ 26.5%						2,125,231	3,459,941			5,585,170
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					40,365					1,763,160
9	Project Management @ 8% of Total Direct + Indirects										2,706,780
(B) TOTAL INDIRECT COST											17,175,680

J-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
	TOTAL DIRECT COST										19,385,820
	TOTAL INDIRECT COST										17,175,690
	DURATION FACTOR (3.2% On Direct+Indirect)										1,169,328
	TOTAL INITIAL CONSTRUCTION COST										37,711,000
B	<u>O & M COSTS</u>										
	• Groundwater Monitoring Laboratory Analysis of Samples & Report Writing (Quarterly)	120	EA							225	27,000
	• Inspection Activities of Facility - Monthly	240	HR							75	18,000
	• Subsidence Monitoring Annual Survey	80	HR							75	6,000
	• Maintenance of Asphalt Cover - Crack repair due to subgrade settlement and weathering	80	AC							800	64,000
	• Cover Repair Due To Subsidence	1	LS								14,300
	• Annual Fence Maintenance	1									850
	• Annual Sign Maintenance	28								40	1,120
	• Annual Monitoring Well Maintenance	30								75	2,250
	(B) TOTAL O & M COST										133,520

J-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-104

SUMMARY

EIGHTY (80) ACRES SITE - ASPHALTIC CONCRETE

C TOTAL COST (Total Present Worth)

(Present Worth of O & M Cost
(5% discount Rate for 30 Year)
(Total O & M x 15.3725)

2,053,000

(I) Total Initial Construction Cost

57,711,000

(B) TOTAL PROJECT COST (Rounded to the nearest Thousand)

59,764,000

J-11. Cost Estimate for a Cover System Asphalt Concrete Hydraulic Barrier and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@320	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
<u>EIGHTY (80) ACRES SITE - CONCRETE SLAB</u>											
A	<u>DIRECT COSTS</u>										
I	<u>SITE PREPARATION</u>										
1	Clearing & Grubbing	100	AC	-	40	4,000	80,000	0	24,000	-	104,000
2	Precontouring Site	20	AC	-	32	640	12,800	0	3,640	-	16,640
3	Silt Fence (Includes Maintenance)	5,600	LF	0.50	0.05	280	5,600	2,800	-	1.50	8,400
4	Temporary Sediment Control	1	LS	-	-	0	0	0	3,000	-	53,400
5	8"DPX20' Wide Gravel Haul Road	9,280	LF	8.50	0.1	928	18,560	78,880	5,568	11.10	103,010
6	2-15" RCP Culverts	128	LF	12.00	0.75	96	1,920	1,536	576	31.50	4,030
7	35' x 35'x 4" Gravel Decon. Area	160	SY	3.00	0.1	16	320	480	96	5.60	900
8	6'x 35'x 4'Deep Wash Water Containment Ditch	35	CY	10	20	700	14,000	350	4,200	532	18,550
9	Construction Trailer (Rental) (Include Power & Water)	36	MO	-	-	0	0	0	-	720	25,920
(E) PAGE 1 TOTAL						6,660	133,200	84,048	41,280		334,850

J-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML

DETAIL ESTIMATE

LOG #: 7-03
ACTIVITY CODE: ESE260412
PROJ. NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: PG/WLK
PHONE: 7-3266
DATE: 09/09/93
LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH \$420	MAT'L \$	BEACAP \$/MH	UNIT COST	TOTAL COST
II. COVER CONSTRUCTION											
10	Waste Stabilization (Crushed Limestone)	111,662	TN	50	0.1	11,166	223,324	5,553,100	66,997	53.60	5,573,420
11	Place and Compact Foundation Soil in 8" Lifts to 95% Std. Proctor	687,000	CY	-	0.065	56,655	1,133,900	0	340,170	2.20	1,474,070
12	Placement of 30 Mil Flexible Membrane Liner	3,619,800	SF	0.14	0.0055	19,909	\$96,178	506,772	-	0.30	904,950
13	Placement of 1'-0" Coarse Sand Drainage Layer	133,350	CY	10.50	0.025	3,334	66,675	1,400,175	20,003	11.10	1,466,950
14	2" PVC Perforated Drainage Pipe placed in Drainage layer	28,200	LF	1.00	0.08	2,336	46,720	28,200	-	2.00	75,920
15	4" Concrete Slab with 1 Layer of (conc.+form) 6X6-W 2.9xW 2.9(wld.wire fab)Broom Finish.	391,900	SY	7.50	0.36	141,084	2,821,690	2,939,250	(0.60/hr) 112,867 (comp rate)	15.00	5,573,800
16	Sprayed on Curing Compound	391,900	SY	0.16	0.01	3,919	78,390	62,704	23,514	0.40	164,000
17	Joint Sealant 6" PVC Water Stops	381,000	LF	2.30	0.05	19,050	381,000	876,500	-	3.50	1,257,500
18	Excavation of Triangular Drainage Ditch	44,280	CY	-	0.1	4,429	66,590	0	26,574	2.60	115,150
19	4" Thick Concrete Perimeter Drainage Ditch	37,740	SY	7.20	0.36	13,556	271,728	271,728	81,516	18.00	624,970
(E) PAGE 2 TOTAL											17,851,030

J-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

D E T A I L E S T I M A T E

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: ESE260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-5266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR MH@\$20	MAT'L \$	BEMCAP \$\$/MH	UNIT COST	TOTAL COST
20	Seeding, Fertilizing & Mulching of Grassed area Inside the Security Fence	21,920	SY	0.25	0.01	219	4,384	5,480	1,315	0.50	11,180
21	Install 8' High Chain Link Perimeter Fence	9,520	LF	12	0.25	2,380	47,600	114,240	14,280	18.50	178,120
22	Chain Link Security Gate 8'Hx20'W	4	EA	1500	24.00	96	1,920	6,000	-	1,980	7,920
23	Warning Signs 4-18"x 24" - Installed	28	EA	150	2.00	56	1,120	4,200	-	180	5,320
24	Survey of Final Cover & Subsidence Markers	1	LS	-	-	0	0	0	-	28,000	28,000
25	Ground Water Monitoring Wells (100' Deep)	30	EA	500	80.00	2,400	48,000	15,000	14,400	2,580	77,400
(E) PAGES 1,2,3 TOTAL						287,319	5,748,369	11,898,185	742,919		18,491,820
Escalation for 1994 on Direct Labor is 1.9% & on Direct Material is 2.5%							109,181	297,453			406,640
Clean up & Demobilize (Assume 5% of Total Direct Cost)											924,590
LOCATION FACTOR @ 40% on (Total Labor Cost + Escalation)							2,342,230				2,342,230
(E) TOTAL DIRECT COST						287,320	6,197,800	12,195,650	742,920		22,185,280

J-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

CHK'D BY: S. MEAD

LOG #: 7-03

ACTIVITY CODE: E3E260412

PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

ESTIMATOR: PG/WLK

PHONE: 7-3266

DATE: 09/09/93

LOC: MDC-106

LINE #	ACTIVITY	EST QTY	UM	UNIT MAT'L	UNIT MH	TOTAL MH	LABOR Mhr@\$20	MAT'L \$	BEMCAP \$6/MH	UNIT COST	TOTAL COST
INDIRECT COSTS											
1	Certification of the Final Cover (Assume 1.5% of the Total Direct Cost)	1	LS								332,480
2	Health & Safety Assume 2% of Total Direct Cost	1	LS								443,310
3	Scope Contingency Assume 10% of Total Direct Cost	1	LS								2,218,530
4	Administrative & Legal @ 5% of Total Direct Cost	1	LS								1,108,280
5	Engineering & Services @ 15% of Total Direct Cost	1	LS								3,324,790
6	Craft Support @ 20.8% of Total MHRS(\$19/hr)					59,760					1,135,440
7	Field Indirects of Total Direct Labor @ 48.5%, Mat'rial @ 28.5%						3,611,977	3,231,847			7,043,820
8	Construction Nonmanual @ 25.2% of Total Direct MH @ Rate of \$43.68					72,405					3,379,850
9	Project Management @ 8% of Total Direct + Indirects										3,291,960
(E) TOTAL INDIRECT COST											22,278,480

J-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE B

CHK'D BY: S. MEAD

LOG # : 7-03
ACTIVITY CODE: BSE260412
PROJ.NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL
ESTIMATOR: PG/WLK
PHONE: 7-5266
DATE: 09/09/93
LOC: MDC-106

LINE	ACTIVITY	EST	UM	UNIT	MATL	QTY	UM	UNIT	TOTAL	LABOR	MH\$20	\$	BEMCAP	\$/MH	UNIT	COST	TOTAL	COST
	TOTAL DIRECT COST															22,185,280	22,276,480	1,422,136
	TOTAL INDIRECT COST																	
	DURATION FACTOR (3.2% On Direct+Indirect)																	
	TOTAL INITIAL CONSTRUCTION COST																45,864,000	
B	Q & M COSTS																	
	Groundwater Monitoring Laboratory																	
	Analysis of Samples & Report																	
	Writing (Quarterly)																	
	Inspection Activities of Facility-Monthly																	
	Subsidence Monitoring Annual Survey																	
	Maintenance of Concrete Slab																	
	Cover Repair Due To Subsidence																	
	Annual Fence Maintenance																	
	Annual Sign Maintenance																	
	Annual Monitoring Well Maintenance																	
(E)	TOTAL O & M COST																	

J-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)

DETAIL ESTIMATE

LOG # : 7-03
ACTIVITY CODE: ESE260412
PROJ NAME: ECON. EVALUATION OF CLOSURE CAP BARRIER MATERIAL

CHK'D BY: S. MEAD
ESTIMATOR: POWELL
PHONE: 7-3244
DATE: 08/19/93
LOC: MDC-104

SUMMARY

EIGHTY (80) ACRES SITE - CONCRETE SLAB

C TOTAL COST (Total Present Worth)

(Present Worth of O & M Cost
(5% discount Rate for 30 Years)
(Total O & M x 15.3725)

2,235,000

(I Total Initial Construction Cost

45,664,000

(E) TOTAL PROJECT COST (Rounded to the nearest Thousand)

48,000,000

J-12. Cost Estimate for a Cover System Utilizing Poured-in Place Concrete Slab and a 30-mil FML (Cont'd)